4-15-2022

Stakeholder Participation and Influence at State Public Utility Commissions

Genevieve Theresa Kruse
Portland State University

Stakeholder Participation and Influence at State Public Utility Commissions

by

Genevieve Theresa Kruse

A dissertation submitted in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy
in
Public Affairs and Policy

Dissertation Committee:
Craig Shinn, Chair
Phillip Cooper
Hal Nelson
Joshua Eastin
Max Nielsen-Pincus

Portland State University
2022

Abstract

Despite the international consensus that climate change is a problem, few substantive policies are being pushed forward at the national level to meet international greenhouse gas reduction commitments under the Paris Agreement. The most significant climate change policies are emerging at state public utility commissions (PUCs). While PUCs were traditionally structured to regulate utilities, state PUCs are now finding themselves at the hub for renewable energy, clean energy, and distributed energy policies. Despite the increase in renewable and clean energy policies at state PUCs, there is a noticeably small environmental and clean energy stakeholder presence at those PUC proceedings. A similar gap is reflected in the state interest group and regulatory literatures, as most scholarship has focused on federal regulatory agencies and industry influence.

Based on the lack of knowledge of environmental and clean energy interest group participation and influence at state PUCs, this study seeks to answer two interrelated questions. First, what participatory mechanisms lead to greater levels of influence among environmental and clean energy groups at public utility commissions? Second, what effect do the social dynamics among stakeholder groups have on shaping a stakeholder's ability to be influential?

This dissertation advances a new model of access points and stakeholder influence. The model proposes that participatory and inclusive mechanisms throughout the PUC stakeholder process can provide distinct access points for environmental and clean energy interest groups. These access points can shape their ability to influence the

rulemaking process and their behaviors towards other stakeholders. The benefits from an inclusive stakeholder framework can carry over to subsequent proceedings in which stakeholders can, at a minimum, have a mutual understanding of important issues and, ideally, mutually beneficial relationships with one another.

This dissertation approaches the methodology in two phases. For the first phase of the methods, Qualitative Comparative Analysis (QCA) is employed (Ragin, 1987, 2000). This dissertation utilizes QCA to examine stakeholder access points across energy storage proceedings at state PUCs in California, Oregon, Nevada, New York, and Virginia. The second phase of this dissertation's methodology analyzes interviews with stakeholders involved in Oregon's energy storage proceeding. The coding software NVivo is employed in conjunction with the qualitative approach, thematic analysis (TA), to examine stakeholders' perceived influence.

The QCA findings confirmed that the pre-proposal and the comment period were crucial access points for stakeholder influence. In addition, the QCA findings highlighted that environmental and clean energy stakeholders will be more influential when there are more *inclusive* opportunities. Inclusive access points provide greater opportunities for stakeholders to gain knowledge, coproduce important documents, and create issue and network linkages.

The findings from the interview analysis discovered that stakeholders construct their perceptions of influence based on implicit assessments of an individual's expertise, experience, group capacity, group reputation, and network. This dissertation encapsulates this phenomenon in the model of implicit influence. The model of implicit influence explains how an individual's level of implicit influence can affect how others perceive them and subsequently, interact with them.

The dual models of access points and implicit influence provide meaningful contributions to the state regulatory literature and interest group literature regarding when, why, and to what extent stakeholders can be influential at state PUCs. In addition, the findings from this dissertation are important to ensuring that environmental and clean energy groups are being invited to the table and have equal opportunities to shape the content of PUC proceedings. It is through these institutional changes that environmental and clean energy groups can begin to advance energy policy that supports climate change goals.

Acknowledgements

I would like to express my deepest gratitude to my committee. It has been a privilege to be supported by such a distinguished group of scholars and humanitarians. Foremost, I am indebted to Craig Shinn, for guiding me through this long journey. You have been a source of inspiration and knowledge from the first time I stepped into your class on collaborative governance. Your unwavering belief in me has sustained me during times of doubt. Thank you for being by my side this entire time. There are not enough words to express how much your mentorship has meant to me over the years.

I am extremely grateful to Phillip Cooper, who taught me to appreciate the complexity of state and local politics. You opened up a whole new world for me and provided me the platform to construct this dissertation. I am also deeply inspired by your integrity and unwavering belief that we can make this world a better place. This dissertation would not be what it is without the indispensable advice by Hal Nelson, who recommended that I take a closer look at energy storage policy. You have graciously shared your expertise with me. A special thanks to Josh Eastin, who was an invaluable source of encouragement and counsel from the very beginning. I am so appreciative of the opportunities and guidance that you gave me when I first started the program. Finally, I would like to thank Max Nielsen-Pincus for your significant input. Your wider perspective of natural resource management helped me expand my ideas beyond what was familiar to me.

My family and friends have been a huge part behind my success. To my parents, Willy and Julie Smith, thank you from the bottom of my heart. To my father, I will

always cherish our kitchen table talks and all of the stories you would tell me about your college and post-graduate days. You have been the inspiration behind my love for learning, and I appreciate all of the sacrifices that you have made to help me reach this point. To my mother, thank you for being my biggest champion. Your encouragement and love have propelled me throughout this whole process. There are no words that can express the level of gratitude that I have for you. I would not be where I am without you.

I would also like to extend my deep appreciation to my 72nd Avenue family. As we joke, we may not be able to choose the family we are born into, but we have chosen each other as a neighborhood family. The happy hours, socials, park picnics, and neighborhood shenanigans have kept me sane during this long process! Thank you for your friendships, support, wine, and most of all, for loving my boys.

To my sons, James Franklin and Dean Louis, thank you for your unconditional love and especially for all of the laughs and cuddles that we have shared. I will always cherish the times when we played chickadee babies and had mega story night. I appreciate your patience with me when I had to get work done and your funny jokes when I needed cheering up. I love you to the moon and beyond. And finally, last but never least, thank you to my husband, Josh Kruse. You have been by my side through the ups and downs of this process. I am so grateful for your love and support throughout all these years. You have pushed me to put forth the best version of myself when any challenges come my way. Thank you for making me laugh through all of the tears and dancing with me (or watching me make a fool out of myself?) during the many good times. I love you.

Table of Contents

List of Tables

List of Figures

Chapter 1 Introduction

The United States is currently the second-largest emitter of carbon dioxide globally, with 14.69% of the world's energy-related emissions and emissions from deforestation (Climate Change Performance Index, 2014). Of particular concern is the United States' electric sector, which makes up 40 percent of the country's total energy consumption, of which approximately 60 percent comes from natural gas and coal (U.S. Energy Information Administration, 2020). Emissions from coal and natural gas are significant contributors to climate change. Coal-fired power plants are the single largest contributor to man-made carbon dioxide, which has deleterious effects on global temperatures, the environment, and the population's health. Given the inextricable link between rising global temperatures and the severe effects of climate change, the United States must begin to transition away from fossil fuels and work towards integrating renewable energy more predominately into its energy resource mix.

While the United States has recommitted to the Paris Agreement, it is far from being on track to meeting its greenhouse gas (GHG) emissions reduction target. According to a report by the Rhodium Group (2022), emissions in the United States increased during 2021 by 6.2 percent relative to 2020 (although emissions did remain 5 percent below 2019 levels). The United States' international GHG commitments are further undermined by the lack of a viable national climate policy at home.

The United States' national climate change policy has been at a standstill for well over a decade. The partisan divide in Congress poses a major barrier to any substantial climate legislation being enacted at the national level. It does not help the situation that there has been a series of failed national climate bills in Congress over the course of three decades. Therefore, the United States currently lacks the political will to see a unified, national climate change policy emerge.

In the absence of any consistent national leadership on renewable energy or climate change policy, states in the United States have taken the lead in developing climate and renewable energy policies. Renewable portfolio standard (RPS) programs have been perceived as a promising renewable energy policy as the cost of renewable energy sources (i.e., wind and solar) becomes cheaper. As of 2021, 30 states and the District of Columbia have passed RPS mandates, and many states are presently amending them to make their targets more ambitious. In 2020, renewable energy in the United States accounted for 20 percent of the country's energy generation mix (BCSE, 2021). In addition, global investment in clean energy transition amounted to $500 billion, of which the United States invested $85 billion of that global total (BCSE, 2021). Therefore, despite concerns that COVID-19 would decrease demand for clean energy and renewable investment, the global trend shows steady growth and optimism.

However, the momentum feeding the current investment in renewable energy policy in the United States will plateau unless there are concrete innovations in energy storage technology. Volatility and oversupply problems make renewable energy generation especially complex and inefficient within the current energy system. For renewable energy policies to be effective, states need to integrate energy storage plans with renewable energy policies.

As of 2021, only nine states (California, Oregon, New York, New Jersey, Massachusetts, Nevada, Virginia, Connecticut, and Maine) have passed renewable energy storage targets. Table 1.1 shows the energy storage targets of the nine states, their target, and follow-through mechanisms to meet the target.

Table 1.1 State Energy Storage Targets

State	Target	Follow-through	Others
California 2010 bill 2013 regulation	1,325 MW by 2020 (Target)	Required solicitations, programmatic support, progress reporting	Carve-outs by segment (Tx connected, Dx-connected).
Oregon 2015 bill	Minimum 10 MWh, up to 1% peak load by 2020 (Mandate)	Legal mandate, utility plan required, planning reforms	
Massachusetts 2016 bill 2017 regulation 2018 bill	200 MWh by 2020, 1,000 MWh by 2025 (Target)	Target Utility plan required, programmatic support	Denotes target in MWh
New York 2017 bill 2018 regulation 2019 bill	1,500 MW by 2025, 3,000 MW by 2030 (Target)	Progress reporting, programmatic support	
New Jersey 2018 bill	600 MW by 2021, 2,000 MW by 2030 (Goal)	Goal	Has not established regulatory proceeding
Nevada 2017 bill 2020 regulation	1,000 MW by 2030 (Target)	Target Utility plan required, planning reforms	Biennial interim targets
Virginia 2020 bill 2020 regulation	3,100 MW by 2035 (Mandate)	Legal Mandate Interim targets	Requirement of at least 35% procured from third parties
Connecticut 2021 bill	300 MW by 2024, 650 MW by 2027, 1,000 MW by 2030 (Mandate)	Legal Mandate	PUC has not completed rulemaking
Maine 2021 bill	300 MW by 2025, 400 MW through 2030 (Mandate)	Legal Mandate	PUC has not completed rulemaking

Source: Modified from Burwen, Jason. (April, 24 2020). "Energy Storage Goals, Targets, Mandates. What's the Difference?" Energy Storage Association.

It should be noted that only six of those states have implemented their storage targets. New Jersey, Connecticut, and Maine successfully passed energy storage legislation, but they have not started their regulatory process to date. It is only a matter of time before other states begin to follow suit with legislative mandates for energy storage. Yet it is essential to examine how and why specific energy storage rules and regulations are created, given that energy storage is at the heart of a thriving renewable energy market. One can see the differences among state energy storage policies by looking at the distinction among their targets, goals, and mandates. On the less stringent side of the spectrum is a goal, which "is a number without defined accountability" (Burwen, 2020). In the middle of the spectrum is a target, which is a goal that possesses measures to follow through (Burwen, 2020). The most stringent on the spectrum is a mandate, which is a goal that possesses legal liability if not followed through (Burwen, 2020). These three types of policies evoke important features such as transparency, accountability, learning, flexibility, and monitoring.

While the legislation for renewable energy storage in the nine states has been highlighted for its innovativeness, the most substantive component of the policy process occurs during the regulatory stage, in which regulatory agencies implement, prescribe, and interpret rules through proceedings such as rulemakings (Kerwin and Furlong, 2011). In the case of energy storage rulemakings, state regulatory agencies (such as public utility commissions) set specific targets and rules to meet the authorizing statute. Kerwin and Furlong (2011, p. 7-8) highlight that "statutes provide the legal authority for rules and the various processes by which they are made. Rules provide the technical detail so often missing in statutes, and rulemaking brings a capacity for adaptation to changing circumstances that the letter of the law alone lack". It is important to note that any rules from the rulemaking process carry the force of the law (Cooper, 2006). The rulemaking process in every state is slightly different, depending upon a state's version of the Administrative Procedure Act, the authorizing statute of the rulemaking, the administrative agency handling the rulemaking, the current issue at hand, and state policymaking structures. Thus, the scope and the content of a rulemaking can vary from state to state.

It is also important to highlight that the rulemaking stage is the stage in the policy process in which there are more significant opportunities for public participation due to procedural rules that allow open participation and comment on the rule setting by any individual or group. While participation rates during the rulemaking process vary according to issue and level of government, organized interest groups perceive the rulemaking stage as being just as critical of a stage in the policy process as the legislative stage (Furlong and Kerwin 2004). The rulemaking process offers individuals and interest groups a unique opportunity to participate and influence the final rules.

Much of the bulk of renewable energy policy has been funneled through state public utility commissions (PUCs). State public utility commissions have traditionally been responsible for overseeing energy, telecommunications, and water policy. However, with the increase of state renewable energy policy, PUCs are entering new policy domains that do not always match up well with their traditional economic spheres of authority and jurisdiction.

Tangentially to the new roles that PUCs have encountered with renewable energy, PUCs are also seeking to institute more participatory mechanisms to combat the scars left from years of scandal and corruption. However, it is unclear whether these participation mechanisms effectively provide non-industry groups with more significant opportunities to engage in the process actively.

The literature across multiple disciplines has noted the overwhelming influence of business and industry in regulatory proceedings (Golden, 1998; Carley, 2009; Laird and Stefes, 2009; Wiener and Koontz, 2010; Lyon and Yin, 2010). Industry groups are defined as regulated entities (Crow et al., 2016). Industry groups are typically utility companies and trade groups. In contrast, non-industry groups are defined as being unregulated organizations and groups. Types of non-industry groups include environmental groups, clean energy groups, advocacy groups, and citizen groups. However, few studies have sought to examine the role of non-industry groups during the state rulemaking process regarding their level of participation and ability to influence the outcome of the rules. Non-industry groups possess diverse interests in the energy field.

Environmental groups are an especially underrepresented stakeholder during PUC proceedings. Until the past decade, most state PUC proceedings were centered around utility regulation and policy. However, the development of state renewable and clean energy policy has altered the scope at state PUCs to the extent that electric and gas regulation has significant environmental implications. Therefore, some environmental groups have begun to seek a greater role at their state PUCs.

While participation is not a unique challenge just to PUCs, PUCs traditionally have high barriers to participation due to the technical and legal nature of their proceedings. Many participants are not used to the legal nature of PUC rulemakings, which makes it difficult for them to engage in PUC proceedings effectively. The process is so intensive that industry stakeholders often hire attorneys to represent them at the PUCs. This is a critical barrier to many environmental and clean energy interest groups with scarce resources and staff. Many PUCs are working to break down barriers for participation, so it is essential to examine whether these efforts have been effective and, if they have not been, what are the factors that continue to hinder diverse participation.

Based on the lack of knowledge of environmental and clean energy interest group participation and influence at PUCs, this study seeks to answer two interrelated questions. First, what participation mechanisms at public utility commissions led to greater levels of influence among environmental and clean energy groups? Second, what effect do the social dynamics among stakeholder groups have on shaping a stakeholder's ability to influence the process and outcome? This dissertation argues that participatory and inclusive mechanisms throughout the PUC stakeholder process will provide distinct access points for environmental interest groups, which will shape their ability to influence the rulemaking process and shape their behaviors towards other stakeholders. These participatory and inclusive mechanisms directly effect on the ability of stakeholders to engage and influence the rulemaking process, the tactics interest groups employ to influence the process, the range of stakeholders involved in the process, and opportunities for collaboration (or conflict) throughout the process.

This study is unique for several reasons. First, this study takes a more focused examination of the roles and influence of environmental and clean energy groups in renewable energy policy than previous literature. The renewable energy policy literature has largely overlooked the role of environmental interest groups in shaping policy (Matisoff, 2008; Lyon and Yin, 2010; Carley, 2011; Carley and Miller, 2012; Berry, Laird, and Stefes, 2015). In addition, while the literature acknowledges the critical role that interest groups can exert during the policy process, it has been unable to draw definitive conclusions about their actual influence over policy outcomes. This lack of empirical knowledge is especially apparent at the state level. Little is known about interest groups' actions and influence in state policymaking processes.

Second, this study is critical because it contributes to the greater theoretical and empirical knowledge of PUCs. The interest group and renewable energy literatures have largely overlooked the regulatory phase. The interest group and renewable energy literatures have focused primarily on the policy adoption stage (Matisoff, 2008; Carley, 2009; Laird and Stefes, 2009; Wiener and Koontz, 2010; Lyon and Yin, 2010; Carley and Miller, 2012; Berry, Larid, and Stefes 2015). In addition, there have been few studies on state rulemaking but much less on stakeholder participation and influence at PUCs (Rinfret, Cook, and Pautz, 2014; Roundtree and Baldwin, 2018; Crow, Albright, and Koebele, 2016, 2020).

Finally, this study is essential to the climate change literature because energy policy is at the core of any substantial mitigation policy. States need to transition from fossil fuels if they want to lower their GHG emissions. State renewable energy policy is particularly important in the current environment, given the dramatic shifts in climate and weather that we have witnessed in the past decade. In addition, given the lack of stringent climate change policies (i.e., carbon pricing) at either the national or subnational level, renewable energy policy is the next best solution to addressing climate change policy goals of decarbonizing the economy and diversifying the national energy resource mix with cleaner energy sources and practices.

This study seeks to bridge the theoretical and empirical gaps within the interest group, rulemaking, and renewable energy literatures. The following section shows a genuine need for clean energy storage innovations at the global, federal, and subnational levels. Therefore, it is important to examine how the rules and regulations for energy storage are created to understand how to best structure and plan the next wave of renewable energy integration into the current energy system.

Outline of the Dissertation

In Chapter 2, I provide the background on the current state of energy storage policy in the United States and how energy storage can mitigate many of the issues that the energy sector is facing. I discuss the benefits and barriers to integrating energy storage into the current electrical grid.

Chapter 3 reviews the renewable energy and the interest group literatures. I also examine the importance of the rulemaking process and the increasing importance of participation at state public utility commissions. This chapter shows that there is a significant gap across the literatures regarding state studies on non-industry stakeholders.

Few studies have examined environmental and clean energy stakeholders' influence at state PUCs. Chapter 4 develops this dissertation's theoretical framework. Two models of influence are presented: a model on stakeholder access points and influence and a model on stakeholder perceived influence.

Chapter 5 takes time to explain the two methodologies that I utilize in this dissertation. The first methodology is Qualitative Comparative Analysis (QCA). A discussion of QCA as a research approach and QCA as an analytical technique is presented. The chapter details the steps necessary for the QCA approach and how the data was employed across those steps. The second phase of the dissertation is based on an analysis of stakeholder interviews. A version of thematic analysis (TA) is used to examine themes across stakeholder interviews that were conducted with eleven stakeholders in Oregon.

In Chapter 6, the QCA results of the study and a review of the cross-case and within-case conclusions from the QCA analysis are presented. These results are then applied from the truth table to the state cases.

Chapter 7 compares the cases of Oregon and Nevada, which had similar processes and similar outcomes for environmental and clean energy stakeholders. The energy storage proceedings in these states only attracted a small number of stakeholders. However, the stakeholders were subsequently able to come together to experience a collaborative and deliberative process that resulted in consensus much of the time.

Chapter 8 takes a more in-depth examination of the background, stakeholders, and process of the energy storage rulemakings in California and New York. These two cases are interesting because they have similar contexts and backgrounds, but the rulemaking process in each state was very different for stakeholders. California's rulemaking provided inclusive and participatory opportunities for its stakeholders, while New York's rulemaking only provided participatory opportunities. Chapter 9 rounds out the state case summaries and examines Virginia's rulemaking. The Virginia energy storage rulemaking had minimal participatory and no inclusive features, which resulted in a disappointing stakeholder process. The chapter concludes by reviewing the important cross-case and within-case implications for future energy storage rulemakings.

Chapter 10 examines how perceptions of influence can shape stakeholder relationships and interactions with one another. Using interview data from key stakeholders in Oregon, I generate a model of implicit influence to explain how individuals construct their perceptions of influence for one another.

The Conclusion reviews the key findings from this dissertation and examines the theoretical and policy implications. There is also a discussion on how the findings from this dissertation can apply to future research. The chapter ends with an address of the initial concerns of this dissertation: how environmental stakeholders can meet climate change policy goals while participating at state PUCs.

Chapter 2 Background: Energy Policy and Energy Storage

Introduction

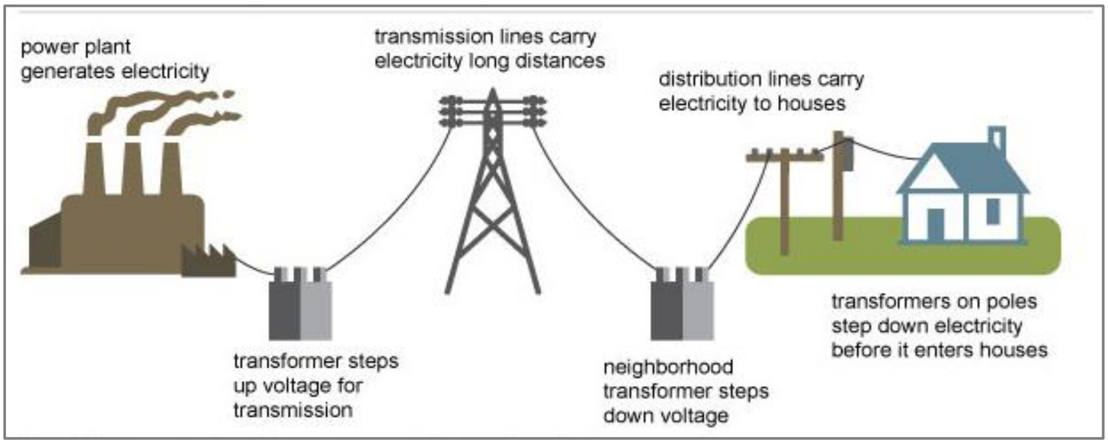
The United States' electrical grid is a network of varying levels of authority across multiple jurisdictions. There are still many barriers to integrating energy storage into this network despite the immense growth the energy storage industry has seen in the past decade. At the beginning of this chapter, I provide a basic overview of the various energy jurisdictions and how energy storage fits within this complicated network of jurisdictions and authorities. I then explore energy storage's potential to meet many of the country's grid and environmental concerns. Finally, this chapter addresses how energy storage policy is a bridge to decarbonizing our world and an integral pathway to mitigating climate change.

Balancing Multiple Levels of Authority and Jurisdictions to Overcome Barriers to Energy Storage

Regulating Electrical Supply and Demand

At the basic level, the country's electrical grid is composed of a complex web of infrastructure relating to electric generation, transmission, and distribution. This trinity ensures that customers receive electricity on demand: the power plant generates electricity, the transmission lines carry electricity to transformers which then distribute electricity to residential and commercial customers. What seems like a simple dynamic of supply and demand becomes increasingly complex as different sources of energy generation enter into the mix, transmission lines zigzag throughout and over state boundaries, and customer social patterns change the daily demand for electricity. Yet, for the purposes of this discussion, Figure 2.1 simplifies the nature of electrical supply and demand.

Figure 2.1 Electricity Generation, Transmission, and Distribution

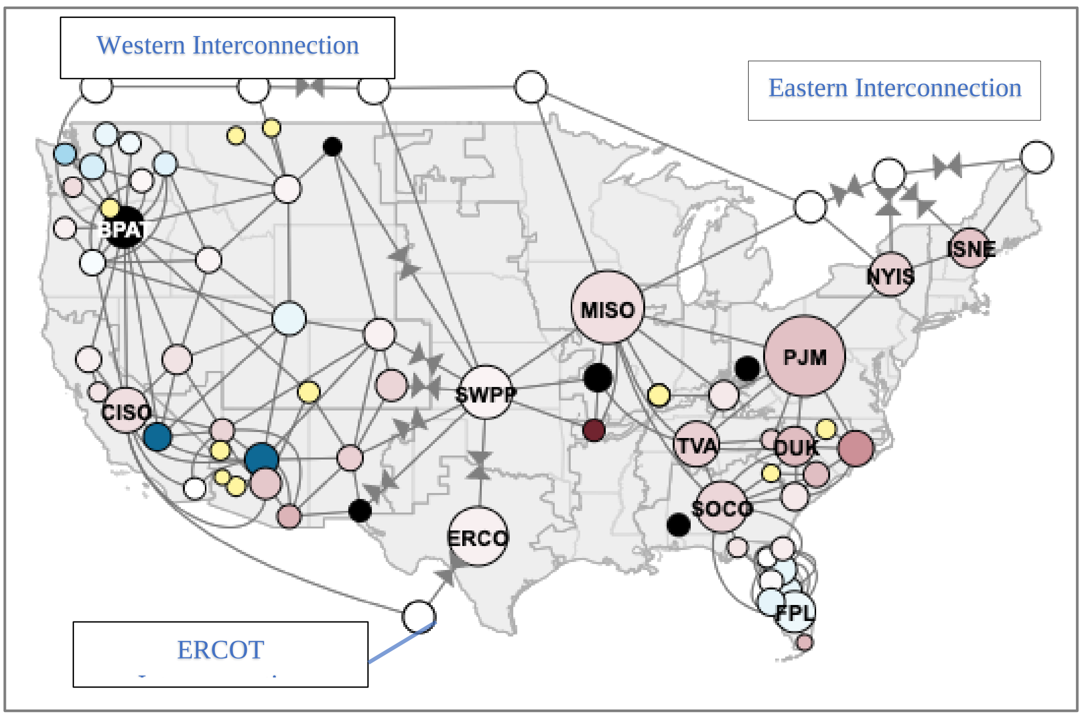


Source: National Energy Education Development Project (public domain)

The U.S. electric grid is divided into three interconnection regions. Each interconnection connects thousands of power plants and millions of miles of power line (high and low voltage) into a consolidated electric network. The purpose of these three interconnection regions is for reliability and commercial purposes. There are three interconnection regions in the lower 48 states: the Eastern Interconnection (Eastern), the Western Interconnection (Western), and the Electric Reliability Council of Texas (ERCOT). These three interconnections operate independently, with little electric power-sharing among them. The three interconnections are structured to help maintain the power system by providing multiple routes for power to flow over the region and for power-sharing among generators to ensure that there is not a break in service should there be any transmission or power plant failures.

Balancing authorities (BAs) operate the electric system within these three interconnections. There are 66 balancing authorities responsible for maintaining the balance of electricity within its jurisdiction. Often balancing authorities are utilities that have taken on the responsibility of ensuring the supply and demand balance within their operating area. Figure 2.2 depicts the various ISOs/RTOs and balancing authorities that work to ensure the balance of electricity on a daily basis.

Figure 2.2 U.S. Electric Grid Interconnections, Balancing Authorities, and ISOs/RTOs



Source: Modified from the U.S. Energy Information Agency's "Hourly Electric Grid Monitor". (11/3/2021, 7 p.m. EDT.) US EIA. https://www.eia.gov/electricity/gridmonitor/dashboard/electric_overview/US48/US48

In addition to balancing authorities, there are nine independent system operators (ISOs) and regional transmission operators (RTOs) in North America that also ensure the operation and reliability of the grid: California ISO, Electric Reliability Council of Texas (ERCOT), Southwest Power Pool (SPP), Midcontinent ISO (MISO), PJM, New York ISO (NYISO), New England ISO (ISO-NE), Alberta System Operator, and the Electricity System Operator (IESO). States such as Virginia, New Jersey, Massachusetts, Maine, and Connecticut are part of regional markets. Unlike the eastern states, the western states do not have an RTO. California runs its own ISO, California Independent System Operator (CAISO). In recent years, though, CAISO has operated the Energy Imbalance Market (EIM), which has brought western state energy policy together more.

The operation of ensuring the supply and demand of electricity is complex. There are many federal, regional, and state entities that work to supply electricity to customers while keeping the grid balanced. However, as the next section highlights, there is just as an intricate network of entities managing the sale of electricity, too.

Electricity Markets

Throughout most of the 20th century, electric utilities had a monopoly over the grid: the utilities owned and oversaw the generation, transmission, and distribution of electricity. This traditional electric model is known as being vertically integrated. It was not until the late 1980s and 1990s that many states deregulated their electric and gas sectors, which has had a sustained impact on state and federal energy policy.

In deregulated states, electric customers have the option to choose their electric supplier (customer choice), thereby creating competition in retail electricity prices among utilities. California[1], Connecticut, Maine, Massachusetts, New Jersey, New York, and Virginia are deregulated states. In a customer choice, competitive market, utilities do not have monopolies over the electric system and must procure power from other generation sites. Since utilities do not have a monopoly on the generation side of the electric system, RTOs or ISOs were created to replace utilities as the grid operators and eventually the operators of wholesale markets for electricity. In regional markets such as PJM and ISO NE, the market operator is responsible for generation and transmission competencies, leaving utilities only responsible for electric distribution.

In contrast, many southern and western states such as Nevada remain vertically integrated. In vertically integrated regulatory systems, utilities have ownership and operational control over all three elements of the electric system: generation, transmission, and distribution. Utilities, therefore, have greater discretion to decide the structures and operations of their energy systems. In vertically integrated states, customers do not have a choice in where their energy comes from, which becomes an important issue when subsets of the population are seeking cheaper electrical prices or cleaner energy sources. PUCs continue to regulate generation, transmission, and distribution to customers in vertically integrated states.

[1] It should be noted that California's notorious foray into deregulation in the early 2000s greatly impacted its electricity deregulation in the subsequent years. California's electric sector is not completely deregulated, but has been "deregulated" in a piecemeal fashion through specific policies and regulations.

Oregon has a hybrid market structure, in which utilities maintain a vertically integrated monopoly structure for residential customers. Still, some commercial and industrial customers may directly procure electricity from other competitive sources. Regulatory agencies such as the Oregon Public Utilities Commission (OPUC) have some authority to ensure that utilities follow the rules and regulations and ensure that utility consumers are protected from unfair practices.

In addition to PUCs, there are multiple entities involved in regulating energy policy at the federal and state levels. At the federal level, there is the Federal Energy Regulation Commission (FERC). FERC is an independent agency that regulates the interstate *transmission* of electricity, natural gas, and oil. At the state level are PUCs.

FERC derives its legal authority from the Federal Power Act, which directs the agency to ensure wholesale rates are "just and reasonable" and not "unduly discriminatory or preferential." It is important to stress that FERC only regulates wholesale electricity transactions and electricity transmission that *cross* state lines. In the case of Texas, the state intentionally sought to avoid FERC regulation by containing all transmissions lines within its state boundaries.

In 2006, FERC delegated authority to the North American Electric Reliability Corporation (NERC) to develop and enforce reliability standards of the grid by monitoring the bulk electric system, assessing the future adequacy of the grid, auditing owners and operators of the grid. In turn, FERC approves these standards and plans. NERC oversees seven Reliability Entities and 16 Reliability Coordinators to meet its mission.[2] These electric reliability organizations set mandatory reliability standards for planning and operating power systems for grid operators. In addition, these reliability organizations ensure that grid operators are monitoring the security concerns of critical electrical infrastructure. Table 2.1 shows the different jurisdictions and authorities that FERC oversees in contrast to state PUCs.

Table 2.1 FERC and State PUC Jurisdictions and Authorities

FERC	**State PUCs**
• Regulation of rates and services for electric transmission in interstate commerce • Regulation of wholesale power sales in interstate commerce • Sets reliability standards for the bulk power system • Certification and decertification of "qualifying facilities" (QFs) and oversight of QF-utility dealings. • Hydroelectric dam licensing and safety • Reviews certain mergers and acquisitions and corporate transactions by electricity companies • Monitors and investigates energy markets	• Regulates investor-owned utilities to ensure they offer safe and reliable energy at reasonable rates • Regulates the distribution and sale of retail electricity to consumers • Regulate utility rate design • Approves siting and construction electric generation facilities • Approves construction of new transmission lines

The complexities of state and federal electricity markets create distinct implications for energy storage across these varying jurisdictions. As the next section

[2] Some of the major NERC regions include Florida Reliability Coordinating Council (FRCC), Midwest Reliability Organization (MRO), Northeast Power Coordinating Council (NPCC), Reliability First Corporation (RFC), SERC Reliability Corp. (SERC), Southwest Power Pool (SPP), Texas Reliability Entity (TRE), and Wester Electricity Coordinating Council (WECC).

shows, some regions and states have overcome key barriers to energy storage, but there is still much to be done at the regional and state levels.

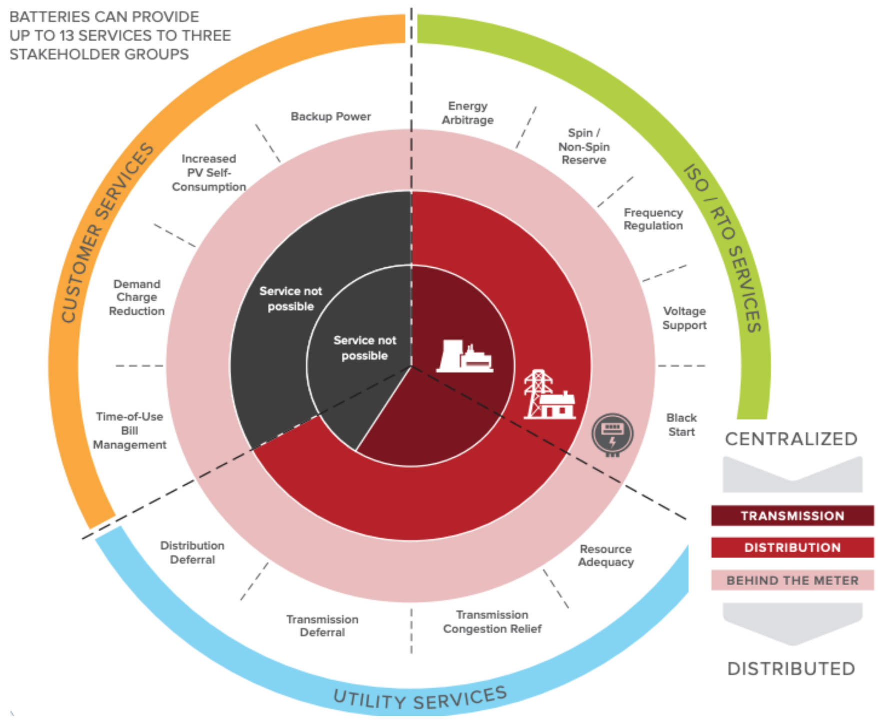
Benefits of Battery Energy Storage

While energy storage is often associated with renewable energy technologies such as wind and solar, it is important to note that the most prevalent source of energy storage is *battery energy storage*, which is not a renewable energy source: battery energy storage a distributed energy resource (DER). DERs are small-scale energy generation or storage technologies that are easily deployable, modular, and are usually only able to produce a maximum of 10 megawatts (MW) of power (NREL, 2021). Examples of DER technologies include wind turbines, photovoltaics (PV), fuel cells, microturbines, reciprocating engines, and energy storage systems. This dissertation will refer to battery energy storage as energy storage interchangeably unless it is discussing another type of energy storage such as pumped hydro energy storage or fly wheel energy storage.

While energy storage is a nascent technology to the traditional electric grid, there are many significant benefits of energy storage to the electric grid regarding generation, transmission, and distribution. At the generation level, energy storage can store energy during periods of low demand and then deploy it during periods of high demand.

This is especially important in renewable energy systems with storage. Renewable energy such as solar and wind are intermittent resources, often producing large quantities of energy during specific times of the day or in the season, but are not always easily deployed during peak demand times (e.g., in the evening after people come home from work). Figure 2.3 illustrates battery energy storage's wide range of services and uses.

Figure 2.3 Services Batteries Can Provide to Three Stakeholder Groups



Source: Fitzgerald, Garrett, James Mandel, Jesse Morris, Hervé Touati. (2015). "The Economics of Battery Energy Storage". Rocky Mountain Institute.

Energy storage can improve grid reliability by managing power flows when energy storage is deployed at the transmission levels (Andersen et al., 2021). Storage as transmission (SAT) involves an energy storage system being integrated into transmission equipment, which can inject or absorb electricity to facilitate power flows during heavy usage periods (Thomas, 2020). Many liken it to adding a lane to a highway for rush hour traffic. Integrating storage on the transmission side saves utilities from building new transmission projects and, therefore, quite a bit of money. Essentially, SAT offers congestion relief to the grid when there is insufficient transmission line capacity to deliver electricity (Thomas, 2020). This can lower generation costs and increase system reliability.

In general, energy storage benefits provide greater flexibility and scalability than traditional energy resources. Most energy storage technologies can switch between charging or discharging electricity quickly. In addition, many energy storage technologies are scalable, in which they can be ramped up to meet the demand of many customers or scaled down to meet the demands of a single customer (Thomas, 2020). Integrating energy storage into the electric system this way mitigates energy congestion and voids the need for increasing dirty natural gas peaker plants to meet load fluctuations (Andersen, 2019).

Speaking to just the distribution side, weather is the primary disruption to distribution services. Weather is attributed as the leading cause of failures and damages to distribution power lines. Weather, especially severe weather events from climate change, cause the downing of many trees and branches, which damage distribution power lines and equipment. As hurricanes and storms become stronger, the damage to the distribution side of the power grid becomes more extensive, which makes it harder for powerlines to be repaired quickly on a massive scale.

Behind the meter energy storage can be a resilient resource for homeowners. The sale of residential solar and storage systems jumped in states such as California, which have experienced massive power outages and grid failures in recent years due to wildfires and extreme weather (Stevens, 2021). In addition, energy storage is a smart resource for communities that have the capacity to install and run microgrids. Rural communities would benefit the most from microgrids, as their power services are likely the last to come back online when there are severe weather events.

Despite the many benefits of storage, energy storage continues to face many institutional barriers that prevent it from being widely integrated on a larger scale. As the next section highlights, many of these barriers to energy storage stem from the inflexibility of the traditional grid.

Barriers to Energy Storage

There are four systemic barriers to energy storage: system resource planning, transmission planning, distribution planning, and market operations (Andersen et al., 2021). These barriers can vary based on the state and the region.

First, integrating energy storage systems into a state's grid can be complicated when their value is undefined. In states that are not part of a competitive market, utilities utilize integrated resource plans (IRPs) to create long-term forecasts of what types of energy sources they will need to deploy and invest in to meet customer demands. Generally, energy planners analyze the electrical system on an hourly basis, given that there are major fluctuations in renewable sources throughout the day and that demand peaks at certain points in a day and seasonally. Thus, the traditional hourly IRP model is unable to properly value energy storage given that at the front of the meter, it can be deployed rapidly when necessary. However, when energy supply is behind the meter and at the demand of individual customers, it is difficult to quantify or rely upon. Therefore, it can be difficult to forecast a long-term plan to balance the electrical grid with these changing patterns of customer and utility use.

Second, there are no clear guidelines for how energy storage should be integrated into the interstate transmission system. Federal regulation requires that utilities who own interstate transmissions systems conduct regional transmission planning to identify potential opportunities for regional projects that would be beneficial for all jurisdictions involved. Yet, when it comes to energy storage and other demand response resources, FERC's directive is unclear, as it does not provide specific guidelines as to how energy storage can "fit" into transmission planning, much less regional transmission planning (Andersen et al., 2021).

Third, the distribution of energy storage is complicated when one considers front of the meter (usually utility or third-party owned) in junction with behind the meter (customer-owned). While there is not a specific answer as to how to overcome these challenges to meet load growth with DERs, the National Association of Regulatory Utility Commissioners (NARUC) and the National Association of State Energy Officials (NASEO) released the "Blueprint for State Action" to aid states in aligning aging electricity planning processes with newer distributive energy policies and technologies (Andersen et al., 2021).

Finally, integrating energy storage into the larger electrical market is incredibly complicated when it is introduced into regional energy markets. Traditionally, the market structures supporting regional RTOs and ISOs were served by large, centrally located generators. Therefore, it is difficult for energy markets and operators to address the inclusion of smaller, variable, and more flexible resources such as energy storage that can provide dual services of "load" and supply. Energy system operators shape the ability of states to implement RPS effectively and efficiently and energy storage policy. For example, PJM controls a large region, making it challenging to implement a uniform energy storage policy across many states. In contrast, California and New York run their own state ISOs, which makes coordination easier.

In a bold move to resolve the incongruencies across different jurisdictions, FERC issued Order 841 (2018), which required regional markets to remove barriers to energy storage and find ways to value energy storage within the system properly. In addition, FERC Order 2222 (2020) leveled the playing field for energy storage systems by requiring that energy storage located in front of or behind the meter be allowed to compete alongside traditional energy resources in the regional electricity markets. These are important steps at the federal level to ensure the standardization of energy storage across state lines. A clear national energy storage policy is essential to a successful integration of energy storage at all levels of the energy system.

At the heart of these barriers to energy storage is the difficulty of integrating a multifunctional energy asset into an antiquated and rigid electric grid. The traditional electricity grid and markets do not have the appropriate tools to value and deploy energy storage to its full potential. Despite these barriers, there are many opportunities for energy storage that extend beyond being a flexible source of energy deployment and storage. Energy storage has the potential not only to be a bridge to mitigate climate change but also to be considered a flexible and resilient asset to secure the electric grid from severe weather events caused by climate change.

Opportunities for Energy Storage

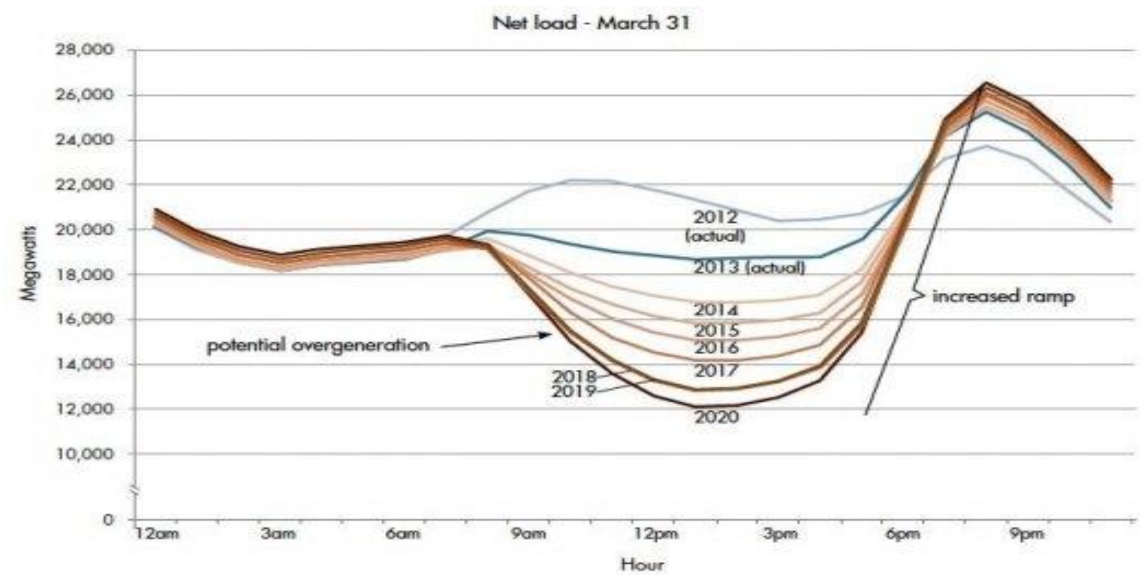
States are in a prime position to meet the challenges of decarbonizing and diversifying their energy policies to meet the demands of mitigating the effects of climate change. First, states have sole jurisdiction over the retail sales, generation siting, and fuel choice of state energy sources. The federal government only has authority with regard to interstate transmission and wholesale sales. Second, states are considered “laboratories of democracy,” in which they are better suited to develop smaller-scale policies that meet local conditions and needs (Carley, 2011). This is critical for energy policy, given that each state faces different contexts and environments in developing renewable energy sources. States are therefore able to craft energy policies that are economically, politically, and environmentally feasible for them.

Carley (2011) highlights that states possess many promising energy policy tools, which seek to diversify, decentralize, and decarbonize the electricity sector: renewable portfolio standards (RPS), net metering, interconnection standards, tax incentives, and public benefit funds (PBFs). While each energy policy tool has its advantages and disadvantages, RPS programs have been perceived to be the most promising policy instrument for renewable energy given that they are politically popular with little costs (Carley, 2011). The majority of the cost burden is placed upon utilities, who carry over the cost to consumers (Carley, 2011). RPS programs require that utilities meet a mandated percentage of generation or sales that come from renewable energy sources. As of 2021, 30 states and the District of Columbia have passed RPS mandates, and many states are amending them to make their goals more ambitious.

However, previous renewable energy literature has questioned the stringency of states' RPS commitments and their effectiveness at reducing greenhouse gases, transitioning away from fossil fuel sources, and reducing energy demand (Carley 2009; 2011; Carley and Miller, 2012; Berry, Laird, and Stefes, 2015). Carley (2009; 2011) notes that while states have met their RPS targets and have increased in-state renewable energy generation, they have been less successful in significantly increasing renewable energy percentage growth relative to the total state generation portfolio. RPS policy can only be driven to a certain point before the incentives for further renewable energy development plateau. Therefore, innovative energy storage policies must further incentivize states with RPS targets and ambitions. Winfield et al. (2018, p. 573) notes that complementary developments in renewable energy technologies, smart grids, and energy storage will be able to "make better use of renewable, low carbon energy sources; be more reliable and resilient through expanded roles for distributed and technologically diverse energy sources; have improved ability to adapt to changing circumstances and needs; and have the potential to offer more control to consumers."

Energy storage is essential for renewable energy programs such as RPS given problems of variability and oversupply with renewable energy sources such as wind, solar, and hydropower. First, solar and wind energy often is in conflict with natural climate and weather patterns. For example, in the Pacific Northwest, the problem with wind generation is its variability. Wind generation tracks poorly with seasonal load. Wind peaks during months and hours when demand is already low (e.g., winter months and during the morning and evening). Lazar (2016) highlights the difficulty of renewables meeting peak seasonal and hourly energy loads (see Figure 2.4).

Figure 2.4 California's Duck Curve



Source: California Independent System Operator (2013)

Lazar describes this situation as the duck curve, in which "as more solar and wind energy are added to the grid, the "net load" to be serviced from dispatchable resources (the duck's belly) sags in the middle of the solar day when solar generation is highest, but the load to be served in the early evening after the sun goes down continues to grow (the head) and the transition between the two gets more severe (the neck)" (2016, p. 6).

Utilities must then rely upon other more reliable sources of energy such as coal or natural gas during times of variability.

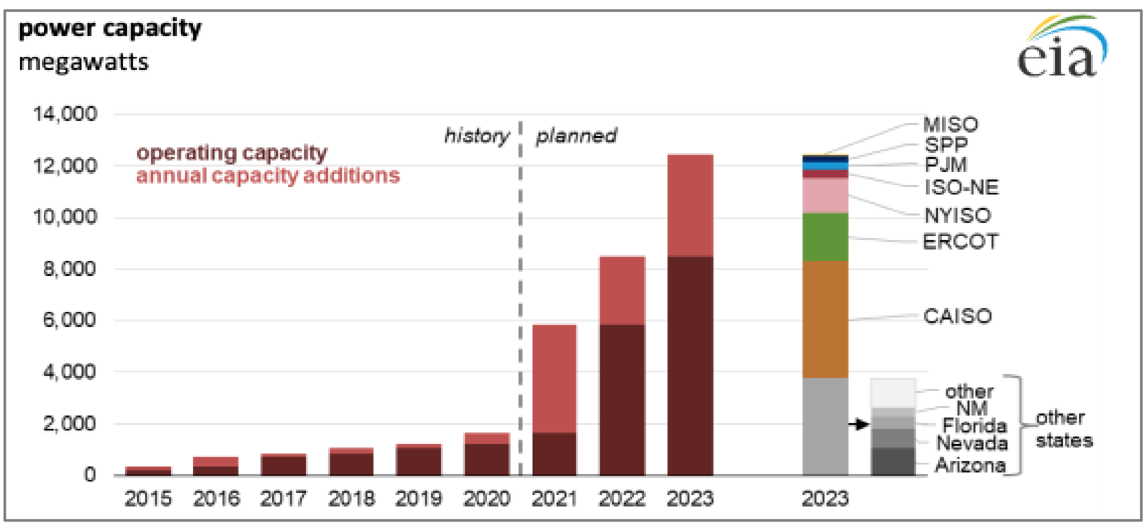
On the flip side of renewable energy development is the issue of oversupply. Renewable sources such as wind and solar may be variable. Still, during peak periods, they can produce an oversupply of energy, which can negatively impact their wholesale cost relative to other forms of energy and cause the curtailment of wind and solar energy production. The issue of oversupply is less of a concern presently, as it primarily affects a small number of states (i.e., California, Hawaii, and Oregon). However, as renewable energy generation increases, oversupply challenges may become more prevalent across the country. Therefore, energy storage policies help bridge the gaps between renewable energy generation and its variable output by mitigating problems of supply and demand during high peak periods of energy demand and providing a means to store energy when demand is low.

Energy storage technologies have been expensive in the past, which has made it costly and risky for potential investors. Energy storage technologies have multiple considerations that impact their deployment: energy/power density, lifespan, capital, operating costs, storage capacity/duration, round trip efficiency, response time, and technological maturity (Aneke and Wang, 2017). These factors have made it difficult for energy storage technologies to establish themselves in the renewable energy market. In addition, a key challenge to deploying energy storage systems is that each type of system has differing characteristics and capacities, which makes it challenging to employ a single system across the board. However, there are emerging opportunities for energy storage that are making them more economically feasible and more affordable.

There are four primary types of energy storage technologies that are best suited for large-scale applications: mechanical (flywheel, pumped hydroelectric, and compressed air), electrochemical (batteries and supercapacitor), chemical (hydrogen and biofuel), and thermal. Mechanical energy storage such as pumped hydroelectric systems and compressed air have been the most widely used energy storage technologies. Pumped hydroelectric energy storage makes up approximately 99% of the global large-scale energy storage installation (Aneke and Wang, 2016). Pumped hydroelectric stores extra electrical energy by pumping water into upper reservoirs when it is not needed; when the energy is needed, the water is then released to lower reservoirs which then drives a generator to produce electricity. Pumped hydroelectric storage has relatively high efficiency (65-85%) and can be reliably delivered in a short amount of time (Aneke and Wang, 2016).

However, there are new developments in electrochemical systems such as batteries (e.g., flow, lithium-ion, NaS), which have recently made these types of systems appealing on a mass-scale, albeit on a smaller scale than hydroelectric storage. In addition, the cost of batteries has gone down dramatically in recent years (especially with regards to lithium-ion batteries), making them more cost-efficient and less of a financial risk for investors. Battery storage is advantageous because it is “pollution free-operation, high trip efficiency, flexible power and energy characteristics to meet grid functions, long cycle life, and low maintenance” (Dunn, Kamath, and Tarascon 2011, p. 928). The innovations in battery storage have recently helped build up renewed interest in renewable energy storage policy, particularly regarding their utility for electric vehicles and use in remote areas. Battery storage has been further popularized by significant investments by companies such as Tesla, which has been behind the development of battery packs. A pivotal moment for the battery industry was when the California Public Utilities Commission approved a plan by PG&E in November 2018 in which three retiring gas plants would be replaced by energy storage (Bade, 2018). Battery storage is no longer a theoretical concept. It has gained a tangible space in states' energy resource planning. As Figure 2.5 shows, the spread of large-scale battery storage installations in the United States has begun to take on a more significant presence in many of the regions in the country.

Figure 2.5 U.S. Large Scale Battery Storage Capacity by Region



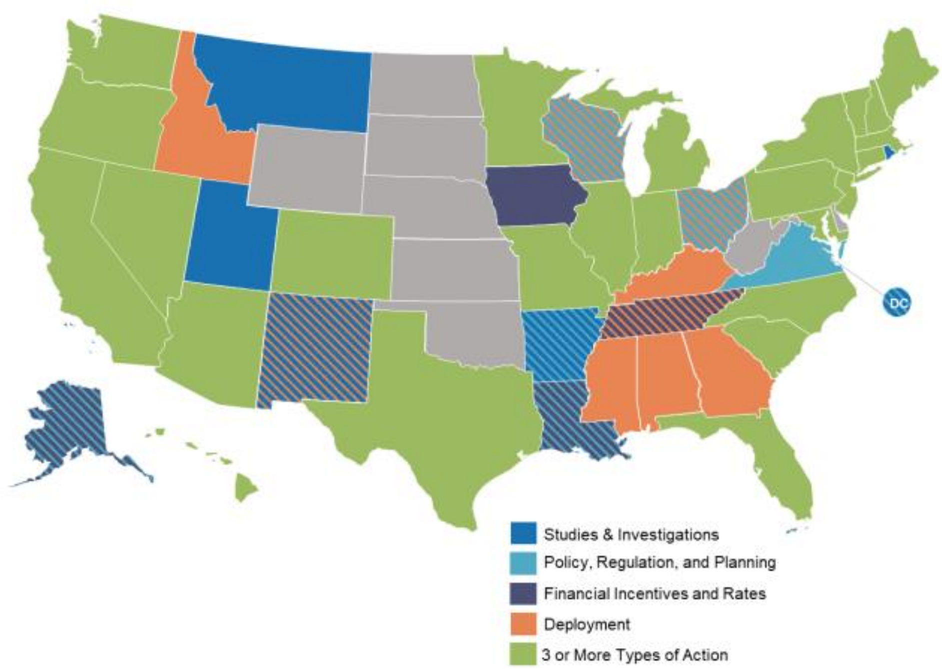
Source: U.S. Energy Information Administration, Form EIA-860M, Preliminary Monthly Electric Generator Inventory; U.S. Energy Information Administration, Form EIA-860, Annual Electric Generator Report.

CAISO and PJM have especially attracted the most large-scale battery systems in recent years due to their favorable market rules for energy storage. However, it is important to note that even though energy storage systems such as battery storage have gained support and popularity over the past few years, they still are just a tiny percentage of the total energy mix in the United States. Therefore, energy storage mandates are an essential tool for stimulating the infant energy storage trends we are witnessing in the present.

At the federal level, FERC passed Order 841 in 2018, "Electric Storage Participation in Markets Operated by Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs)." Order 841 has the potential to create new opportunities for renewable energy storage within RTO and ISO markets. The Order requires RTOs and ISOS to include participation models that encourage the integration of electric storage resources into the system. The FERC's findings noted that electric storage resources are disproportionately disadvantaged. Most markets are designed for traditional resources, which has implications for tariff rates and how energy storage systems are deployed to meet energy system needs (or not). Therefore, FERC's Order 841 will help even the playing field for the emergence of competitive energy storage projects. It should be noted that increased market access through Order 841 would not necessarily lead to more energy storage projects. Yet, given the multi-utility of energy storage systems, many investors and even utilities are open to integrating them into the current grid to increase grid resiliency and flexibility while maintaining costs.

At the state level, while there are only nine states with energy storage mandates, there is an increasing amount of state activity, ranging from exploratory studies and investigations on energy storage to the installation of energy storage sites. Other states like Colorado are continuing to work to pass energy storage legislation. In addition, there is a strong movement in other states to implement energy storage policy even without state-mandated energy storage targets. States such as Arizona are pursuing energy storage policies through less stringent measures, such as clean energy initiatives and aspirational targets. As Figure 2.6 displays, there are many different types of state actions on energy storage currently going on across the United States, which is only feeding the momentum for energy storage.

Figure 2.6 State Energy Storage Actions in 2021

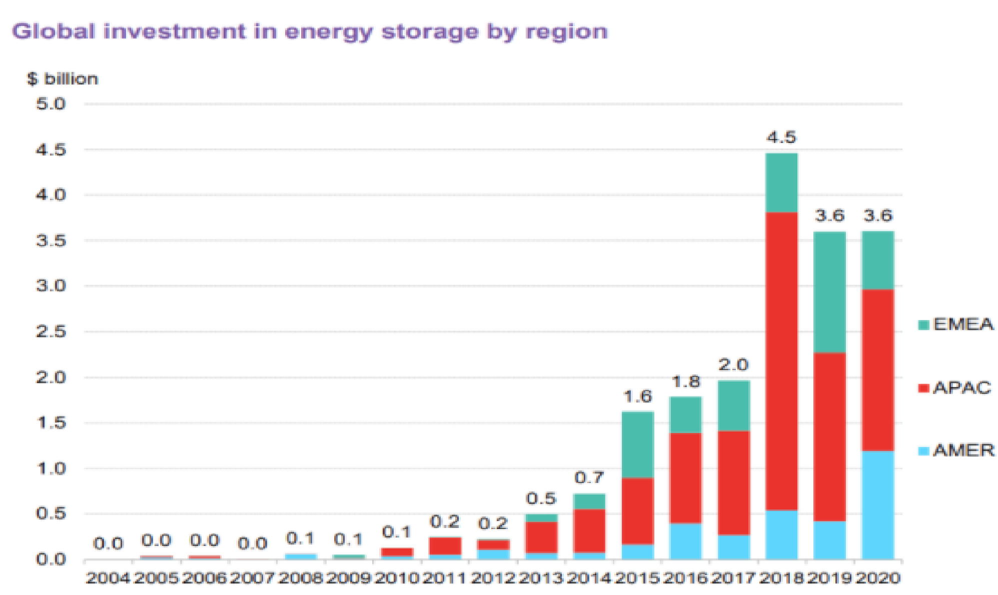


Source: North Carolina Clean Energy Technology Center. (July 2021). “The 50 States of Grid Modernization: 2021 Review and Q2 2021 Quarterly Report”.

It is important to note that even though there is an increased amount of activity around energy storage in the United States, legislative mandates for energy storage are considered the most stringent and effective policy tools for integrating energy storage into state and regional energy systems. There are market-based energy storage initiatives and projects that hold much promise to spread the installation of energy storage. However, their deployment of energy storage on a larger scale is not guaranteed, given that there is little incentive or coercion to make energy storage a priority. It is among these reasons why the focus of this study is purely concentrated on legislatively mandated energy storage policy rather than all types of energy storage policy.

Figure 2.7 shows, global investments in energy storage have risen dramatically.

Figure 2.7 Global Investment in Energy Storage by Region



Source: BloombergNEF "Energy Transition Investment Trends: Tracking global investment in the low-carbon energy transition". Bloomberg NEF.

Given the growing support for energy storage, it is likely that battery storage will only continue to become more mainstream and integrated into current energy systems within the United States and even globally. In 2020, The United States saw an increase in investment of $1.2 billion towards energy storage projects (BloombergNEF, 2021). Despite the COVID-19 pandemic, the Americas saw record investment in energy storage at a rate of $1.2 billion (BloombergNEF, 2021). While the Americas (AMER) and Asia-Pacific (APAC) began a sustained effort to invest in large energy storage projects around 2015, Europe is making strides in EMEA (Europe, the Middle East, and Africa). While energy storage investment went down in 2020 in Europe, investment in renewables rose by 67 percent (BloombergNEF, 2021). The rise in renewables will likely be matched by similar investment rates in energy storage.

However, while there is a clean energy technology and access gap between developed and developing countries, there have been some significant investments to ensure greater equity among the world's regions. The World Bank pledged $1 billion in September 2018 towards energy storage deployment for developing and middle-income countries. The World Bank President Jim Yong Kim noted that the development of energy storage in remote communities would be a major game-changer, allowing lower-income countries to "leapfrog to the next generation technology, expand energy access, and set the stage for much cleaner, more stable energy systems" (World Bank, 2018). In addition, the World Bank agreed to finance $465 million towards the Regional Electricity Access and Battery-Energy Storage Technologies (BEST) Project, which seeks to build energy storage capacity and grid connections in West Africa. There is a strong drive by subnational, national, and global entities to transition towards energy storage systems. While the motivations for transitioning to energy storage systems vary, their integration into current electric grids will help continue to decarbonize and diversify the world's energy.

Thus, many exciting developments are occurring for renewable energy storage at state, federal, and global levels. However, it should be noted that despite optimistic projections, renewable energy and energy storage remain just a tiny percentage of the overall energy mix compared to fossil fuel sources. There is still much that needs to be done to ensure that these renewable energy and renewable energy storage policies and good practices continue to develop across the states to decarbonize and diversify America's energy resource mix.

The Political and Economic Feasibility of Energy Policy Instruments for Climate Change Mitigation

Energy policy in the United States holds many opportunities for mitigating the effects of climate change. However, previous literature (Nelson, 2008; Rabe, 2008; Carley, 2011) has noted that energy policy instruments are not climate change instruments. Carley (2011) notes, "energy policies are less cost-effective for carbon mitigation because they do not directly address the market failures associated with climate change, but also because the manner in which they are currently used is fraught with inefficiencies associated with carbon leakage" (p. 289). Carley (2011) argues that more cost-effective carbon mitigation policies should place a specific price on carbon, which would encourage utilities to find cheaper alternative sources of energy and immediately shift consumers' behavior to reduce their use of electricity. The two primary climate policy instruments are cap-and-trade programs and carbon pricing. However, optimal climate change policy instruments such as carbon pricing and cap-and-trade programs are politically and economically unfeasible in the United States currently.[3]

First, cap-and-trade programs place a cap on the allowable emissions from participants (e.g., utilities) and allow trading of emission allowances among participants. During the 2000s, there were several regional cap-and-trade programs in the United States: the Regional Greenhouse Gas Initiative (RGGI) (10 Northeastern states), the Midwestern Greenhouse Gas Reduction Accord (MGGRA) (6 Midwestern states and one central Canadian province), and the Western Climate Initiative (WCI) (7 Western states and four provinces in Canada). While states were quick to adopt regional cap-and-trade programs, many states were also quick to drop them. Rabe (2016) notes that the MGGRA and the WCI collapsed due to the lack of political resiliency over the long term and the lack of constituency support. While the RGGI and the state of California (in the fallout of the WCI) have been successful cases for cap-and-trade, it seems unlikely at the present moment that other states will attempt for a second time to implement statewide cap-and-trade programs.

As Rabe (2016) highlights, many states lacked the enduring political capacity that cap-and-trade programs require. In many cases, non-compliant states left the cap-and-

[3] Adopted from the feasibility framework in Phillip Cooper and Claudia María Vargas, *Implementing Sustainable Development: From Global Policy to Local Action* (Rowman & Littlefield, 2004), p. 28.

trade when there was political turnover (i.e., the governor and their administration that spearheaded the policy left and was replaced with a successor who opposed it). In addition, in many of the states, the legislation passed along tight partisan lines, which highlighted the controversial nature of the cap-and-trade. Therefore, while cap-and-trade remains an economically feasible option for many states, it currently lacks political capacity.

Second, carbon pricing faces economic and political challenges. At the state level, carbon-pricing policies face opposition from industry groups. For example, the state of Washington attempted to pass a carbon tax ballot measure during the 2018-midterm elections that would have required industry to pay for their carbon emissions. This ballot measure faced intense pressure from the fossil fuel industry and failed to pass, receiving only 44 percent of the vote (Berton, 2018). Therefore, even in environmentally friendly states, it can be challenging to institute carbon-pricing policies.

In addition, optimal climate change instruments like carbon pricing are economically unfeasible given the current state of the energy market.[4] While renewable energy sources have gained a greater share of the energy market in recent years (20 percent in 2020), they remain at a disadvantage to fossil fuel energy sources. While coal's command of the national energy mix has dramatically decreased between 2018 and 2020, it is expected to see new gains beginning in 2021 due to increased oil prices (IEA, 2021). Gas-fired power plants continue to maintain a firm hold on state energy resource mixes

---

[4] The regional cap-and-trade programs in the United States were implemented during a special policy window between 2000-2008. As the section above argues, it seems unlikely that states will readopt cap-and-trade policies in the current political and economic climate.

(IEA, 2021). Regarding government investment, federal subsidies (i.e., tax expenditures, direct expenditures, research and development, and DOE loan guarantees) for renewable energy decreased dramatically from $15 billion in 2013 to $6.7 billion in 2016, a 56 percent decrease (US EIA, 2018b). Some of the reductions in funding were due to the expiration of certain renewable energy provisions of the American Recovery and Reinvestment Act of 2009 (ARRA). The Biden Administration will likely reinstate and create new federal subsidies for the clean energy sector. However, presently, those investments have not come to fruition. Therefore, clean energy continues to be at an economic disadvantage to fossil fuels.

Another reason why it is economically unfeasible for climate policy instruments to be effective at the federal level in the current economic and political environment is that the price of fossil fuels remains cheap. Domestic supplies of coal, natural gas, and oil are abundant and have become easier to extract through processes such as fracking. There are not enough compelling economic incentives to transition away from a cheap, readily available source of energy. Therefore, the energy market makes it economically unfeasible at the present to shift policy towards placing an added economic burden on decarbonizing the economy.

It is important to recognize that while current DER and clean energy policies instruments are not optimal for mitigating climate change, they are the most economically and politically feasible instruments that states possess in light of the gridlock at the national level. Clean energy's policy goals to diversify, decarbonize, and decentralize domestic energy sources are similar policy goals for climate change policies.

Given that energy is at the core of our economic and social activities, energy policy should be a natural partnership with climate policy. While market-based instruments such as carbon pricing monetize social behaviors in hopes of changing behavior (i.e., use less energy), clean energy policies transform the way society perceives their relationship with the environment and energy, which is a more enduring strategy to influence social behaviors. Clean energy policies possess a normative component that can potentially trump the fluctuating economic incentives of market-based policies.

In addition, recent innovations in DER and clean energy technologies make them an economically and technically attractive alternative to more stringent carbon reduction policies. As noted previously, the price for clean energy sources such as wind and solar have become more affordable in recent years. In addition, the recent innovations in energy storage have made wind and solar power a more realistic source of energy for the long term.

From a theoretical and empirical perspective, climate change and clean energy policies are different and should not be considered interchangeable. However, from a policymaking perspective, the public and policymakers have inextricably linked the two as the same. Clean energy policies are perceived to be the panacea for rising emissions in global climate change even if they have been proven not to be as effective of a policy tool for lowering carbon emissions as carbon pricing (Nelson, 2008; Carley, 2011). Policymakers find it easier to champion clean energy policies than carbon pricing policies. Setting accessible renewable energy targets provides easy reputation benefits for policymakers with little of the risk or costs associated with imposing stringent carbon reduction policies. In addition, carbon-pricing policies are more controversial than renewable energy policies, as the example of Washington's failed carbon pricing ballot measure highlights. There is strong opposition by the fossil fuel industry against carbon pricing policies, which makes it especially difficult to implement in the current political environment. Therefore, while it is clear that clean energy policies are not climate policies, they have become the next best option to mitigate rising levels of GHG emissions in the face of poor energy and climate change leadership at the national level in the United States.

Conclusion

This chapter has provided an introductory background on the critical issues and challenges facing the implementation of renewable energy storage and its overall effect on climate change policy. While many exciting energy storage developments are occurring at the state, federal, and international levels, there are still many political and economic challenges that make it difficult to effectively decarbonize and diversify the United States' energy resource mix.

The next chapter examines previous literature on energy storage policy, especially as it relates to the creation of energy storage rules and regulations at state public utility commissions.

Chapter 3 Review of Literature

Introduction

This chapter reviews the previous literature on the stakeholder process at state public utility commissions during the regulatory stage. There has been a robust examination of interest groups and regulatory processes at the federal level, but less so at the state level. There is even less information at the state level on whether interest groups can influence the regulatory process. This chapter seeks to fill these theoretical and empirical gaps by examining stakeholder influence throughout the regulatory process.

Overlooking the Regulatory Stage of the Policy Process

The regulatory process has been overlooked across the renewable energy and interest group literatures. The main bodies of the literatures have primarily examined the legislative branch. The renewable energy literature has mainly focused on the internal and external state factors that drive renewable energy policy innovation and diffusion (Matisoff, 2008; Carley, 2009; Laird and Stefes, 2009; Wiener and Koontz, 2010; Lyon and Yin, 2010; Carley and Miller, 2012; Berry, Larid, and Stefes 2015). For example, political ideology, state affluence, and state ideological affinity have been major drivers of the adoption and diffusion of renewable energy policy (Matisoff, 2008; Lyon and Yin, 2010; Carley and Miller 2012; Yi and Feiock, 2012; Berry, Larid, and Stefes 2015). However, to this author's knowledge, the literature has not addressed the importance of energy storage policy, much less in the context of the regulatory process. This scholarship deficiency stems from the fact that energy storage legislation is relatively new (California was the first to pass an energy storage mandate in 2010), and only nine other states have passed energy storage legislation in the past decade (although many state legislatures have considered the issue).

However, the regulatory process is just as important if not more so than the policy adoption stage given that it produces the substantive part of the policy. It is important to highlight that much of the regulatory processes produce rules and regulations that carry the force of the law.

Following the authorizing statute, there are three main types of regulatory cases that can be employed: non-contested, contested, and rulemakings. Non-contested cases do not require testimony or briefs by intervenors. Much of the record consists of just stakeholder comments. The commission relies purely on the record to make determinations. Contested cases require testimony and briefs. This is the most formal and legal type of case. In contested cases, the commission does not interact with any of the stakeholders or staff and makes determinations purely based on the record produced for them. Rulemakings are considered to be the most flexible type of PUC case and grants the commission the greatest amount of flexibility to make discretionary decisions.

At the federal level, the U.S. Administrative Procedure Act (APA) of 1946 guides rulemaking procedures. The APA defines *rulemaking* as the "agency process for formulating, amending, or repealing a rule" (5 U.S.C. §551(5)). Under section 555(4), the APA defines a *rule* as,

> mean[ing] the whole or a part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe

> law or policy or describing the organization, procedure, or practice requirements of an agency and includes the approval or prescription for the future of rates, wages, corporate or financial structures or reorganizations thereof, prices, facilities, appliances, services or allowances therefor or of valuations, costs, or accounting, or practices bearing on any of the foregoing.

Section 553 of the APA describes the rulemaking process. Section 553 was novel at the time of its creation because it requires that for all significant federal rulemaking procedures, federal agencies provide: some opportunity for public participation during the process; clear and advance notice of the contents of the new rule; and a comment period (Cooper, 2006). At the time, the APA promoted unprecedented opportunities for participation for external groups and individuals (interest groups and ordinary citizens) and channels for accountability and credibility for federal agencies. The Model State Administrative Procedure Act of 1946 similarly guides rulemaking at the state level.

The state and federal rulemaking process is unique given its institutional mechanisms that seek to foster greater public participation, openness, and transparency. However, these institutional mechanisms are not consistent across states or issues (Rinfret, Cook, and Pautz, 2014). The institutional mechanisms in the rulemaking process are context dependent. Often, the institutional mechanisms for rulemaking are first guided by the state level APA, then the authorizing statute, and finally by the tasked administrative agency.

First, each state agency is guided by their state administrative procedures act (SAPA). Each state's SAPA has distinct requirements, however, in general, the requirements for public participation, notification, and stakeholder engagement in state PUC rulemakings are similar. There are requirements for public notice and public comment with specific timelines. In addition, many states have implemented greater access to stakeholders by allowing parties to call in to public meetings. It is important to note again that the state versions of the APA often vary from one another, although the core procedures of the rulemaking are often similar to that of the federal rulemaking process.

Second, the authorizing statute has a great influence in shaping the scope and purpose of a rulemaking. The authorizing statute can determine the type of rules or actions that are to be authorized, the timeline for the rulemaking, and resources to be used throughout the rulemaking. The authorizing statute may also indicate which stakeholders or agencies must be included in the process. For example, in many energy rulemaking mandates, the authorizing statute specifically names electrical utilities that must submit proposals to the state agency.

Finally, agency procedures (administrative procedures and rules), agency culture, and resources can shape the rulemaking and the ability of interest groups to influence the overall outcome (West and Raso, 2012; Crow, Albright, and Koebele, 2016). Even though all state regulatory processes are governed by their SAPAs, state regulations for the rulemaking process differ from state, policy issues, and even across state agencies. For example, Rinfret, Cook, and Pautz (2014) note very different agency approaches to participation in developing fracking rules. In particular, Rinfret, Cook, and Pautz (2014) highlight that New York's Department of Environmental Conservation (NY DEC) had a good history of inclusion during the rulemaking process, upholding New York's good government model. The good government model sought greater transparency and responsiveness by having an "open door policy" and by taking extra consideration into the public comments submitted to the agency. However, when it came to the issue of fracking, the NY DEC was notably exclusionary during the pre-proposal stage of the process due to possible agency resource and capacity problems (Rinfret, Cook, and Pautz, 2014). Therefore, in many instances, regulatory agencies will have some degree of discretion in determining the procedures that may or may not increase democratic practices pertaining to legitimacy, accountability, effectiveness, transparency, and responsiveness (Jewell and Bero, 2007).

Taking a closer look at the process, a rulemaking can be broken down into three primary stages: (1) the pre-proposal stage, (2) notice of proposed rulemaking (NPRM) and comment period, and (3) the final ruling (Kerwin and Furlong, 2011). There also instances in which there will be an Advanced Notice of Proposed Rulemaking (ANPRM), which is a formal invitation by the PUC to participate in drafting the proposed rule. The rulemaking process is important for three reasons. First, the rulemaking process produces the bulk of rules and regulations. It is estimated that more than 90 percent of American law stems from administrative rules created by government agencies, not from statutory law passed by the legislative branch (Warren, 2004). Furlong and Kerwin (2005) highlight that many interest groups perceive lobbying during the rulemaking process to be just as important as lobbying Congress.

Second, rulemaking provides a remarkable opportunity for public participation that is not provided in any other stage of the policy process. The most popular type of rulemaking is hybrid rulemaking, which requires the expansion of the following: notification, the notice and comment period, public participation, and the rulemaking record (Cooper, 2006). Of particular importance to interest groups is the requirements for the notice and comment period of the rulemaking process and the expanded efforts to increase public participation during the notice and comment period. The comment period allows any group or individual the opportunity to submit their opinion on the rule or regulation of interest. The participatory structure of the notice and comments period is beneficial for weakly organized groups that may not possess the resources to effectively lobby during the legislative process.

The increased rulemaking record further incentivizes the agency to take meaningful consideration of participants' comments. The docket's record requires that the agency note whether the submitted comment led to a change in the rulemaking or not. This transparency mechanism holds the agency to be more accountable to the comments of all participants. However, it should be noted that not all state agencies require stakeholder comments be addressed in the final record. Nonetheless, the record is invaluable documentation of stakeholder comments and actions.

In addition, increased participation by a diverse range of external actors is likely to provide a greater range of information for the agency to utilize to determine the rules

(Woods, 2009). However, it should be noted that there are often disparities in group participation and openness even though the rulemaking process possess structural elements to promote these objectives. Of particular importance to the structure of the rulemaking process are the requirements from its authorizing statute (Cooper, 2006). The statute will indicate the timeline and scope of the rulemaking process. In the case of state energy storage polices, the authorizing statute can provide strict requirements that have tight deadlines and specific targets; or it can provide a loose structure, in which it requests the regulatory agency to research the feasibility of the policy over a period of years and report back to the state legislature.

Finally, the rulemaking process provides multiple opportunities for participants to directly influence the content of the rules. While the notice and comment period is structured as the key mechanism for influencing the content of the rules, the pre-proposal and the ANPRM stages also provide interest groups opportunities to shape the content of the rules. For example, Yackee (2011; 2015) highlights the importance of lobbying during the pre-proposal stage in which the draft rule is initially created. During the pre-proposal stage, the leading agency may decide to create an advisory group in which they invite outside groups to lend their expertise and information in the drafting of the rule. It is important to highlight, though, that not all rulemakings will include a ANPRM and that the pre-proposal stage is not always open to all stakeholders.

In some situations, the authorizing statute mandates the participation of specific groups from the beginning. For example, in Oregon's energy storage mandate, the statute mandated that Portland General Electric and PacifiCorp to provide specific proposals that would meet the required minimum of 5 MWh of energy storage in service by January 1, 2020. Therefore, the participation and potential to influence the rules of these two groups was established even before the beginning of the rulemaking process. It is during the pre-proposal stage that interest groups are often able to engage with government officials *ex-parte*, or off the record.

The rulemaking process is an important component of the policy process, but is often overlooked. At a minimum, the rulemaking process provides stakeholders opportunities to submit comments on proposed rules and regulations, and at best, shape the final rules. The following section takes a deeper examination into the importance of participation at state public utility commissions and whether stakeholders can successfully influence the process and final rules.

Participation and State Public Utility Commissions

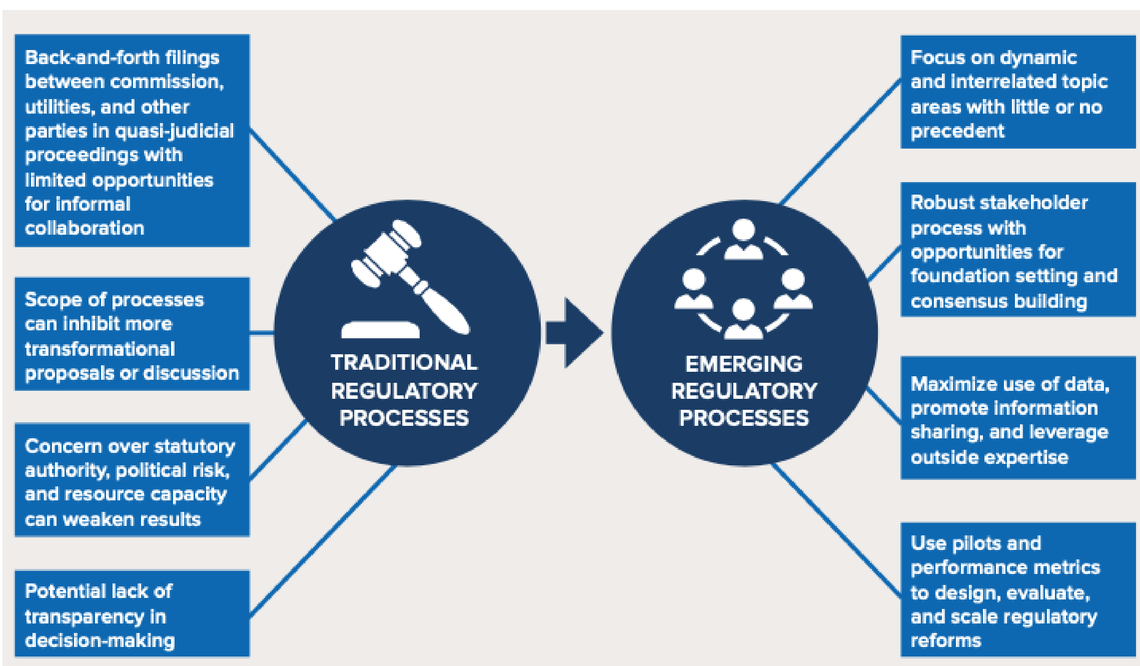
Much of the bulk of clean and renewable energy policy has been funneled through state public utility commissions (PUCs). State public utility commissions have traditionally been responsible for overseeing energy, telecommunications, and water policy. However, PUCs are entering unchartered energy domains that do not always match up well with their traditional economic spheres of authority and jurisdiction. PUCs face new challenges due to changes in customer demands, public policy goals, and emerging technologies.

PUCs guiding objectives are to balance consumer interests (safe and reliable service and affordability) and utility interests (right to reasonable return and timely recovery of costs). PUCs have traditionally embraced only an economic role. However, PUCs are increasingly being asked to make decisions on energy infrastructure modernization, electricity system transition, energy system resilience, energy policy goals, energy equity, and the intersection of utility regulation with innovative economic sectors that push beyond the agency's traditional purvey. PUCs are beginning to face the need to modify their statutes to enable them greater regulatory authority to consider environmental issues in conjunction with economic considerations given that clean energy issues are gaining a larger share in state energy generation and distribution.

There are select PUCs that are breaching the divide between economic and environmental considerations. Washington D.C. and Connecticut have expanded their PUC's mandate to consider climate change issues. In 2008, Washington D.C. passed the Clean and Affordable Energy Act which directed the PSC to "consider the preservation of environmental quality" in its decision-making. This Act paved the road for 2018's Clean Energy Omnibus Act, which added on considerations for "global climate change and the District's public climate commitments". Connecticut's Public Utility Regulatory Authority (PURA) embedded climate change issues through the Global Warming Solutions Act, which requires PURA to focus on how the state's Comprehensive Energy Strategy, Integrated Resources Plan (IRP), and Conservation and Load Management Plan (C&LM) can meet its binding climate targets. Despite the promising changes from these states, there are many more states that continue to struggle with the rapid changes to the power sector.

Amongst the policy community, there has been a growing consensus that PUCs need to evolve to address these new challenges and expectations (De Martini et al. 2016; Bilimoria et al., 2019; Cross-Call et al., 2019; McAdams, 2021). Traditional regulatory approaches and processes are not sufficient to handle the complexity and intersectionality of the new energy issues that PUCs are being tasked to manage (Cross-Call et al., 2019). De Martini et al. (2016) argues that the traditional regulatory approach of resolution through adjudication is underequipped to ensure a balanced and long-term solution. Figure 3.1 depicts Cross-Call's et al. (2019) diagram of the evolution of the regulatory process design.

Figure 3.1 Evolution of Regulatory Process Design



Source: Cross-Call, Dan, Cara Goldenberg, and Claire Wang. (2019). *Process for Purpose: Reimagining Regulatory Approaches for Power Sector Transformation*, Rocky Mountain Institute.

The diagram highlights the differences between traditional regulatory processes and the emerging regulatory processes and reflects the utility regulatory reforms seen across ten states.[5] California was among the first states in 2014 to initiate a docket to address a regulatory framework for distributed energy resources (DERs). Many of these states initiated regulatory reform to update regulatory structures to better meet the new developments in the power sector. However, these reforms have major implications for how PUCS will meet the challenge of adapting their stakeholder frameworks to accommodate the large influx of energy market participants.

De Martini et al. (2016, p. 2-3) highlight that proactively engaging stakeholders provides three primary benefits. First, a robust stakeholder process provides a forum for information sharing and education, which can create a common vocabulary and knowledge platform for participants. This is especially important when policy issues are technical and complex. Second, stakeholder focused processes can create an environment that encourages collaboration, resolution, and even consensus as opposed to the traditional regulatory environment that often resulted in adversarial relationships. Finally, stakeholder focused processes can lead to productive, long-term relationship benefits among parties. These relationships are reinforcing to the entire stakeholder process by encouraging communication, trust, and common ground.

At the heart of a stakeholder focused process are the concepts of inclusion and participation. Quick and Feldman (2011) make a distinction between participation and

[5] States included in the Cross-Call et al. (2019) study and the year: California (2014), New York (2014), Minnesota (2014), Michigan (2016), Arkansas (2017), Illinois (2017), Ohio (2017), Oregon (2017), Rhode Island (2017), Hawaii (2018).

inclusion. Participation seeks to increase input for decisions. Democratizing participation can occur through increased public scrutiny, public notification, and access mechanisms (Woods, 2015). Concrete changes would include inviting more groups to be involved in the processes, ensuring the process is broadly accessible to the public, and collecting community input to influence policy decisions (Quick and Feldman, 2011, p. 274).

Quick and Feldman (2011) emphasize that their conceptualization of inclusion is distinct from the process of ensuring diverse participants. Rather, inclusion seeks to make *connections* among people and provide an “expansive and ongoing framework for interaction that uses the opportunities to take action on specific items in the public domain as a means of intentionally creating a community engaged in an ongoing stream of issues” (Quick and Feldman, 2011, p. 274). Quick and Feldman (2011) advance three features of inclusive practices: engaging in multiple ways of knowing, coproduction of the processes and content of decision making, and sustaining temporal openness (p. 282). These three features of inclusion can be integrated into the deliberative processes at PUCs.

First, engaging in multiple ways of knowing embraces bringing in varying values, perspective, and ideas. From this perspective, deliberative practices can be part of an inclusive process when the emphasis of that deliberation is to build a “community that can work together to adapt to implementation challenges and pick up new issues” (Quick and Feldman, 2011, p. 285).

The second feature of inclusion is coproducing, which is entails multiple parties collaborating to produce procedural or written work together. Coproduction of the process and content can reinforce deliberation when participants are on equal playing fields with one another. The practice of consensus during coproduction ensures that there is a balance of power among each of the participants. Quick and Feldman (2011) note that deliberation is not inclusive when the process and content are predetermined prior to the coproducing process.

Finally, deliberation can be inclusive if it sustains temporal openness. The concept of temporal openness embodies processes that encourage connections over time and issues. The practice of temporal openness does not stop when the initial outcome is achieved. Temporal openness emphasizes processes that encourage the development of relationships over iterative opportunities.

It is important to note that the absence of inclusive processes can reinforce divisions among groups. Already the PUC process engenders a “winners” and “losers” dynamic that incentivizes group divisions. Group divisions can breed distrust and animosity among groups (Quick and Feldman, 2011). Reluctance to share information and perspectives is detrimental to the process as a whole and can stymie the pace and progress of the work. Therefore, it is in the interest of PUCs and stakeholders to embrace more inclusive practices to ensure the effectiveness of the process.

Inclusive practices at PUCs could include the creation of stakeholder working groups, technical meetings, consensus building, discussion papers, party briefs, and network policy linkages. Per Quick and Feldman (2011), each of these stakeholder engagement practices embody engaging in multiple ways of knowing, coproduction of the processes and content of decision making, and temporal openness. For example, PUC working groups and stakeholder meetings encourage stakeholders to share information, values, and perspective with other stakeholders. The comment periods are also a time to share information and reflect on the perspectives of other stakeholders. In addition, the emphasis on stakeholder interactions at meetings and working groups create connections among groups, issues, and processes that extend to future interactions and proceedings. Finally, the stakeholder meetings and extensive comment periods potentially give stakeholders the opportunity to coproduce content for the final rules or order.

However, like any process, there are potential benefits and drawbacks with increasing participatory and inclusive practices at state PUCs. With regards to benefits, regulatory proceedings have a greater likelihood of being perceived as transparent, fair, and equitable when there are more opportunities for stakeholders to participate in the decision-making process. In addition, stakeholders can provide novel knowledge, information, ideas, and opinions that the PUC may not have considered or been knowledgeable about. This is particularly important when the policy issue is new, as energy storage was for these cases.

However, increasing stakeholder participation can also be costly and time-consuming. A large stakeholder pool may make it harder for stakeholders to achieve consensus with one another on important issues. Increasing the range of interests and preferences can make it difficult to find an outcome that is acceptable for all parties. In addition, opening up the process to new stakeholders does not necessitate that they will have credible opportunities to have a meaningful role in the decision-making.

The regulatory literature has provided mixed results on public participation in the regulatory setting. Yackee (2005) highlights that written comments during the notice and comment period can have a noticeable impact on the final rule, however she also shows that often the individuals are able to exert the greatest influence over the final rule during the pre-proposal stage. Similarly, Roundtree and Baldwin (2018) discover that meaningful participation is limited to expert stakeholder groups, especially those that have ties to decision-makers and formal processes. Roundtree and Baldwin (2018) noted that stakeholders with less expertise and experience with PUCs were often frustrated by the process and felt that their participation throughout the process was superficial.

Baldwin (2018) found that increased stakeholder participation through deliberative approaches can lead to more environmentally favorable outcomes. However, Baldwin (2018) cautions that her results may only apply to certain policy contexts in which there is not a high level of knowledge about the issues. This is in line with Stokes (2015), who advances the dynamic of the 'fog of enactment', in which innovative renewable energy laws had the opportunity to pass during moments of crisis and stakeholder division. Utilities were unable to forecast how these policies will impact them.

In addition, Stokes (2015) emphasizes that environmental groups can exert greater influence when there is greater division or distraction by the opposing coalitions. This is similar to Falkner (2008), who advances the business conflict model. The business conflict model highlights how conflict and discordance among business and industry stakeholders can weaken their power position, thus providing an opportunity for environmental policies to develop independent of the full pressure of the opposing coalition.

Despite the indeterminant nature of participation on regulatory outcomes, at the center of each of these studies is the inherent understanding that without outside participants, rules will be heavily influenced by the regulated industries. Opening regulatory proceedings to stakeholders provides increased opportunities for other groups to participate and promotes greater accountability and transparency of the agency. Accountability and transparency are essential features to ensuring that an agency maintains its organizational mission and upholds the public's interest justly and equally in its decisions and actions.

Stakeholder Influence

Conceptualizing Influence

There is the perception that influence is pervasive throughout any policy process. However, it is difficult to conceptualize and even prove. Influence is a heavy-loaded concept in any context but especially during the rulemaking process when there are multiple avenues and periods when influence can occur.

Influence is often considered the ability of a group to control the outcome of a policy (Lowery, 2013). However, there is then a need to conceptualize control and its various gradations. At the extreme end, the concept of control in the regulatory process often manifests as the notion of agency capture (or regulatory capture), in which interest groups are able to control, or "capture", the agenda of the government agency tasked to regulate it (Stigler, 1971; Sabatier, 1975). Therefore, the interests of the public that the agency is supposed to be looking after are effectively undermined in favor of the powerful interest group.

Carpenter and Moss (2013) note that agency capture has often been misunderstood because it has lacked a clear definition. Carpenter and Moss (2013, p. 13) define regulatory (agency) capture as "the result or process by which regulation, in law or application, is consistently or repeatedly directed away from the public interest toward the interests of the regulated industry, by the intent and action of the industry itself". Of particular importance to this definition of agency capture is the conceptualization of public interest and intent. First, in order for there to be a clear instance of agency capture, the public interest must be clearly defined; secondly, it must be shown that there was a clear policy shift away from the public interest and toward the industry interest; and finally, there must be the intent and action by the industry to push regulation away from the public interest (Carpenter and Moss 2013, p. 15).

While it cannot be doubted that interest groups would like to control the entire rulemaking agenda, the notion of agency capture is extreme in the current context of most of these regulatory proceedings. The intention and action by interest groups to control the agency in direct opposition to the public interest is difficult to prove, even in the case of industry groups. In the case of energy storage policy, regulated utility groups and trade groups have a direct relationship with the public interest through consumer and market exchanges and interactions. While industry groups are concerned with profits and their shareholders, the consumer remains an integral component of their broader interests.

Yackee (2013, p. 9) provides a more nuanced definition of agency capture “as the control of agency policy decision-making by a sub-population of individuals or organizations external to the agency”. From this definition, one might note that utilities have historically “captured” state public utility commissions, as they have possessed a high level of control over the agency. Yet, Yackee (2013) emphasizes that influence and control are two very different concepts. An interest group can be influential without controlling the regulatory process of the decisions of agency members (Gormley, 1982 as cited in Yackee 2013, p. 9). In this context, influence is a necessary, but not sufficient condition of agency capture (Yackee, 2013). Therefore, a group’s influence over the rulemaking process is conceptually distinct from a group’s ability to control an agency and its decision-making abilities through agency capture. Any group could then be influential from this conceptualization of influence, as long as one could show that the group had made a definitive change or action to the decision-making process.

It is important to note that interest groups often engage in the policy process with different goals for success or even effectiveness that preclude absolute control over the final outcome of a policy. Some interest groups will be satisfied with small changes in the framing of an issue, incremental changes, or building or blocking parts of the policy language. In addition, some groups may be content to simply be included in the process, in hopes of future inclusion and influence. Therefore, influence and control are not absolutes throughout the process. There is an ebb and flow of influence and control by various groups at different moments of the process. The ensuing discussion highlights how previous literature on interest group influence has examined these phenomena at the federal and state levels.

Previous Interest Group Influence Literature

The study of interest group influence is popular in the literature, however much of the literature is concentrated on interest group influence at the federal level in the US Congress with regards to lobbying, mobilization, and group tactics and strategy. The findings of the federal literature are mixed, in which some studies have noted interest group influence to be limited (Baumgartner and Leech, 1998; Burstein and Linton, 2002 Baumgartner et al. 2009; Hojnacki et al. 2012), and others have found that interest groups are able to influence the policy process only in certain contexts (Rosenthal, 2001; Berry and Wilcox, 2008).

The federal rulemaking literature is much smaller than that of the legislative literature. The federal rulemaking literature is divided mainly between examining interest group participation (Golden, 1998; Furlong and Kerwin, 2004; Woods, 2009, 2015), interest group tactics (Knownes and DeAlejandro, 2009; Nelson and Yackee, 2012) and to a lesser degree, interest group influence during the rulemaking process (Baumgartner et al. 2009; Yackee, 2011; 2015; Yackee and Yackee, 2006).

Across the federal interest group and rulemaking literatures, it has been noted that business and industry groups are often perceived to have a stronger influence over the policy process (Baumgartner et al. 2009; Golden, 1998; Rosenthal, 2001; Yackee and Yackee, 2006). Often resources determine an interest group's influence: financial assets, organizational capacity, number of staff, membership numbers, and clientele (Rosenthal, 2001). Therefore, it is not surprising that well-organized business and industry groups often dominate the policy process given that they possess the staff and monetary resources to maintain a strong presence throughout the entirety of the process. Rosenthal (2001) highlights that often lobbyists from powerful interest groups will be more effective in their endeavors primarily as a result of the group that they are representing.

With regards to rulemaking, Yackee and Yackee (2006) highlight that there is a bias towards business interests during the notice and comment period of the rulemaking process. However, the renewable energy literature has found mixed evidence that the presence of fossil fuel industry groups in a state will negatively impact a state's support for renewable energy policies. The majority of the renewable energy literature notes that states that possess strong coal and petroleum interests are less likely to support renewable energy development (Carley, 2009; Laird and Stefes, 2009; Wiener and Koontz, 2010). Similarly, utilities that rely on natural gas will also be more opposed to renewable energy policies (Lyon and Yin, 2010). However, Mastitoff (2008) and Lyon find little significance for the correlation between the presence of fossil fuel groups in a state and their renewable energy development. States that possess a large potential for renewable energy (e.g., wind, solar, and hydropower) will be more apt to support renewable energy policies. In addition, there has been little examination on the role of environmental and civil society groups in shaping renewable energy policies. While it may be that industry interests do dominate the policy process, there are still areas in which non-industry groups can exert change or influence.

While the literature on federal rulemaking and lobbying has begun to gain greater attention (Golden, 1998; Kerwin and Furlong, 2011; Yackee and Yackee, 2006; Yackee, 2011), there remains less known about state rulemaking, regulatory agencies, and the subsequent roles of state interest groups during the process. Aniza (2019) is critical of the lack of attention that subnational policy studies have received and notes that this is likely due to empirical design challenges and the dearth of easily accessible data at the subnational level. Aniza (2019) argues that interest groups likely do have more influence at the subnational level than the national level due to challenges of group competition, partisanship, and ideology at the national level.

One reason why researchers have neglected the study of interest groups at the subnational level is because of the challenges of too much variability. The variability of state contexts, groups, and conditions is high and difficult to control. It is also often problematic to make generalizations across so much variability as no two states are alike. Subnational scholarship does attempt to address this variability by making general connections amongst states based on demographics, size, political culture, and other similar factors.

The scholarship that has explored subnational interest group influence has confirmed much of the findings from the federal literature with regards to: (1) at which point in the regulatory process stakeholders are most influential and (2) the factors that affect stakeholder participation.

First, Crow, Albright, and Koebele (2016) found that industry groups have a particularly pronounced role during the pre-proposal phase, which enables them to work with agencies to define and frame the issues. Similarly, Rinfret, Cook, and Pautz (2014) similarly note that the pre-proposal stage was a critical point in which interest groups could exert the most influence. In addition, Rinfret, Cook, and Pautz (2014) highlight that state agencies are integral in shaping the boundaries of the debate and in determining when and how interest groups engage in the rulemaking process. Second, with regards to stakeholder participation, Roundtree and Baldwin (2018) concluded that stakeholder groups that are able to participate the most effectively at PUCs have: (1) a strong knowledge about the issues; (2) the resources to engage in the process for the long-term; and (3) a long-standing relationship with other stakeholders and decision-makers.

Although there has been substantial development in the state rulemaking and interest group influence literatures, there are few studies that have sought to determine the *level of influence* of influential interest groups. The primary challenge of determining a group's influence over a policy outcome (or set of policy outcomes) is that the researcher must first accurately determine the policy position of the group, and secondly the position of the policy output (Pritoni, 2014).

Scholars have attempted to determine policy positions from political documents from handing-coding and from computer-based text analysis programs (WORDSCORES, WORDFISH) (Laver, Benoit, and Garry, 2003; Proksch and Slapin, 2008). There is also the qualitative data analysis software, such as NVivo, which helps researchers organize, analyze, and discover themes and patterns within and across primary and secondary documents.

Even once a researcher is able to determine interest group policy positions, it is difficult to determine the policy output as there is an inherent problem of endogeneity with this approach. As Baumgartner and Leech (1998) concede, the status quo policy already embodies the preferences of influential groups. So not seeing any changes to the policy output does not necessarily reveal that groups are not influential. It may very well signify the enduring influence of already powerful groups. It is therefore difficult to assess interest group influence from this approach.

In addition, with these methods, one must assume that a group's policy position and preferences will remain constant, which is not always reflective of the real process. This is especially true when decisions are being made in a social setting where collaboration and compromise can occur (e.g., working groups and committees). In addition, policy positions can be difficult to determine in situations where the policy outcome is complex. For example, across the five energy storage proceedings, there were many policy outputs as opposed to a single rule on a single issue to determine.

Also, the shift in one policy point outcome may in turn shift a group's collective policy preferences. Therefore, policy preferences and policy positions will not always remain constant over the period of the rulemaking. This was true in the case of California. In the beginning of the rulemaking, many stakeholders, and even staff, were hesitant about the novelty of California developing an energy storage market. However, once there was a transition to a more progressive clean energy commissioner, there was a sharp shift among stakeholders towards accepting the imposition of specific energy storage targets.

Another method for determining influence is through preference attainment, in which groups can indicate whether the policy outcome met their policy preferences. However, this method can be problematic, too, as it relies upon the responses of individuals as measures of influence. Individuals are often likely to inflate their success and ability to influence the process (Rosenthal, 2001). This is understandable given that interest groups seek to exert influence and will seem ineffective if they are unable to provide some support for their existence. There is a distinction between a group's strategic policy and its real policy position.

Previous rulemaking literature (Yackee and Yackee, 2006; McKay and Yackee, 2007) has measured influence based on a 3-point scale of the difference in direction between the draft rules and the final rules: (+1) more government involvement; (0) remained the same level; or (-1) less regulation. The authors note that this method simplifies the complexity of interest group politics, but it enables them to distinguish core positions and changes in the final rules. Yet, given the wide array of interest group preferences in the energy storage proceedings, such a simplification of interests is not robust enough to explain environmental and clean energy group influence. In addition, this method risks the same problem of endogeneity of the policy output that was discussed above from Baumgartner and Leech (1998). Therefore, it has been a challenge to conceptualize and measure influence across multiple disciplines. Influence is a complex and multifaceted concept.

Conclusion

This chapter has reviewed the previous literature on the importance of the regulatory phase in the policy process, the role of participatory mechanisms at public utility commissions, and interest group influence during the regulatory phase. In general, there has been few studies that have specifically examined stakeholder participation and influence at state PUCs. The literature on interest groups, rulemaking, and energy policies have taken a piecemeal approach to examining the scope of an interest group's ability to influence the policy process. It is clear from the findings of interest group influence at the national and state levels that there are unexplored linkages and causal explanations that do not fit neatly into models.

The following chapter builds upon what the previous literature has provided to construct a model to explain stakeholder participation and influence.

Chapter 4 Theoretical Framework

Introduction

This dissertation advances a causal model of access points to explain stakeholder participation and influence during state energy storage proceedings. This dissertation argues that participatory and inclusive mechanisms throughout the PUC stakeholder process will provide distinct incentives or constraints for environmental interest groups which will shape their behaviors towards other stakeholders and ultimately their ability to be influential. These participatory and inclusive mechanisms have a direct effect on the access points for stakeholders to engage and influence the rulemaking process, the tactics groups employ to influence the process, the range of stakeholders involved in the process, and opportunities for collaboration (or conflict) throughout the process.

However, given the theoretical and empirical complexity of untangling the causal relationship between stakeholder participation and stakeholder influence, this dissertation explores these connections in two phases. The first phase of the dissertation examines how stakeholders are able to successfully maximize access points throughout the regulatory proceeding to influence the final rules. The second phase of this dissertation analyzes stakeholder perceptions of influence throughout the entire proceeding.

While the distinction between the two conceptualizations of influence seems unnecessary, this dissertation seeks to highlight that influence is multidimensional. Influence can present itself at different moments in the rulemaking process and through different group behaviors. It is important to note that influence is not absolute. Rosenthal (2001, p. 213) notes that the perception of influence and the ability to get stuff done is at times held with higher regard than a group's actual effectiveness. Therefore, the perception of influence can hold much power in explaining group dynamics and, subsequently, the outcome of policies.

Conceptualizing influence also as perceived influence, accounts for the bias of respondent's perception of influence. While this dissertation attempted to determine the level of influence as objectively as possible (as described in the research designs section in the next chapter), it is amiss to ignore the importance of stakeholders' perception in what is a social process. Again, it is imperative to note that perceptions shape influence. Actual influence and perceived influence are two very different constructs.

The following discussion is split into two sections to address the distinct frameworks that examine stakeholder influence on multiple levels.

Phase 1: Access Points and Influence During the Regulatory Processes

Contextual Factors that Shape the Stakeholder Process

There is a myriad of contextual factors that shape the context of a rulemaking. This dissertation focuses on the guiding role of the authorizing legislation, issue salience, and information ambiguity. First, the authorizing legislation provides specific directives, requirements, or timelines to the state regulatory agency (i.e., PUCs). The authorizing legislation can be very specific or open to the PUC's interpretation. This, in turn, can have a great impact on the scope and intent of the process. If the authorizing legislation is not prescriptive, PUCs will have greater discretion over the rulemaking process and scope. However, prescriptive legislation provides greater legal certainty that the PUC must comply with the legislation's original intent, as the legislation is codified into the state law (e.g., statutes).

In addition, the authorizing statute can instill aggressive timelines or deadlines for specific commissioner decisions. In the case of energy storage, the authorizing statutes for all five states were quite different from one another. Some authorizing statutes had specific directives and requirements that PUCs must follow. The most critical directive to come out of the energy storage legislation was the mandate for specific energy storage targets. Out of the five states in the first wave of energy storage legislation, only Oregon and Virginia specified the energy storage target level. However, the legislatures of the newest states (Connecticut and Maine) passed specific energy storage targets, which may be indicative of an encouraging trend in energy storage legislation.

Second, issue salience is a key context for any policy. Issues with little salience will likely not attract as many stakeholders as issues with greater salience. Stokes (2015) highlights that there is a greater likelihood that environmental groups can exert greater influence when policy issues are new and have little saliency. In addition, the level of issue salience will impact which groups decide to prioritize the energy storage proceeding over others. At any moment, there are many legislative and regulatory proceedings occurring simultaneously. No matter what their resource and staffing capacity, most interest groups will have to decide what policy issues to pursue or not. Therefore, issue salience can greatly impact the stakeholder process.

Finally, connected to issue salience is the challenge of issue ambiguity. Issue ambiguity is loosely defined as being a policy issue that does not have clear boundaries regarding its definition, functionality, and domain. When California became the first state to pass energy storage legislation in 2010, there was very little real-world application or knowledge of energy storage systems. Even experienced energy and clean energy interest groups had little understanding of the complexity and multi-uses of energy storage. There was confusion on how and to what degree energy storage should be installed into traditional electrical systems regarding its generation, distribution, and transmission.

Throughout these periods of issue ambiguity, some groups can shape the dialogue, definitions, and agenda of the issue. This can be a very powerful opportunity for stakeholders. While defining issues may seem small, defining what energy storage *is* and its applications were pivotal moments for each of the early states' proceedings.

In addition, when there is issue ambiguity, often there will be divisions among interest groups, thereby preventing the formation of powerful coalitions that can be a barrier to progressive policies. Faulkner (2008) notes that interest group divisions among traditional powerful interest groups (i.e., industry and business) environmental groups are able to navigate the process more successfully, as they are not encountering such a bloc of powerful resources. Concurrently, Stokes (2015) highlights that some powerful interest groups may be distracted with other issues or not perceive the issue to be a priority until it is too late to intervene.

Therefore, context matters in structuring the scope and timeline of a regulatory proceeding. The authorizing legislation, issue salience, and issue ambiguity each had a major role in the context of the five state energy storage proceedings. As the next section highlights, the policy context can be integral in shaping how the stakeholder process is conducted.

Stakeholder Access Points and Influence

There are multiple stages throughout the regulatory process in which stakeholders are allowed to participate. These stages provide access points for stakeholders to potentially influence the content and the process of the regulatory proceeding. Access points are critical to how effectively and how often stakeholders can influence the process and the content of the rules (Crow, Albright, and Koebele, 2016). There are potentially four key access points during a rulemaking: before the advanced notice of proposed rulemaking (ANPRM), the pre-proposal stage, the notice of proposed rules

(NOPR) in which there is a formal notice and comment period, and the final rules. Interest groups that are able to exploit these access points have a greater likelihood of influencing the regulatory process through tactics such as lobbying and issue definition (e.g., agenda building and agenda framing). It is important to highlight that not all PUCs will facilitate a ANPRM or the pre-proposal stages. The number of formal access points often depends upon the authorizing statute and the discretion of the agency.

The first access point is right after the legislation has passed. After the legislation has passed, stakeholders involved with the legislation still have much work to complete to see their legislative efforts continue into the regulatory phase. Not all interest groups involved in the legislative phase will carry through to the regulatory phase; however, some groups will. This was especially the case in California, in which two important groups, Vote Solar and the California Energy Storage Association (CESA), were heavily involved in the legislation and throughout the beginning of the energy storage rulemaking.

During this gap period between the passage of the legislation and the commencement of the regulatory proceeding, stakeholders have an opportunity to engage with staff from the PUCs, legislative members, and other interest groups. Much of this engagement is informal, although it can be quite fruitful as PUC staff begins to collect information for the regulatory proceeding. Often staff will actively seek outside expertise to help shape the beginning of the proceeding. Therefore, stakeholders that possess expertise on the issue can be quite influential during this phase. In the California case, CESA was integral in helping the CPUC staff understand the technological aspects of energy storage and helped write up key documents.

This informal stakeholder engagement can bleed into the second stage, the pre-proposal stage. Not all rulemakings will have a pre-proposal stage. This is the stage in which stakeholders are invited to help inform the docket and share their comments on what rules or regulations should be included before a draft has even been written. In the case of New York, there was not a pre-proposal stage as the rules had essentially been written before the rulemaking had even begun.

Yackee (2011; 2015) highlights the importance of lobbying during the pre-proposal stage, in which interest groups are able engage with government officials *ex-parte*, or off the record.[6] Interest groups are allowed to engage with the agency's staff throughout the rulemaking process and the commissioners at a limited capacity within the confines of the agency rules of conduct. Lobbying can come in many forms, from providing information to the agency to directly influencing the rules. It should be noted, though, that *ex-parte* lobbying has greatly diminished after decades of PUC commissioner scandals. Nonetheless, these access points provide multiple opportunities for some interest groups to influence the rulemaking process.

---

[6] It is important to make a distinction between Yackee's (2011, 2015) meaning of *ex-parte* and *ex-parte* in PUC regulatory proceedings. In Yackee (2011, 2015), *ex-parte* just refers to the informal lobbying of agency members and staff. This is considered a customary form of strategy by stakeholders and is not considered to be controversial. In contrast, the *ex-parte* communications with PUC commissioners or law judges are considered to be tenuous after decades of scandals and undue influence. In most PUC cases, *ex-parte* is allowed, but stakeholders must report when and what was discussed with the official. *Ex-parte* communication is considered to less common in recent years.

The regulatory agency has some discretion over who they allow to participate during the pre-proposal stage. However, in some situations, the authorizing statute may mandate the participation of specific groups from the very beginning. For example, in New York, the legislation mandated that the New York Department of Public Service and the New York Energy Research and Development Authority (NYSERDA) work together to formulate an energy storage roadmap. As the New York case will show, this had a large impact on the stakeholder framework.

The pre-proposal stage is important regarding the potential for agenda-setting, agenda building, agenda blocking, and framing (Kamieniecki, 2006). Agenda building entails a group's ability to introduce information for the agency to consider, define policy problems, and develop the content of the proposed rules (Yackee, 2014). Much of the rulemaking literature (Rinfret, Cook, Pautz 2014; Yackee, 2011; Crow, Albright, and Koebele, 2016) has noted that the pre-proposal stage is a critical juncture in the process, in which key interest groups and agency personnel work together to build and block key issues in the rules. Crow, Albright, and Koebele (2016) noted that an open stakeholder process during the pre-proposal stage encouraged collaborative relationships at times among the interest groups. These processes can make for a more expedited rulemaking process and provide opportunities for compromise and collaboration.

However, in many circumstances, even before the notice and comment period is conducted, a minority of stakeholders have determined the final rules. Previous literature (Roundtree and Baldwin 2018) has noted that utilities often have an upper hand in crafting plans and programs in PUC regulatory proceedings. Non-utility stakeholder participation is therefore reactive, in which they are only able to respond to the proposal with written comments during the formal comment period.

In addition, agenda blocking, the ability to block specific rules, is an important indicator of group influence. The power of "no" is just as strong as the power of "yes", if not more so in some instances. Rosenthal (2001, p. 68) notes that business groups are often more likely to block policies rather than attempt to create good policy, in which the power of "no" preserves the status quo for them.

The third stage, the notice and comment period, traditionally attracts the most stakeholder involvement, as any group or individual can submit comments to the regulatory agency. It is also an important stage of the process for expert stakeholders, as this is when they can build up the record to formalize their perspectives, evidence, and facts. The commission must consider the record to inform their decision. However, in many cases (e.g., rulemakings), the commission can use their discretion (in accordance with the administrative rules of the state and regulatory agency) as to how receptive they may or may not be towards the submitted comments.

The fourth stage, the delivery of the final rules or orders, is not always a key access point, as often the rules have already been finalized by the agency and the commission. It is possible to submit comments on the final rules to express one's opinion, but few meaningful changes can be made at this point. Yet, comments on the final rules or orders may help set up stakeholders for future proceedings with the PUC or other stakeholders.

Finally, contextual and institutional factors may provide other access points for interest groups to seek out. For example, PUC working groups provide greater opportunities for interest groups to inform, shape, and influence the final outcome. Working groups may also spill over from other policy issues and proceedings.

While there are potentially four key access points in which stakeholders have the opportunity to influence the process and the rules, this dissertation argues that the *type* of access can greatly affect how effective a stakeholder will be or not. Access can either facilitate stakeholder participation or inclusion. To review, participation mechanisms increase input for decisions, which can include broadening stakeholder participation and making it more accessible (Quick and Feldman, 2011). Participatory mechanisms will often be found most often during the comment periods and even for public meetings. Inclusive mechanisms build community capacity and seek to build "connections among people, across issues, and over time" (Quick and Feldman, 2011, p. 274). Quick and Feldman (2011) note that inclusion can incorporate deliberation, so long as deliberation embodies three criteria: multiple ways of knowledge, coproduction, and temporal openness. Inclusive mechanisms in a PUC stakeholder framework might include stakeholder working groups, workshops, intentional agency policy linkages, and the establishment of institutional norms for consensus.

Inclusive measures encourage stakeholder deliberation with one another. Nabatchi and Leighninger (2015, p. 15) define deliberation as the "thoughtful, open and accessible discussion about information, views, experiences, and ideas during which people seek to make a decision or judgments based on facts, data, values, emotions, and other less technical considerations." It is the *sharing* of information and coming to *mutual* understandings that makes deliberation an enduring facet of the stakeholder process.

Most PUC stakeholder processes seek to promote participatory stakeholder processes. Yet not all PUC stakeholder processes are inclusive. This dissertation argues that environmental and clean energy stakeholders will be more influential over the final rules when PUC stakeholder processes are participatory *and* inclusive. Environmental and clean energy stakeholders will have greater opportunities to deliberate with other stakeholders and staff to advance their perspectives and share information. Table 4.1 details the various PUC activities that embody either a participatory or inclusive framework for stakeholder participation.

Table 4.1 Participatory and Inclusive Mechanisms

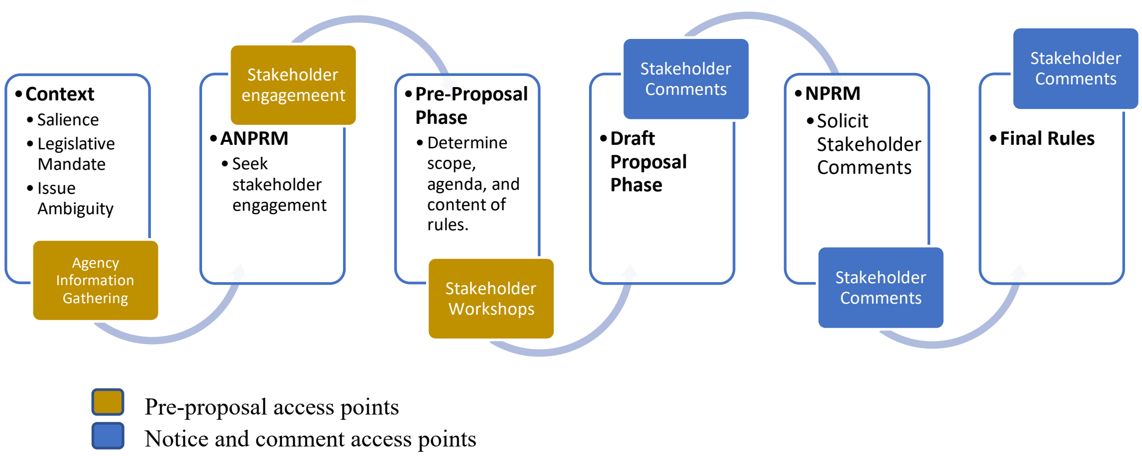
Type of Stakeholder Engagement	PUC Activities
Participatory Mechanisms	• Broad public participation • Multiple comment periods • Technical meetings • Public Meetings
Inclusive Mechanisms	• Agency norms for stakeholder consensus and deliberation • Stakeholder workshops • Coproduction of important documents • Agency emphasis on policy linkages among PUC proceedings

As Table 4.1 shows, most participatory mechanisms at state PUCs involved measures to include more stakeholders and make information more readily available. In contrast, inclusive measures seek a deeper level of engagement, in which stakeholders take time to deliberate and create connections with other stakeholder groups. The context and scope of the proceeding will determine which participatory and inclusive measures will be employed. In addition, the organizational culture of the state PUC will also have some role in which participatory mechanisms the PUC prefers to utilize.

A Model of Stakeholder Access and Influence

This dissertation advances a model of stakeholder access and influence. This model provides a foundation for understanding at what points during the process stakeholders are able to access to participate and whether that participation leads to greater influence. The type and quantity of access points is important for stakeholder influence. Figure 4.1 illustrates the key access points and conditions of interest throughout the rulemaking process that stakeholders are able to exploit to influence the final rules or order.

Figure 4.1 A Model of Stakeholder Access Points and Influence Over the Final Rules



The model depicts the context of the proceeding in the first box, which shapes the scope and PUC's discretionary powers. The main boxes show the key stages of the rulemaking: the advanced notice of proposed rulemaking (ANPRM), the pre-proposal phase, the draft proposal phase, the notice of proposed rulemaking (NPRM), and the final rules. The smaller boxes in gold and blue represent the access points in which stakeholders have the potential to participate and influence the process.

The boxes in gold notate access points that occur during the pre-proposal stage. It is during the pre-proposal stage that stakeholders will have the greatest level of influence to define and frame the content of the rulemaking. The boxes in blue represent access points during the formal notice and comment portion of a rulemaking. It is important to note that not all of the rulemakings have all of these stages or opportunities for stakeholder engagement. For example, many rulemakings do not have an ANPRM or a pre-proposal phase that is open to all stakeholders.

At the heart of this model of stakeholder influence is a stakeholder's ability to access points of potential influence throughout the process. The model advances that stakeholders will be more influential when they are able to access the pre-proposal phase, attend multiple stakeholder meetings, and submit multiple rounds of comments. As this model shows, the greater number of access points, the greater chance a stakeholder will be able to influence the outcome. The model also highlights that contextual factors (i.e., salience, the legislative mandate, and issue ambiguity) can have an impact on the stakeholder process, and thereby the number of access points that are available to stakeholders.

Table 4.2. articulates the key propositions for the model of stakeholder access points and influence.

Table 4.2 Propositions for Stakeholder Access Points and Influence

Propositions: Access Points and Influence
Proposition 1_a: How a PUC addresses the challenge of issue ambiguity will shape the scope of the stakeholder framework.
Proposition 2_a: Environmental and clean energy stakeholders that participate during the four major access points (the advanced notice of proposed rulemaking, the pre-proposal phase, the draft proposal phase, and the notice of proposed rulemaking (NPRM)) will be more likely to be influential over the Final Rules.
Proposition 3_a: Environmental and clean energy stakeholders will be more influential over the Final Rules in states that provided more than the minimum requirement for stakeholder comments.
Proposition 4_a: Environmental and clean energy stakeholders will be more influential over the Final Rules in states that hold stakeholder technical workshops and meetings.
Proposition 5_a: Environmental and clean energy stakeholders will be more influential over the Final Rules in states that included stakeholders during the pre-proposal process.

These propositions create the foundation for exploring the social dynamics of stakeholders and how that can lead to varying levels of perceived influence. The next section develops the conceptual framework for analyzing the concept of perceived influence.

Phase 2: Stakeholder Group Dynamics and Perceptions of Influence

As the previous section discussed, inclusive stakeholder frameworks can create mutually beneficial relationships for stakeholders. Inclusive stakeholder frameworks provide opportunities for groups to have positive interactions with one another in an iterative process. These positive (or negative) interactions can spillover to future proceedings and even have reinforcing effects on inter-group dynamics. Ultimately, these interactions and experiences shape an individual's perception of influence of themselves and of other stakeholders.

At the heart of the second phase of this dissertation is the desire to examine the factors that shape an individual's perception of influence, and how those perceptions affect their actions and relationships with other stakeholders. This portion of the dissertation is exploratory and conceptual, given the difficulty of quantifying social interactions and individuals' perceptions of one another.

This dissertation draws from the findings by Roundtree and Baldwin (2018). Roundtree and Baldwin (2018) explored how and why stakeholders participate in regulatory proceedings. Much of their study is informed by stakeholder interviews that describe stakeholders' perceptions on how to successfully participate and even influence the regulatory process. Their key findings provide a strong foundation for exploring the social dynamics of stakeholder groups:

(1) Agency culture and stakeholder experience can affect how and when specific stakeholders are allowed to participate.

(2) Stakeholders seek multiple formal and informal avenues for participation.

(3) Stakeholders are often playing the long game, in which they will seek to build relationships with other stakeholders and agency members to further their agenda.

While Roundtree and Baldwin's (2018) findings provide a greater understanding of stakeholder perceptions of participation and influence , their study offers only a cursory description of stakeholders' and agency members' social connections and relationships. This portion of the dissertation seeks to provide a richer examination of the social dynamics of these important groups and how those relationships can shape their perceived level of influence among one another. The following section goes into greater detail on how these themes of stakeholder experience, agency culture, multiple avenues of participation, and stakeholder networks can be constructed to examine stakeholder perceptions of influence.

Stakeholder Experience and Familiarity with Agency Culture

Stakeholder experience and familiarity with PUC culture takes time and poses a steep learning curve for many individuals to master. Experience is only achieved after many years of active participation. Addressing the capacity and experience factors around group participation in PUC proceedings helps provide context on group power imbalances and exclusion and equality issues (Quick and Bryson, 2016).

First, an interest group's ability to participate in a PUC regulatory proceeding is often predicated by its capacity (e.g., organizational resources, staffing, and finances). Some of these PUC proceedings are lengthy and require a great amount of time and resources. A traditional rulemaking will usually last approximately six months. Stakeholders are expected to write up informed comments, attend meetings, attend hearings, and engage with other stakeholders. This can be a time-consuming and costly process that may deter groups from participating at all. In addition, most stakeholders are involved in multiple policy proceedings, which adds further strain to an interest group's capacity for funding and staff.

Second, there is a minimum level of knowledge and experience of PUCs required to participate successfully. As previous sections have emphasized, there is a steep learning curve at state PUCs. The PUC proceedings are often very technical, legalistic, and saturated in industry language and logic. Therefore, successful stakeholders are often organized entities that have the resources to keep up with the job's information and technical demands along with a history of intervening.

Previous literature has noted the importance of PUC experience and the status that experience brings to certain groups. Crow, Albright, and Koebele (2016; 2020) note the difference in influence between "insider" and "outsider" groups. Crow, Albright, and Koebele (2016; 2020) highlight that a group's "status" as an insider or outsider affects its ability to influence the proceeding. Similarly, Roundtree and Baldwin (2018) use the distinction of "lay" and "expert" stakeholders.

In both instances, expert (i.e., insider) stakeholders are regulars around the PUC. These stakeholder groups are often industry groups that have a history of participating at the PUC and understand the formal and informal mechanisms to succeed in PUC proceedings (Crow, Albright, and Koebele, 2020). These expert stakeholders have a reputation that has been accrued over the years due to interactions with other stakeholders and agency members and through their organization's history with the PUC. Often expert stakeholders will be familiar with PUC staff due to working closely with them over the years. All of these reputational and experience factors can give expert stakeholders an advantage at the PUC.

Crow, Albright, and Koebele (2016) emphasize that relationships can develop among stakeholders and the regulatory agency over time from previous rulemaking iterations, which subsequently leads to the regulatory agency inviting those stakeholders to participate in other pre-proposal workshops. These staff invitations to participate during the pre-proposal phase are important for stakeholders. The pre-proposal stage is a major access point in the process in which stakeholders can influence the rulemaking by creating or blocking specific rules (Yackee, 2012).

In contrast, lay or outsider stakeholders are often advocacy groups or citizens that have little experience with the PUC. They will often lack the expertise and capacity to participate to the level that expert stakeholders are able to participate. Previous literature has also noted that despite formal public notification requirements, there is very little public media attention and notification informing lay stakeholders and citizens to participate in the proceedings. Often stakeholders must be on a PUC list server or aware of the PUC to keep up to date with what proceedings are happening. Therefore, unless it is a contentious mainstream issue such as fracking, citizens will not be aware of these proceedings occurring or even what the PUC is.

Experience and familiarity with the PUC culture are important facets of stakeholder influence. As the state rulemaking literature has noted (Crow, Albright, and Koebele 2016; 2020; Roundtree and Baldwin, 2018), there is a stark difference in success between expert stakeholders and lay stakeholders. Experience matters and can open access to other opportunities at the regulatory agency.

Formal and Informal Avenues for Participation

Roundtree and Baldwin (2018) highlight that expert stakeholders will seek multiple formal and informal avenues for participation to increase their "impact on decisions." These avenues for participation cross over multiple PUC proceedings and provide issue and network linkages for stakeholders. As the previous sections noted, expert stakeholders often have a long history of interacting with PUC staff and other expert stakeholders. These relationships can be beneficial in formal settings (e.g., stakeholder meetings and commission hearings) and informal networking. Sharing information and finding common ground among stakeholders can create a more productive platform for future negotiations and interactions (Roundtree and Baldwin, 2018). In particular, informal avenues for participation or networking have been noted as especially advantageous.

Previous literature has noted the importance of coalition building (Gray and Lowery, 1998; Baumgartner and Leech, 1998; McKay and Yackee, 2007; Baumgartner et al., 2009; Nelson and Yackee, 2012; Crow et al., 2019). Coalition building is a key component of the lobbying literature. At the federal level, coalitions offer many benefits to members with regards to groups sharing skills, information, and resources (Baumgartner et al., 2009). Nelson and Yackee (2012) find that lobbying coalitions in Washington D.C. are able to influence the content of policies. Nelson and Yackee (2012) found that coalition success is predicated on group consensus and coalition size and composition. Crow, Albright, and Koebele (2019) discovered that environmental advocacy groups with few resources and less capacity formed alliances with professional groups that possessed greater expertise in the policy area.

Therefore, it is clear that maintaining and nurturing relationships with regulatory agencies and other stakeholders is important for interest groups that want to be invited to the table. In addition, forming coalitions (even if they are brief) can help create network connections and relationships that will carry over to future proceedings. Having social influence with other stakeholders can be advantageous for group deliberations, bargaining, and negotiations.

Playing the Long Game

Finally, Roundtree and Baldwin (2018) note that many expert stakeholders are "playing the long game." This is an important finding because it explains stakeholder patterns of behavior. When stakeholders perceive themselves as being in the long game, they will behave in certain ways to ensure their longevity in that "game." Stakeholders will work to create coalitions and allies that will endure past the current proceeding. Stakeholders will be cautious in how they act towards opposing groups, as their past actions will often affect how they are received later on.

Playing the long game, the right way, can ultimately lead to reputational benefits for a stakeholder and their organization. These reputational benefits (or detriments) are social signals for other stakeholders and agency members. Stakeholders with good reputations will be held in greater esteem than those with bad reputations. That esteem and respect can lead to greater formal and informal opportunities throughout the PUC process. Thus, the concept of "playing the long game" possesses a host of reputational and social advantages that can be observed over time throughout multiple proceedings and interactions. The experience gained from playing the long game reinforces the perceived influence of those stakeholders, too.

A Conceptual Model for Perceived Stakeholder Influence

Based on the three themes discussed above (i.e., experience, group tactics, and playing the long game), I advance a model for exploring perceptions of stakeholder influence. This model of perceived stakeholder influence provides a framework for explaining why some stakeholders are perceived as more influential than others. Rather than a single driver for influence, this model proposes multiple facets of influence relating to capacity, experience, reputation, expertise, and networking.

It is important to note that most of these facets of influence are fluid, given that they exist within a social environment. These conditions are difficult to quantify, which is why they have not been fully examined in previous literature. This dissertation recognizes that the PUC process is a social process. Therefore, these fluid facets need to be addressed to provide for a richer understanding of the stakeholders, processes, and behaviors observed at PUC proceedings. Table 4.3 lists the propositions that support the conceptual model for perceived stakeholder influence.

Table 4.3 Propositions for Perceived Influence

Propositions: Perceived Influence
Proposition 1_b (Capacity): Stakeholders whose organization possesses greater resource capacity (i.e., staff and finances) will be perceived as more influential.
Proposition 2_b (Experience): Stakeholders who have a long history of experience and are more familiar with formal and informal processes at the PUC will be perceived as more influential.
Proposition 3_b (Expertise): Stakeholders that have greater expertise over an issue will be perceived as more influential.
Proposition 4_b (Intra-Group): Stakeholders that have a collaborative coalition with similar group types will be perceived as more influential. In the inverse situation, stakeholders in a conflictual relationship with similar group types will be perceived as less influential.
Proposition 5_b (Inter-Group): Stakeholders that have a collaborative coalition with opposing group types will be perceived as more influential. In the inverse situation, stakeholders that are in a conflictual relationship with opposing group types will be perceived as less influential.
Proposition 5_b (Network): Stakeholders with a wide array of network contacts (personal and professional), will be perceived as more influential.

As this model depicts, there are multiple factors that contribute to an individual's implicit influence. Some of these factors are more tangible (e.g. resources), while others are more fluid (social interactions with other individuals). The effects from these social interactions and stakeholder relationships are pervasive across multiple proceedings.

Stakeholders are in a constant state of action and reaction with one another throughout the entire PUC proceeding and into the next. An individual's implicit influence can therefore create opportunities or barriers to their ability to actually influence the process and the outcome. While most of the following substantive chapters focus on stakeholder access points and influence, it is important to continue to keep the model of perceived influence in consideration as there are linkages between inclusive stakeholder frameworks and perceived influence.

Conclusion

This chapter presented the dual models of stakeholder influence. During the first portion of this chapter, the theoretical framework is built for the model of stakeholder access points and influence. A stakeholder's ability to influence the outcome of the proceeding depends upon the *type* and the *quantity* of access points they can achieve. In particular, the model advances that stakeholders will be more influential when they have access to the pre-proposal phase, multiple stakeholder meetings, and multiple comment periods.

The second portion of this chapter presented the model of perceived influence. The model on perceived influence examines the factors that contribute to an individual's perception of influence of themselves and of other stakeholders. These perceptions of influence are integral for how individuals are received by other stakeholders and the engagement opportunities that they encounter (or do not encounter) throughout the regulatory process.

The next chapter provides a detailed discussion of the methodological approaches utilized in this dissertation to support the dual models of stakeholder influence.

Chapter 5 Methodology

Methodological Perspective

The scope of my research is an exploratory study that focuses on description and theory building. The focus on thick description and theory building was an important component for the research design give that there is a lack of prior scholarship on interest groups influencing energy policy throughout the state rulemaking process. There is a gap across the literatures regarding environmental and clean energy stakeholder influence at state public utility commissions.

This dissertation seeks to remedy this gap by answering two interrelated questions. First, what participatory mechanisms at public utility commissions lead to greater levels of influence among environmental and clean energy groups? Second, what effect do the social dynamics among stakeholder groups have on shaping a stakeholder's ability to be influential? This dissertation answers these questions in two phases. Approaching the research question in two phases was necessary in order to offer a cohesive and rigorous analysis of the complex processes and interactions of the stakeholder experience at state public utility commissions.

In the first phase of the methods, the methodology called Qualitative Comparative Analysis (QCA) is employed. QCA was developed by Charles Ragin (1987; 2000) as a middle ground between qualitative and quantitative methods. Unlike statistical linear models that examine general associations or tendencies among variables, QCA analyzes variables based on set relations (Ragin, 1987). Set relations enables the researcher to examine the connections among causal conditions and outcomes. The software, fsQCA

3.0 (Ragin and Davey, 2016) is used to analyze the key conditions of interest. The output from fsQCA 3.0 provides a detailed analysis of the causal relationships.

The second phase of the analysis is based on the interview analysis of key stakeholders from the energy storage proceeding in Oregon. Interviews were conducted with key stakeholders to explore the connections between stakeholders' perceived influence of themselves and of other stakeholders.

A codebook was developed prior to analyzing the interviews. Key themes and conceptual frames were coded under each question and topic to be discussed in the interview. With the help of the coding software, NVivo, a minimalist version of thematic analysis was employed to the interview data to explore the key themes within and across the interview data.

The rest of the chapter is divided into two sections. The first part of this chapter provides a detailed explanation of QCA and how it was applied throughout this dissertation. The next section presents a discussion of the six main steps in QCA while also describing the unique output from this approach. The second part of this chapter explains the interview process: the construction of the interview questions, the codebook, and selection of participants. The following section reviews the steps to thematic analysis and note its flexibility as an approach. This chapter concludes with a discussion on the balance between inductive and deductive approaches within this dissertation.

Introduction to Part I: Qualitative Comparative Analysis

Benefits of Qualitative Comparative Analysis

The objective of this first part of the dissertation is to examine what types of access points environmental and clean energy stakeholders are able to take advantage of to influence the final rules. This dissertation utilizes a methodology called Qualitative Comparative Analysis (QCA) to examine the relationships between the cases. Cases were determined based on four criteria: 1) legislative mandated regulatory process, (2) policy issue type, (3) interest group type, and (4) led by the state's public utility commission. Across the five states, there were only 18 cases that fit the research design's criteria. The cases and states used in this dissertation represent the total population, as there have been only five states that have conducted regulatory proceedings on energy storage targets.

Most quantitative methods that rely on statistical analysis are a poor fit for research designs with a small quantity of cases. Therefore, most statistical methodologies were not an option for the scope of this dissertation.

The natural solution to small case study research designs is through qualitative methods. In particular, comparative case analyses is appealing given that it focuses on rich explanations and is often supported by interviews from key actors involved with the process or event. In comparative case analysis, researchers rely heavily on content analysis to make inferences about the causal relationships among variables. However, content analysis can fall easily to researcher bias, which impacts the reliability of the research design. Concerns about content analysis were especially importantly in this dissertation given that specific stakeholder positions were extracted to assess their level of influence from secondary docket materials (i.e., the Commission's rulings and orders). While researchers can work to create better reliability through more transparent practices and records, it still remains a challenge to determine the validity of the study's conclusions.

A middle ground between statistical analysis and comparative case analysis is Qualitative Comparative Analysis (QCA). Ragin (2008) argues that QCA is a bridge between qualitative and quantitative methods. Unlike linear statistical methods, QCA is based on Boolean or fuzzy algebra. Boolean Algebra is based on set relations, in which the researcher seeks to establish causality among the key conditions (i.e., variables) through set relationships.

There are five main types of uses of QCA: summarizing data, checking the coherence of the data, testing hypotheses or existing theories, quick test of conjectures, and developing new theoretical arguments (Rihoux and Ragin, 2009). QCA's methodology and overall objectives are a particularly strong match with this research design given the theoretical and empirical limits of the cases and the desire to balance thick description with concerns regarding the reliability and validity of the inferences.

QCA is an appropriate methodology for this research design over a statistical design for four reasons. First, QCA is ideal for small to medium research designs (Ragin, 2008). The research design was inherently limited in the number of available cases to examine given its narrow focus. Ultimately, there were only 18 cases spanning five states. It would be difficult to infer any meaningful conclusions from such a small set of cases using other quantitative methods based on regression. In addition, the framework of

QCA helps address the inherent problem of over-specification, when there are too many variables and too little cases to capture the patterns and connections among the data. The QCA framework mitigates over-specification through several processes: minimizing formulas, necessary and sufficient condition analyses, and the creation of causal combinations. By the end of the QCA process, the researcher has been able to isolate the key cases and causal relationships among the conditions of interest.

Second, QCA provides a rigorous method to examining complex causality (Ragin, 2008). This is especially relevant to this research given that the cases are context dependent. As the previous section noted, the literatures have noted many factors that contribute to a group's ability to influence the rulemaking, but they have done so in isolation of one another. The literatures have not taken the time to properly examine any causal connections or interactions among the key factors. Therefore, QCA provides an appropriate framework to explore the multiple findings from previous studies as a whole, rather than piecemeal.

Third, the foundation of QCA is based on set theoretic relations (Ragin, 2008). Set relations are preferential to correlational connections because they: "(1) involve causal or other integral connections linking social phenomena, (2) are theory and knowledge dependent, (3) are central to social science theorizing, (4) are asymmetric, and (5) can be very strong despite relatively modest correlations" (Ragin 2008, p. 17). Correlational research methods are particularly poor at providing clear conclusions when the number of cases is small or medium, as in this dissertation. In addition, QCA's set relations are grounded in necessity and sufficiency conditions, which help to explain causal complexity. The necessary and sufficient framework is especially useful studying interactions and patterns among condition, as in this dissertation, which seeks to examine the interaction between institutional conditions and social conditions.

Finally, QCA bridges qualitative and quantitative analysis (Ragin, 2008). The majority of the federal rulemaking literature has been primarily quantitative, which has limited its ability to focus on the rulemaking process in its entirety. Often quantitative rulemaking research has only examined single stages of the rulemaking process. In addition, quantitative research has often been constrained in its focus on the actions of single units of analysis (e.g., interest groups or the bureaucracy), rather than assessing their roles and actions together as a whole. A QCA approach provides a more holistic examination of the multiple causal factors and their interactions with one another which quantitative research is unable to provide. Again, QCA is better suited to analyze the complexity of fluid, social phenomena than a purely quantitative methodology provides.

Limitations of Qualitative Comparative Analysis

It is important to discuss the methodological limitations of QCA. First, not all research questions will be suitable for QCA. QCA requires that the outcome and the conditions be interval-based *and* grounded in the logic of a condition being present or absent.

Second, QCA does not have a method to address missing data for a case. There must be complete data for the cases and conditions to conduct a QCA analysis. This is a challenge when using interview data or conditions that do not have widely available data. Entire cases must be dropped if there is missing data for a certain condition.

Another disadvantage of QCA is that it relies heavily on a researcher's intimate knowledge of the cases to construct the methods and then analyze the results. This risk is especially high during the calibration of conditions, the minimization of the truth table, and the analysis of the final solutions. There are inherent dangers of researcher bias in these critical steps.

During the calibration stage, the researcher must create cut-off points based on their knowledge of the condition. The calibration can sway the results if not done carefully and in consideration of previous empirical cases and theory.

The minimization of the truth table also requires the researcher to use their knowledge of previous empirical cases and theory. One of the inherent challenges of the QCA process is that the truth table and the number of configurations become increasingly complex as more conditions are added. Therefore, the minimization of the truth table must be guided by knowledge and theory.

In the final stage of the analysis, there are often instances in which there are multiple pathways to the final outcome (i.e., equifinality). The researcher must then use their knowledge to determine the "best" configuration that explains their outcome. Therefore, the QCA process can be a major challenge to the validity and rigor of one's research if not conducted transparently and within the boundaries of previous literature and empirical cases.

Despite these limitations, QCA provides more advantages than disadvantages. Based on the scope of this dissertation, QCA provides the strongest methodology to examine how and at what points in the regulatory process environmental and clean energy stakeholders are influential. QCA can balance concerns regarding reliability and validity of the data collection and analysis while supporting this dissertation’s goal to provide a thick description of the stakeholders, processes, and causal mechanisms at play across and within the five states.

The rest of the chapter provides a more detailed discussion of how QCA was applied throughout this dissertation. The first section of this chapter examines the logic behind QCA and what types of research designs it can be utilized for. It then summarizes the rationale and calculations that went into performing the six steps of the QCA methodology: (1) case specification; (2) selection and conceptualization of conditions; (3) data collection; (4) conceptualization and calibration of membership scores; (5) analysis of sufficient and necessary conditions; and (6) construction and analysis of a truth table.

Applications of Qualitative Comparative Analysis

Before proceeding to the methodology section of this chapter, it is important to make the distinction between QCA as a *research approach* and QCA as an *analytical technique*. As a research approach, QCA homes in on the qualitative aspects of a research design through its iterative process of data collection, model specification, case selection, and reconceptualization of the conditions and the outcome (Wagemann and Schneider, 2010). QCA as an approach utilizes a distinct vocabulary that differs from traditional quantitative methods. For example, rather than independent variables, QCA examines conditions. Similarly, the dependent variable is called the outcome. In addition, rather than measuring conditions, QCA calibrates conditions.

Complementarily, but not the same as the research approach, is QCA as an *analytical technique*. As an analytical technique, QCA adopts its quantitative application and examines empirical patterns in the data, usually with the help of software programs (Wagemann and Schneider, 2010). QCA as an analytical technique utilizes computer-based and mathematical data analysis to determine causal relationships and a range of possible configuration patterns from the cases. The research methods discussed below reach their culmination in this final phase.

QCA can be utilized by itself as a research approach, but it cannot be relied upon purely as an analytical technique. The foundation of the QCA approach is a strong empirical and theoretical knowledge of the cases. This knowledge informs how the researcher determines cases, conditions, outcomes, calibration points, and minimization techniques. Therefore, for the purposes of this dissertation, QCA is used foremost as a research approach and then reinforced with QCA's analytical techniques.

There are three types of QCA: crisp-set (csQCA), fuzzy-set (fsQCA), and multi-value (mvQCA). Crisp-sets QCA establish dichotomous distinctions that are qualitative in nature (Rihoux and Ragin, 2012). The dichotomous values of [1] and [0] determine membership for each condition. The value of [1] represents "fully in" membership for that set while the value of [0] represents the condition being "fully out" of that membership. For example, a crisp set condition could be whether an interest group submitted comments during the notice and comment period [1] or did not submit any comments during the notice and comment period [0]. Table 5.1 shows the differences in membership between crisp sets and fuzzy sets.

Table 5.1 Crisp Versus Fuzzy Sets

Crisp set	*Three-value fuzzy set*	*Four-value fuzzy set*	*Six-value fuzzy set*	*"Continuous" fuzzy set*
1 = fully in	1 = fully in	1 = fully in	1 = fully in	1 = fully in
0 = fully out	0.5 = neither fully in nor fully out	0.67 = more in than out	0.9 = mostly but not fully in	Degree of membership is more "in" than "out": $0.5 < X_i < 1$
	0 = fully out	0.33 = more out than in	0.6 = more or less in	0.5 = cross-over: neither in nor out
		0 = fully out	0.4 = more or less out	Degree of membership is more "out" than "in": $0 < X_i < 0.5$
			0.1 = mostly but not fully out	0 = fully out
			0 = fully out	

Source: Rihoux, B. & Ragin, C.C. (2012)

Multi-value QCA is an extension of csQCA, in which the main difference is that mvQCA allows for multi-value variables rather than purely dichotomous variables (Rihoux 2009). Multi-value QCA establishes subsets of the cases. For example, rather than the dichotomous variable of submitting comments (a score of either [0] or [1]), mvQCA might further distinguish this by creating three subsets: no comments [0]; submitted one to three comments [1]; submitted more than three comments [2]. In practice, there is no limit to the number of subsets that mvQCA could use, as long as they were grounded in theory or empirical work.

The third type of QCA, fuzzy sets QCA, further distinguishes crisp-sets membership by including intervals between [0] and [1]. Like the previous types of QCA, a fuzzy membership score close to [1] indicates strong, but not full membership in a set and a score closer to [0] but less than .5 indicate that the case is more "“out" than "in" a set, but still weak members of the set" (Rihoux and Ragin 2012, p. 4). The score of .5 is the anchor for maximum ambiguity, in which a case is neither in nor out of a set.

This dissertation utilizes fsQCA. This dissertation is well suited for fsQCA for several reasons. First, the key conditions and outcome (i.e., influence) in this study are interval based. The conditions of interest group influence are multidimensional and cannot be reduced to dichotomous conditions, in which membership must either be fully in (1) or fully out (0).

For example, the condition of *level of participation* cannot be configured to being open or closed. Some stakeholders were able to participate fully throughout the entire proceeding whereas other stakeholders only participated for a short amount of time. There are multiple levels of participation from high participation to no participation. Therefore, fsQCA is able to encompass the different intervals for each condition that csQCA is unable to account for. Similar to the conditions of this study, the outcome of this study is interval based, which precludes both csQCA and mvQCA. In order to utilize either csQCA or mvQCA, the outcome must be dichotomous (Rihoux and Ragin, 2012).

Second, while fsQCA possesses quantitative characteristics of interval and ratio-scale variables, it also enables rigorous qualitative analysis. The researcher must have a deep theoretical and empirical knowledge of the cases in order to effectively employ fsQCA.

While QCA has been primarily utilized in comparative politics research, it has many uses for different levels of analysis and across different units of analysis. This dissertation employed the statistical software, fs/QCA 3.0 to analyze the results.[7] This software was developed by Charles Ragin and Sean Davey (2017). While there have been critiques that the truth table analysis does not always put forth all the possible solutions, this software was well-suited for this study. The researcher had in-depth knowledge of the cases and the number of cases and variation among the cases is small. For a larger N-study, this discrepancy may be too large to oversee. However, the truth table results only confirmed what had been analyzed by hand. The fs/QCA software was able to provide more concrete numbers and causal associations that strengthen the dissertation's theoretical and empirical claims.

The following section goes into greater detail of how fsQCA was applied and what the key steps are to the process.

Applying Fuzzy Sets to a Research Design

There are six distinct steps for fsQCA: (1) case specification; (2) selection and conceptualization of conditions; (3) data collection; (4) conceptualization and calibration of membership scores; (5) construction and analysis of a truth table; (6) analysis of

[7] Ragin, Charles C. and Sean Davey. 2016. *Fuzzy-Set/Qualitative Comparative Analysis 3.0*. Irvine, California: Department of Sociology, University of California.
For more information on the software, go to https://www.socsci.uci.edu/~cragin/fsQCA/software.shtml

sufficient and necessary conditions. The six sub-sections below go into specific detail of these steps and how to apply fsQCA and its logic to this study. Again, it is important to recall that QCA is based on set relations and Boolean Algebra, which makes its application, and even logic, different from other types of quantitative and qualitative research designs.

Specification of Cases

One of the most important stages of QCA is determining the cases. QCA is case oriented, which is distinct from variable oriented research that many quantitative methods prioritize. The empirical setting for this dissertation is states since state level processes are the being examined (i.e., state energy storage PUC proceedings). However the unit of analysis is environmental and clean energy interest groups. It should be noted that there were specific reasons for why interest groups are the unit of analysis for this dissertation. Across disciplines, there are multiple terms that are used to describe groups or individuals that engage with the political process (i.e., stakeholders, lobbyists, interest groups). For the context of this study, the group is the unit of analysis.

It is important to emphasize that there is a distinction between interest groups and stakeholders. There is a distinction between groups that participate in PUC proceedings (i.e., stakeholders) and groups that do not participate (i.e., interest groups). In regulatory proceedings, interest groups are referred to as stakeholders. In many instances, interest groups must formally request to the PUC commission to be a party to a PUC proceeding. There are few instances in which an interest group will not be allowed to be a party to the proceeding. Therefore, this dissertation uses the term interest group and stakeholders interchangeably when referencing groups that are a part of the regulatory proceeding.

QCA not only provides the opportunity to examine the conditions within the empirical setting of an interest group's ability to influence the rulemaking process (i.e., within-case analysis), but it also provides an opportunity to examine interest groups across the states to determine whether there are more general trends across the states that can explain a group's ability to influence the rulemaking process (cross-case analysis).

The following section goes through the steps that were taken to determine the case selection for this dissertation.

Most Similar and Most Different System Designs. There are two main strategies for determining one's cases: "most similar" and "most different" system designs (Przeworski and Teune, 1970). In instances of "most similar" system designs, cases are compared that share many similarities (similar systems), but ultimately have different outcomes (Berg-Schlosser and De Meur, 2009). The researcher seeks to control for most of the variation among the cases to determine the conditions that differentiate the cases from one another. "Most similar" system designs are usually most appropriate for small-N situations (2-4 cases) (Berg-Schlosser and De Meur, 2009).

In contrast, "most different" system designs "seeks maximal heterogeneity" in which cases share few commonalities with one another, but have similar outcomes (Berg-Schlosser and De Meur 2009, p. 4). Given its focus on maximal heterogeneity, "most different" system designs are most appropriate for mid-sized-N cases (15-25 cases) (Berg-Schlosser and De Meur, 2009).

This dissertation utilized a "most different" system design. While the scope of this dissertation is narrow regarding the type of issues and groups (as will be discussed more below in the case criteria), the cases vary with one another given the different empirical settings. Each state possesses unique state agencies and institutions, administrative and procedural rules, legislative processes, and political cultures. In addition, the types of clean energy and environmental groups can vary quite a bit across each state, in which it is unlikely that the groups will have similar preferences, capabilities, or interests over the policy outcome. Therefore, a "most different" system design was most appropriate for this study.

Case Criteria. The cases in this research design are environmental and clean energy interest groups that were involved in energy storage proceedings across five states: California, Oregon, New York, Nevada, and Virginia.

Four criteria were employed to determine cases: (1) legislative mandates, (2) policy issue type, (3) interest group type, and (4) led by the state's public utility commission. The first and most obvious criterion is that cases must come from states whose legislatures have passed energy storage mandates. This criterion creates the foundation for examining the behavior of interest groups during the rulemaking process. The stipulation of legislative mandates is important because the regulatory process and mechanisms for participation and notice can vary widely if the rules were promulgated by a regulatory agency (non-legislative rulemaking) than by a legislative mandate (Cooper 2006).

In addition, legislative mandates for energy storage are considered the most stringent and effective policy tools for integrating energy storage into state and regional energy systems. By focusing on just a single type of policy (legislative mandates), it was easier to control the contextual variation of the empirical setting. While including a wide array of different types of energy storage policies would increase the cases, it would also be difficult to provide internal validity within the cases and external validity across the cases.

Related to this first criterion is the second criterion, in which interest groups will be chosen based on their involvement with the policy issue of energy storage. Interest groups involved in energy storage proceedings must be organized entities. Individuals must represent the interests of a specific organized group to be included as a case. In addition, interest groups that were a sister organization or a front group for an industry group were excluded. In some instances, industry or business groups will create smaller interest groups to represent their interests so as not to draw attention to their greater corporate identity

The third criterion was that the interest groups must be clean energy or environmental interest groups. The focus on clean energy and environmental interest groups is important given that these groups are often at a disadvantage in the policy process as a result of the disproportionate influence of business and industry interests. Industry groups are defined as regulated entities (Crow et al. 2016). Industry groups are typically utility companies and trade groups. In contrast, non-industry groups (e.g., environmental, clean energy, and advocacy groups) are defined as being unregulated organizations and groups. Non-industry groups represent a more varied range of interests in the energy field. Given the diversity of energy policy, it is likely that there is a wide range of interests that defy the industry versus environment dichotomy of other environmental policy areas.

Fourth, energy storage proceedings must occur at state public utility commissions. This was an important criterion given that the most PUCs are required to provide a record of regulatory proceedings, even if they are not specifically rulemakings. From a research perspective, it is important to have a complete (or nearly complete) archive of the key documents such as list servs, stakeholder comments, commission orders, stakeholder meeting notes, and other regulatory documents.

The cases (i.e., clean energy and environmental interest groups) were selected from five states that have conducted energy storage regulatory proceedings. However, the other candidates, Massachusetts and New Jersey, were rejected from the case list due to not meeting the key criteria noted above. Despite its legislative mandate to conduct a rulemaking, New Jersey's Board of Public Utilities (BPU) never commenced its rulemaking. The NJ BPU was directed to respond to nine questions about energy storage in a report by May 23, 2019.

The NJ BPU hired Rutgers University to write up the report, ("New Jersey Energy Storage Analysis"). The NJ BPU was then required to launch an energy storage proceeding six months after the report was released, however nothing has been initiated by the NJ BPU. The NJ BPU has been fairly quiet as to why it has not commenced its rulemaking for energy storage, but a BPU spokesperson did note that the agency's top priority presently is the COVID-19 response despite the lapse in scheduling the proceedings within six months from May 2019. Since New Jersey has not commenced its regulatory proceedings, it is no longer eligible for this dissertation.

Massachusetts's energy storage target proceeding was conducted not by the Massachusetts Department of Public Utilities (DPU), but by Department of Energy Resources and the Massachusetts Clean Energy Center.[8] Massachusetts has a unique division of clean energy issues between the DOER and the DPU. While the DOER is structured similarly to the DPU with regards to having the authority to create rules and regulations, it is considered to be less of a traditional regulatory agency and more of a policy advocacy agency for clean energy policy. The DOER possesses statutory authority to manage renewable energy issues ranging from renewable portfolio standards to clean peak standards. The DPU has authority to manage policies relating to utility regulation and net metering. The DOER does not possess the authority to regulate the actions of investor-owned utilities (IOUs), however it was authorized by legislative mandate to establish energy storage targets.

The subsequent DOER process was not a rulemaking. Despite what was touted as a major stakeholder process, the regulatory process was less formal than what would be expected at the Department of Public Utilities. The process did not have distinct phases that were documented. DOER staff also did not provide responses to stakeholder

---

[8] In 2015, Governor Baker initiated the State of Charge energy storage study. The DOER and CEC were put in charge of the study and provided $10 million in funds to facilitate a study on the potential benefits of energy storage technologies. The DOER and CEC selected Customized Energy Solutions (CES) as the lead to conduct the study. Four additional subcontractors were added to help CES with the final report. CES utilized the modeling algorithms from Alevo Analytics.

comments or about the procedure as PUC staff often do for most types of cases. Most importantly, while at some point there were stakeholder documents, they were not retrievable or readily accessed as required by state PUCs.

DOER proceedings are often stakeholder heavy and exceed the legal requirements for public input. In the 2016 energy storage proceeding to determine whether to establish an energy storage target, the DOER and CEC led a large stakeholder meeting that included a wide array of stakeholder groups. The meeting facilitated workshop breakout sessions whose aim was to create comprehensive responses to barriers and recommendations. There was a follow-up online webinar, stakeholder survey, and comment period. However, these materials were not available despite many requests to procure them.

Therefore, while New Jersey and Massachusetts initially appeared to be potential sources for cases, there were multiple challenges to incorporating them into this study. The cases that I did identify and include in this study meet the four-criterion relating to: 1) legislative mandates, (2) policy issue type, (3) interest group type, and (4) led by the state's public utility commission.

Identification of Cases and Number of Cases. Key interest groups were identified through several means. First, interest groups involved with the legislative process and the rulemaking process were analyzed to ascertain which interest groups were involved. The rulemaking docket was examined to determine the interest groups that were involved in the energy storage proceedings.

Cumulatively, there were 18 cases (i.e., clean energy and environmental) across all five states. Table 5.2 lists the number of cases per state.

Table 5.2 Cases in Each State

State	Number of Cases (environmental/clean energy groups)
California	9
Oregon	3
New York	3
Virginia	2
Nevada	1

There was a disproportionate number of cases in California compared to other states. However, the level of participation among these groups provides interesting case details that will be discussed in later chapters. In addition, Virginia had an environmental coalition of eight environmental groups that formed joint comments. However, the eight joint commenters never commented outside of the environmental coalition comments. In order for parsimony, these groups were categorized as a single, joint stakeholder group. A more in-depth analysis of this environmental coalition will be addressed in the subsequent chapters.

Selection and Conceptualization of Conditions and Outcomes

Conceptualizing Outcomes. As noted in previous sections, measuring stakeholder influence is difficult, as influence does not always culminate to a single moment in time. However, for the purposes of this dissertation, influence was conceptualized at the most transparent point in the regulatory process: the comment period. This is not an uncommon practice, as previous literature has measured stakeholder influence over the final rules. Previous rulemaking literature (Yackee and Yackee, 2006; McKay and Yackee, 2007) has measured influence based on a 3-point scale of the difference in direction between the draft rules and the final rules: (+1) more government involvement; (0) remained the same level; or (-1) less regulation. The authors note that this method simplifies the complexity of interest group politics, but is able to distinguish core positions and changes in the final rules. Yet, given the wide array of interest group preferences in the energy storage proceedings, such a simplification of interests is not robust enough to explain environmental and clean energy group influence.

The outcome for the QCA model is influence of clean energy and environmental interest groups. Influence was calculated at the comment phase of the proceeding. I measured influence by using content analysis of the comments and submitted documents. I examined the written comments of the stakeholder and then compared them to the commission staff's response to stakeholder comments in the final order.

During most regulatory cases, commission staff is required to directly acknowledge stakeholder comments in the final order. Stakeholder's ability to influence the commissioner's final decision were measured by examining the key issues at stake for that docket. For example, in Oregon, key issues in contention included debate on use cases, definitions, the timeframe, and criteria, competition, granularity, and proposed approach.

Stakeholders received an additive score for the issues that they submitted comments on during the comment periods. Scores reflected the level of influence from high staff or commission concurrence (e.g., adopt, recommend) to low (e.g., disagrees and supports the opposite action). Levels of influence ranged from a (-2) to positive (+2):

- (+2) Staff agrees and supports action (adopt, recommend)
- (+1) Staff agrees (recognizes, shares, etc.).
- (0) No objection or No response
- (-1) Staff disagrees, no action
- (-2) Staff disagrees and proposes to support the opposite action

If for some reason, Staff did not provide a proficient response to stakeholder comments, stakeholder comments were analyzed relative to the Final Order. This was the case with the majority of the stakeholder documents for the cases in New York. Generally, stakeholder comments clustered around specific issues or sets of questions (e.g., comments to a straw poll, comments for sections to proposed order). The comments, draft proposal, and final order were compared to elucidate whether the stakeholder was able to impart language or ideas into the final order.

Finally, cut-off points were calibrated for stakeholder influence based on the high, middle, and low raw scores. The issues were not weighted because this resulted in too much researcher bias. What might have been considered a small concession over a definition, could have actually been revolutionary for the entire docket. Therefore, it was better to err on the side of caution by not introducing what could be considered undue researcher bias. The codebook in Appendix A provides a more in-depth discussion of how stakeholder influence was measured and calibrated.

Conceptualizing Primary Conditions, Institutional Mechanisms, Group Tactics, Group Capacity, and Inter-Group and Intra-Group Dynamics. One of the problems of any small to mid-level research design is that of over-specification, when there are too many variables. The section below addresses the primary conditions highlighted from the literature. However, the framework of QCA helps address over-specification through several processes: minimizing formulas, necessary and sufficient condition analyses, and the creation of causal combinations. This is a natural part of the QCA process. Therefore, the problem of over-specification is not as serious of an issue as it would be for other types of qualitative research design. The sections below will go into greater detail of how these processes were integrated into the research.

There are three key themes across these conditions: institutional participation, institutional inclusiveness, and procedural constraints or opportunities. First, institutional participation was measured based on the agency's opportunities for (1) public comment (e.g. OPPCOM and PCOM), and (2) stakeholder access to technical meetings or workshops (e.g., ACCESSM).

Next, institutional inclusiveness was measured by: (1) whether stakeholders were invited to pre-proposal meetings (or were part of the pre-proposal phase) (e.g., PREPROP and PALL), (2) whether stakeholders were part of working groups related to energy storage or similar energy issues (e.g., WORKG). Institutional inclusiveness is an important condition for a group's ability to participate and potentially influence the rulemaking process. It matters who is invited to the "table" and who is not. Table 5.3 provides a complete list of the outcomes and conditions.

Table 5.3 Complete List of Outcome and Conditions

Outcome	**Influence** (influence over the Final Rule or Order)
Causal Conditions	**RULEM** (Indicates whether case was a rulemaking or not a rulemaking)
	TARMAN (Indicates whether an ES target was mandated in the legislation or not)
	GOV (Indicates whether process was governor led or not)
	GUIDE (presence of framing document)
	PREPROP (Stakeholder access to pre-proposal phase)
	WORKG (Whether there were working groups on ES or similar)
	ACCESSM (Amount of stakeholder technical meetings)
	OPPCOM (Amount of stakeholder opportunities to comment)
	PCOM (Stakeholder level of participation during comment periods)
	PALL (Whether stakeholder was present throughout entire proceeding)
	FINS (stakeholder group's financial status)
	EMCAP (stakeholder group's staffing status)
	RVIEW (Indicates whether Final Rules were required to be vetted by another government agency or government entity)
	CONADV (Indicates whether state had a consumer advocate or not participating in the proceeding)

Third, contextual factors encompassed conditions that shaped stakeholder's opportunities and constraints to participate (e.g., GOV, TARMAN, RULEM, RVEIW). The rationale behind whether a regulatory proceeding was led by a governor is that a powerful governor will essentially mandate specific aspects of the policy to the PUC or the legislature to follow-up on. This occurred in New York, Massachusetts, New Jersey, and Virginia. The governors of these states made clean energy (and energy storage) a central part of their governor's agenda. This was signaled overtly in their state of the state addresses at the beginning of each year.

While the PUC is an independent body, separate from the governor's office, the Commissioner's in these states are appointed by the Governor. So, while commissioners will be independent, they will likely take on cues that they receive from the Governor. In addition, governor appointed commissioners are likely to embody certain policy preferences that the governor perceives to be important.

Collection of Data

Data was collected through primary and secondary sources. Secondary data was collected through regulatory agency dockets (draft and final rules, public comments, formal statements, and other documentation), interest group website information, and state websites. Based on prior research and determinations, a protocol was created for each relevant condition and outcome along with their create cut-off points.

Context analysis was used to determine the raw scores for the conditions and the outcome. In some cases, it was a simple count or a determination of "yes" or "no" (e.g., compensation, had access to pre-proposal proceedings, submitted comments). In other instances, data sets and grey literature were employed to measure certain condition.

Calibration of Membership Scores

A crucial step in being able to reliably determine the causal complexity of the results of fsQCA is to calibrate membership thresholds for the conditions of one's dissertation. A key concern for fsQCA is ensuring that thresholds are based on theoretical and empirical foundations as calibrated member scores are vulnerable to researcher bias or error. Table 5.4 below shows how the conditions and outcome were calibrated. Appendix A provides a more complete discussion of how the outcome and the conditions were calibrated.

Table 5.4 Fuzzy Set Calibration of Outcome and Conditions

OUTCOME	**INFLUENCE**	1.0, .8, .6, .4, .1, 0
CAUSAL CONDITIONS	**RULEM**	1.0, 0
	TARMAN	1.0, 0
	GOV	1.0, 0
	GUIDE	1.0, 0
	PREPROP	1.0, 0
	WORKG	1.0, 0
	ACCESSM	1.0, .67, .33, 0
	OPPCOM	1.0, .67, .33, 0
	PCOM	1.0, .8, .6, .4, .1, 0
	PALL	1.0, 0
	FINS	1.0, .8, .6, .4, .1, 0
	EMCAP	1.0, 67, .33, 0

Each of the conditions was calibrated dichotomously or through a four or six value fuzzy set. It is important to note that the subset relation is the key to understanding the causal relationships in one's dissertation. However, it can be difficult to establish causality in fsQCA because each case's fuzzy membership scores may be unique, despite sharing a specific combination of conditions or outcomes (Rihoux and Ragin 2009). That is why the calibration stage of fsQCA is so important.

Analysis of Sufficient and Necessary Conditions

This section will briefly discuss the important method of assessing necessary and sufficient conditions and how this method is beneficial to determining complex causality. A necessary condition “is a condition that must be present for the outcome to occur, but its presence does not guarantee that occurrence” (Rihoux and Ragin 2012, p. 22). In contrast, sufficient conditions must always produce the outcome in question (Ragin, 2000). Rihoux and Ragin (2012, p. 22-23) note that, “In general, a necessary condition can be interpreted as a superset of the outcome, while sufficient conditions (usually combinations of conditions) constitute subsets of the outcome”.

It is important to address necessary conditions prior to the construction of the truth table given that the truth table is an analysis of sufficient conditions and combinations of sufficient conditions. However, that just because a condition is a necessary condition does not mean that it does not have any theoretical or empirical value; it just indicates that its explanatory value is not strong enough to explain consistent patterns of the outcome.

Ragin (2000, p. 91) notes that analyzing necessity and sufficiency is key to addressing the problem of being able to generalize one’s empirical findings. Assessing necessity and sufficiency of the conditions of interest established parameters around their generalizability. Necessary conditions can be considered of import only in certain instances (with little generalizability), however sufficient conditions once established, can be generalized to other like cases. Establishing generalizable conclusions with sufficient conditions is important because it increases the validity of smaller studies that might have been previously considered to possess low external validity. A necessary condition test was conducted on fsQCA 3.0 to determine the necessary conditions. The following results are highlighted in Table 5.5.

Table 5.5 Analysis of Necessary Conditions

Conditions	Consistency	Coverage
GUIDE	0.753623	0.40000
PREPROP	0.57971	0.44444
ACCESSM	0.863768	0.426019
OPPCOM	0.959420	0.451877
PCOM	**0.971014**	**0.690722**
FINS	0.826087	0.548077
EMPCAP	0.834783	0.508385
PALL	0.797101	0.610000
TARMAN	0.333333	0.460000
GOV	0.246377	0.340000
RULEM	0.594203	0.315385

There are two parameters of fit to consider in this test. First, consistency is a parameter of fit in which the proportion of cases in the configuration are also in the outcome set, with a score of 1.0 indicating a perfect subset relationship (Kahwati and Kane, 2020). A minimum consistency for the necessary conditions test should be 0.90. The second parameter is coverage, which measures the proportion of cases that the solution covers from the cases. Minimum coverage scores should be 0.60. The condition PCOM (stakeholder's level of participation during the comment period) was the only condition that reached the minimum thresholds for consistency and coverage. Therefore, PCOM is a necessary condition. The identification of this necessary condition is important when presenting the final results of the fsQCA analysis in the following chapter.

Construction of Truth Table

Once the data was collected and each case was assigned membership scores, the truth table was constructed to analyze the results. The truth table is culmination of this dissertation's results. Truth tables are an important tool for analyzing causal conditions and outcomes, in which the researcher can determine whether certain combinations of conditions share similar outcomes (Ragin 2009). The truth table lists all of the different possible combinations of causal conditions. This helps determine condition sufficiency by logically simplifying patterns of the causal conditions in the truth table.

The truth table consists of the calibrated membership scores of the key causal conditions and the outcome. There are three main operations on fuzzy sets that enable the analyze of the complex causality among the conditions and the outcome: negation, logical AND, and logical OR (Rihoux and Ragin, 2012). These three operations will be especially useful to analyzing the truth table given the complex interactions that I have predicted among the institutional and social conditions.

First, negation reverses scores so that they are the inverse of themselves. For example, the outcome label of "influence" (with [1] being highly influential and [0] being no influence) would be negated to being “no influence”. Interest groups that are labeled to have high influence (close to [1]) would then be negated to have a score closer to [0] and vice versa for interest groups that were originally labeled to have little to no influence. The operation of logical AND is best understood as the set intersection, in which two or more compound sets are combined (Rihoux and Ragin, 2012). Finally, the operation of logical OR is the union of sets, in which two or more sets are joined. These operations determine the causal combinations among the key conditions of interest and the outcome. The following chapter on the truth table results delves into the intricacies and implications that the truth table analysis.

Final Notes on fsQCA 3.0 Software

There have been critiques of Ragin’s fsQCA 3.0 software because it does not adequately address the problem of limited diversity. Limited diversity is a natural occurring challenge that most small sample studies suffer from (although it exists with large studies, too). A small sample size is often unable to account for all the possible combinations of the solution. QCA provides counterfactual cases, which are combinations of causal conditions that lack empirical instances.

However, concerns about limited diversity are minor given the dissertation’s narrow scope. This dissertation’s scope is focused on a distinct policy issue across a small number of state PUCs, during a period of time in which there was little salience for that policy issue. So, the configuration of the cases represents the total population of the cases that this dissertation is interested in explaining.

In addition, the fsQCA analysis was supported by a strong familiarity and understanding of the cases and the state contexts. Therefore, while fsQCA 3.0 software may be problematic for other research agendas that seek to explain all possible combinations of conditions, it is a good fit for this research design.

The following section of this chapter discusses the methods that were employed to analyze how the regulatory process shapes the interactions and perceptions of influence among stakeholders.

Introduction to Part II: Examining Perceived Influence

The methodological approach for the second portion of the dissertation employs a version of thematic analysis. The goal of the second part of this dissertation seeks to assess stakeholder perceptions of influence along multiple points in the process. In addition, this portion of the dissertation seeks to provide a strong picture of the social interactions and behaviors that occur at state PUCs.

This study utilized stakeholder responses from semi-structured interview data to provide a more granular examination of stakeholder perceptions of influence for the entire PUC proceeding. Themes of perceived influence were then analyzed across the interview data using the coding software, NVivo.

The qualitative analysis of the interview data from Oregon was important to include in this dissertation to provide a richer explanation of the social dynamics at state PUCs and among stakeholders. The findings from this second phase confirm and build upon the initial QCA analysis. The rest of this section describes the processes for collecting interview data, coding data, and consolidating the interview data into key themes.

Case Selection and Interviews

Case selection was constrained by the availability of interview data. Only the cases in Oregon were chosen because it was difficult to obtain a sufficient level of interview data from the other four states. Some key stakeholder participated in many of the state energy storage proceedings, but declined to be interviewed, which negatively impacted the quality of data for states that had a more limited amount of stakeholders involved. In other instances, it was difficult to track down key stakeholders as they had moved on from their position. However, for the majority of requests, the stakeholders either declined or did not respond.[9]

California and Oregon had the best response rate for interview requests. Yet, the circumstances for only examining Oregon stakeholders were stronger for a few reasons. First, Oregon had a small number of stakeholders that represented a broad range of interests. The smaller number of stakeholders made it easier to achieve a saturation point in the interview data.

The methodological principle of saturation is important in qualitative research as it helps determine the number of interviews that need to be conducted to capture the key themes and ideas of the issue of interest. Saturation originated in qualitative research in grounded theory by Glaser and Strauss (1967). Glaser and Straus (1967) originally defined data saturation as the point in which "no additional data are being found whereby the [researcher] can develop properties of the category" (pg. 61).

In the case of Oregon, eleven interviews were conducted with the following types of stakeholder groups: environmental, clean energy, trade, research, utility, consumer advocacy, and PUC staff. By the last few interviews, a saturation point had been

[9] The lack of response rate for interview requests may be due to several factors. First, many of the requests in non-responsive states were conducted during the first half of the COVID-19 pandemic in 2020. Second, individuals may have been wary of the aim of examining "stakeholder influence". Even in the interviews that I did conduct, stakeholders at times expressed concern that the study might be looking for instances of undue influence or unethical behavior. As was mentioned in other sections, there has been a history of corruption at state PUCs and unethical behavior by regulatory members and interest groups.

achieved: there was not a lot of new information being collected and interviewees were beginning to repeat similar accounts and themes.

California had a large number of stakeholders, which made it difficult to determine if a saturation point had been reached in the data. Second, there was an issue with time passage in the case of California. California's framework energy storage rulemaking occurred almost a decade ago, which made it difficult for participants to recollect important details about the rulemaking. In contrast, only three years had passed since the energy storage docket had been initiated in Oregon. Therefore, just focusing on Oregon stakeholders was a better fit for the data, scope, and the intent of exploring the facets of perceived influence.

The goal of these interviews was to assess stakeholder group perceptions of influence along multiple points in the process, group tactics to influence the process, and stakeholder group dynamics (i.e., collaboration and conflict). The interviews were conducted over a year, from September 2019 until October 2020. Interviewees were selected based on their participation with the PUC energy storage proceedings. Each PUC docket has a list server that denotes which groups are parties to the docket. Key stakeholders were identified from the docket materials and the list server. A total of nine interviews were conducted with key stakeholder groups. The response rate for interview requests with active participants was 69 percent.

In addition to the key stakeholders involved with the energy storage proceeding, other environmental groups were contacted to be interviewed. The environmental groups that were contacted were involved with similar legislative issues or had been involved with other OPUC proceedings in the past (i.e., negative cases). It was important to understand outside environmental groups' perceptions of the OPUC and the regulatory process. The response rate for these groups was only 40 percent and resulted in just two interviews that were negative cases.

In total, five interviews in-person and six interviews were conducted over the phone. There were distinct questions and prompts that were followed. However, the general structure of the interviews was open-ended. In addition, the interviews were on background, in which respondents had greater freedom to disclose information with the assurance of anonymity. The interview survey questions were intentionally developed to be in chronological order to the energy storage proceeding. The interview questions were structured this way to build up respondents' memories over the course of the interview, so that they would have a stronger recollection of the proceeding by the time they were asked questions about stakeholder collaboration and influence. Appendix C includes that response rate data for the interview requests. Table 5.6 lists the key conditions.

Table 5.6 List of Key Conditions to Explain Perceived Influence

Outcome	Perceived Influence
Key Conditions	Group Capacity
	Institutional Constraints
	Individual Expertise
	Individual Experience
	Formal Lobbying
	Ex-Parte Lobbying
	Intra-Group Collaboration or Conflict
	Inter-Group Collaboration or Conflict
	Perceptions of Fairness During Process

The interview questions relied upon a combination of Likert scale questions and open-ended questions (see Appendix C for the interview survey). The interviews questions were constructed to examine specific mechanisms and themes. The bulk of the emphasis throughout the interviews was centered around a respondent's participation (and factors that contributed to the level of participation of their group), collaboration with other stakeholders, perceptions of the regulatory process, and perceptions of stakeholder influence.

The original intent of the interviews and the subsequent coding of the interviews was to use them in a larger fsQCA analysis. The codebook was constructed to easily convey interview answers into verbal scores and then into fuzzy membership scores. Yet, the lack of state interview data dramatically altered the possibility of conducting a QCA analysis. Therefore, the codes for the QCA analysis were modified into larger themes and concepts to use to qualitatively code the interview data.

This dissertation utilized the qualitative coding software, NVivo, to code the interview data. NVivo provided useful tools for analyzing the interview data for patterns and key themes. In addition, NVivo provides descriptive data on the frequency of specific words and the percentage that codes show up within and across the data. NVivo is also useful for clustering and collapsing the codes within the data sets to ensure that each code is distinct and robust. Appendix B shows the specific codes, definitions, and examples used to guide the coding process.

The next section discusses how the thematic analysis (TA) was employed to interpret and generate meta-themes from the interview data.

Thematic Analysis

This portion of the methods employs a version of thematic analysis (TA). TA is a tool for analyzing qualitative data. It has been predominantly utilized in the social sciences. While the practice of TA has been around for quite some time (e.g., exploring themes in qualitative data), there is not a consensus on a particular method that one must follow (Terry et. al, 2017).

Terry et al. (2017) notes that there are two broad 'schools' across the TA community: 'Small q' and 'Big Q'. The first approach, 'Small q" comes from positivist research. Themes are determined in advance of the analysis and are often grounded in theory. 'Small q' analysis relies heavily on coding reliability, in which the researcher's results can be confirmed and replicated using the codebook.

In contrast, the 'Big Q' TA approach "operates within a qualitative paradigm and is characterized by (genuine) theoretical independence and flexibility, and organic processes of coding and theme development" (Terry et. al, 2017, p. 8). 'Big Q' coding can utilize a codebook, but relies more on repeated engagement and immersion with the data to extract themes. Coding under 'Big Q' is a subjective and interpretative process that results in a deeper level of analysis.

This dissertation fits between the 'Small q' and the 'Big Q' TA approach. While the first round of themes was grounded in the content of the interviews and the initial codebook for the interview questionnaire, the final analysis was shaped by my knowledge of the cases and the meta-theme that emerged from the interview data.

Again, while there is not a sole method to conduct TA, Clarke and Braun (2006) provide a flexible framework for thematic analysis which involves six steps:

(1) Identify items of interest from the data

(2) Generate codes

(3) Generate themes

(4) Review potential themes

(5) Define and name themes

(6) Analysis

It is important to note that this dissertation did not prescribe entirely to the organic analysis that Clarke and Braun (2006) promote. As noted earlier, the foundation of the thematic analysis relied on a set of codes that were set prior to the content analysis. For this reason, this dissertation has assumed a more flexible version of TA, which Terry et al. (2018) observe as a commonplace practice across the disciplines.

The first step of TA is similar to any method of content analysis. The researcher identifies important concepts and themes from the data set and previous research. It is during the second step of the coding process that TA begins to differentiate itself from other content analysis methods. During the second step, the researcher generates codes, however the process is “iterative and flexible” allowing for code revision and development to clarify and provide a more rigorous product (Terry et al., 2018).

During the third step of ‘generating themes’, the researcher examines the codes for pattern formation and identifies key themes. NVivo is especially useful during this stage as it enables the researcher to cluster and collapse codes within the data. The researcher identifies potential 'candidate' themes that are then transformed into a rough thematic map.

It is during the fourth and the fifth step that the researcher reviews and defines the themes to ensure that the themes are distinct from one another but also relate to each other. The fifth step in the reviewing process adopts a more interpretive stance, in which the researcher is able to construct a narrative that embodies the richness and connections among the themes. This step of the TA process requires that the researcher have a deep knowledge of the dataset and have developed robust themes. The final phase is the analysis, which produces the narrative to connect the themes.

Thematic analysis was a natural draw methodologically because of the codes and themes that were discovered prior to the analysis of the interview data. Thematic analysis is applied seamlessly with the coding software NVivo. Using NVivo, thematic analysis provided a compelling approach to organizing the interview data while taking into consideration the nuances and moods from within the data that would otherwise been too risky to address in more positivist approaches.

Examining themes of perceived influence is important because it captures social subtleties that are missed just by looking at docket materials. As previous sections throughout this dissertation have noted, the concept of influence is multi-faceted and is difficult to determine with just one method. Many studies fight to control the fluidity of social phenomena in order to pin down relationships and processes. However, the second portion of this research design embraces the complexity and fluidity of the social experience at public utility commissions. While these social interactions and calculations are not easily transmissible to neat tables and models, it is important to address them because they are significant aspects of the regulatory process for stakeholders. The rich details and empirical conclusions from these interviews provide a strong picture of the social interactions and behaviors that occur at public utility commissions

Conclusion

The Balance Between Deductive and Inductive Frameworks

The first phase of this dissertation is largely deductive and based on empirical and theoretical findings from previous literature. The conditions and relationships that were propositioned amongst them were shaped by previous studies or white papers. The propositions were tested using fuzzy set Qualitative Comparative Analysis (QCA) to determine which inclusive and participatory mechanisms interest groups are able to access most successfully to influence the final rules.

The QCA framework is especially useful qualitatively, as it enables the researcher to identify relationships among the cases and conditions, while also generating logical patterns of causality. The results provide a comparison of cases *within* states and *across* states. The five state case analyses provide thick description of the complex institutional processes and their subsequent effect on the behavior of key interest groups, agency members, and other relevant stakeholders. Previous quantitative rulemaking scholarship has not provided nearly enough qualitative cases that explore these relationships.

The second phase of the analysis strikes a balance between deductive and inductive approaches. A minimalist version of thematic analysis was applied in this portion of the dissertation. The initial data collection and analysis of the second phase is grounded in a deductive approach. First, a codebook was constructed around key conditions and concepts. The codebook helped to ensure the rigor and validity of the process and analysis.

Second, interviews were utilized to provide greater detail on how stakeholders perceived the act and concept of influence throughout the energy storage proceeding, the PUCs, and among other stakeholder groups. The interview questions were based on themes and concepts that were grounded in theory and empirical findings. While many of the interview questions were framed to gain a greater understanding of stakeholder influence, networks, and collaboration, there were unanticipated themes that were discovered during the coding process that provided a shift to a more inductive and interpretative approach.

An inductive approach was adopted during the coding process of the interview data with the coding software, NVivo. NVivo was useful to analyze the interview data as one can cluster and collapse codes within the data, view code frequency, and compare how certain codes were spread across the cases. It became clear that more was going on after some time was spent examining the codes and their frequency across the interview data. Drawing from previous theory, the cases, and the Oregon interview content, a conceptual model of implicit influence was constructed based on the analysis of certain themes from within the interview data.

The balance between a deductive and inductive framework was not intentional, but necessary with greater familiarity with the data. The findings from these two approaches are complementary to one another and provide a richer picture of the events, processes, drivers, relationships, and actors involved in PUC energy storage proceedings.

Notes on Generalizability

This dissertation examines a small set of cases across a niche issue area and within similar state regulatory agencies. It is important to reiterate that the range of cases in this dissertation represents the entire population of cases (i.e., environmental and clean energy interest groups). So, a limited number of cases existed from the beginning. This limited focus is further narrowed in the second phase of the research, in which a single, unique state case is examined. However, even though the focus of this dissertation is limited, the methodologies and models in both phases of this dissertation are generalizable for future research in similar issue areas or even for examining stakeholder processes in other regulatory agency settings.

First, the fsQCA framework used in this dissertation is easily adaptable for other research agendas or research on new states that pass energy storage regulations. One of the advantages of fsQCA is that the researcher can modify the conditions throughout the analysis as they gain a greater understanding of the cases and their causal relationships. So, while certain conditions may not be sufficient in this framework due to the small number of cases, they may be sufficient in others with more cases. Similarly, some effects examined in this dissertation may not be present for other cases. However, as was mentioned previously, the research question and conditions must be interval-based, indicating the presence or absence of a condition or the level (high or low). Therefore, the fsQCA approach may not be appropriate for all research.

Second, fsQCA is an ideal approach for research studies with a small number of cases. Many state-level research studies have a limited number of cases making it difficult to analyze within-case and cross-case implications. The fsQCA methods provide a rigorous qualitative and quantitative approach that generates generalizable results for future studies. The fsQCA analysis determines which conditions (or combination of conditions) are sufficient or necessary. Therefore, any final solution will include sufficient conditions which are generalizable to similar cases and contexts. This aspect of the fsQCA process helps relieve generalizability concerns that afflict other methodologies for small-N research.

Third, while fsQCA was created for small-N research, fsQCA can also accommodate larger sets of cases, enabling it to be used across many contexts and research questions. For example, this methodological framework would continue to be a good fit to examine the participatory and inclusive stakeholder frameworks of future energy storage proceedings in other states. It could even be extended to examining the stakeholder process for renewable portfolio standard mandates.

It is important to note that the fsQCA framework requires a strong understanding of the cases and the contexts. Results from fsQCA analyses should be supported with comprehensive case studies to elucidate the causal connections that each of the conditions have with one another to produce the outcome. Therefore, results cannot be blindly applied to other cases without the proper knowledge of the unique contexts.

The second phase of this dissertation also provides a generalizable methodology for future studies. The interview methodology for the second phase should be used in future research to continue to test the rigor of its framework. The interview framework and subsequent thematic analysis of perceived influence could easily be expanded to include other state contexts. As mentioned earlier, the initial methodology sought to include interviews from all of the five states. So, it is important to the validity of this dissertation to continue to broaden the available data on perceived influence.

However, there does need to be some caution with utilizing the methodology for perceived influence. There needs to be a high saturation rate of interviews among a diverse range of participants, and again, the researcher needs to have a strong understanding of the cases and contexts. It would likely be difficult to implement this framework when there is a large number of cases (e.g., more than 50 stakeholders), given the difficulty of reaching a saturation point with the interviews.

One would likely have to shift to questionnaires to address such a large number of cases. Even then, much of the richness of the interview process would be lost in the process. Therefore, it is preferable to maintain the interview structure to examine conditions of perceived influence to retain the integrity of the rich details of the case.

This dissertation will come back to some of the issues raised on generalizability more in the Conclusion as the findings from the fsQCA analysis, and the interview data will clarify the generalizability of these methodological frameworks. The following chapter presents the findings from the fsQCA analysis of the five energy storage proceedings.

Chapter 6 Results and Summary Findings

Introduction

This chapter presents the fsQCA truth table analysis results and discusses the important features from those results. As the previous chapter highlighted, fsQCA analysis is different than traditional regression and statistical analyses. Therefore, this chapter spends some time going over the process and the rationale behind some key decisions for the truth table. Appendix D provides pictures of the steps that were took using the fsQCA 3.0 software since it is not as common as other statistical software.

In addition to the comprehensive fsQCA analysis of all five state energy storage proceedings, a fsQCA analysis is conducted on just the stakeholders in California. California is a special set of cases because it disproportionately included half of the cases for the entire study and is one of the few states that allows environmental groups to be eligible to receive intervenor compensation. It was important to isolate the nine California cases to confirm the study's findings and ensure that there were not any outliers that were skewing the results. In addition, another fsQCA test is run without the California cases to check for robustness of the truth table solution.

Finally, the last portion of this chapter reviews the cross-case findings and the within-case findings of each of the states. The cross-case findings confirm the findings of the fsQCA truth table analysis and the within-case findings provide a rich examination of the key contexts for each of the five states in this analysis.

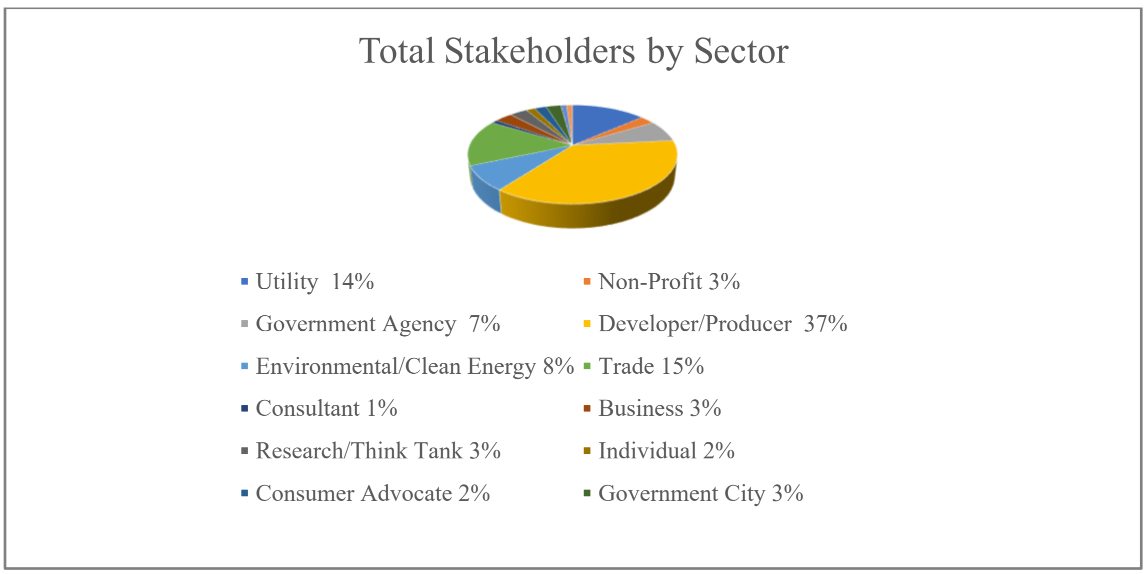
However, before examining the truth table results, this chapter provides a brief summary of the key stakeholders involved across the five state energy storage proceedings. It is important to have an understanding of the different types of stakeholders that each energy storage proceeding attracted because this contributed to how the stakeholder process was conducted. The unique stakeholder make-up for each state energy storage proceeding added to the diversity of expertise in some cases (e.g., California), while ensuring the opportunity for consensus among a small group of stakeholders in other circumstances (e.g., Nevada).

Regulatory Stakeholders: Who Participates and Who Does Not

Each state's energy storage proceeding attracted a different array of stakeholders. Some proceedings were small such as Nevada and Oregon, whereas New York and California brought in many different stakeholders. The type of stakeholder also varied across each of the states. For example, Virginia brought in the most environmental stakeholders however that did not seem to help their position or influence throughout the rulemaking. There was a wide range of stakeholders involved in the energy storage dockets across each of the five states.

While this dissertation focuses more on environmental and clean energy groups, the role of developers and producers in these proceedings is important to note since it has not been greatly examined in the academic literature. Energy storage developers and producers make-up the largest group of stakeholders at 37percent. While there are many smaller, start-up energy storage developers and producers, there are also some big names that come to the table with money, resources, and expertise. Tesla is the most well-known mainstream developer of batteries, however there are major energy storage developers that participated in many of the state proceedings such as NextEra Energy, Siemens, Fluence, RES, Eversource Energy, Invenergy LLC, National Grid, AES, SunPower, Borrego Solar Systems, Key Capture Energy, and Avangrid. Energy storage producers and developers are taking large stakes in the energy storage market and are subsequently becoming major actors in the policy making process. Figure 6.1 shows the proportion of stakeholder groups across the five states.

Figure 6.1 Total Stakeholders by Sector



The high proportion of energy storage developers and producers participating in these proceedings is therefore not surprising. Energy storage developers and producers are attempting to influence the content of the energy storage final rules while also courting utilities to award them energy storage contracts. However, what is good for energy storage developers and producers is not always good for utilities. The issue of third-party ownership is a key point of contention that divides energy storage developers and producers from utilities. Utilities typically prefer to have greater control over the energy storage projects they are implementing. Yet, third-party ownership provides greater opportunities for developers to be awarded contracts for storage projects. So, developers and producers must engage in these types of proceedings carefully, often playing a two-level game.

Another important group of stakeholders were trade groups. Trade groups represent a diverse range of interest groups. The participation of trade groups was integral for the overall scope of each of the proceedings as these groups often brought a wide range of expertise to the dockets and reputational power from their members. In addition, there were instances in which members of the trade groups were also participating to some level throughout the same proceedings. While not all trade group members will agree with one another, having the trade group as a common identifier and source of informational networking is useful to the learning and deliberation process for any PUC proceeding.

While the majority of trade groups involved in the energy storage proceedings were energy storage and solar groups, there were also trade groups for hydropower, wind power, and hydrogen energy. These groups often were all in favor of energy storage, but only within the confines of their sector. There were divisions among these trade groups as they sought to show that their energy storage technologies should be included in the procurement process.

Table 6.1 shows the numeric breakdown of each type of stakeholder across the five states.

Table 6.1 Stakeholder by Sector Across Five States

STAKEHOLDER TYPE			**STATES**			
	VA	NV	OR	CA	NY	Total
Utility	4	1	2	10	8	25
Non-Profit	2	0	1	1	1	5
Government Agency	1	1	3	3	5	12
Developer/Producer	7	2	12	28	19	68
Environmental/Clean Energy	2	1	3	7	2	15
Trade	3	2	7	10	6	28
Consultant	0	0	2	0	0	2
Business	1	0	1	3	1	6
Research/Think Tank	1	0	1	2	2	6
Individual	1	0	0	2	0	3
Consumer Advocate	1	0	1	2	0	4
Government City	0	0	1	2	2	5
Legislature	1	0	1	0	0	2
Other	0	0	0	1	1	2
Total	24	7	34	71	47	183

Despite these policy divisions, the participation of energy storage developers, energy storage producers, trade groups, and research institutions brings to light the importance of expert, technical knowledge in shaping the energy storage process and ultimately the final rules. In many of the cases, the issue of energy storage was new for utilities and stakeholders. Therefore, many PUCs turned to experts to inform the process and gain a better understanding of the intricacies of energy storage. This requisite to learn is seen through the publication of energy storage study reports (e.g., Massachusetts, New York, New Jersey, and Nevada), consultation with research institutions (e.g., Oregon), and trade group experts (e.g., California).

Environmental, clean energy, and non-profit groups make-up a small proportion of the total amount of stakeholders. While the energy storage proceedings span eight years across five states, there has been few changes to the proportion of environmental stakeholders that have participated. Environmental and clean energy groups continue to remain on the fringes of energy storage policy at the regulatory phase.

The lack of participation of environmental groups appears to stem from a few issues. First, some environmental stakeholders may not be aware that the proceeding is occurring. While state PUCs are required to publish public notifications of the proceedings, stakeholders must be privy to the sources that PUCs are sending their notifications to or be on a list serv for that topic. Therefore, less experienced stakeholders may never know that the proceedings are occurring, or may eventually join later once they have heard from other stakeholders. This was especially true for environmental groups that focus more on the legislative side of the policy process than the regulatory process. These groups are less aware of PUC list servs and public notification processes.

Second, some environmental groups are structured to be more effective at different phases of the policy making. For example, some environmental groups may place greater importance upon the legislative phase than the regulatory phase because they realize that they can direct their resources and utilize their tactics more effectively during that phase. In addition, often board members of non-profits want to prioritize more salient and flashy legislative outcomes than the quieter, technical outcomes from a regulatory proceeding.

Third, while it is considered to be important, energy storage legislation has not garnered the same attention as renewable energy mandates or larger DER issues. With the exception of professional journals and trade websites, there was little to find about state energy storage legislation and regulatory proceedings in the mainstream newspapers and magazines. It was difficult to find any mention of the energy storage proceedings for the five states in any of their major state newspapers or in a search of national news sources. Since there was so little data to find from these sources, it was not possible to construct a condition for political salience based on news sources.

Finally, some environmental groups may not have the capacity to participate due to financial or staffing shortages. There are often dozens of legislative and regulatory proceedings occurring simultaneously. These groups must make decisions on what issues or proceedings to prioritize. In the case of Oregon, the contentious Coal to Clean bill was working its way through the legislature during the time that the energy storage bill passed and then the subsequent PUC regulations. Many environmental groups were putting a large amount of their resources into ensuring that the Coal to Clean bill passed the legislature.

Another notable group of stakeholders with a small presence at PUCs is individuals. There were very few individuals or citizen groups that participated in energy storage proceedings. While PUC proceedings are open to all stakeholder groups, there is a lack of participation by individuals. The PUC process is dominated by professional stakeholder groups and experts in the energy sector. It is likely that individuals and citizen groups are not aware of how to participate during PUC proceedings due to the technical nature of energy policy and PUC processes.

What is absent in this breakdown of stakeholder groups is telling as it highlights the difference in stakeholder dynamics in PUC energy storage proceedings from those depicted in the environmental literature. Business groups have a small presence in many of the state energy storage proceedings. The largest presence of business groups occurred in California, but even then, their participation was minimal. The conflict dyad between environmental and business is replaced environmental and clean energy interests versus utility interests.

However, even that conflict dyad does not embody the real dynamics of the proceedings. Contrary to Baumgartner et al. (2009), there were not always two distinct opposing interest group coalitions fighting over a policy dimension. In many of the energy storage proceedings, differences arose among environmental, trade, utility, and developer and producer groups at multiple policy points. Therefore, the key issues at stake were not divided between pro-utility versus pro-clean energy concerns. Environmental groups can be fractured and advocating for different outcomes. For example, the determination to exclude hydropower as an allowable energy storage project in California's rulemaking was a major divide across many stakeholder groups. Some environmental groups advanced that hydropower should be included in energy storage cases, while others believed its inclusion would detract from the aim to procure new sources of storage (i.e., batteries).

In addition, many utilities were not necessarily against energy storage. Rather, utilities were cautious about binding targets, storage ownership, regulatory oversight, and how storage would be integrated into their resource mix. For example, the NV Energy was already in the process of procuring pilot energy storage projects when the binding targets were established. Therefore, there were many issues and contexts at stake in these proceedings. It was not simply a policy division between groups that advocated for energy storage and those that did not want energy storage.

It should also be noted that there did not appear to be any major veto players across the regulatory proceedings. While there were differences of preferences and some stakeholders were against the establishment of energy storage targets, there were not outstanding stakeholders that were able to prevent the establishment of the energy storage targets and subsequent framework. The state commissions oversaw the establishment of energy storage targets that were meaningful. In the coming years, we may see major veto players arise in these types of proceedings as the gain salience. The lack of veto players may change as more states begin to seek to implement energy storage targets in states that possess greater fossil fuel interests. As evident in the Virginia case, the natural gas industry has begun to realize their diminishing role in state energy resource mixes and have begun to seek new paths to continuing natural gas' legacy in future renewable energy policy.

This lack of oppositional or veto groups is likely the result of the issue ambiguity surrounding energy storage. As previous literature has discovered (Falkner, 2008; Stokes, 2015), divisions among powerful groups can create an opportunity for environmental interest groups to be influential. In addition, when a specific policy issue is unfamiliar, divisions have not been formed yet. Therefore, while the utilities were forced to participate, other traditionally powerful stakeholders such as the fossil fuel groups and business groups remained on the fringes of the proceedings. It was not until Virginia and New York that there were more distinct coalitions, yet even then, there remained ambiguity among the stakeholder groups on how to proceed with energy storage.

There was also collaboration and engagement amongst various stakeholders. In proceedings in California, New York, Virginia, and Oregon, clean energy and environmental stakeholders would often submit joint comments with one another. Across the states, environmental stakeholders had great familiarity with one another and actively sought to interact with one another, despite any differences that they had with one another. This collaborative dynamic will be examined in greater detail in the state studies in the following chapters.

This section has reviewed what types of stakeholders were involved in the energy proceedings across the five states in this dissertation. Environmental and clean energy interest groups made up a relatively small proportion of the stakeholders in each of the five states. However, the following section shows how some of these environmental and clean energy stakeholders were able to successfully navigate the energy storage proceedings to be influential.

Fuzzy Set QCA Truth Table Results

Setting Up the Truth Table

The results of the fsQCA analysis confirmed two major theoretical assumptions for this study. First, stakeholders *are* influential in the rulemaking process, and second, that environmental interest groups have greater influence over the final rules when state PUC stakeholder processes were more inclusive and participatory. These results are significant because previous literature (Golden, 1998; Woods, 2009; Baumgartner, 2009; Yackee, 2011; 2015; Rinfret, Cook, and Pautz, 2014; Crow, Albright, and Koebele, 2016) has provided mixed results on the influence of non-industry stakeholders during rulemakings. There is even less information within the rulemaking literature on the influence of environmental and clean energy groups during state rulemaking processes.

In addition, these results show that process matters and can lead to more stringent and progressive policy outcomes in the final rules. The findings show that while utilities and other traditional industry stakeholders continue to have the greatest capacity (finances, time, and staff) to engage in PUC proceedings, they do not possess unfettered influence over the process. Utilities and industry stakeholders often must endure losses and engage in processes they oppose. Therefore, utility influence during the energy storage proceedings was not near the level that the agency capture model would have predicted.

The fsQCA analysis examined conditions relating to institutional participation, institutional inclusiveness, group capacity, and procedural constraints or opportunities. Table 6.2 shows the conditions and outcome variables that were used in the fsQCA analysis along with their abbreviations.

Table 6.2 Research Conditions and Outcome

Conditions	Outcome
• GUIDE (Presence of framing document) • PREPROP (Access to pre-proposal phase) • ACCESSM (Amount of stakeholder technical meetings) • OPPCOM (Amount stakeholder comment periods) • PCOM (Stakeholder level of participation during comment periods) • PALL (Present throughout entire proceeding) • GOV (Governor led the policy process) • WORKG (Whether there were working groups on ES or similar) • RULEM (Indicates whether case was a rulemaking or not a rulemaking) • TARMAN (Indicates whether an ES target was mandated in the legislation or not) • RVIEW (Indicates whether Final Rules were required to be vetted by another government agency or government entity) • CONADV (Indicates whether state had a consumer advocate or not participating in the proceeding)	INFL (Influence over Final Rules)

It is important to note that the data was revisited a few times to achieve the final results that are shown in this chapter. Revisiting the data is an important step in QCA that Ragin (2008) emphasizes as a standard part of the process. Some conditions were deleted and added other conditions as greater empirical knowledge of the cases was gained and the causal relationships became clearer in the truth table. There were some conditions that did not have strong consistency scores that appeared to overcomplicate the minimization process. For example, in the first iteration of the truth table results, it is clear that state level conditions (i.e., target type, case type, governor led, rule review, and the presence of a consumer advocate) were not sufficient conditions. These conditions were dropped.

The second iteration of the truth table examined agency level and group level conditions (e.g., access to pre-proposal phase, number of comment periods, number of meetings, groups finances, group staffing, group participation, and presence throughout the entire proceeding). These agency and group level conditions had greater explanatory value and consistency scores.

In addition, while there were some interesting relationships to observe with group factors such as financial strength and employee capacity, these conditions were contradictory at times. The results showed that group financial and staffing capacity were not causal conditions in determining the level of influence a group could achieve or not: there were some cases in which low financial and low staff capacity led to high levels of influence and some cases in which high financial and high staff capacity led to higher levels of influence. However, this is a condition that should be studied in the future as many interviewees noted the importance of financial and staffing capacity as a *determinant* for choosing to participate in PUC proceedings or not. Yet, when stakeholders make efforts to prioritize certain PUC proceedings, finances and staffing are not seen as immediate barriers to their participation.

The Table 6.3 on the next page, shows the calibrated membership scores for the cases. The conditions were calibrated on different scales, but were consistent within the condition. For example, the condition PREPROP (whether there was a pre-proposal stage open to stakeholders) was calibrated dichotomously (1 or 0), while PCOM (participation during comment periods) was calibrated along a six-point fuzzy score. These differences in calibration were made to fit the different degrees certain conditions embodied. In addition, the directionality of the conditions was calibrated to match the outcome of influence.

Table 6.3 Data Matrix of Cases for Stakeholder Influence

CASE	GUIDE	PRE PROP	ACCESS M	OPP COM	PCOM	FINS	EMPCAP	INTV COM P	RULE M	TARMAN	CON ADV	RVIEW	PALL	GOV	INFL
Sierra Club (CA)	**1**	1	1	1	1	1	1	1	1	0	1	1	1	0	0.9
RNW/ NWEC (OR)	**1**	1	1	1	1	0.4	0.67	0	0	1	1	0	1	0	0.9
WRA (NV)	**1**	1	1	1	1	0.8	0.67	0	0	0	1	0	1	0	0.9
GPI (CA)	**1**	1	1	1	0.6	0.4	0.67	1	1	0	1	1	1	0	0.6
CEJA/Sierra Club (CA)	**1**	1	1	1	0.4	0.4	0.33	0	1	0	1	1	0	0	0.6
IREC (OR)	**1**	0	1	1	1	0.4	0.33	0	0	1	1	1	1	0	0.6
Clean Coalition (CA)	**1**	0	1	1	0.4	0.4	0.33	1	1	0	1	0	0	0	0.4
NRDC (NY)	**0**	0	0.33	0.33	0.4	0.6	1	0	0	0	0	1	1	1	0.4
NYCEJA (NY)	**0**	0	0.33	0.33	0.4	0.4	0.33	0	1	0	0	1	1	1	0.4
Sierra Club (VA)	**0**	0	0	0.33	1	1	1	0	1	1	1	0	1	1	0.4
Environ. Adv. (VA)	**0**	0	0	0.33	1	0.6	0.67	0	1	1	1	0	1	1	0.4
Vote Solar (CA)	**1**	1	1	1	0.4	0.4	0.33	0	1	0	1	1	0	0	0.1
FOE (CA)	**1**	0	1	1	0.1	0.6	0.67	0	1	0	1	1	0	0	0.1
IREC (CA)	**1**	0	1	1	0.1	0.4	0.33	0	1	0	1	1	0	0	0.1
ACES (NY)	**0**	0	0.33	0.33	0.4	0.4	0.33	0	1	0	0	1	0	1	0.1
EDF (CA)	**1**	1	1	1	0.1	1	1	0	1	0	1	1	0	0	0
UCS (CA)	**1**	1	1	1	0	0.8	1	0	1	0	1	1	0	0	0
NWEC (OR)	**1**	1	1	1	0.4	0.4	0.67	0	0	1	1	0	0	0	0

Stakeholder Abbreviations: Sierra Club (Sierra Club), Renewable Northwest (RNW), Western Resource Advocates (WRA), Green Power Institute (GPI), California Environmental Justice Alliance (CEJA), Interstate Renewable Energy Council, Inc. (IREC), Clean Coalition (Clean Coalition), Natural Resources Defense Council (NRDC), New York City Environmental Justice Alliance (NYCEJA), Environmental Advocates (Environ. Adv.), Vote Solar (Vote Solar), Friends of the Earth (FOE), Alliance for Clean Energy New York (ACE NY), Environmental Defense Fund (EDF), Union of Concerned Scientists (UCS), Northwest Energy Council (NWEC).

Minimizing the Truth Table

Once the membership scores have been determined, the data is ready for the truth table analysis. The results of the truth table from the fuzzy QCA analysis highlight important conclusions about state PUCs, stakeholder participation, and the resulting level of influence of certain groups. In the original output of the fsQCA, there are many logical configurations shown (there were 64 configurations for this data set). Many of the configurations are logical remainders, which are outcome configurations that do not have any cases that meet the configuration. Since there are not any cases in those rows, these configurations are dropped to minimize the set of possible solutions. As Table 6.4. shows, there were only 7 configurations that fit the cases.

Table 6.4 Truth Table Analysis Results

GUIDE	PREPROP	ACCESSM	OPPCOM	PCOM	PALL	Number	INFL	Raw consist.	PRI consist.	SYM consist	CASES
1	1	1	1	0	0	5	0	0.189189	0.0625	0.0625	• Vote Solar • CEJA/Sierra • EDF • UCS • NWEC
1	1	1	1	1	1	4	1	0.916667	0.896552	1	• RNW/NWEC • Sierra Club (CA) • WRA • GPI
1	0	1	1	0	0	3	0	0.25	0	0	• Clean Coalition • FOE • IREC (CA)
0	0	0	0	0	1	2	0	0.666667	0	0	• NRDC • NYCEJA
0	0	0	0	1	1	2	0	0.747664	0	0	• Environ. Adv. (VA) • Sierra Club (VA)
0	0	0	0	0	0	1	0	0.166667	0	0	• ACES NY
1	0	1	1	1	1	1	0	0.6	0.333333	1	• IREC (OR)

The previous chapter discussed the importance of logical remainders, which are the extra configuration rows in the truth table that lack empirical cases. These empty configuration rows highlight the problem of limited diversity, in which the researcher's cases are limited by the available social phenomena. Therefore, there can be configurations that are a better fit for counterfactuals. In the case of this dissertation, it is likely that there are future cases that may fit different data configurations better than the current set of cases.

Yet, for what this dissertation is seeking to explain about forerunner states during a specific moment in energy storage's policy history, it is entirely appropriate to *only* examine the configurations that are representative of the actual cases. The clean energy and environmental groups in these first five states are the entire population. In addition, these cases showcase a period in the energy storage policy history in which energy storage was a new policy issue with nascent technologies. Given these factors, addressing the problem of logical remainders is not a major concern for the results of this study currently.

Moving on, one will notice that the results of the truth table analysis only show 0s and 1s, to represent membership. While the output only shows 0s and 1s, the fuzzy table consistency scores are calculated differently from that of a crisp set (only dichotomous data). In fuzzy sets, cases are calibrated in such a way that they hold membership in multiple rows simultaneously.

It is important to explain the parameters that the truth table utilizes to examine the configurations: raw consistency, PRI consistency, and SYM consistency. First, raw consistency is a parameter of fit in which the portion of cases in the configuration that are also in the outcome set. Consistency determines the configuration's degree of sufficiency. Consistencies for fuzzy sets should have a minimum consistency of at least .80 (Kahwati and Kane, 2020). A consistency of 1 indicates a perfect subset relationship and therefore a strong relationship of sufficiency.

The raw consistency score is used in the minimization of the truth table by establishing a minimum consistency score to determine which configurations are the best "fit". The only configuration in Table 6.4 that had a raw consistency score above .80 was the second row. The rest of the configurations lacked a sufficient relationship to outcome (INFL). The researcher then codes the outcome (INFL) with 1 for configurations that have a raw consistency above .80 and 0 for configurations with a raw consistency lower than .80.

The PRI consistency stands for "proportional reduction in inconsistency" and is an "alternate measure of the consistency of subset relations in social research" (Kahwati and Kane, 2020). It is only relevant in fuzzy sets and provides a more accurate measure than raw consistency.

SYM consistency is known as symmetric consistency and was established for fuzzy set analysis of the original outcome and the negated outcome (the inverse relationship). In crisp set QCA, the raw consistency score is symmetrical for the original outcome and its negated form. However, the raw consistency score for the original outcome and the negated outcome is different for fuzzy set QCA. SYM consistency ensures that the consistency score is symmetrical for both types of analyses. Therefore, in this dissertation, a high SYM consistency of 1 indicates that the inverse solution explains a stakeholder *not* influencing the final rules. This is a good indicator of the strength of the causal relationships among the conditions because it is logical in its original state and in the inverse.

There are several prime implicants identified by the fsQCA software before the final analysis of the Truth Table in completed: (1) PREPROP and PCOM and (2) PREPROP and PALL. Prime implicants are expressions that cannot be reduced any further. In some instances, there are multiple prime implicants (reduced expressions) that cover the original primitive expressions (Ragin and Davey, 20I7). During the minimization process of the truth table, the researcher seeks to find a solution in which the prime implicants cover the most expressions as possible. The researcher determines which prime implicants to use in the final analysis according to his or her theoretical and substantive knowledge of the cases (Ragin and Davey, 2017). Since the prime implicants are simple to understand, they were included in the final analysis for transparency.

Interpreting the Final Truth Table Analysis

Once the truth table has been minimized and coded, the researcher conducts the analysis. Fs/QCA 3.0 software provides three solutions with the standard analysis: complex, parsimonious, and intermediate solutions. The results of the three solutions are shown in Table 6.5.

Table 6.5 Results from Truth Table Analysis

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/FINI.csv
Model: INFL = f(GUIDE, PREPROP, ACCESSM, OPPCOM, PCOM, PALL)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.916667
                                              raw       unique
                                            coverage    coverage
consistency
                                           ----------  ----------
----------
GUIDE*PREPROP*ACCESSM*OPPCOM*PCOM*PALL     0.478261    0.478261    0.916667
solution coverage: 0.478261
solution consistency: 0.916667


**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/FINI.csv
Model: INFL = f(GUIDE, PREPROP, ACCESSM, OPPCOM, PCOM, PALL)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.916667
                    raw       unique
                  coverage    coverage   consistency
                 ----------  ----------  ----------
PREPROP*PCOM     0.550725    0.0724638   0.844444
PREPROP*PALL     0.478261    0           0.825
solution coverage: 0.550725
solution consistency: 0.77551


**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/FINI.csv
Model: INFL = f(GUIDE, PREPROP, ACCESSM, OPPCOM, PCOM, PALL)
Algorithm: Quine-McCluskey

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.916667
Assumptions:
                                              raw       unique
                                            coverage    coverage
consistency
                                           ----------  ----------
----------
GUIDE*PREPROP*ACCESSM*OPPCOM*PCOM*PALL     0.478261    0.478261    0.916667
solution coverage: 0.478261
solution consistency: 0.916667
```

The three solutions are derived based on how they treat the remainder combinations (Ragin and Davey, 2017).

Complex: remainders are all set to false, no counterfactuals

Parsimonious: any remainder that will help generate a logically simpler solution is used, regardless of whether it constitutes an “easy” or a “difficult” counterfactual case

Intermediate: only remainders that are “easy” counterfactual cases are allowed to be incorporated into the solution.

The parsimonious solution is the most basic solution, but presents the “core conditions” to the solution. In the parsimonious solution from Table 6.5, one will notice the two prime implicants and their dual pathways to reach the outcome. The consistency scores and coverage scores for both are lower than the intermediate and complex solutions. The consistency score for the parsimonious solution PREPROP*PALL is the strongest, but its unique coverage is naught. In contrast to the parsimonious solution, the complex solution presents every possible combination of the conditions. In some cases, the large combinations from the complex solution make it difficult to make any inferences about the cases and the conditions.

The intermediate solution is a part of the complex solution and includes the parsimonious solution. Both the complex and intermediate solutions are the same in the truth table and advance a relationship between all six of the conditions. The expression for the solutions is:

GUIDE*PREPROP*ACCESSM*OPPCOM*PCOM*PALL=>INFL

The multiplication symbol in the results indicates a logical AND relationship, in which each condition is a combination of the other. The conditions that appear in the intermediate solution, but not the parsimonious solution (GUIDE, ACCESSM, OPPCOM) are considered "peripheral conditions".

The consistency score is 0.917 with a raw and unique coverage score of almost .48. While the coverage score is initially not as robust as one might want (i.e., .60 or above), it is does not undermine the final results. As noted above, there is often a trade-off between high consistency scores and coverage scores. In addition, the empirical understanding of the cases confirms the unique relationship between these conditions and the level of influence environmental stakeholders are able to impart on the final rules.

While Ragin (2008) recommends using the intermediate solution, he also emphasizes that the researcher should rely on empirical information to guide his or her decision on which solution best fits the data and cases. However, among the QCA community, there is division on which solution should be used (Baumgartner, 2015; Thiem, 2019). The original critique of Ragin's fsQCA software (1999-2003)[10] was that the complex solution was too complex and detracted from the "interpretability of its findings" and the parsimonious solution made unrealistic assumptions about the empirical material (Thiem, 2019).

Ragin and Sonnett (2005) sought to remedy this issue by devising what is now known as the intermediate solution, which seeks a balance between the parsimonious and

[10] Drass, Kriss A. and Charles C. Ragin. 1992. *Qualitative Comparative Analysis 3.0*. Evanston, Illinois: Institute for Policy Research, Northwestern University.

complex solutions. The intermediate solution was found to be more attractive given that "[t]he rationale for creating intermediate solution terms is that, on the one hand, the conservative solution often tends to be too complex to be interpreted in a theoretically meaningful or plausible manner and that, on the other hand, the most parsimonious solution term risks resting on assumptions about logical remainders that contradict theoretical expectations, common sense or both" (Schneider and Wagemann, 2012, p. 175). Yet, there is still controversy that the intermediate and the complex solutions provide inaccurate inferences about the dataset that are contradictory.

Despite these criticisms, for these results, the intermediate and the complex solutions reinforce one another and provide a stronger fit of the empirical cases than the parsimonious solution. Given my empirical knowledge of the cases, the intermediate and complex solutions are not contradictory of the cases. The final solution proposes that clean energy and environmental stakeholders were more successful at influencing the final rules when

(1) The group participated during the pre-proposal process.

(2) There were three or more stakeholder meetings.

(3) There were three or more comment periods.

(4) The group participated in the majority (90 percent) of the comment periods.

(5) The group was present from for the entire proceeding.

(6) There was not a guiding document.

It is important to reiterate that the final solution advances a "logical and" relationship, in which the single solution is a combination of all of the conditions list above.

Table 6.6 shows the standout configuration for all values over the solution threshold greater than 0.8. The solution consistency for the parsimonious solution did not meet the 0.8 threshold, so was not included. Notice that the size of the black circles indicates whether the conditions are core or peripheral conditions.

Table 6.6 Configuration for Stakeholder Influence

	Solution
Configuration	Intermediate/Complex
Guide	•
Pre-proposal	●
Access to Meetings	•
Opportunity to comment	•
Participation During Comment	●
Presence	●
Consistency	0.916667
Raw Coverage	0.478261
Unique Coverage	0.478261
Overall solution consistency	0.916667
Overall solution coverage	0.478261

Note

● Black circles indicate the presence of a condition
⊗ Circles with ""x" indicate absence of a condition
● Large circles indicate core conditions
• Small circles indicate peripheral conditions
○ Blank circles indicate "don't care"

The fsQCA results are significant because it supports this dissertation's argument that there are important access points throughout the proceeding. Specifically, the pre-proposal stage and the comment periods are integral to a group's ability to influence the final rules. This is important on two levels. First, these findings show that the pre-proposal stage is important for stakeholders. Being at the “table” before major decisions or rules are proposed does provide advantages to stakeholders.

However, the findings also support that the comment period is also an important stage in which stakeholders can be influential. This is important because not all regulatory proceedings will hold a pre-proposal stage for all stakeholders. The findings on the importance of the comment period also emphasize that the quantity and likely the quality of the comments is linked to a group’s level of influence.

However, these two conditions (PREPROP and PCOM) rely on other peripheral conditions in order for a group to be influential. These findings highlight that stakeholders must also display a high level of participation in stakeholder meetings and the comment period to be influential. Therefore, the process is time intensive for influential stakeholders as they must take time to be a part of the pre-proposal phase, attend stakeholder meetings, and submit multiple rounds of comments. From a practical point, this highlights that interest groups that want to be influential must put in the time to be so.

As more states pass energy storage mandates, different configurations and conditions may emerge. As the following sections discuss, the newness of energy storage in these proceedings was a major factor in how each state approached the stakeholder process. As state PUCs and utilities gain greater knowledge of energy storage systems, the dynamics in energy storage rulemakings will likely shift so that there is less emphasis on information gathering, learning, and deliberation.

One condition that this analysis did not examine was whether the presence of intervenor compensation had a causal relationship with a stakeholder's ability to influence the final rules. The California cases are notable since a few of them were eligible to receive intervenor funds. The following section takes a brief examination of the Californian cases.

California and Intervenor Compensation

Out of all five states in this dissertation, California has nine clean energy and environmental groups, which is the greatest number of cases. Given the large number of cases attributed to California, it was important to isolate what was going on among these cases to see if there were causal relationships that were unique to California.

In addition, the deeper analysis of California would show whether there was a connection between intervenor compensation and a stakeholder's ability to influence the final rules. The membership data was separated so that it just had cases from California. Only the group level conditions were included, as the state level conditions are negligible when examining variation within state cases. The nine stakeholder groups represented a range of environmental and clean energy groups with varying staffing, financial capacities, and participation rates.

The California energy storage rulemaking attracted a diverse and large number of environmental and clean energy groups. The age and type of the groups were varied. Friends of the Earth, Environmental Defense, and the Union of Concerned Scientists are older, national non-profit advocacy groups that arose from the environmental activism of the 1960s. Sierra Club is among the oldest and largest environmental groups, being founded in 1892. In contrast, clean energy groups such as Clean Coalition, Vote Solar, Interstate Renewable Energy Council, California Environmental Justice Alliance, and Green Power Institute are newer groups from the 2000s (see Table 6.7).

Table 6.7 California Stakeholders Truth Table

CASE	PCOM	FINS	EMPCAP	INTV COMP	PALL	INFL
Sierra Club	1	1	1	1	1	0.9
GPI	0.6	0.4	0.67	1	1	0.6
CEJA/Sierra	0.4	0.4	0.67	0	1	0.6
Clean Coalition	0.4	0.4	1	1	0	0.4
Vote Solar	0.4	0.4	0.33	0	0	0.1
FOE	0.1	0.6	0.33	0	0	0.1
IREC	0.1	0.4	0.67	0	0	0.1
EDF	0.1	1	0.67	0	0	0
UCS	0	0.8	0.33	0	0	0

Stakeholder Abbreviations: Sierra Club (Sierra Club), Green Power Institute (GPI), California Environmental Justice Alliance (CEJA), Interstate Renewable Energy Council, Inc. (IREC), Clean Coalition (Clean Coalition), Natural Resources Defense Council (NRDC), Vote Solar (Vote Solar), Friends of the Earth (FOE), Environmental Defense Fund (EDF), Union of Concerned Scientists (UCS).

Just like the comprehensive analysis of all five states, a necessary conditions test was ran before the truth table analysis. The necessary conditions test in Table 6.8 shows that PCOM, FINS, and EMCAP have strong consistency scores. However, PCOM is the only necessary condition as it is the only condition that meets the minimum coverage score, too.

Table 6.8 Necessary Conditions Test

Conditions	Consistency	Coverage
PCOM	0.928571	0.83871
FINS	0.857143	0.444444
EMCAP	1	0.493827
INTVCOMP	0.678571	0.633333
PALL	0.75	0.7

After analyzing which of the conditions were necessary conditions, the truth table analysis was conducted (see Table 6.9 on the next page).

Table 6.9 California Truth Table Analysis

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/California QCA.csv
Model: INFL = f(PCOM, EMPCAP, INTVCOMP, PALL)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.9375
                                  raw       unique
                                coverage   coverage   consistency
                               ---------- ---------- ----------
PCOM*EMPCAP*INTVCOMP*PALL      0.535714   0.535714   0.9375
solution coverage: 0.535714
solution consistency: 0.9375

**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/California QCA.csv
Model: INFL = f(PCOM, EMPCAP, INTVCOMP, PALL)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.9375
            raw       unique
          coverage   coverage   consistency
         ---------- ---------- ----------
PCOM     0.928571   0.928571   0.83871
solution coverage: 0.928571
solution consistency: 0.83871

**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/California QCA.csv
Model: INFL = f(PCOM, EMPCAP, INTVCOMP, PALL)
Algorithm: Quine-McCluskey

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.9375
Assumptions:
PCOM (present)
PALL (present)
                                  raw       unique
                                coverage   coverage   consistency
                               ---------- ---------- ----------
PCOM*EMPCAP*INTVCOMP*PALL      0.535714   0.535714   0.9375
solution coverage: 0.535714
solution consistency: 0.9375
```

The parsimonious solution had a much stronger consistency and coverage score than the original analysis. A stakeholder's level of participation during the comment periods (PCOM) is shown to have a strong causal connection to their ability to influence the final rules. Like the original fsQCA results, the intermediate and the complex solutions are the same. Table 6.10 provides a simplified table to interpret the results from the fsQCA California analysis.

Table 6.10 Configuration for California Stakeholder Influence

	Solutions	
Configuration	Intermediate/Complex	Parsimonious
Group finance capacity	⊗	⊗
Group employee capacity	•	⊗
Intervenor Compensation	•	⊗
Participation During Comment	●	●
Presence	•	⊗
Consistency	0.9375	0.83871
Raw Coverage	0.535714	0.928571
Unique Coverage	0.535714	0.928571
Overall solution consistency	0.9375	0.83871
Overall solution coverage	0.535714	0.928571
Note		
●	Black circles indicate the presence of a condition	
⊗	Circles with ""x" indicate absence of a condition	
●	Large circles indicate core conditions	
•	Small circles indicate peripheral conditions	
○	Blank circles indicate "don't care"	

Again, group financial capacity is not a major condition for explaining influence. However, unlike in the original analysis, group staffing (EMCAP) was a significant condition. Therefore, the solution shows that stakeholder groups that were more likely to be influential in the final rules had (1) a high level of participation during the comment periods (PCOM), (2) were present during the entire proceedings (PALL), (3) had a stronger level of staff funding (EMCAP), and (4) received intervenor compensation (INTVCOMP).

The solution expression is represented as:

PCOM*EMCAP*INTVCOMP*PAL => INFL

In addition to running a fsQCA analysis on the California cases, an analysis was conducted on the other four state cases to see whether the California cases skewed the results. The results for the four state fsQCA analysis were consistent with the original results (see Appendix D for the truth table analysis of the four states).

These findings on California environmental and clean energy groups confirm the importance of stakeholder comments in an interest group's ability to influence the final rules. In addition, these findings are significant because they highlight the important role that intervenor compensation can have for interest groups. While intervenor compensation was not a core condition, it does contribute to a group's ability to influence the final rules. Finally, the strength of a group's employee capacity was significant in this fsQCA analysis, which indicates that there may be more to say about a group's resource capacity in future research.

It was important to conduct an additional set of tests on the California cases to ensure the rigor and validity of the original fsQCA analysis. The following sections take more time to examine the implications of the results from the original fsQCA analysis.

Theoretical Implications

The findings from the fsQCA truth table analysis clarify some of the ambiguities in the interest group influence and regulatory literatures. The most substantial theoretical finding in this dissertation was that interest groups are influential in the regulatory process. While utilities do possess a large amount of influence throughout these PUC processes, there is still room for other interest groups to influence the agenda, the process, and the final rules. These five state energy storage proceedings highlight that environmental and clean energy groups were able to influence the final rules. The truth table results uncovered three cross-case themes regarding: (1) information and learning, (2) stakeholder participation, and (3) stakeholder inclusiveness (see Table 6.11).

Table 6.11 Cross-Case Themes

Cross-Case Themes:
Information: How each state sought to overcome information and nascent technology concerns.
Stakeholder participation: How did each state seek to enrich the stakeholder process?
Stakeholder inclusiveness: What measures did PUCs take to create greater inclusivity?

First, how each state sought to overcome the information and learning gap for energy storage (i.e., issue ambiguity) determined the scope of their stakeholder process. The results show that states that did not rely on a framing document (GUIDE) had more inclusive and participatory stakeholder processes. These states used the stakeholder process to learn about energy storage and to deliberate on which features were important to include for the state's energy storage framework and programs. States also relied heavily upon consultants and experts to inform the process. The states that began their energy storage proceedings first (California, Oregon, and Nevada) adopted a more intensive stakeholder process to learn, consult, and deliberate. These states eventually did conduct state energy storage studies later in the process. Yet, not having a guiding document allowed for a more robust stakeholder process which some environmental and clean energy groups were able to navigate successfully.

In contrast, states that relied upon a guiding document conducted less participatory and inclusive stakeholder processes. New York and Virginia relied upon guiding documents to frame their rulemakings. New York's Governor Andrew Cuomo directed the Department of Public Service (DPS) and the New York State Energy Research and Development Authority to publish a roadmap on energy storage before the rulemaking was to commence. The Energy Storage Roadmap was eventually used to guide the scope and content of the energy storage rulemaking. The energy storage rulemaking essentially was the medium for securing stakeholder "approval" on the Energy Storage Roadmap.

So, across these five cases, the states that had published a guiding document prior to the rulemaking had already set the agenda. It was difficult for stakeholders to influence the final rules because the rules had already been established. In contrast, the states that did not have a preset agenda or framework were more open to a deliberative stakeholder process. It is within these states that stakeholders were invited to be part of the pre-proposal process.

Second, access to the pre-proposal (PREPROP) phase of the rulemaking was another important condition for a stakeholder's level of influence. Opening the pre-proposal phase to stakeholders is important because it allows stakeholders the opportunity to set the agenda or frame issues or concepts in a particular way. It is a deeper form of stakeholder engagement because it embodies inclusive practices that mutually define and address policy issues.

The nexus of this relationship hinges on which groups possess the power over the issue definition (Kamieniecki, 2006). The groups that are able to set the agenda and frame the issue have the greatest influence over the whole process. When the issue is defined and settled in a finished document, it is difficult for other groups to redefine or reframe key issues or concepts.

Previous literature (Yackee 2011, 2015; Rinfret, Cook, Pautz 2014; Crow, Albright, and Koebele, 2016) has highlighted that the pre-proposal period is critical phase of the rulemaking process because stakeholders can develop content of the proposed rules through agenda-setting, agenda building, agenda blocking, and framing (Kamieniecki, 2006). As the case of New York highlights, it is difficult to change the final rules when the agenda has already been established.

However, merely attending the pre-proposal stakeholder meetings and conversations is not sufficient for influencing the final rules. Stakeholders were more influential when they were present from the beginning of the proceeding (i.e., the pre-proposal phase), until the end of the proceeding. The longevity of a stakeholder's participation was important to their level of influence in addition to their participation at the beginning of the pre-proposal phase.

Third, the number of opportunities to attend stakeholder meetings was integral to a stakeholder's success in influencing the final rules. Stakeholder meetings, especially during the pre-proposal phase of the process, gave stakeholders the opportunity to learn, deliberate, and engage with other stakeholders. Previous literature (De. Martini et al., 2016; Bilimoria et al., 2019; Cross-Call et al., 2019; McAdams, 2021) has noted the importance of stakeholders having the time to interact with one another to gain better information of the issue, of each other's perspectives, and the process. This interactive portion of the process ultimately can benefit stakeholders by creating meaningful opportunities to collaborate and deliberate with one another. These interactions are advantageous for stakeholders that are in it for the "long game", as the PUC process is iterative across issues and dockets. The collaborative success of one proceeding is likely flow into future interactions.

Fourth, the number of opportunities to comment was also connected to an environmental and clean energy group's level of success. Environmental and clean energy groups were more influential over the final rule in PUC proceedings that had more than three comment periods. Potentially, a rulemaking proceeding could have at least four opportunities for stakeholders to submit comments: the order instituting the rulemaking, pre-proposal, draft, and final order. Many times, the opportunity to comment also includes an opportunity to submit reply comments after the initial round of comments.

The opportunity to submit comments provides stakeholders with potential access points to influence the final rules and regulations. The more points of access, the more opportunities to potentially influence the process and the final rules. Across the states, interviewees highlighted that the comment period was a crucial phase in which they believed that they could sway the final rules the most.

The number of opportunities to submit comments did not necessitate that environmental and clean energy stakeholders would be more influential. Environmental and clean energy stakeholders needed to submit comments for the majority of comment periods to influence the final rule. Groups that contributed comments for at least 90 percent of the comment periods had higher levels of influence. Strong participation during the comment periods was a necessary condition. Groups that had many opportunities to comment and that did comment at a high rate were more influential over the final rules. Groups that had a high opportunity to comment, but who commented less frequently had lower levels of influence.

There was one outlier to this, though. In Virginia, there was not a relationship between participation and the level of influence among groups. Virginia's rulemaking lacked key institutional mechanisms for stakeholder participation. There was not an opportunity for stakeholders to be involved in any pre-proposal workshops much less any stakeholder meetings.

In addition, there were only two opportunities for stakeholders to comment on the draft rules. Trade groups, energy storage industry groups, and environmental groups all seemed at odds with the Commission's position. The Commission's position lined up with the utilities. Even trade groups and storage developers, which often held a strong position in other proceedings, "lost out" in that docket. The utilities held a clear line of dominance during the Virginia energy storage docket. Thus, the level of participation of some stakeholders was negligible in institutional settings that offered few stakeholder access points. Table 6.12 summarizes the cross-case findings of the fsQCA analysis.

Table 6.12 Cross-Case Findings

Cross-Case Findings
• The role of learning and information were critical to the success of the state PUC energy storage proceedings. Energy storage was a new technology, which prompted a different learning strategy in each state (Information and Learning). • Environmental and clean energy stakeholders were more influential in states that did not rely on a guiding document or study (Information and Learning). • Environmental and clean energy stakeholders were more influential over the final rules in states that held more than three comment periods (Stakeholder Participation). • Environmental and clean energy stakeholders were more influential over the final rules in states that held more than three stakeholder technical workshops and meetings (Stakeholder Inclusion). • Environmental and clean energy stakeholders were more influential over the final rules in states that included stakeholders in the pre-proposal process (Stakeholder Inclusion).

There were also important within-case results from the empirical research that can be corroborated with the fsQCA results. The within-case findings provide a more granular examination of the stakeholder process in each of the five states. In addition, the within-case findings analyze the unique contexts that shaped the inclusive and participatory framework of the five states' energy storage proceedings. There are distinctions within each state's energy storage proceeding that are important regarding why certain stakeholders participated or did not, constraints from the legislative mandate, emphasis on consensus norms, and the leadership at state PUCs.

Table 6.13 summarizes the key within-case findings across each of the five states.

Table 6.13 Within-Case Findings

California	Oregon	New York	Nevada	Virginia
• Was the first state to establish an energy storage target mandate **(L)** • Intervenor compensation helped environmental stakeholders **(I)** • Created policy connections to other proceedings **(L, P, and I)** • Leadership of Commissioner Carla Peterman **(C)**	• Relied on third-party experts to help shape rules **(L)** • Process focused on learning, deliberation, and consensus **(P and I)** • The prioritization of the Coal to Clean Bill that was occurred during the same time **(C)**	• Rulemaking agenda pre-set around Energy Storage Roadmap **(L)** • There was a strong interagency presence throughout the rulemaking **(L)** • Lead workshops around the state to encourage stakeholder participation **(P and I)** • Timeline constraints of rulemaking **(C)**	• Small stakeholder process focused on collaboration and consensus **(P and I)** • Brattle Report was commissioned during pre-proposal phase **(L)** • Legislation mandated for investigatory phase *and* rulemaking **(C)** • In-state political turnover **(C)**	• Did not have stakeholder workshops **(~P and ~I)** • New legislation and policy shaped final rules (Task Force, FERC, and RPS) **(~L)** • Many of the unanswered questions from the rulemaking were referred to the Task Force **(~L and ~P, ~I)** • Timeline constraints of rulemaking **(C)**

Key: (C) Context (L) Learning and Information; (P) Participation; (I) Inclusiveness;(~) absence of factor

In each of the state cases, there was variation with regards to: (1) how each state handled issue ambiguity; (2) who was chosen to facilitate and inform the energy storage proceeding; (3) the timeline of the proceeding; and (4) other legislation or regulatory proceedings that shaped the energy storage proceeding. Yet, despite the variation within the five state cases, there was a strong causal connection between the type of access points (inclusive and participatory access points) and a stakeholder's ability to influence the final rules.

The following chapters will delve more into the case details of these five states and how these unique contexts shaped how each state PUC managed the challenge of issue ambiguity and subsequently the stakeholder process.

Conclusion

This chapter presented the results from the fsQCA software analysis on the five states that conducted energy storage regulatory proceedings. The truth table analysis confirms cross-case propositions that environmental and clean energy stakeholders will be able to influence the final rules when PUC proceedings provide participatory *and* inclusive opportunities throughout the proceedings. The fsQCA results uncovered an intermediate solution which advanced that clean energy and environmental stakeholders were more successful at influencing the final rules when: (1) they participated during the pre-proposal process; (2) there were three or more stakeholder meetings; (3) there were three or more comment periods; (4) the group participated in the majority (90 percent) of the comment periods; (5) the group was present from the beginning until the end; and (6) there was not a guiding document or roadmap that defined the regulatory proceeding.

These findings are significant because they provide clarity to the mixed findings from previous interest group and regulatory literatures. Foremost, the findings from the fsQCA analysis highlight that stakeholders can influence the process and more specifically, that environmental and clean energy stakeholders are influential in certain contexts. This finding dispels the notion that utilities are the only stakeholders that are influencing regulatory proceedings. While utilities remain influential, they have not "captured" state PUCs, at least for less salient issues such as energy storage.

In addition, the fsQCA analysis confirmed the importance of the pre-proposal phase and the comment periods of the regulatory process. However, the findings distinguish that these phases are only prominent when stakeholder groups are provided multiple opportunities to engage in stakeholder meetings (at least three or more) and stakeholder comment periods (at least three or more). In addition, stakeholders must maintain active participation throughout the entirety of the regulatory proceeding: the pre-proposal phase, the meetings, and the comment periods. This is a resource and time intensive process for stakeholders, and explains why some groups may decide not to participate in certain regulatory proceedings, as to save resources for proceedings that are of greater priority.

With regards to the conditions related to capacity, there was not a significant relationship found in the original analysis of the five states. However, the focused analysis on the California cases shows that while financial capacity was not a significant factor in a stakeholder's level of influence, the group's employee capacity was significant. While this finding was unique to California, it will also be explored in other chapters.

The latter half of this chapter explored the cross-case and within-case findings and their implications for previous literature on interest group influence and regulatory agencies. These findings add greater insight to the fsQCA results with regards to how each context and set of conditions are connected with one another.

While the findings from the fsQCA confirm the main propositions that are advanced in Chapter 5, they do not provide sufficient explanatory power on their own. In order to truly understand the causal relationships among the six conditions from the fsQCA analysis, individual state case summaries are constructed for each of the five states.

The state case summaries are divided into three chapters based on the five state PUC's stakeholder framework. Coincidentally, the state summaries divided simply between big states (California and New York) and smaller states (Oregon and Nevada), with Virginia being an outlier in the middle. As the case summary chapters will show, it is likely that the size of the state had an impact on the size of the institutions and subsequently the types and quantity of stakeholder groups that participated in the energy storage proceedings. However, as the California and New York chapter emphasize, the size of the state and the institutions do not preclude the type of stakeholder framework PUCs choose to implement. There are other contexts and factors (relating to the organization culture of institutions along with the political, social, and economic contexts of each of the states) that will have some impact on the process.

The next three chapters provide a detailed analysis of how each state's PUC sought to overcome the issue ambiguity surrounding energy storage and how that ultimately shaped the inclusivity and participatory nature of the stakeholder process. These case summaries also explore contextual factors for each of the states such as issue ambiguity, the timeline of the proceeding, constraints or issues stemming from the legislative mandate, and the organization of the PUC and its commissioners.

Chapter 7 The Cases of Oregon and Nevada

Chapter Overview

Oregon and Nevada are small states that are known for their urban centers, but are primarily comprised of expansive rural areas. In addition, while the main population concentration in both states exists in one metropolitan area, the state capital resides in another. Therefore, state policy is diffuse across two main political centers. In both states, the public utility commissions' (PUC) energy storage proceeding was more protracted than the other states. Nevada and Oregon learned about the costs and benefits of energy storage in an exploratory manner. In the case of Nevada, the rulemaking shifted from being investigatory to a rulemaking. For Oregon, the docket was a contested case that gave stakeholders the time to learn and deliberate as opposed to a regimented rulemaking.

While Oregon and Nevada implemented different types of regulatory proceedings, they are similar in that the proceedings encouraged consensus building among key stakeholders. The PUCs provided participatory *and* inclusive opportunities for stakeholders throughout the energy storage proceedings. Both proceedings sought ample opportunities for stakeholders to come to a mutual understanding of energy storage. There were also multiple stakeholder meetings prior to the draft rules to deliberate on the framework and rules. This deliberative approach (focused on learning and consensus) proved to be a successful framework for environmental and clean energy stakeholders.

The rest of this chapter examines in greater detail how both Oregon and Nevada's environmental stakeholders were able to benefit from a participatory and inclusive focused on learning and deliberation.

The Case of Oregon: Learning and Deliberation

Introduction

Oregon was the second state to pass legislation for an energy storage target mandate in June 2015 (HB 2193). While Oregon's energy target was not aggressive, it signaled that Oregon was committed to integrating energy storage into its electrical system. Oregon stakeholders entered the energy storage proceeding requiring time to learn about issues relating to nascent energy storage technologies, the barriers to energy storage on a traditional electrical grid system, and the unchartered policy space. While Oregon's regulatory proceeding was not a traditional rulemaking, the Oregon Public Utility Commission (OPUC) ensured that stakeholders were given the time to understand the important issues associated with energy storage and then provide opportunities for stakeholders to engage with one another in an inclusive and participatory stakeholder framework. The sections below examine how some clean energy stakeholders were successful in influencing the final energy storage framework.

Brief Energy Background

Oregon possesses few in-state power sources. Oregon imports coal power from plants in Utah, Wyoming, and Montana while receiving some nuclear power from Washington. Most of the electric power that Oregon generates and consumes comes from hydroelectric power. Oregon relies heavily on its hydroelectric power to meet the majority of its renewable electricity mix. However, in 2019, hydroelectric power dipped to less than half of its typical generation due to an unusual bout of dry weather and resulting drought (US EIA, 2019). Even before 2019, Oregon's hydroelectric generation has been decreasing from 89 percent in 1997 to 61 percent in 2017. The continuation of the drought into 2021 highlighted the vulnerabilities of Oregon's renewable energy mix in the face of hotter summers, less rain, and quickly evaporating mountain snowpack.

In 2019, wind power made up almost 11 percent of the electricity mix. However, approximately 30 to 40 percent of generated wind power is exported to California so that California can continue to meet its in-state renewable mandate (NTESS, 2021). Other renewable energy sources (i.e., solar, geothermal, bioenergy, and biogas) make a very small contribution to Oregon's electricity mix, representing less than 1 percent altogether (US EIA, 2021).

Oregon has been a leader in environmental and renewable energy policies regarding energy efficiency, waste and recycling disposal, renewable portfolio standards, and the retirement of fossil fuels. Oregon has adopted progressive renewable energy policies such as the Oregon Clean Electricity, Coal Transition Act or the "Coal to Clean" (SB 1547B) which set a timetable for Oregon's major investor-owned utilities, Portland General Electric (PGE) and Pacific Power, to phase out their coal-fired generation and increased PGE and Pacific Power's Renewable Portfolio Standard (RPS) from 25 percent to 50 percent by 2040. At the time of the energy storage docket, Oregon was in the process of retiring its only coal plant, the Boardman Coal Plant (retired in 2020). Both PGE and PacifiCorp have some ownership in coal plants out-of-state in Montana and Wyoming.

Given that Oregon's individual impact on America's aggregate carbon emissions is small, its energy storage mandate of 5MWh of energy storage will have a similarly small impact on electricity usage in the region. However, Oregon's present attempt to integrate energy storage rules and regulations into its energy sector is notable, especially given that few states possess the institutional and structural resources to do so. Therefore, Oregon is currently among a small group of states paving the way for a larger transformation of our national and regional energy systems to include new energy storage infrastructure, rules, and regulations.

Oregon's Public Utility Commission (OPUC) oversees the regulation of investor-owned electric utilities, natural gas utilities, land-line telephone service providers, and select water companies. The OPUC has three commissioners that the governor appoints for a four-year term. The main office is located in Salem, which is approximately an hour away from Portland. A small office is maintained in Portland for staff, but formal commission proceedings are held in Salem. During the 2015/2016 energy storage proceeding, the OPUC employed approximately 128 staff members to oversee PUC dockets.

The head commissioner at the time the energy storage legislation was passed was Commission Chair Susan Ackerman. Chair Ackerman's approach to clean energy policies appeared to be pragmatic, preferring policies that were cost-effective and protected the consumer. In an interview for *Fortnightly* in 2015, Chair Ackerman noted, "While I strongly agree that we need to go as far as we can in decarbonizing the power sector, I also strongly believe that we need to keep utility services affordable. As a society, we seem to be pursuing renewables for the sake of renewables, and DG [distributed generation] for the sake of DG." (Fortnightly, 2015). With regards to the then-recent passage of HB 2193, Chair Ackerman highlighted, "The Oregon PUC has recognized the need for our utilities to add flexible capacity to integrate renewable resources…and storage could be one of those options. Of course, our preference is always for the most cost-effective option to be used first" (Fortnightly, 2015). Chair Ackerman's focus on cost-effectiveness and pragmatism underscores the OPUC's duty to protect consumer interests and ensure that utilities are implementing cost-effective projects and practices that do not fall on ratepayers.

However, this duty to cost-effectiveness and pragmatism is not mutually exclusive from supporting clean energy policies. Oregon's history as an environmental forerunner, its environmentally progressive governors, and democratically held legislatures have created a strong foundation for the OPUC to adapt to transitioning towards more aggressive clean energy rules and regulations.

Legislative and Regulatory Background of the Energy Storage Mandate

Oregon was the second state in the United States to pass an energy storage mandate. In 2015, Oregon's legislative Assembly passed HB 2193, which required Oregon utility companies (Portland General Electric and PacifiCorp) to have a minimum of 5MWh of energy storage by January 1, 2020. However, the mandate was capped at 1% of a utility's peak load in 2014. The bill took effect immediately upon its passage.

The bill was introduced by Representative Paul Holvey, who sought the help of the OPUC to support the bill. The OPUC, especially Commissioner John Savage, and OPUC staff were supportive of an energy storage mandate and were involved throughout the legislative process. Staff at the OPUC testified to the legislature's committee on the benefits of storage. In addition, Staff were instrumental in helping to write the bill, as the ideas and language of energy storage required technical knowledge. While the bill was uncontroversial, there was little support for the bill. As one respondent noted, "I don't remember [the utilities] trying hard to kill it because when you try to kill something you really got to make a commitment" (OR Interview 003). Many believed that it would not pass, which may explain the lack of major opposition against the bill.

The energy storage bill (HB 2193) coincided with the first attempt to pass a version of what is now known as the Coal to Clean Bill, which was finally passed in the 2016 legislative session. The Coal to Clean Bill (SB 477) sought to establish a timetable for IOUs to replace their out-of-state coal-generated energy with renewable sources of energy. However, despite a strong environmental and clean energy coalition, SB 477 failed. PGE and Pacific Power were strongly against this bill and were able to defeat it. Therefore, the majority of the focus during the 2015 legislative session was on the Coal to Clean Bill, which may have allowed the energy storage bill to pass without much notice or contention.

HB 2193 directed the OPUC to oversee the implementation of the energy storage program. Unlike in the case of California, HB 2193 set specific procurement targets and timelines for the OPUC. HB 2193 directed the Oregon Public Utility Commission (OPUC) to:

(1) adopt guidelines for the submission of PacifiCorp and PGE's energy storage proposals by January 1, 2017,

(2) accept utilities' project proposals by January 18, 2018, and

(3) evaluate and authorize the project proposals by January 2020.

The broad timeline for this docket gave the OPUC and the electric utilities flexibility for navigating the process. However, the regulatory scope and framework were bound by the legislature's mandated energy storage target of 5MWh.

It was stressed that HB 2193 was an exploratory phase for utilities to learn and discover more about which energy storage technologies best matched their energy systems. Given that the bill was *exploratory*, the docket was assigned as a contested case that would produce Commission orders rather than quasi-legislative rules. Since energy storage was a relatively new and unchartered policy issue, it was beneficial to have the extra flexibility of the order than the rulemaking. Regulatory proceedings by *order* are easier to modify than *rules* through rulemaking proceedings.

Therefore, the initial proceeding began as a policy-based contested case given that specific rules were not being proposed. Three dockets were established to meet the directives of HB 2193. The first docket, UM 1751 sought to implement a framework for energy storage program guidelines. Following the adoption of the Commission Order 17-118 on Implementing Energy Storage Program Guidelines pursuant of HB 2193, two more dockets were initiated that oversaw the draft storage potential evaluations of

PacifiCorp (UM 1857) and PGE (UM 1856). A select number of stakeholders from UM 1751 participated in the dockets UM 1857 (PacifiCorp) and UM 1856 (PGE). This portion of the regulatory proceeding was unique because stakeholders relied upon testimony and the use of stipulations to ensure that any extenuating issues are resolved in a consensual manner. This portion of the implementation phase was more formal and required greater legal resources and process.

Given that a specific energy storage target had been established in the legislative bill, stakeholders did not have to deliberate on whether to establish a specific target or not. The docket (UM 1751) was divided into two main phases. The first phase centered on establishing energy storage project and proposal guidelines for PacifiCorp and PGE. The second phase focused on developing a framework for the utilities' storage potential evaluations, which would be used later as a metric to evaluate proposed energy storage projects.

During the first phase, the OPUC sought to examine the potential value of applying energy storage system technology within the context of six specified categories and a seventh "other" category to be defined during the meetings: (1) deferred investment in generation, T&D; (2) reduced need for peak generation; (3) integration of renewable resources; (4) reduced GHG emissions; (5) improved reliability of transmission or distribution systems; (6) reduced portfolio variable power costs; and (7) other (OPUC, 2016). This phase of the regulatory proceeding looked much like a rulemaking, with opportunities for stakeholders to meet at technical workshops and to submit comments on OPUC discussion documents, draft orders, and final orders.

There were two staff led workshops over a period of a month and then a Commission workshop later in May of 2016. This portion of the energy storage proceeding was strongly shaped by issue ambiguity. Many of the stakeholders did not have a strong understanding of energy storage and how it could be integrated into Oregon's electric system. The technical workshops enabled stakeholders to come to a mutual knowledge of energy storage. In these workshops, experts and key stakeholder provided informative presentations on the benefits of energy storage (Pacific Northwest National Laboratory (PNNL), the Oregon Department of Energy (ODOE), PacifiCorp, PGE, SolarCity, AES Energy Storage, and Strategen Consulting). The participation of PNNL was especially integral in guiding the stakeholder learning process.

PNNL is a federal research laboratory based out of Richmond, Washington. There is a small Portland office, which offered its research services for free to the OPUC. PNNL provided energy storage expertise to OPUC Staff and stakeholders, as many stakeholders had a rudimentary knowledge of energy storage. PNNL was instrumental in drafting the straw poll discussion document and portions of the final energy storage framework such as the process and the taxonomy of benefits of storage. These meetings were crucial to the development of the final energy storage framework.

After the technical meetings, stakeholders then had four opportunities to comment on the content of the rules (straw proposal, proposed storage potential requirements, proposed competitive bidding requirements, and the draft project guidelines and proposal guidelines) over a period of three months. Comment periods are an opportunity for stakeholders to impart expertise and opinions about the direction of the docket: the more opportunities to comment, the more potential opportunities to influence the process. As the analysis from Chapter 6 highlighted, the stakeholders that participated the most during comment periods were more influential in shaping the final order. While the Commission and Staff did not directly address particular stakeholder group comments until the final round of comments on the draft guidelines and framework, they addressed them generally in formal orders and Staff comments.

Figures 7.1 and 7.2 below highlight the timeline of workshops and comment periods.

Figure 7.1 Oregon Energy Storage UM 1751 Workshops and Meetings

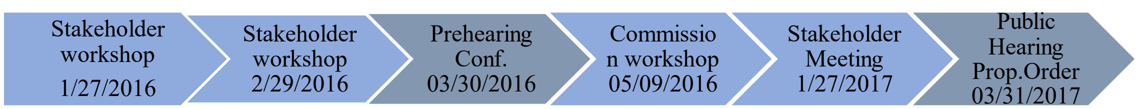
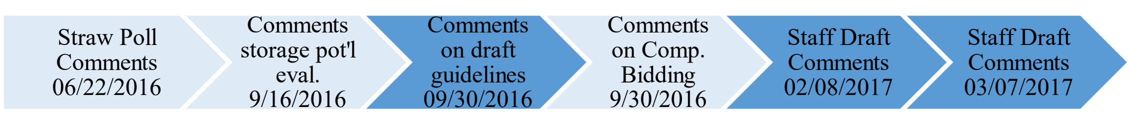


Figure 7.2 Oregon Energy Storage UM 1751 Comment Periods



During the second phase of the docket, a stakeholder meeting was held in which Staff developed a discussion document to address the main issues for the utilities' draft Storage Potential Evaluations. Staff also opened up an additional two comment periods beginning on February 8, 2017, and March 7, 2017. Staff used the discussion document and the comment periods to establish consensus among the stakeholders. The emphasis on consensus was integral to making this phase of the process especially inclusive. In its first order (Order No. 16-504), the Commission directed Staff to conduct workshops and develop a consensus framework for the Storage Potential Evaluations. The Staff recommendations that followed this comment period were adopted by the Commission in their Final Order.

Once a framework for the energy storage program was established, the regulatory proceeding turned to the utilities' storage potential evaluation in two separate contested case dockets, UM 1856 and UM 1857. Only a handful of stakeholders remained during this phase: Citizen's Utility Board (CUB), Alliance of Western Energy Consumers (AWEC), Renewable NW (RNW), Northwest &Intermountain Power Producers Coalition (NIPPC), Community Renewable Energy Association (CREA), and Oregon Department of Energy (ODOE). Some of these stakeholders maintained more of a monitoring role during the initial framework docket (UM 1751), but were more active in the utility dockets.

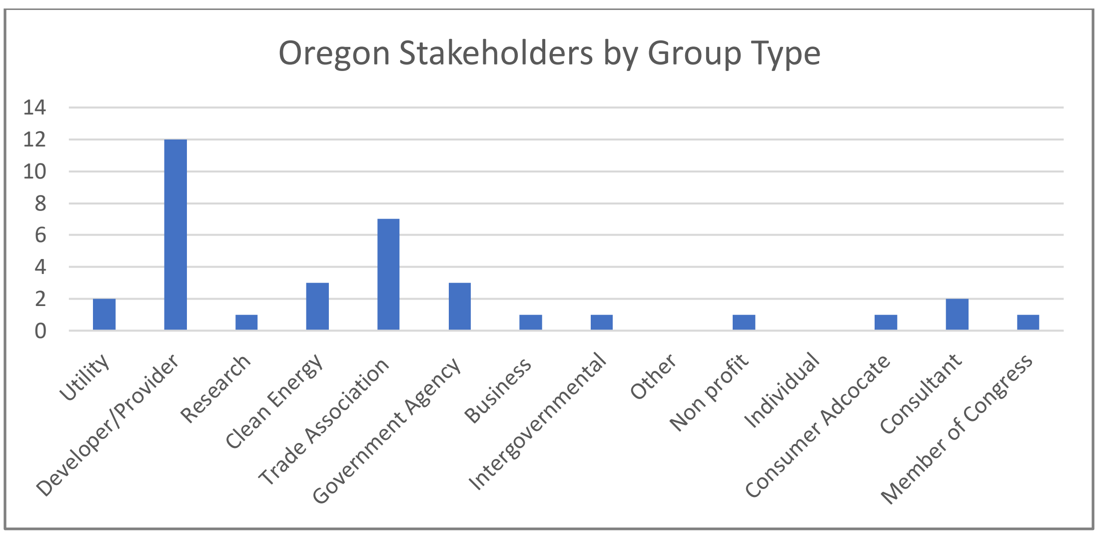
There was greater stakeholder engagement in the PGE docket given that PGE was responsible for the largest portion of the energy storage target. In contested cases, parties can submit testimony and comments to the Commission. The procedures are more formal than a rulemaking, and parties and Staff do not have access to the Commission, as the Commission seeks only to make decisions based on the record and facts. The fsQCA analysis did not include these additional contested cases because of the lack of available data for how the Commission reached its decision (there were not any Staff or

Commission comments on stakeholder comments). However, it should be noted that parties to these cases were encouraged to reach consensus over key issues and that this was an active period for just a handful of key stakeholders.

Stakeholder Influence

In total, thirty-five stakeholder groups were parties or intervenors during the contested case, with nineteen groups taking an active role throughout the proceeding (e.g., submitting comments, attending workshops). While the turnout and diversity of stakeholders for UM 1751 were small, the participation rate among those engaged was strong. Figure 7.3 shows the quantity of each type of stakeholder group.

Figure 7.3 Oregon Stakeholder Group Participation by Group Type



Trade groups and developer groups were the most numerous groups at the beginning of the proceeding, but their participation dropped off after the technical workshops. The two IOUs (PGE and PacifiCorp) were central throughout the stakeholder process given that the energy storage legislation specifically directed PGE and PacifiCorp to implement energy storage projects into their energy systems. There were only three clean energy groups that participated throughout the proceedings: NW Energy Coalition (NWEC), Renewable NW(RNW), and Interstate Renewable Energy Council (IREC).

While there was initially a strong stakeholder presence throughout the technical workshops, active stakeholder participation dropped during the comment period. The stakeholder influence scores are a cumulative total of three comment periods that occurred around the final order: comments on the staff draft and comments on each of the utility's proposed energy storage evaluation proposals. The stakeholder influence scores below in Table 7.1 show how influential stakeholders shaped the guidelines.

Table 7.1 Total Oregon Stakeholder Influence Scores

Stakeholder	Fuzzy Score	Type
Renewable NW and NW Energy Coalition	0.9	Clean Energy
Interstate Renewable Energy Council	0.9	Clean Energy
Northwest Power and Conservation Council	0.6	Government Agency
Community Renewable Energy Association	0.4	Intergovernmental
Oregon Solar Energy Industries Association	0.4	Trade
Energy Storage Association	0.4	Trade
Small Business Utility Association	0.1	Business
ITM	0.1	Developer
Northwest &Intermountain Power Producers Coalition	n/a	Trade
Citizen's Utility Board	n/a	Consumer Advocate
Alliance of Western Energy Consumers	n/a	Trade

The utilities PGE and PacifiCorp were not included in the influence scores since they are inherently influential for their roles in submitting the framework and evaluation proposals. The stakeholders in italics did not submit formal comments during the initial energy storage framework docket (UM 1751). However, they did participate in dockets UM 1856 and UM 1857, which evaluated the utilities' energy storage program proposals. The stakeholders that participated in the utility dockets were: NWEC, RNW, IREC, CUB, NIPCC, AWEC, CREA, ODOE.

The clean energy groups did well at influencing the final draft order. RNW provided a strong, active presence from the beginning of the energy proceeding. RNW took the lead for many other environmental and clean energy groups that were monitoring the docket on the sidelines. This included OSEIA (a solar trade group that often allies with clean energy and environmental groups), which was invested in the docket but had other issues that it was following more actively than the energy storage docket. Similarly, while NWEC submitted joint comments with RNW and was involved throughout various points in the proceedings, it often let RNW take the lead. NWEC and RNW have a familial organizational history, as RNW was established in 1994 when NWEC realized that there was a larger need for an organization that focused on renewable energy. RNW is independent of NWEC but remain close given their organizational history.

RNW was present at all of the technical workshops and submitted comments for all of the comment periods. IREC entered the proceeding a bit later than RNW, though. IREC missed the technical workshop meetings but submitted comments four out of the five comment periods. It should also be noted that IREC is an out-of-state clean energy group, whereas RNW is a local group, so it may have been more difficult to engage in some aspects of the proceeding fully. For example, while there are call-in options for PUC workshops, it is not the same as physically and metaphorically being "at the table".

At the time of the energy storage proceeding, Oregon granted intervener compensation for three types of stakeholders: CUB fund, issue fund, and matching funds. CUB receives intervenor funding because it directly represents the interests of customers. The Oregon CUB was originally established in 1984 as a means to protect the rights of residential utility customers before administrative, judicial, and legislative bodies. Often, energy regulatory proceedings are very technical in nature, requiring experts and stakeholders to help inform the process and the Commission. Intervenor compensation is a means to defray some of the costs of participation. Intervenor compensation funds attorney and consultant fees, expert witness fees, travel costs, and studies, testimonies, and briefs.

The Alliance of Western Energy Users (AWEC, formerly ICNU) has an agreement to draw from the matching fund because it represents industrial electric and gas users. Utilities are responsible for funding the intervenor compensation fund. However, utilities are able to use portions of their ratepayer fees to fund the intervenor compensation fund.

The third type of fund is the Issue Fund, which was open to other non-profit organizations on a case-by-case basis. Non-profits needed to prove that their participation represented: (1) broad customer interests, (2) interests not represented, (3) other funding sources, and (4) effective advocacy. Most environmental and environmental justice non-profits did not qualify for the Issue Fund because they did not represent “broad customer interests”.

AWEC and CUB monitored the initial docket (UM 1751) on the framework and storage potential evaluations. It was not until the utility dockets (UM 1856 and UM 1857) that either group took a more active role. Both groups were awarded intervenor compensation for their work on these dockets.

At the time, clean energy and environmental groups were not eligible for intervenor compensation funds. It was not until 2021 that environmental and environmental justice groups became eligible for intervenor funds. This is an instrumental change to the OPUC that will likely bring in a broader range of interests, especially as Oregon energy policy continues to examine the importance of equitable access to energy. Chapter 10 will provide a more in-depth discussion of how greater access to intervenor compensation may encourage environmental and clean energy groups to participate more actively at the OPUC.

Discussion: A Deliberative Learning Process

Oregon’s energy storage mandate was the second in the country. Therefore, much was still unknown about the technical feasibility of energy storage and how it could be incorporated into utility planning and systems. Nevertheless, the Oregon energy storage proceeding provided a successful institutional environment for clean energy stakeholders to influence the final draft order. What made the Oregon case successful was the OPUC’s focus on learning and deliberation through (1) pre-proposal stakeholder workshops, (2) the employment of experts to guide the learning of parties involved, (3) multiple comment periods, and (4) a norm for consensus.

First, there was a concerted effort for Staff and stakeholders to learn about energy storage through technical workshops. The legislative mandate noted that the energy storage program was exploratory, which encouraged the OPUC and its Staff to take the time to examine the costs and benefits of an energy storage program for Oregon. Experts were brought into technical workshops to help stakeholders understand the multiple facets of energy storage. Expert clean energy groups such as PNNL, Solar City (now known as Tesla), Applied Energy Services (AES), the Clean Energy Group, and Strategen provided presentations on energy storage. These technical workshops occurred before any document drafts were established, thereby enabling stakeholders and Staff to work organically from the bottom-up. There were no prior studies or established draft proposals that guided the pre-proposal process.

Second, the role of experts was critical to the Oregon experience. The engagement by PNNL was critical for OPUC Staff and stakeholders' learning. PNNL was involved from the beginning of the energy storage process to provide guidance and information. PNNL presented during legislative committee hearings and helped stakeholders understand key energy storage issues during the OPUC proceedings. PNNL worked closely with OPUC staff to help draft the content to key parts of the straw poll and the framework's analysis of the process and the taxonomy of benefits of storage. PNNL provided energy storage expertise during a time when little was known about the issue and the potential of storage technologies.

Third, the stakeholder process was heavy in participatory and inclusive opportunities. With regards to inclusivity, there were three stakeholder workshops (with one being a Commission workshop) conducted even before the drafting of the first documents. All stakeholders were invited to attend the technical workshops, with opportunities for stakeholders to call in to listen. In addition, over the course of the docket, there were six opportunities to submit comments, of which four were during the drafting phase.

Finally, the OPUC's emphasis on consensus was an inclusive mechanism for stakeholder engagement. Throughout the energy storage proceedings, Staff worked to create a consensus among parties through mechanisms such as discussion documents, draft polls, and comment periods. While consensus was not always reached among the stakeholders, the Staff was able to achieve consensus for the majority of the key issues for the energy storage framework.

Oregon Conclusion

Oregon's energy storage proceeding is notable for its inclusive and participatory stakeholder framework. While the energy storage proceeding was not a rulemaking (rather a set of contested cases), this enabled the OPUC to conduct a more meaningful stakeholder process over a longer timeline.

Oregon's stakeholder framework embodied Quick and Feldman's (2011) criteria for inclusiveness. First, the proceeding facilitated multiple ways of knowledge as the framework of the stakeholder meetings were planned to overcome the issue ambiguity of energy storage. Energy storage experts were brought in to help inform stakeholders and the process. This helped stakeholders come to a mutual knowledge of energy storage while allowing stakeholders the opportunity to share their perspectives and interests in energy storage openly.

Second, the OPUC and Staff encouraged stakeholders to coproduce key documents and drafts. Stakeholders were invited to participate in the drafting of the framework before anything had even been written. This is unique to most PUC proceedings, as often utilities or Staff will develop a draft proposal or document before engaging stakeholders.

Staff utilized discussion documents, straw polls, and multiple comment periods to create consensus among the stakeholders. The emphasis on consensus carried over to the utility dockets, as the remaining stakeholders continued to find ways to reach consensus through stipulations (UM 1856 and UM 1857).

Finally, the proceeding fostered temporal openness at multiple points. The stakeholder workshops encouraged stakeholders to build connections with one another. In addition, the practice of consensus required that stakeholders make concerted efforts to deliberate with one another. The three dockets (UM 1751, UM 1856, and UM 1857) created iterative opportunities for stakeholders to collaborate.

The Oregon energy storage proceeding came and went as it did in the Oregon Legislature: unnoticed by many. However, the proceeding established an energy storage framework that will help Oregon and its neighbors innovate its electrical grid while supporting infrastructure to transition to a low carbon future. The participatory and inclusive opportunities throughout the stakeholder process will continue to strengthen stakeholder and Staff interactions so that they can come together to develop innovative clean energy and DER policies.

The next section examines the energy storage proceeding in Nevada. Like Oregon, there was a strong emphasis on stakeholder consensus, which shaped stakeholder informal and formal interactions. The emphasis on stakeholder collaboration and consensus simultaneously facilitated a meaningful stakeholder process and a robust energy storage framework for Nevada.

The Case of Nevada: Forming a Consensus Among the Few

Introduction

The Nevada case is unusual given the small stakeholder process. Participatory processes often seek to engage a broad array of stakeholders, which often results in more stakeholders. Yet, Nevada's energy storage stakeholder process focused on fostering a deeply deliberative process with only a few stakeholder groups. The small number of stakeholders enabled the groups to generally reach a consensus with one another throughout multiple points in the rulemaking. While this was unique in contrast to the other states that conducted energy storage proceedings, this deliberative process appeared to be successful for the groups involved. The following sections show how stakeholders were able to successfully influence the final rules due to a stakeholder process rich in formal and informal opportunities.

Energy Background

Nevada's resource mix relies primarily on natural gas. Natural gas-fueled approximately two-thirds of the state's electricity net generation in 2019 (US EIA, 2021). Nevada possesses few fossil fuel reserves and ranks among the lowest ten states with little generation capacity in-state. The state relies heavily on out-of-state sources of natural gas and petroleum products. In 2019, approximately 85 percent of Nevada's energy came from outside the state (US EIA, 2021). Nevada only has one utility-owned coal fired power plant, in which it receives its coal from neighboring states of Wyoming, Utah, and Colorado.

Nevada's reliance on out-of-state energy resources and its rich renewable energy potential has stimulated the state to invest in renewable resources. In the first eleven months of 2020, approximately one-third of Nevada's electric generation came from renewable resources (US EIA, 2021). Nevada traditionally was able to rely upon a stable source of hydropower. Hoover Dam is Nevada's third-largest power plant by capacity and fifth largest by generation (US EIA, 2021). However, years of drought have greatly diminished hydropower's stability. In 2021, Lake Meade (the reservoir formed by Hoover Dam) was 35 percent under capacity (Van Voorhis, 2021).

Nevada's resource mix is unique in that it is able to tap geothermal power. Geothermal energy provides one-third of Nevada's renewable generation. In 2015, a geothermal power plant was outfitted to include solar thermal energy and solar PV, becoming the first of its kind hybrid geothermal solar power plant. Nevada is second in the nation after California for geothermal power production.

NV Energy is the only investor-owned utility in the state and provides service for approximately 90 percent of the state. However, in recent years, NV Energy has actively sought to integrate renewable energy resources in its energy plans. Independent of any legislative mandates or PUCN regulation, in 2018, NV Energy outlined in its IRP a plan to service its customers with 100 percent renewable energy. In addition, NV Energy had several energy storage projects planned prior to the 2018 energy storage mandate.

NV Energy is owned by Warren Buffett's Berkshire Hathaway Companies, which seeks to move its utility subsidiaries away from coal-fired generation to renewable-centric generation portfolios (NCSS-Nevada, 2021). However, Buffett has been outspoken about the challenges that distributed generation (DG) possesses for electric systems (e.g., residential rooftop solar) and stands firm on implementing renewable energy through a centralized, regulated business model (Pyper, 2017).

Nevada's clean energy policy has experienced periods of booms and busts throughout the past twenty-five years. Nevada was one of the first states to implement an RPS back in 1997 and later updated its RPS to 50 percent by 2030 in 2019 (SB 358). This updated RPS target strengthened the viability of energy storage at the time of the rulemaking. Increasing Nevada's RPS target also increased the value of combining energy storage systems with renewables to meet that mandate.

However, Nevada's progress was stunted with the PUCN's contentious net metering decision in 2015, which sought to phase out net metering credits and dramatically increase fees for residential solar customers. It was not until 2017 that net metering was reinstated under AB 405. AB 405 was important because it was the first time in US history that customers were allowed the right to self-generate electricity, while ensuring that customers do not incur additional fees or unfair electric retail rates. In addition, AB 405 ensured that customers who own solar in combination with energy storage, will have full control over their systems and not be disadvantaged as such. AB 405 helped lay the foundation for Nevada's energy storage policy.

The contentious net metering decision had major implications for the Nevada PUC (PUCN). The PUCN has three commissioners that that the governor appoints to a four-year term. The main office is located in Carson City, although there is another office in Las Vegas. The Commission experienced major turnover in the wake of the 2015 net metering fiasco. Then-Governor Brian Sandoval chose not to reappoint two of the commissioners involved in the net metering decision and reappropriated the chairmanship. The following years saw high turnover as five commissioners came and went from 2016 until 2019. On a high note, beginning in November 2018, the PUCN was led by an all-female commission. The bulk of resignations and retirements of the commissioners occurred over the period of the energy storage rulemaking (from August 2018 until December 2019). By the end of the energy storage rulemaking in March 2020, the Commission was understaffed with only two commissioners. Whether it is in spite of the commission upheaval or not, the energy storage rulemaking went from a tenuous beginning to a strong finish.

Throughout the energy storage rulemaking, there was also a transition from a republican governor (Governor Brian Sandoval) to a democratic governor (Governor Steve Sisolak). Governor Sisolak has openly embraced a clean energy economy. Governor Steve Sisolak was able to appoint two commissioners since coming into office in 2019. These leadership changes continued to help secure the path for a more stringent energy storage program in Nevada.

Energy Storage Target Legislation and Rulemaking

On July 13, 2017, Nevada passed SB 204, which directed the PUCN to open an investigatory and rulemaking docket to implement SB 204. SB 204 gave the PUCN a large amount of discretion over the establishment of energy storage targets. The bill required that the Commission should determine whether the establishment of biennial energy storage targets was in the “public interest”. If the Commission were to determine that biennial targets were in the public interest, there was a series of stipulations that the Commission needed to consider and then meet.

August 21, 2017, the PUCN opened an investigation and rulemaking to implement Senate Bill 204 (Docket No. 17-07014). The first order on the docket was to determine whether the Commission should mandate utilities to meet specific energy storage targets. A stakeholder workshop was held in November 2017 to lay the foundation for determining how to proceed. Tesla led two informal teleconferences in December 2017, in which participants discussed supporting a third-party study on energy storage potential in Nevada and its scope. There were two issues of contention during these teleconferences regarding the deregulation of Nevada’s electricity market and the timeframe of the storage study.

At the suggestion by Tesla, stakeholders requested a third-party evaluation study that examined the energy storage potential in Nevada. The PUCN staff (Staff) was initially against this because they believed it to be repetitive of a similar study conducted by NV Energy. However, the Commission determined that an independent study would be beneficial to the process. The Governor’s Office of Energy (GOE) and Pacific Northwest National Laboratory (PNNL) helped the Commission select the Brattle Group to conduct the evaluation. In the study, the Brattle Group was aided by PNNL, which also provided technical help during the Oregon energy storage rulemaking.

The Brattle Report identified four main benefits of energy storage: avoided distribution outages, delayed T&D investments, production cost savings, and avoided capacity investments. The Brattle Report ultimately concluded that it was in the public interest to establish biennial targets for the procurement of energy storage systems.

After the Brattle Report, stakeholders had an opportunity to comment on the study and its findings. Environmental and trade groups favored biennial targets and believed that the Brattle Study had actually underestimated the benefits of energy storage. In contrast, NV Energy, the Bureau of Consumer Protection (BCP), and PUCN Staff were against biennial targets and argued that Nevada's IRP and distributed resource planning would provide superior means for implementing energy storage projects. The groups against the establishment of targets also had concerns with the actual costs of energy storage and the unpredictability of energy storage technology in the near future.

Ultimately, the Commission supported the results of the Brattle Report and declared that it was in the public interest to establish energy storage targets. The Commission referenced NV Energy's recent evaluation of energy storage during its IRP process and how that evaluation had shown that energy storage was cost-effective. The beneficial results from the Brattle Report only strengthened the viability of real-world instances of energy storage that NV Energy had discussed in its report.

After the Commission accepted the results of the Brattle Report, stakeholders agreed to engage in "an informal stakeholder-driven process" to develop a draft consensus regulation. These informal interactions often included email communications, phone calls, and teleconferences. It was standard practice for the Commission to encourage the parties to reach a consensus before formal hearings. Ultimately, there were a few issues of contention regarding: (1) the definition of the energy storage target; (2)

the final storage target amount); (3) the biennial target amount; (4) requirements for sub-categories of the energy storage procurement target; and (5) additional requirements for data and project solicitations.

The PUCN's Hearing Officer (i.e., Administrative Law Judge) monitored the stakeholder's progress on a draft regulation. NV Energy sent progress reports on the stakeholder's development of a draft consensus regulation to the Hearing Officer over a period of four months. By November 2019, the stakeholders were able to come to some level of consensus over the course of multiple informal and formal meetings and communications. A series of workshops and comment periods followed the draft regulations. It was not until March 3, 2020, that the Commission issued a Final Order on the proposed regulations.

Stakeholder Influence

The energy storage rulemaking attracted a very small number of stakeholders to participate actively. While the energy storage rulemaking email list server had dozens of individuals and groups listed, it appears that many of the PUCN proceedings have a relatively small number of stakeholders that actively engage in the proceeding. There were only eight stakeholder groups involved in the rulemakings. The rulemaking was unique because there were not any in-state environmental or clean energy groups. NV Energy and the Bureau of Consumer Protection were the only in-state groups. The rest of the stakeholders represented regional or national organizations.

Table 7.2 shows the type of stakeholder groups involved in the rulemaking.

Table 7.2 Nevada Stakeholders by Group Type

Stakeholder Type	Quantity
Environmental	1
Developer/Producer	2
Utility	1
Government Agency	1
Trade Association	2
Total	7

There was only one environmental stakeholder involved in the rulemaking, Western Resource Advocates (WRA). WRA is a regional environmental group in the western and southwest states. While there was an in-state attorney in Nevada employed by WRA, the main office working on the rulemaking was out-of-state in Colorado. One participant highlighted that few environmental groups participated at the PUCN (NV Interview 001). The participant noticed that there has been greater involvement in the past four to five years by other large environmental organizations such as Natural Resources Defense Council (NRDC) and the Sierra Club. The NRDC and the Sierra Club had stronger presences in other energy storage rulemakings in California and Virginia. However, these groups were not directly involved in the energy storage rulemaking in Nevada.

Only a core group of five stakeholder groups remained active throughout the entire process: Western Resource Advocates, Tesla, the Bureau of Consumer Protection, NV Energy, and the Energy Storage Association. These five stakeholder groups worked closely together to create a consensus among the parties. Many of their interactions were informal and formal. There were in-person workshops and conferences and many informal exchanges among this core group.

The cohort of five stakeholders were influential in the Final Rules. Table 7.3 breaks down which stakeholder groups were most influential in shaping the final rules.

Table 7.3 Nevada Stakeholder Influence Score

Stakeholder	Fuzzy Score	Type
Western Resource Advocates (WRA)	0.9	Environmental
Tesla	0.9	Developer/Producer
Bureau of Consumer Protection (BCP)	0.9	Government Consumer Advocacy
NV Energy	0.6	Utility
Energy Storage Association (ESA)	0.4	Trade
Able Grid Energy Solutions	0.1	Developer
Interwest Energy Alliance	0.1	Trade

While there is a range of influence scores, it should be noted that influence is *relative to another stakeholder*. Therefore, while ESA may have a lower score than WRA, that does not necessarily indicate that they were not influential throughout the entire process. It just shows that ESA was not as influential in shaping the final rules relative to the other stakeholders who submitted comments on the final draft. The last two stakeholders in italics from Table 7.3 (Able Grid and Interwest Energy Alliance) were only involved during brief periods of the rulemaking. They often did not partake in the informal and informal workshops and meetings that the core group of five participated in. Their influence scores are lower than the rest of the core group of five stakeholders.

One surprising finding is the low influence score of NV Energy. NV Energy had a key role in crafting the Final Rules, but there were key issues that the utility lost out on. In particular, NV Energy failed to persuade the PUCN to take its position on non-binding targets, a lower energy storage target, and an incremental schedule on biennial targets. Rather, the PUCN adopted the more stringent target recommendations of Tesla, WRA, and the ESA. This is not to say that NV Energy was not influential at all throughout the proceeding. However, this highlights that utilities do not have an iron grip of state PUCs. Other stakeholders can be influential at key points during the proceeding, too.

The ESA has been a major stakeholder across all four other energy storage proceedings. The ESA continued to have a strong presence during the Nevada energy storage rulemaking. However, in the end, while the ESA was able to make substantial advances in some issue areas (e.g., targets), it was unable to convince the PUCN to commit to more stringent rules for NV Energy. Tesla experienced similar setbacks in ensuring that NV Energy adopted a more competitive procurement framework.

WRA was the only environmental group involved in the docket and was successful in many of the key issues it attempted to influence in the Final Rules. WRA brought a wealth of technical and regulatory expertise with its participation in the rulemaking. WRA is unique from traditional environmental groups in that it is mainly focused on regulatory proceedings rather than legislation. Therefore, WRA had a strong history of intervening in regulatory proceedings at the PUCN and other PUCs in the region. In addition, WRA's mission is science-based, which gave the group an advantage in possessing the technical knowledge to engage with the key issues fully. Since energy storage is a relatively new technology, many non-industry interest groups do not have the technical expertise or administrative knowledge to participate effectively in energy regulatory proceedings.

Another advantage that WRA had compared to other out-of-state stakeholders was that the group had an attorney on-site at the PUCN. Other out-of-state stakeholders relied on teleconferences and the occasional in-person visit throughout the proceedings. Interest groups with in-state staff often have a greater knowledge of the PUC, its staff, and procedures.

Despite the range of stakeholder influence over the final rules, the stakeholder process provided each of the key stakeholders opportunities to learn, deliberate, collaborate, and ultimately influence the rulemaking process and ultimately the final order. The following section examines what inclusive and participatory mechanisms the PUCN utilized to facilitate a successful stakeholder process.

Discussion: Collaboration and Consensus

What made the Nevada case so successful for its energy storage rulemaking was the focus on stakeholder collaboration and consensus. The PUCN achieved this by first, providing a myriad of informal and formal stakeholder workshops and meetings, and secondly, by facilitating stakeholder collaboration and consensus throughout the majority of the stakeholder process. In addition, discussion documents were employed to encourage stakeholders to collaborate and reach a consensus with one another.

Table 7.4 details the various types of stakeholder activities throughout the rulemaking process.

Table 7.4 Nevada Stakeholder Activity

	Comments	Formal Workshop	Teleconference	Informal Workshop	Hearing
Pre-Proposal	3	3	3	2	0
Draft	3	2	0	0	1
Total	6	5	3	2	1

During the pre-proposal and draft proposal periods, the PUCN facilitated multiple informal and formal interactions among stakeholders. There were at least ten on the record meetings, although it is likely that the stakeholders had more conversations and communications with one another than was noted in the official docket record. Often stakeholders will write emails and call one another to determine their positions or gain specific information about the docket. According to Nevada's APA, the PUCN is only required to hold a single workshop to solicit comments during a rulemaking per *NRS* 233B.061. The energy storage rulemaking far exceeded this requirement.

These formal and informal meetings provided stakeholders meaningful opportunities to be part of an inclusive and participatory framework. The Commission's prioritization of stakeholder consensus helped to shape this inclusive stakeholder framework. All of the stakeholders were part of the coproduction of the discussion documents.

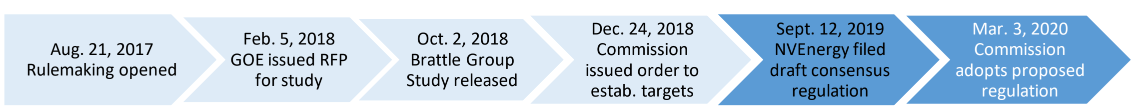
It is also important to highlight that the core group of five stakeholders were actively involved in the pre-proposal phase. During the pre-proposal phase, stakeholders were able to provide input on establishing energy storage targets. In addition, energy storage advocates (Tesla, WRA, and ESA) were able to effectively advocate for an independent study on energy storage (the Brattle Report) to help sway the Commission to determine that energy storage was in the public interest of the state.

While NV Energy was key in writing its draft proposal, other stakeholders were directly involved in this process. This is unique from the other state contexts, as often the utilities drafted their regulations independent of the greater stakeholder process. Other stakeholders only became involved in the drafting process once utilities submitted their proposals for stakeholder comment. Yet, in Nevada, Tesla, WRA, and ESA all were able to actively come to a consensus on the draft proposal *in collaboration* with NV Energy.

Another component of the stakeholder process that worked in favor of a more stringent outcome was the long timeline of the rulemaking. The rulemaking lasted two and a half years, which is quite long for any PUC rulemaking. This long timeline could have led to the dissembling of the original intent of the legislation, but instead, it enabled the stakeholders and the Commission enough space and time to come to a mutual understanding about the benefits and costs of an energy storage program to Nevada.

The timing factor is important because at the beginning of the docket, there was a sharp division between stakeholders on whether to establish an energy storage target or not. Essentially, there were two positions on the targets throughout the rulemaking: those that supported stringent energy storage targets and those that did not want mandated targets. Tesla, Western Resource Advocates, and the Energy Storage Association strongly supported stringent energy storage targets and energy storage program guidelines and rules. Whereas PUCN Staff, NV Energy, and the Bureau of Consumer Protection (BCP) took a more cautious stance on energy storage due to the uncertainty of energy storage technology and their desire to maintain NV's *existing* electrical needs rather than a major system overhaul. Discussion documents were utilized to further the conversation of the key issues of contention among stakeholders and to refine the scope of the proceedings. These discussion documents are a notable inclusive mechanism that increases transparency and consensus among the stakeholders. Figure 7.4 highlights the timeline of key events during Nevada's energy storage rulemaking.

Figure 7.4 Timeline of Key Events in Nevada



In addition, the extra time spent during the investigatory phase of this docket enabled the research and then publication of the Brattle Report. The Brattle Report was instrumental in convincing the Commission to establish a state energy storage target.

It is also likely that the concrete developments in clean energy legislation after the fallout from the contentious 2015 net metering PUCN decision helped lay a stronger foundation for energy storage policy. By the time the Commission determined it was in the public interest to establish an energy storage target, there had been greater policy and technological developments for energy storage. Other states such as New York, New Jersey, and Massachusetts had passed similar energy storage legislation in 2018. There were also similar state studies to the Brattle Report released during this period of time on the benefits of energy storage (Massachusetts's Energy State of Charge, New York's Energy Storage Roadmap, New Jersey's Energy Storage Analysis). These studies were further supported by positive economic and business forecasts showing that battery energy storage was becoming more resilient and affordable (Bloomberg NEF, 2018). In addition, Governor Sisolak was elected in the November 2018 election signaling a change of state leadership. Thus, there were a myriad of contextual factors that developed after 2017 that continued to shape the energy storage policy sphere in Nevada and the country.

Nevada Conclusion

Despite the small number of stakeholders involved, the Nevada energy storage rulemaking is noteworthy for its facilitation of stakeholder collaboration and consensus. The stakeholder process was likely successful because there were so few stakeholder groups. The small number of stakeholders fostered an environment more amenable to small group collaboration and consensus.

Like Oregon, the Nevada energy storage rulemaking embodied Quick and Feldman's (2011) criteria for inclusiveness. First, the rulemaking enabled stakeholders to share multiple ways of knowledge through the tight collaborative stakeholder framework. The five primary stakeholder groups had multiple informal and formal interactions with one another in which they were able to communicate their interests and perspectives on energy storage. Stakeholders were encouraged to reach a consensus with one another through these deliberations. In addition, the request for a third-party study (the Brattle Report) helped the stakeholders to reach a common understanding of energy storage during a period in the process in which stakeholders were divided.

Second, the five primary stakeholder groups were involved with coproducing the energy storage framework. Stakeholders were involved during the pre-proposal phase, which allowed them to shape the framework's content and direction. Again, the use of discussion documents and multiple comment periods provided stakeholders opportunities to coproduce the content of what became the final rules. The use of discussion documents was especially helpful in reaching a consensus with the groups.

Finally, the stakeholder process supported temporal openness through the many formal and informal meetings and communications among stakeholders. The stakeholder process was iterative and required stakeholders to collaborate with one another for an extended amount of time.

Nevada's energy storage rulemaking is unique. The final outcome of the rulemaking highlights how the PUCN's emphasis on collaboration and consensus resulted in a meaningful stakeholder process that enabled multiple stakeholder groups to be influential throughout the process.

Chapter Conclusion

As these two state contexts demonstrate, environmental and clean energy stakeholders successfully influenced the final regulations in stakeholder processes that embraced an inclusive and participatory stakeholder framework. Inclusive practices included stakeholder involvement during the pre-proposal and drafting phases, stakeholder workshops, stakeholder technical meetings, and the use of discussion documents. In addition, stakeholders were given multiple opportunities to participate in comment periods before and after the draft framework was written.

In Oregon, the OPUC led a deliberative proceeding and focused on stakeholder learning about the costs and benefits of energy storage. The OPUC's participatory and inclusive stakeholder process enabled clean energy storage groups to effectively influence the final order. Stakeholders were able to participate in in-person technical workshops during the pre-proposal phase. Stakeholders who participated in these pre-proposal workshops were literally and metaphorically "at the table" which contributed to their influence by the end of the docket. Inclusive workshops ensure more meaningful stakeholder engagement.

In Nevada, the long timeframe of the energy storage rulemaking provided stakeholders the time to collaborate with one another through multiple informal and formal meetings and discussions. These multiple meetings and workshops facilitated not only stakeholder deliberation, but also stakeholder consensus. The PUCN's emphasis on stakeholder consensus deepened the core group of five stakeholders' interactions and fostered a strong environment of inclusivity.

While Nevada's case is exemplary for its inclusive and participatory stakeholder framework, it should be noted that it was most likely successful due to the small number of stakeholders involved. Such an intimate and focused stakeholder process would likely be ineffective for rulemakings with a large number of stakeholders in a limited timeframe. Yet, Nevada's case does highlight that the stakeholder process can be meaningful even when there is not a diverse range of stakeholders involved (i.e., less emphasis on broadening participation and more emphasis on deepening inclusivity).

The following chapter examines the cases of California and New York. These two cases are quite different from the Oregon and Nevada cases as California and New York are much larger. Therefore, the PUCs in California and New York are larger and were able to attract a large number of stakeholders for the energy storage rulemakings. While California and New York's administrative contexts are similar, each state's PUC conducted their rulemaking and stakeholder processes quite differently from the other.

Chapter 8 The Cases of California and New York

Chapter Overview

This chapter seeks to explain why environmental and clean energy stakeholders in California were more successful in influencing their energy storage rulemaking than their counterparts in New York. California and New York have similar socioeconomic contexts. Both California and New York possess large populations and boast high gross domestic product (GDP) and GDP per capita rates. In addition, both states have been clean energy forerunners, implementing progressive renewable energy, distributed energy resources, and interconnection policies. Both states have intentionally sought to link and coordinate energy policies from the legislature to the public utility commissions (PUC) for a seamless implementation process. Another similarity is that California and New York operate their own state-independent system operators (ISOs) (Texas is the other state with their own ISO). Finally, California and New York possess a highly bureaucratic network of agencies that work together on energy policies.

However, the stakeholder process in California sharply contrasts in comparison to the stakeholder process in New York. Environmental and clean energy stakeholders were able to succeed at much higher levels at influencing the final rules in California than in New York. This discrepancy can be explained by:

(1) the differences in the legislative mandate,

(2) how each PUC sought to overcome the issue ambiguity surrounding energy storage,

(3) the *type* of stakeholder opportunities (participatory and inclusive), and

(4) the quantity of access points (stakeholder meetings and comment periods)

The following case summaries examine the differences in California and New York's stakeholder process and how these contexts and the presence of inclusive and participatory opportunities enabled environmental stakeholders in California to be more successful in influencing the final rules than their counterparts in New York.

The Case of California: Creating Policy Linkages

Introduction

California was the first state to pass an energy storage target mandate in 2010. With that prestige also came a lengthy process of learning about energy storage and then establishing an energy storage program that could be integrated seamlessly into the traditional electrical system. Given that energy storage was a nascent technology and that there was a lack of full-fledged energy storage projects, it was important for the California Public Utilities Commission (CPUC) to turn to its stakeholders to inform the rulemaking. The CPUC held many stakeholder meetings, workshops, and comment periods to help facilitate learning for stakeholders and the Commission. The CPUC also promoted policy linkages and network connections, as the rulemaking was occurring simultaneously with other proceedings on interconnections and distributed energy resources. After several years of stakeholder engagement, the CPUC instituted the country's first energy storage program. The success of the energy storage program can be credited to the CPUC's inclusive and participatory stakeholder framework.

California's Energy Background

California faces many climate change challenges: the availability of water from snowpack in the Sierra Nevada Mountains, rising sea levels and coastal areas, the effect of droughts on agriculture, extreme weather, forest fires, degradation of natural resources, and health problems associated with poor air quality. California has among the worst air quality of any of the states (Schmidt 2007). California has a long history of air pollution problems. In particular, Southern California's poor air quality can be attributed to high vehicle traffic due to its low-density sprawl, heavy border traffic with Mexico, and the Los Angeles-Long Beach port complex (Schmidt 2007). The air quality is especially bad because the air pollution becomes trapped in the region due to low-lying valleys and is unable to dissipate quickly.

As a result of these environmental and socioeconomic challenges, California became an environmental forerunner early on and began to invest in renewable energy resources during the late 1970s and 1980s. However, it was not until the 2000s under Governors Arnold Schwarzenegger (2002-2011) and Jerry Brown Jr. (2011-2019) that aggressive decarbonization policies were enacted. In 2002, California passed its first of a series of Renewable Portfolio Standards (RPS) goals (with the most recent update in 2018 directed California to be 100 percent carbon-free energy by 2045). The 2006 Global Warming Solutions Act (AB 32) was one of the first pieces of state legislation that required California to reduce its greenhouse gas emissions.

Regarding DER programs, the 2001 Self-Generation Incentive Program (SGIP) encouraged the rise of residential solar and energy storage installations. California's energy storage bill (AB 2514) continued to revolutionize California's energy sector. During the 2016 legislative section, lawmakers continued to support the institutionalization of behind the meter and utility energy storage capacity with the passage of AB 1637 (Low), AB 2868 (Gatto), AB2861 (Ting), and AB 33 (Quirk). Of particular note was AB 2868, which mandated another 500 MW of behind-the-meter storage for the state's three IOUs.

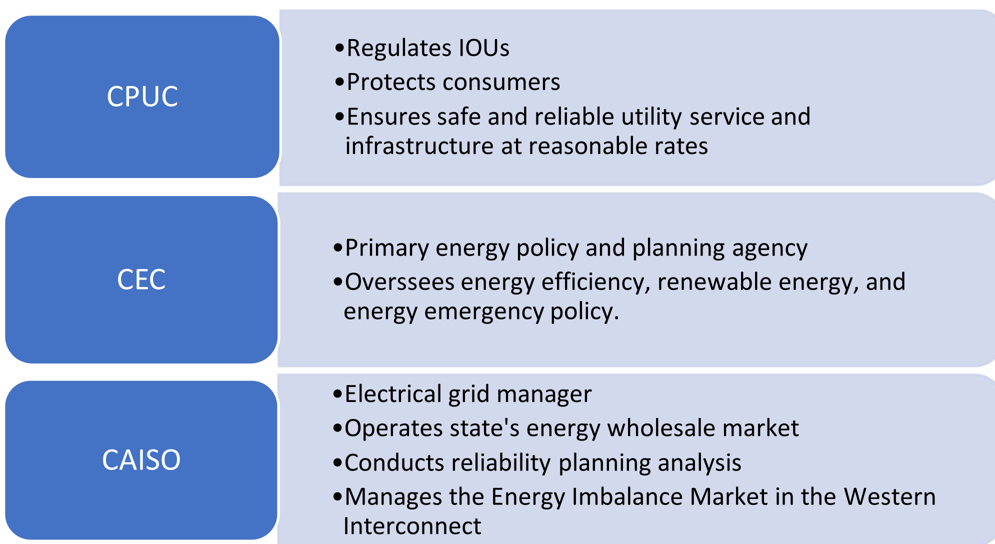
However, California faces immense challenges in mitigating its greenhouse gas emissions. California is the most populous state in the United States. Its total energy consumption is the second highest in the country (US EIA, 2019). The transportation sector makes up 40 percent of California's energy consumption, in which California is the largest consumer of jet fuel in the United States (US EIA, 2019). As noted above, vehicle emissions have continued to be a problem despite innovative policies to increase vehicle efficiency and lower emissions. In addition, California's oil industry has been a major barrier to the state's transition to renewable energy sources. In 2016, California was the fourth-largest crude oil producer in the country and the third in oil refining capacity in 2017 (US EIA, 2019).

Nevertheless, it is interesting to note that approximately half of California's electricity mix is from renewable energy sources, with natural gas making up more than two-fifths of electricity generation (US EIA, 2019). Since there are no utility-owned coal plants in California, little of California's energy is generated by coal-fired plants. While most of California's renewable energy comes from hydroelectric power, it is notable to highlight that solar, wind, geothermal, and biomass generate about a quarter of the state's renewable energy (US EIA, 2019).

Unprecedented droughts and wildfire seasons have uncovered major vulnerabilities in California's electrical grid system. These natural disasters have prompted California to implement energy policies that support a more reliable and resilient electrical grid as a means to prevent future crises. In 2015, the CPUC ordered Southern California Edison to install energy storage systems to mitigate power failures after large portions of the state were put at risk of power outages in two incidences due to infrastructure failures (The Climate Group, 2016). California's environmental and energy agencies continue to lead the nation in clean energy and renewable energy policy.

California has a highly bureaucratic energy system managed by multiple agencies: the California Public Utilities Commission (CPUC), the California Energy Commission (CEC), and the California Independent System Operator (CAISO). Figure 8.1 provides a summary of each of the agencies.

Figure 8.1 California Energy Agencies



CAISO manages approximately 80 percent of California's electrical grid and operates the state's energy wholesale market. CAISO conducts reliability planning analysis and coordinates energy policy with neighboring balancing areas. In addition, CAISO leads the Energy Imbalance Market (EIM), which is a real-time energy market that connects balancing authorities across the western states. The EIM analyzes regional grid needs and makes available low-cost generation to demands leading to improved efficiency and lower costs across the entire western interconnect.

The CEC is the state's primary energy policy and planning agency. The CEC is responsible for forecasting energy needs, promoting energy efficiency, supporting renewable energy policy (e.g., RPS), maintaining historical energy data, supporting public interest energy research, and planning for state emergencies. It has a similar organizational structure to the CPUC but does not conduct as formal and technical rulemakings as the CPUC does. The CEC has roughly 700 staffers across its divisions and offices.

The CPUC has regulatory authority to regulate natural gas, electric, telephone, railroads, and marine transportation companies. The CPUC is responsible for serving "the public interest and ensuring the provision of safe, reliable utility service and infrastructure at reasonable rates with a commitment to environmental enhancement and a healthy California economy" (CPUC Mission Statement, 2021).

Regarding energy companies, the CPUC regulates investor-owned utilities such as PG&E, SCE, and SDG&E, but not municipal utilities. In the CPUC, there are five commissioners that are appointed by the governor (and confirmed by the state Senate) for six-year staggered terms. The CPUC is a highly staffed agency, with over 1,000 staffers across fifteen offices and divisions. The CPUC deals with many different issues due to California maintaining a fulltime legislature. The California legislature maintains oversight of the CPUC activities and rules.

There is a large amount of coordination and policy overlap across these three agencies. In addition, there has been a large amount of organizational growth within these agencies as they work to meet the new demands that have arisen with renewable and clean energy policies.

Legislative Background

AB 2514 emerged during an innovative period of clean energy policy. Before AB 2514, California had passed notable renewable energy and climate legislation such as AB 32, California Global Warming Solutions Act of 2006, SB2 California "Renewable Energy Resources Act", the 2006 Self-Generation Incentive Program (SGIP), and California's Renewable Portfolio Standards. In addition, at the federal level, the American Recovery and Reinvestment Act (ARRA) of 2009 invested $685 million in energy storage and smart grid demonstration projects. This injection of funds encouraged utilities and industry to invest in energy storage projects and create partnerships with governments.

Assembly Member Nancy Skinner (D-Berkley) authored AB 2514 in partnership with then California Attorney General Jerry Brown in 2010. AB 2514 was the nation's first energy storage target legislation. Assembly Member Skinner noted, "The Assembly's passage of AB2514 is another step that advances California's clean energy economy and represents a great economic opportunity for the State" (CESA, 2010).

The bill was considered flexible given that it did not define the procurement targets, the types of energy storage projects, various recovery mechanisms, and the procurement rules and procedures. The original draft of the bill had included specific mandated targets for utilities. However, after pressure from the CPUC and utilities, the bill was modified to direct the CPUC to determine appropriate energy storage procurement targets through the rulemaking process (Wesoff, 2011). While there was opposition from utilities, the bill passed with relative ease after it was “watered down” from its original target mandate. The final bill did not mandate a specific target amount that utilities would be required to adopt.

AB 2514 directed the CPUC to consider procurement targets and policies for the state’s investor-owned utilities (IOUs), while encouraging publicly owned utilities (POUs) to attempt to integrate energy storage into their systems. The legislative mandate directed the CPUC to set procurement targets by March 1, 2013, in which each load-serving entity (LSE) would be required to achieve the initial target by December 31, 2015, and a second by December 31, 2020. The three IOUs in California that were required to procure energy storage deployment were PG&E, Southern California Edison, and San Diego Sempra Energy.

The order instituting rulemaking (OIR) determined that the proceeding would be quasi-legislative. The Commission was proactive from the beginning of the rulemaking. While AB2514 directed the CPUC to begin its rulemaking no later than March 2012, the Commission actually started the rulemaking over a year early, on December 21, 2010. The implementation of AB2514 required coordination with other Commission proceedings at the time, such as California’s 33% Renewable Portfolio Standard (RPS), Long-Term Procurement Planning (LTPP), and Resource Adequacy (RA) activities.

There were two primary phases during the rulemaking process, (1) the establishment of procurement rules and procedures and (2) the establishment of methodologies for evaluating and prioritizing individual projects within the procurement process. The CPUC faced some daunting barriers in establishing a cost-effective energy storage resource policy as a result of a lack of existing rulemaking, procurement, and interconnection processes. The CPUC's Energy Storage Framework noted nine key barriers:

- Lack of definitive operational needs,
- Lack of cohesive regulatory framework, evolving markets, and market production definitions,
- Resource adequacy accounting,
- Lack of cost-effectiveness evaluation methods,
- Lack of cost recovery policy,
- Lack of cost transparency and price signals (for both wholesale and retail electricity),
- Lack of commercial operating experience, and
- Lack of well-defined interconnection processes.

Given that energy storage was a nascent technology and new policy issue, it was important for the CPUC to take the time to understand how energy storage would fit in with California's energy system. Commissioner Carla Peterman took over as the led commissioner for the energy storage rulemaking in 2013, which was instrumental to the direction of the scope of the rulemaking. As Commissioner Peterman noted, "The legislation directed the PUC to consider setting targets for energy storage. But the storage had to be one of those things and it had to be viable, and it had to be cost effective. I've never seen such a high bar for new technology class in legislation. But that was the direction that we had" (Peterman, 2018a 10:55-11:15).

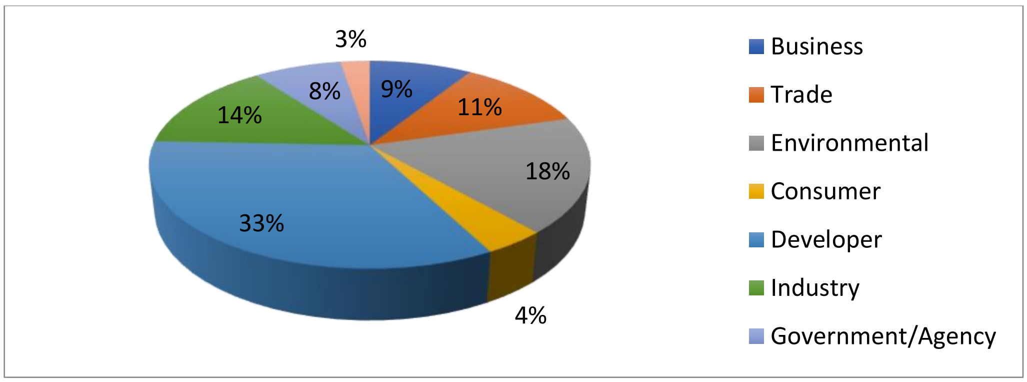
There were other interrelated energy rulemakings throughout the energy storage rulemaking proceedings. However, this issue overlap was beneficial in the case of energy storage as created a common platform for knowledge. In addition, stakeholders were able to interact with one another across multiple issues over a long period time (this is in contrast to other cases in which the rulemaking occurred in a short amount of time, in which there was little issue overlap). The CPUC working groups (e.g., LTPP and Interconnection) also linked issues and stakeholders together during the energy storage docket. These stakeholder working groups made the process more seamless to implement energy storage objectives (Peterman, 2018b).

Stakeholder Influence

The rulemaking attracted diverse stakeholders however industry, trade, and developer groups made-up the majority of the stakeholders. California's bustling technological sector provided a friendly environment for energy storage and clean energy developers and producers.

A large influx of stakeholders requested party status to the rulemaking after Commissioner Peterman's June 10, 2013, ruling proposing aggressive energy storage targets. This was a monumental moment for the rulemaking, as it was not clear whether targets would be mandated and what the framework for an energy storage program would look like. Figure 8.2 depicts the breakdown of each of the major stakeholder group types involved in the rulemaking.

Figure 8.2 California Stakeholder Group Participation by Group Type



Stakeholder groups submitted many comments throughout the process regarding the proposed targets and the framework rules and regulations. Under California's APA, agencies are required to respond to comments through a Final Statement of Reasons (FSOR). The agency can dismiss comments that do not pertain to the proposed regulations or proceedings. California has a 45-day public comment period. If any changes are made to the regulations during the proceedings, a new 45-day notice and public comment period is instituted.

California allows intervener compensation for stakeholders that are able to justify their contributions to the proceeding. Often, energy rulemakings are very technical in nature, requiring experts and stakeholders to help inform the process and the Commission. California established its intervenor compensation program in 1981, and it was codified into state law by 1985. In 2013, the California State Auditor conducted an audit of the CPUC's intervenor compensation program and found that it was effective at bringing in a "broad array of interests", representing environmental interests, low-income ratepayers, ratepayers from specific geographic regions, and minority ratepayers (State Auditor Report 2012-118, 2013).

There are two requirements that intervenors must meet to receive funding. The first requirement is that intervenors must demonstrate significant financial hardship through either the undue hardship test (customer cannot afford to participate without financial aid) or the comparison test (economic interest of individual members is small compared to the costs of effective participation) (State Auditor Report 2012-118, 2013).

The second requirement is that intervenors must demonstrate their customer status through one of three categories relating to (1) being an actual customer that represents the broad interests of other customers, (2) a representative who has been granted the authority to represent actual customers, or (3) a formal organization authorized through its bylaws or articles of incorporation to represent the interests residential customers or small commercial electric customers (State Auditor Report 2012-118, 2013, p. 16).

Within these requirements, environmental and clean energy groups are eligible to receive intervenor funds as long as they pass the requirements of financial hardship and customer status. For the rulemaking, six groups filed for intervenor compensation: Sierra Club California, The Green Power Institute (GPI), the Union of Concerned Scientists (UCS), the Vote Solar Initiative, The Utility Reform Network (TURN), and the Consumer Federation of California (CFC).

With regards to the availability of intervenor compensation, it is clear that groups who were able to receive funds did relatively better than their counterparts in terms of influencing the final rules. It should be noted that the majority of environmental groups involved with the docket could have requested authorization to receive funds, but only three groups followed through. One environmental group (UCS) requested intervenor authorization but chose not to actively participate in the proceeding. Another group noted that they had many other dockets and issues that they were too busy with and chose not to participate as a result (EDF).

A few stakeholders stood out from the proceeding. Naturally, the three IOUs had a strong role in shaping the content and direction of the final decision. The Division of Ratepayer Advocates (DRA) (which is now called the Public Advocates Office) is an independent organization within the CPUC that represents and advocates on behalf of utility ratepayers. The mission of the DRA is to obtain the lowest possible rate for ratepayers that is reliable and provides safe services. The DRA is an influential stakeholder in many proceedings, given its statutory goal is to represent ratepayers at regulatory proceedings.

Table 8.1 on the next page shows stakeholder influence scores for California's energy storage rulemaking.

Table 8.1 California Stakeholder Influence

Stakeholder	Fuzzy Score	Type
Pacific Gas and Electric (PG&E)	0.9	Utility
Division of Ratepayer Advocates (DRA)	0.9	Government
Sierra Club	0.9	Environmental
San Diego Gas and Electric (SDG&E)	0.6	Utility
Southern California Edison (SCE)	0.6	Utility
Green Power Institute (GPI)	0.6	Environmental Research
Sierra Club/ California Environmental Justice Alliance (CEJA)	0.6	Environmental
Megawatt Storage	0.4	Developer/Provider
Marin Energy Authority (MEA)	0.4	Developer/Provider
Independent Energy Producers (IEP)	0.4	Developer/Provider
The Utility Reform Network (TURN)	0.4	Consumer Advocate
Consumer Federation of California. (CFC)	0.4	Consumer Government
Brookfield Renewable Power, Inc. (Brookfield)	0.4	Developer/Provider
Joint Solar	0.4	Trade
Clean Coalition	0.4	Non-profit
California Energy Storage Association (CESA)	0.4	Trade
Center for Energy Efficiency and Renewable Technologies (CEERT)	0.1	Research
Energy Storage Association (ESA)	0.1	Trade
Calpine	0.1	Utility
California Independent System Operator (CAISO)	0.1	Government
Pilot Power	0.1	Utility
California Wind Association (CalWEA)	0.1	Trade
Alliance of Retail Energy Markers (AReM)	0.1	Developer/Provider
PrimusPower	0.1	Developer/Provider
Energy Producer and Users Coalition (EPUC)	0.1	Developer/Provider
Interstate Renewable Energy Council (IREC)	0.1	Developer/Provider
Friends of the Earth (FOE)	0.1	Non-Profit
Duke	0.1	Utility
Beacon Power	0.1	Developer/Provider
Shell Energy North America, L.P.	0.1	Utility
Sunverge	0.1	Developer/Provider
Stem	0.1	Developer/Provider
VoteSolar	0.1	Non-Profit
Electric Power Research Institute (EPRI)	0.1	Developer/Provider

In contrast to the success of the DRA, the Consumer Federation of California (CFC) had trouble asserting its arguments to the Commission. The CFC is a non-profit advocacy organization that seeks to represent consumer interests. It is very likely that new and less experienced personnel assisting in the proceeding led to this lack of influence. The Commission's response to the CFC's intervenor compensation request noted multiple times the inconsistencies and inexperience of the individuals submitting comments.

Similarly, the Utility Reform Network (TURN), a well-respected consumer advocacy organization, was not as influential in the Final Rules. However, TURN did not begin to actively participate in the rulemaking until 2013, when the CPUC was determining whether to establish targets or not.

The Sierra Club was the most influential environmental group in the rulemaking. The Sierra Club commissioned an environmental attorney from Earthjustice to represent their organization. Earthjustice is a non-profit public interest environmental law organization that has worked with the Sierra Club for well over a decade. Earthjustice possessed the legal and energy expertise required for the energy storage rulemaking. The Sierra Club participated from the beginning of the rulemaking and attended most, if not all, of the technical meetings and workshops. The Sierra Club petitioned for intervenor status and received due compensation for its contributions at the end of the rulemaking.

Another unique case was the Clean Coalition. While the Clean Coalition was often at odds with the Commission's decisions, the Commission noted their unique positions and their ability to collaborate with other stakeholders in its response to the

Clean Coalition's intervenor compensation request. So, while Clean Coalition did not have a large influence over the final decision, it seems like its reputation and unique perspective helped them continue to exert a positive influence over the proceeding.

The Commission found that the Green Power Institute (GPI) provided expertise and a diverse perspective throughout the proceeding. In the Commission's decision to grant intervenor compensation to GPI, the Commission noted their substantial contributions throughout the proceeding.

The California Environmental Justice Alliance (CEJA) was another notable environmental stakeholder. CEJA is an alliance of six grassroots environmental justice organizations: the Asian Pacific Environmental Network, The Center for Community Action and Environmental Justice, Center on Race, Poverty & the Environment, Communities for a Better Environment, Environmental Health Coalition, and People Organizing to Demand Environmental and Economic Justice. CEJA was the only environmental justice non-profit involved in the rulemaking. While few environmental groups are involved in PUC proceedings, there are even fewer environmental justice groups involved. Often environmental justice groups are focused more on grassroots campaigning and movements. Therefore, it is notable that CEJA was involved in the rulemaking. CEJA submitted joint comments with the Sierra Club, which helped strengthen their mutual positions on specific issues. While one cannot definitively say that CEJA would not have been as successful without the Sierra Club's alliance, their joint comments were positively received by the Commission. Sierra Club was one of the more active stakeholders to the rulemaking, which would have afforded CEJA an advantage in submitting comments.

There were other stakeholders involved in the docket that were not mentioned as much in the stakeholder address in the final ruling. It should be noted that the influence score only captures changes made from the draft document to the final ruling. The California Energy Storage Association had a big role in drafting the energy storage legislation and the rulemaking. However, this was not apparent from examining influence at the final phase in the rulemaking. I address this issue more in Chapter 11.

Discussion: Overcoming Issue Ambiguity Through Knowledge and Policy Linkages

California's energy storage rulemaking and stakeholder process were defined by issue ambiguity. In 2010, energy storage was a nascent technology that had not been widely tested. The CPUC had a great task in front of them. The CPUC had to simultaneously create an original energy storage program while also working to mitigate any potential barriers to implementing that new energy storage program.

Since California was the first state to implement an energy storage program, it was important to take the time to develop a stable knowledge platform to establish the program. The CPUC established the OIR on December 16, 2010, over a year earlier than the legislation had mandated (the legislation mandated that the CPUC commence the rulemaking no later than March 2012). The extra time granted the CPUC the necessary time to really understand and deliberate on the costs and benefits of energy storage and how it could be integrated into California's electrical grid system.

While there was not a specific roadmap that guided the rulemaking, the Commission's Policy and Planning Division issued a white paper on energy storage on July 9, 2010, called, "Electric Energy Storage: An Assessment of Potential Barriers and Opportunities". This white paper was a good starting point for deliberation. However, there was still not enough known about energy storage at the time and how it could be integrated into California's electrical system cost-effectively. The undeveloped understanding of energy storage and its nascent technologies made it necessary for the CPUC to take more time to understand the costs, benefits, and uses of energy storage fully. The CPUC turned to its stakeholders to help fill in informational and practical gaps.

The CPUC actively sought an inclusive stakeholder process by inviting stakeholders to consult and deliberate on the energy storage framework and the imposition of mandated targets during the pre-proposal phase. Each stakeholder had the opportunity to engage in pre-proposal meetings and workshops while also submitting comments during this time. The pre-proposal period was especially important in the case of California because this was the first energy storage program deployed in the country.

Not all environmental and clean energy stakeholders were parties to the rulemaking during the pre-proposal period. There were multiple cases in which the groups had a short period of involvement. Some groups such as the Environmental Defense Fund and the Union for Concerned Scientists were not actively involved. These groups likely monitored the rulemaking from afar for various reasons (e.g., other priority issues, did not have the capacity to participate).

In the case of Vote Solar, the group had initially been integral in passing the energy storage legislation. It had even been approved to receive intervenor compensation at the beginning of the rulemaking. However, for unknown reasons, Vote Solar stopped submitting comments and participating after the adoption of the framework. Many other groups such as the Clean Coalition, IREC, and Friends of the Earth did not become active with the docket until after the Staff Report in February 2013. Therefore, when one accounts for this discrepancy, the condition of access to draft meetings highlights the importance of being at the table during the drafting of key documents.

The rulemaking facilitated even greater inclusivity through CPUC workshops. Over two years, there were 11 workshops conducted by CPUC Staff. Many of these workshops examined how storage relates to the LTPP proceeding, cost-effectiveness, use-case development, and procurement policy options. These workshops were integral in helping stakeholders understand the key issues surrounding energy storage and how it would be integrated into California's electrical system. In addition, workshops provided opportunities for stakeholders to engage with one another and Staff. These formal interactions helped stakeholders gain a greater perspective on each other's preferences and perspectives. In addition, stakeholders become more familiar with Staff, which can be useful for sharing information throughout the proceeding. Chapter 10 takes a deeper examination into how these stakeholder interactions are beneficial to stakeholders that are in the "game" for the long-term.

Regarding the availability of intervenor compensation for groups, it is clear that groups who were able to receive funds did appreciably better than their counterparts with influencing the docket (the exception being the CFC). California is unique because, at the time, it was one of a few states that allowed non-profit environmental groups to be eligible for intervenor compensation. Receiving intervenor compensation gives groups greater opportunities to participate in the proceedings by enabling groups to expend more resources on the proceeding or to either hire experts to represent them in the proceeding. It should be noted that the majority of environmental groups involved with the California docket could have requested authorization to receive funds, but only three groups followed through. Two groups requested intervenor authorization but chose not to actively participate in the proceeding. One group noted that they had many other dockets and issues that they were too busy with and chose not to participate as a result (EDF).

The California rulemaking also had abundant opportunities for stakeholders to submit comments. There was a total of 13 opportunities for stakeholders to submit comments. The comment periods in the energy storage rulemaking do not represent a typical rulemaking. The multiple comment periods reflect the CPUC's desire to gain a greater understanding of energy storage from stakeholders and come to a stronger consensus of what the energy storage framework and program should look like. Only the utility Southern California Edison (SCE) submitted comments for all 13 comment periods. However, there was a handful of stakeholders that provided 10 to 12 submissions for the comments (i.e., CESA, PG&E, CFC, SDG&E, Sierra Club, and DRA).

One unique factor to the California rulemaking was the leadership of the lead commissioner for the rulemaking. The lead commissioner that oversaw the rulemaking was Commissioner Carla J. Peterman. Prior to Commissioner Peterman's appointment to the CPUC, Peterman was the lead commissioner at the California Energy Commission. Commissioner Peterman's expertise in decarbonization policy, renewable energy, and energy policy were integral in moving the rulemaking forward. Commissioner Peterman is noted for her instrumental work throughout the rulemaking proceedings. Commissioner Peterman's first major docket after her appointment to the CPUC was the energy storage rulemaking. Commissioner Peterman pushed for aggressive energy storage targets despite the initial hesitation among Staff and business stakeholders. She recounted a story that when one utility stakeholder found out about her proposed energy targets, they fell out of their chair in complete surprise (Peterman, 2018c).

Commissioner Peterman also encouraged stakeholders to interact and collaborate. Commissioner Peterman noted that she encouraged technical developers and producers to consult with agency members and stakeholders skeptical about the technologies to convince them that energy storage was a viable technology. This stakeholder networking helped to secure the path for the energy storage targets. The CPUC voted 5-0 to pass the target (Peterman, 2018a).

Compared to the other cases, it is unusual for a PUC commissioner to have such a visible presence in a case. In many states, the commissioners oversee the cases as a collective. In California, each commissioner is assigned specific cases due to their background and expertise on the issue. Commissioner Peterman's actions were completely within the realm of her authority and provided a greater light on the inner workings of the CPUC.

California Conclusion

California set a high bar for establishing an energy storage program. Since California was the first state to implement an energy storage program, it was important that the CPUC take the time to understand how energy storage would be integrated into California's electrical system. In order to address the issue ambiguity around energy storage, the CPUC facilitated an intensive stakeholder process. The CPUC sought stakeholder consultation and deliberation from the very beginning during the pre-proposal phase. Many environmental and clean energy stakeholders were involved to varying degrees in the rulemaking. Ultimately, the environmental groups that were the most successful in influencing the Final Rules had intervenor compensation, were involved from the beginning of the pre-proposal phase, attended the majority of the workshops, and submitted comments 90 percent of the time.

Given the number of stakeholders involved in the California rulemaking, it was a major task to institute an inclusive and participatory stakeholder framework. However, the CPUC was able to provide its stakeholders an inclusive process by hosting frequent stakeholder meetings or workshops, comment periods, and linking policy issues. From this perspective, the California case did meet the three inclusive criteria from Quick and Feldman (2011).

First, during the pre-proposal period, the open stakeholder process fostered a dynamic environment of multiple ways of sharing knowledge. Stakeholders could share their knowledge, perspectives, and interests during these meetings and comment periods. Since the CPUC did not have a strong understanding of energy storage and its multiple uses, the stakeholder process was crucial to informing the Commission about energy storage and retaining a rigorous record.

The California comment periods were central in continuing multiple ways of knowledge as stakeholders had many opportunities to inform the Commission through initial and reply comments. The reply comments were especially interactive as stakeholders would actively engage with the comments from other stakeholder groups, indicating what points they agreed with or not. This style of replying required that stakeholders read the comments of other groups and communicate with groups of their choosing, either to confirm positions or ensure that their comments were not repetitive. This commenting style is intensive but highlights the CPUC's expectation that stakeholders actively deliberate and coordinate with other groups during the process.

It is important to stress again that the Commission does not want the same arguments and repetitive facts. The Commission wants to review diverse perspectives and information so that they can make the most informed decision. Therefore, stakeholders will often check in with other stakeholders to ensure that their comments are distinct and stand out.

Second, there was a strong push for coproduction over a two- and half-year period. The CPUC held many workshops and comment periods during this time. Stakeholder input and expertise was a large component of the rulemaking given that so little was known about energy storage at that time. Again, the intensive comment periods were integral in creating the final energy storage framework.

Finally, temporal openness was a high priority during the rulemaking. The CPUC worked hard to create policy linkages so that stakeholders would better understand how energy storage and other energy issues could be integrated into the electrical system. The CPUC staff held nearly a dozen workshops examining how storage related to the LTPP proceeding, cost-effectiveness, use-case development, and procurement policy options. Also, the emphasis on policy linkages allowed stakeholders to become increasingly familiar with one another over multiple CPUC proceedings. These policy and network linkages carried over to future issues and proceedings.

The California case was exceptional in that it created a statewide program for an emerging technology about which little was known about. While the CPUC faced many barriers and challenges to integrating energy storage into its traditional electric grid, the CPUC took the time to examine the implications of instituting an energy storage program. The CPUC relied heavily on its stakeholders to inform and guide the process. This ultimately led to an inclusive and participatory stakeholder process, which is impressive for such a large regulatory agency.

The case of New York is in sharp contrast to that of California. For all appearances, while the New York DPS facilitated a strong participatory stakeholder process, the process lacked inclusive opportunities, which negatively affected the stakeholder process. New York relied heavily on an interagency process rather than an inclusive stakeholder process. The following case summary takes a deeper examination in New York's stakeholder process for its energy storage rulemaking.

The Case of New York: Agency

Introduction

On paper, New York's energy storage proceeding meets all the main criteria for successful stakeholder engagement: a diverse range of stakeholder groups, multiple technical conferences held in different cities, two comment periods, and a series of public hearings held in different cities. Yet, these participatory components were insufficient in providing a meaningful stakeholder process. Stakeholder participation greatly decreased by the end of the rulemaking. The reason for this diminished stakeholder participation is likely due to the fact that most of the decisions and rules had already been established prior to the rulemaking. The New York Department of Public Service (DPS) relied more heavily on interagency coordination than stakeholder collaboration and input.

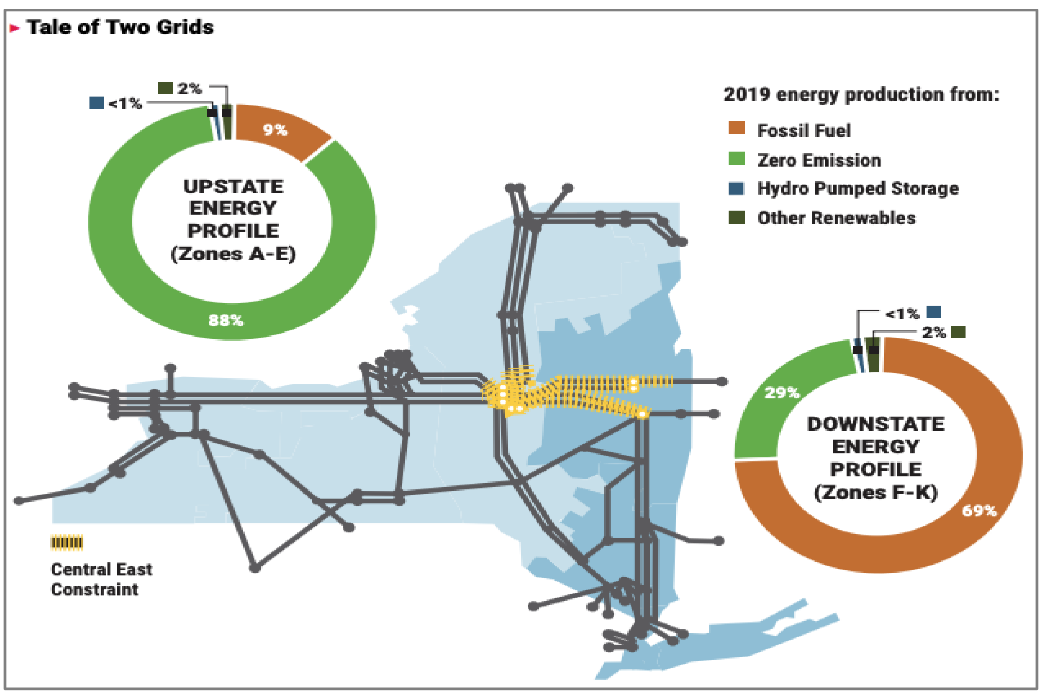
As the following analysis will show, the DPS set up a stakeholder framework that was participatory but not inclusive. While the DPS was ultimately able to produce an impressive energy storage program, the process that produced it was devoid of any robust stakeholder input.

New York's Energy Background

New York is the fourth most populous state in the United States and boasts the third-largest economy. New York possesses few coal, petroleum, or natural gas assets; however, it is a major consumer of all three sources. New York relies the most on natural gas, in which more than half of its generating capacity comes from natural gas-fired plants (US EIA, 2020). In addition, New York is among the five largest consumers of petroleum in the nation, in which four-fifths is used for transportation (US EIA, 2020).

Much of the population density of the state is in New York City, while the majority of the state is rural. Therefore, most of the power generation sites are located in the north, away from metropolitan areas. Transmission lines from these power generation sites must bring electricity to these population hubs, which can create bottlenecks and inefficiencies. Already, wind farms in the upper part of the state must curtail wind generation because of transmission constraints leading to the lower half (NYISO, 2021). Figure 8.3 depicts the imbalance of energy production and transmissions between the upper and the lower of the state.

Figure 8.3 Tale of Two Grids



Source: NYISO. (2021). "A Vision for A Greener Future: Power Trends 2020".

Most renewable and clean energy sources reside in the upper part of the state, while the lower portion of the state relies heavily on fossil fuels. New York City has approximately 19 fossil fuel “peaker” plants along its waterfront that can be employed quickly to meet excessive energy demands on the electrical grid. Peaker plants are operating more with the increase of severe weather events (e.g., record-breaking hot summers and polar vortex winters). Building transmission lines to connect these sources to provide a cleaner, more reliable, and resilient grid is necessary but not easily done.

Despite its high reliance and consumption of fossil fuels, New York has been able to create an energy-efficient economy. It consumes less total energy per capita than residents from all states except Rhode Island. New York has six electric investor-owned utilities (IOUs): Central Hudson & Electric Corporation, Consolidate Edison Company of New York, New York State Electric & Gas Corporation, Niagara Mohawk Power Corporation (National Grid), Orange & Rockland, and Rochester Gas and Electric Corporation. In addition to these IOUs, there are other important energy providers in the state, such as the New York Power Authority (NYPA), which is the largest state-owned energy provider in the United States. During the 1990s, New York decentralized its energy market and transitioned to a more competitive market. New York state’s electrical grid is managed by NYISO, the independent system operator that operates the state’s bulk power system and wholesale energy market. NYISO is unique because it is one of three state ISOs but must also coordinate with regional ISO’s: ISO New England and PJM.

New York has traditionally relied heavily on energy alternatives of nuclear power (one-third) and hydropower (one-fifth) (US EIA, 2021). New York is among the top four producers of hydroelectricity in the country, with the Robert Moses Niagara hydroelectric plant near Niagara Falls being the third-largest hydroelectric power plant by capacity in the United States (US EIA, 2021). In 2019, nuclear power provided one-fifth of New York's net generation however, two out of the five nuclear reactors were retired by 2021 due to environmental concerns. While offshore wind farms are expected to fill the long-term gap left by the retirement of these nuclear plants, it is actually natural gas in the short term that has met the new energy demands.

While wind power has doubled since 2009 and is the second-largest renewable source of generation in the state, it still only made up 4% of utility-scale net generation in 2019 (US EIA, 2020). Solar power has less of a share in the energy mix, with only 2,150 megawatts of capacity in 2020 (US EIA, 2020). However, with the passage of the 2019 Climate Leadership and Community Protection Act (CLCPA), New York seeks to ramp up renewable generation with a target of 9,000 MW of offshore wind by 2035 and 6,000 MW of distributed solar energy by 2025. Therefore, New York continues to make headway to meet its clean energy aspirations.

Energy Storage Legislation and Rulemaking

The massive destruction of Superstorm Sandy in 2012 exposed New York's vulnerable electric grid and infrastructure. In 2014, Governor Cuomo introduced Reforming the Energy Vision (REV), which sought to restructure New York's energy industry to make it more resilient, affordable, and cleaner. A key part of the REV was to reduce GHG emissions by 40 percent by 2030 and 80 percent by 2050. The REV was broken down into seven key policy areas: (1) renewable energy, (2) building and energy efficiency, (3) clean energy financing, (4) sustainable and resilient communities, (5) energy infrastructure modernization, (6) innovation and research and development, and (7) transportation. Key programs such as the 2012 NY Sun Solar Initiative (Solar Initiative), the 2016 Clean Energy Standard (CES), the 2017 Value of Distributed Energy Resources (VDER), and the 2019 Climate Leadership & Community Protection Act have been key cornerstones for supporting REV initiatives.

The Energy Storage Order was another key piece to realizing the goals of REV. In January 2018, during his State of the State address, Governor Cuomo proposed a 1,500 MW energy storage target by 2025. The legislature formally adopted Governor Cuomo's energy storage target goal in AB 8921A, which also established an energy storage deployment strategy. The previous law (PSL§74) had directed the New York Public Service Commission (PSC) to establish an energy storage deployment program along with an appropriate energy storage target.

The amended PSL §74 directed the Commission to establish in consultation with NYSERDA and LIPA a statewide energy storage goal for 2030 along with a deployment policy to support the goal by December 31, 2018. In addition, the Commission was required to summit annual reports on the achievements and effectiveness of the energy storage program to the Governor, the Temporary President of the Senate, and the Speaker of the Assembly. Governor Cuomo sought to further incentivize energy storage by earmarking $350 million towards energy storage deployment, of which $310 million of that were to be incentives administered by the New York State Energy Research and Development Authority and $40 million for solar energy storage.

The deployment of the energy storage program required the collaboration of key governmental agencies. Figure 8.4 highlights the many agencies and other actors involved in the energy storage program.

Figure 8.4 Road Map’s Key Actors and Expected Primary Roles

Source: Based on *The Energy Storage Roadmap*

While Figure 8.4 is a simplistic figure, it highlights the individual roles of the main actors involved in implementing, monitoring, and enforcing the energy storage program. It is important to note that massive interagency coordination is required to see this through. Some of the key actors involved were the Long Island Power Authority (LIPA), The New York State Energy Research and Development Authority (NYSERDA), The New York Public Service Commission (PSC), The New York Green Bank (NYGB), the New York State Department of Environmental Conservation (DEC), and New York Independent System Operator, Inc. (NYISO).

Of particular importance to the energy storage proceeding was the New York State Energy Research and Development Authority (NYSERDA) and the DPS Staff. NYSERDA is a public benefit corporation that advances energy efficiency and renewable energy sources. NYSERDA provides research, analyses, and technical expertise. NYSERDA took on a stronger role in energy planning and policy when the New York Energy Office was closed in 1995 and has continued to provide expertise and agency leadership as New York has embraced clean energy policies.

The Public Service Commission is the body for DPS commissioners. New York's PSC had five commissioners at the time of the energy rulemaking (although it was later expanded to seven commissioners in 2021). Commissioners are appointed by the Governor for a six-year term limit but must be approved by the state Senate. There is a bipartisan requirement which does not allow more than three commissioners to belong to the same party. It appears that the PSC was open to energy storage. At the time of the energy storage rulemaking, the PSC consisted of Governor Cuomo's appointees. The

Commission Chair John Rhodes stated, “Energy storage is not only crucial to achieving our goal of 50 percent renewable energy by 2030, it will improve the resiliency of the grid as we face extreme weather events and other emergency situations…With this step, we continue to advance the deployment of energy storage in line with the target of 1,500 MW deployed by 2025” (Kovaleski, 2018).

New York Governor Andrew Cuomo spearheaded the energy storage target by directing the New York DPS and NYSERDA to create the Energy Storage Roadmap (The Roadmap). The Roadmap developed a series of recommendations and a framework to implement Governor Cuomo’s 1,500 MW energy storage target. The Roadmap was released on June 21, 2018, just three weeks before the energy storage rulemaking commenced. While there were stakeholders involved in crafting The Roadmap, it was not as open as a stakeholder process would be in a rulemaking. NYSERDA and the DPS relied heavily on outside consultants to craft The Roadmap.

The Staff sought assistance from Energy & Environmental Economics (E3), the Center for Renewables Integration, and the Climate Policy Initiative for project economic modeling and developing the recommendations in The Roadmap. The Staff also contracted Acelerex (an energy software company) to prepare an analysis of the benefits and costs of energy storage. The Acelerex study modeled a scenario in which all pre-1990 combustion turbine peaking units in New York City and Long Island were retired by 2025, which resulted in 3,600 MW of energy storage being deployed by 2030. The Acelerex modeling results encouraged the PSC to adopt the energy storage deployment goal of 1,500 MW by 2025 and an aspirational goal of 3,000 MW by 2030.

The Roadmap's authors stated that it consulted with customers, storage developers, renewable energy developers, system integrators, power producers, trade groups, utilities, LIPA, NYPA, NYISO, and other stakeholders through working groups, conferences, and individual meetings. There were two working groups being conducted at the time: the Value of DER (VDER) and the rate design working groups. Staff held public informational webinars on preliminary results prior to the final release of The Roadmap.

The rulemaking was framed around the policy and recommendations of the Energy Storage Roadmap. The rulemaking began on July 11, 2018. Stakeholder comments were solicited regarding The Roadmap recommendations and policy. The agenda and rules had essentially been drafted before stakeholders could come to the table to discuss energy storage. The key issues of concern during the rulemaking were: (1) retail rate actions and utility programs; (2) utility roles; (3) direct procurement; (4) market acceleration incentive; (5) soft costs; (6) clean peak actions; (7) wholesale market actions; and (8) accountability.

There were technical meetings in three locations (New York City, SUNY Farmingdale, and Albany) from late July to August 2018. The technical meetings had the same agenda, in which NYSERDA and DPS Staff introduced key issues and recommendations from The Roadmap.

There were two public statement hearings in October of 2018 at two locations: Colonie (near Albany, New York) and New York City. The official announcement for the public hearings was released just 18 days before the first hearing. Key Capture Energy was the only stakeholder group that attended the first public statement hearing. During the second public statement hearing the following evening, no parties were present in New York City. The public was encouraged to submit comments if they were not able to attend the public hearing however, only five stakeholders submitted comments. This lack of stakeholder presence is troubling, as many professional stakeholders in other states still make an effort to attend public hearings or PSC hearings.

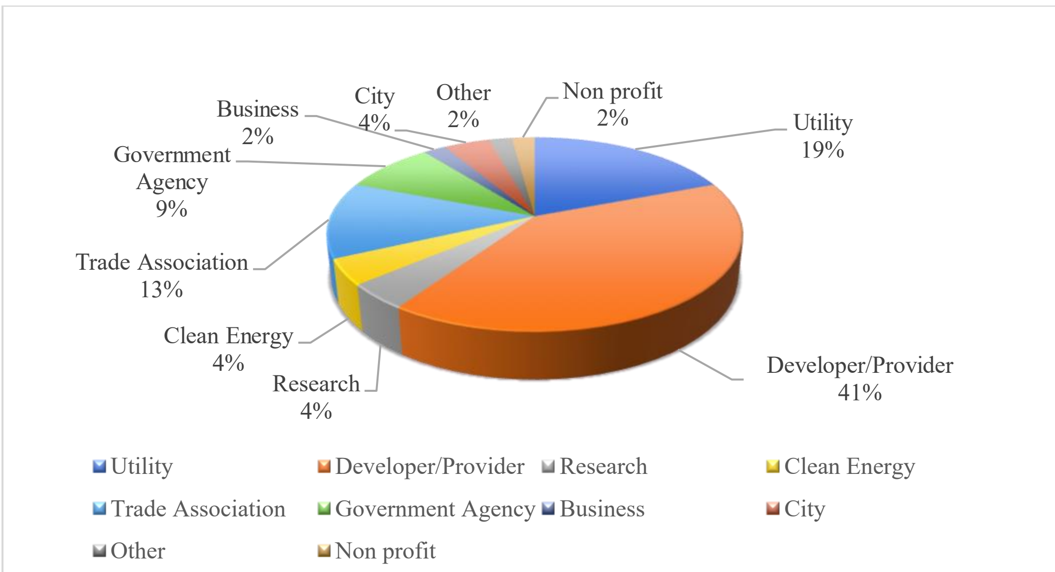
The Final Rules establishing the energy storage goal and deployment policy were released on December 13, 2018. The PSC released a detailed account and Staff response to stakeholder comments. As the section below highlights, despite the Staff's detailed response to stakeholder comments, many stakeholders were not successful in influencing the Final Rules.

Stakeholder Influence

There were 26 listed parties and 17 public commenters to the rulemaking. However, it should be noted that some parties were conglomerations of multiple utilities or groups (e.g., Joint Utilities and Joint IPI). A wide array of stakeholder groups participated in the rulemaking, such as trade associations, energy storage developers, clean energy advocates, environmental groups, and research organizations.

The New York energy storage rulemaking had the largest number of public comments. Most of the public comments were from organizations. However, there were a few public comments from individuals. The engagement of public comments is important because it highlights that there are some organizations and individuals that find it meaningful to submit comments to the DPS. As noted in the background in Chapter 2 (and will be revisited in Chapter 10), most of the groups that participate in PUC proceedings are professional groups with the technical and legal expertise to participate. Lay groups or individuals often find themselves overwhelmed and uninformed on how to participate in the formal PUC proceedings (Baldwin 2018). Figure 8.5 shows the breakdown of each stakeholder group type.

Figure 8.5 New York Stakeholders by Group Type



Generally, few stakeholders were influential in shaping the Final Rules. The top three stakeholders that did influence the Final Rules were the Joint Utilities, New York Battery and Energy Storage Technology Consortium, and GI Energy. The Joint Utilities consisted of the six main electric IOUs: Central Hudson & Electric Corporation, Consolidate Edison Company of New York, New York State Electric & Gas Corporation, Niagara Mohawk Power Corporation (National Grid), Orange & Rockland, and Rochester Gas and Electric Corporation. It is not surprising that the PSC made allowances on behalf of the Joint Utilities since the utilities are the ones that must procure energy storage. It should also be emphasized that the influence results are not necessarily indicative of a problem of undue influence by the utilities.

The New York Battery and Energy Storage Technology Consortium (NY-BEST) was a major source of expertise throughout the energy storage proceeding. NY-BEST is a consortium whose members include manufacturers, academic institutions, technology and material developers, government entities, and system integrators. Many of its members and board members come from influential organizations (e.g., National Grid, Key Capture Energy, EnelX, NYSERDA, Brookhaven National Laboratory, Rochester Institute of Technology, and Con Edison). NY-BEST has a history of partnering with the DPS on projects and research, so its level of influence over the final rules is not surprising.

Table 8.2 on the next page provides the stakeholder influence scores.

Table 8.2 New York Stakeholder Influence

Stakeholder	Fuzzy Score	Type
Joint Utilities	0.9	Utilities
New York Battery and Energy Storage Technology Consortium (NY BEST)	0.9	Trade Association
GI Energy	0.9	Developer/Producer
Advanced Energy Management Alliance	0.6	Trade Association
Energy Storage Association (ESA)	0.6	Trade Association
Enel Green Power North America (ENEL)	0.6	Developer/Producer
GlidePath Development, LLC	0.6	Developer/Producer
Hydrostor, Inc	0.6	Developer/Producer
City of New York	0.6	City
New York Power Authority (NYPA)	0.6	Government Agency
O'Connell Electric Company, Inc.	0.4	Utility
New York City Environmental Justice Alliance (NYC-EJA)	0.4	Environment
Natural Resources Defense Council (NRDC)	0.4	Environment
Metropolitan Transportation Authority (MTA)	0.4	Public Benefit Corp
Borrego Solar Systems, Inc. (Borrego)	0.4	Developer/Producer
Energy Nest	0.4	Developer/Producer
Greenlots	0.4	Developer/Producer
Ingersoll Rand	0.4	Developer/Producer
Key Capture Energy	0.4	Developer/Producer
Northern Power Systems	0.4	Developer/Producer
Plus Power	0.4	Developer/Producer
Stem	0.4	Developer/Producer
Long Island Power Authority (LIPA)	0.4	Government Agency
NY Dept of State Utility Intervention Unit	0.4	Government Agency
Fuel Cell and Hydrogen Energy Association	0.4	Trade Association
Climate Change Mitigation Technologies	0.1	Developer/Producer
Energy Technology Savings, Inc.	0.1	Developer/Producer
Fluence Energy LLC	0.1	Developer/Producer
Fuel Cell	0.1	Developer/Producer
Grid Policy	0.1	Developer/Producer
Sunrun, Inc.	0.1	Developer/Producer
Institute for Policy Integrity (IPI)	0.1	Research
Dept. of State Utility Intervention	0.1	Government Agency
Hydrogen Energy Association	0.1	Trade Association
Independent Power Producers of New York (IPPPNY)	0.1	Trade Association

Table 8.2. New York Stakeholder Influence (continued)

Stakeholder	Fuzzy Score	Type
Solar Energy Industries Association (SEIA)	0.1	Trade Association
Alliance for Clean Energy New York, Inc. (ACE NY)	0.1	Clean Energy
Multiple Intervenors	0.1	Trade Association
New York Smart Grid Consortium	0.1	Business
Sustainable Westchester	0	Intergovernmental
New York State Department of State	0	Government
New York State Energy Research and Development	0	Government
National Fuel Gas Distribution Corporation	0	Utility
National Fuel Cell Research Center	0	Research
NextEra Energy Transmission	0	Developer/Producer

There were only three environmental and clean energy groups involved, which represented a wide spectrum: the Natural Resources Defense Council (NRDC), the Alliance for Clean Energy New York, Inc. (ACE NY), and the New York City Environmental Justice Alliance (NY-CEJA). The NRDC is a powerful environmental group that was originally established to focus on environmental litigation. It is a well-respected national environmental group. The ACE NY is an in-state clean energy group whose 104 members include non-profits and private companies that want to promote a clean energy economy in New York state. Many of ACE NY's members are important non-profit organizations (Sierra Club, NRDC, and the New York League of Conservation Voters) and clean energy groups (e.g., Advanced Energy Economy, NextEra Energy, Avangrid Renewables, and Key Capture Energy) that are regular stakeholders in PUC proceedings for clean energy issues.

The NYC-EJA stands out as an environmental justice non-profit. Very few environmental justice groups participated in PUC proceedings (the exception being in this study the NYC-EJA and the California Environmental Justice Alliance (CEJA)). Often environmental justice non-profits focus their efforts at the grassroots level and the legislative phase of the policy process. Therefore, it is notable that NYC-EJA was involved in the energy storage rulemaking.

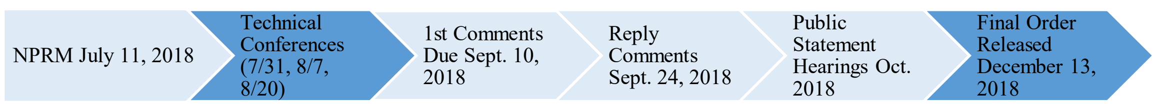
Despite the collective experience of these environmental and clean energy groups, none of the groups had a strong influence over the Final Rules. All three environmental groups only participated during one comment period. The NRDC and the NY EJA submitted comments on The Roadmap for the initial comment period, while ACE NY submitted reply comments during the second comment period. In general, ACE NY took more of a bystander role during the rulemaking.

Discussion: Agency Facilitated Process

The New York rulemaking is interesting because there were multiple access points for stakeholder engagement throughout the proceeding. The rulemaking took into account: notification and time, technical meetings, and public hearings. First, there was timely notification of meetings and comment periods. Second, there was a series of technical meetings in three locations that lasted from 10:00 a.m. to 4:00 p.m. to discuss The Roadmap. Stakeholders could call into these technical meetings if they could not physically attend the meeting. There were even two working groups that were active during this period (Value of DER (VDER) and the rate design working groups). Finally, there were two public statement hearings conducted in two locations in October of 2018. Despite these procedural incentives for stakeholder engagement, many stakeholders did not fully participate in all components of the rulemaking (i.e., provide comments for both comment periods and attend the public hearings). Ultimately, few stakeholders were able to influence the Final Rules. Environmental and clean energy groups were particularly ineffective at influencing the Final Rules.

Despite the DPS's attempt to create a strong stakeholder framework, there were three procedural weaknesses relating to (1) the legislative mandate's deadline for the energy storage rulemaking, (2) the brief comment period, and (3) the lack of a pre-proposal phase. Figure 8.6 depicts the timeline for the rulemaking.

Figure 8.6 Timeline of New York Energy Storage Rulemaking



First, the New York PSC had a deadline to meet. The rulemaking was a quick succession of events. The rulemaking was established on July 11, 2018, and stakeholders had an opportunity to submit initial comments by September 10, 2018. Much of the initial actions for the rulemaking occurred during the summer months. The public hearings were scheduled at the beginning of October, with any final comments to be submitted by October 31. The PSC came out with its final order on December 13, 2018. The rulemaking's aggressive timeline made it difficult for the DPS to lead a deliberative and collaborative stakeholder process.

Second, since the initial focus was on the technical conferences at the beginning of the rulemaking, there was limited time for multiple rounds of formal comment submissions. There were only two opportunities to comment: an initial comment period on the Energy Storage Roadmap and a reply comment period. These comment periods lasted just over a month from the final technical meeting. The lack of a robust comment period is perhaps indicative of the larger issue of The Roadmap.

The Roadmap had already been written prior to the rulemaking. The Roadmap was largely the product of NYSERDA, DPS Staff, along with the help of energy consultants. Therefore, the agenda had been set even before the energy storage rulemaking had begun. While there were modifications to The Roadmap's initial recommendations during the Final Rules, the PSC adopted the vast majority of recommendations. Given that the rulemaking was centered around approving The Roadmap's recommendations, it is likely that stakeholders were less willing to invest time and energy into the proceeding. The agenda had been set and was unlikely to change much.

Governor Cuomo's executive mandate to create the Energy Storage Roadmap gave NYSERDA and DPS approximately six months to complete The Roadmap. The Roadmap was released in June 2018, which was a couple of weeks before the energy storage rulemaking commenced in July 2018. The agencies noted that there was stakeholder engagement in crafting The Roadmap. However the extent of that stakeholder engagement is vague and undocumented. In addition, The Roadmap mentions the word "stakeholders" 49 times throughout the document and emphasizes the importance of engaging stakeholders throughout multiple points in the energy storage implementation process. However, The Roadmap also specifies what key stakeholders to focus the engagement process on in multiple areas in The Roadmap. The Roadmap mentioned Staff from DPS, NYSERDA, NYISO, DEC, the New York Joint Utilities, and transmission owners. So, while The Roadmap encouraged stakeholder engagement, it emphasized greater *interagency* stakeholder coordination and deliberation instead of a diverse array of non-agency stakeholders.

New York Conclusion

New York's energy storage rulemaking, by most appearances, fulfilled many of the necessary features to promote a meaningful stakeholder process. Yet, the stakeholder process was undermined by the pre-established agenda of the Energy Storage Roadmap. The Roadmap helped to create a unified direction for New York's energy storage deployment program. However, it did not give stakeholders the necessary time for deliberation and collaboration that was valued during the PUC energy storage rulemaking in Oregon, Nevada, and California.

Therefore, the predetermined nature of the rulemaking had an impact on potential opportunities for stakeholder inclusivity and participation. The lack of multiple robust comments period highlights how there really was not much to discuss or learn from stakeholders. The weak comment periods do not mean that the DPS was apathetic to stakeholders, but it does indicate that there was less capacity for stakeholder deliberation. Key decisions had already been made so more stakeholder engagement was unnecessary by this point in the process.

The most substantiative portion of the rulemaking was the technical conferences that discussed The Roadmap. While these technical conferences helped inform stakeholders, the agenda had already been established around the key issues at stake. As the section above highlighted, very few stakeholders were influential in shaping the Final Rules. This is in line with previous research that notes that the most influential stage of a rulemaking is during the drafting of the rules (Yackee, 2005, 2011; Rinfret, Cook, Pautz 2014; Crow, Albright, and Koebele, 2016). Once the agenda has been set, it is difficult to make big changes. In addition, the literature notes that many stakeholders perceive PUC participation opportunities to be superficial but continue to participate in hopes of playing the “long game” (Roundtree and Baldwin, 2018).

The DPS worked to create a participatory process for its stakeholders. However, it overlooked the importance of also incorporating inclusive opportunities. Not engaging stakeholders during the pre-proposal phase was a detriment to the process and likely the final document. While there is not necessarily a “right” or a “wrong” way to conduct stakeholder engagement, better practices could help legitimize and bring greater transparency to the process.

Chapter Conclusions

New York and California adopted two different approaches to handling their energy storage mandate. The CPUC implemented a bottom-up approach to energy storage policies. As a result of this bottom-up process, stakeholders have been able to possess a larger role in establishing the groundwork for new energy policies such as energy storage. There is also often policy coordination through CPUC technical workshops and working groups.

In contrast, New York's PSC has taken a top-down approach. While the PSC encourages working groups and stakeholder expertise, the stakeholder process in the energy storage rulemaking was limited more to consultants and interagency collaboration. While both approaches have created strong energy storage programs in their states, California's bottom-up approach afforded its stakeholders a more meaningful experience that took into account stakeholder input.

The California rulemaking focused on learning, deliberation, and policy linkages. The CPUC commenced its energy storage a year earlier than mandated. This is an important distinction from New York's DPS because the CPUC sought an inclusive stakeholder process from the beginning. It was very much in the CPUC's authority to take that additional year to create an agency framework for energy storage. This process could have been stakeholder intensive without the strictures of the rulemaking process. The CPUC could still have sought outside expertise from a diverse range of stakeholders. Yet, the CPUC decided to commence the energy storage rulemaking early and invite stakeholders to the pre-proposal process.

Since the CPUC was leading the way on a statewide energy storage program, the agency took the time to learn about energy storage from experts and stakeholders. The CPUC gave stakeholders the opportunity to learn alongside them and to shape the pre-proposal agenda. The CPUC conducted over a dozen comment periods and led eleven technical meetings and workshops. The California stakeholder process was deeply inclusive and participatory for stakeholders that had the will and capacity to remain active. Long-hauler stakeholders were also more successful at influencing the final rules.

In contrast, New York relied upon its agencies (DPS and NYSERDA) to facilitate the pre-proposal and draft phases. DPS and NYSERDA contracted a third-party to facilitate the Energy Storage Roadmap. While it was noted that there was stakeholder input in the development of The Roadmap, it is unclear which stakeholders were included and whether it was really agencies and utilities that were considered the key stakeholders. By the time the rulemaking commenced, the key decisions had already been established. There were few opportunities for stakeholders to participate in a meaningful way.

It is important to note that since California was the first state to pass an energy storage target, the CPUC was starting at the bottom and gave itself and the stakeholders the necessary time to learn about energy storage. New York had eight years of experience from other states and pilot projects to help accelerate its energy storage program. While there continues to be issue ambiguity around energy storage, New York was able to develop an energy storage program with greater certainty than California had experienced.

The next chapter examines the Virginia energy storage rulemaking. In contrast to New York and California, Virginia lacked both an inclusive and a participatory stakeholder process. The Virginia rulemaking was basic and met the minimum requirements for stakeholder participation and notification. The lack of a participatory and inclusive stakeholder process was a detriment for the majority of the stakeholders involved in the rulemaking. The Virginia case shows that participatory and inclusive stakeholder practices are critical for a robust stakeholder process.

Chapter 9 The Case of Virginia and State Summaries Wrap-Up

The Case of Virginia: Meeting the Bare Minimum

The case of Virginia poses an interesting juxtaposition to the other four cases analyzed in the previous chapters. Virginia experienced a short period in which there was a democratic majority in both chambers of the Virginia General Assembly and the governorship. It was during this period of democratic party control that many clean energy and environmental policies were passed. The energy storage bill was part of a greater set of clean energy bills that sought to innovate and renew Virginia's renewable and clean energy policy.

However, the energy storage rulemaking was unremarkable. The Virginia State Corporation Commission (SCC) set forth a basic rulemaking that met requirements for timely notification, accessible comment periods, a six-month timeframe, and SCC acknowledgment of stakeholder comments. However, this basic rulemaking did not allow opportunities for meaningful stakeholder learning or deliberations despite the SCC's insistence that energy storage was a nascent technology that required more time to learn about. The state utilities largely influenced the rulemaking, and many issues were deferred to another point in time.

As this chapter shows, while the SCC did facilitate participatory opportunities for stakeholders, the stakeholder process was meaningless without any inclusive opportunities for learning and deliberation. The Virginia case is a prime example of why inclusive mechanisms are at the core of a successful stakeholder process. The conclusion of this chapter brings together the key themes of these case chapters and establishes the foundation for the second analysis of stakeholder influence.

Virginia's Energy Background

Virginia relied heavily on coal until the mid-2000s, when natural gas became the predominant energy resource for the state. By 2015, coal-fired power plants had largely been replaced by natural gas-fired plants (US EIA, 2020). By 2019, natural gas supplied 60 percent of the electricity demands in the state. However, the fossil fuel Atlantic Coast Pipeline was canceled in 2020, ultimately impacting Virginia's long-term energy plans. Virginia also has two nuclear power plants, which generate approximately 30 percent of the state's total electricity. Renewable resources provide just over 6 percent of Virginia's electricity (US EIA, 2020).

Virginia has two major IOUs: Dominion and Appalachian Power. Dominion is the largest utility in Virginia. Virginians pay some of the most expensive electricity bills in the nation (US EIA, 2020). This is partly due to the freeze on biennial rate reviews of Dominion and Appalachian Power back in 2015 when the Clean Power Plan was expected to incur significant costs for the utility. However, the CPP never came to fruition, and Dominion earned $503 million above authorized levels from 2017 to 2019 (Rankin, 2021).

For years, Dominion has been scrutinized for its lobbying clout, targeted charitable giving, large donations to political campaigns in the Virginia General Assembly and the Virginia State Corporation Commission (The Virginia Public Access

Project, 2018). In one case in 2019, Dominion was critiqued by competitive service providers (CSPs) and many in-state corporations (Walmart, Costco, Target, Cox, and Kroger) for blocking competition of renewable energy providers.

Virginia's public utilities commission is called the State Corporation Commission (SCC). The Virginia Constitution established the SCC. Virginia's SCC is a large regulatory agency with well over 600 staff. The SCC is unique in that it not only has authority over traditional utilities such as electric, water and communication, but also insurance and financial institutions as well. The SCC has three commissioners that the Virginia General Assembly elects for a six-year term.

In the past, the SCC has come under scrutiny for its secrecy and lack of transparency. In 2011, the Virginia Supreme Court ruled in Christian vs. State Corp. Comm'n that the SCC was not subject to the Freedom of Information Act because the agency's statutory authority lies within the Virginia Constitution and is therefore governed by a different set of laws and should not be considered a public body.[11] Further attempts to create transparency during SCC deliberations were crushed by gas utilities and telecommunication industry later in 2012 when legislation was put forth to require the commission's deliberations be subject to the FOIA.

[11] Christian v. State Corp. Comm'n, 282 VA. 392, 718 S.E. 767 Va. (2011).

Energy Storage Legislation and Rulemaking

Before the energy storage mandate, Virginia was already courting energy storage programs. In 2018, Virginia's General Assembly passed an omnibus energy bill (SB 966), which established a pilot program called the Grid Transformation and Security Act (GTSA) for utilities to invest in storage up to 10 MW or 30 MW.

The GTSA was a key turning point for the SCC's cost-benefit testing as many previous energy efficiency policies had been rejected based on their Ratepayer Impact Measure test, which focused solely on the cost of EE measures to ratepayers without considering other types of benefits. The GTSA changed the state code for cost-benefit testing by requiring that energy efficiency programs only pass three of the four cost-benefit tests to be in the public interest. The 2020 VCEA attempts to rectify the carte blanche of the GTSA by ensuring that the SCC had more oversight over major utility projects and by implementing cost-caps.

The GTSA was also beneficial for utilities, as Dominion was a key champion of the bill. The bill allows utilities to offset profits above their authorized rate of return by investing in projects that are considered in the "public interest". The bill's intent was for utilities to invest in renewable and grid modernization projects; however, this is seen by many critics as a means for the utilities to continue to over-earn without having to refund customers.

In 2019, Governor Ralph Northam attempted to enact a wide-sweeping clean energy plan, Executive Order 43, that laid out a plan for the state to achieve 100 percent carbon-free electricity by 2050 and join the Regional Greenhouse Gas Initiative (RGGI).

However, the Republican-held Assembly were able to stall the clean energy plan, even using the state budget to prohibit Virginia from joining the RGGI. However, once the Democrats regained control in the Assembly later in 2019, the legislature passed the Virginia Clean Economy Act (VCEA) in 2020.

The VCEA saw Governor Northam's clean energy vision come to fruition. The VCEA aims to develop a 100 percent clean energy grid by 2045 through investments in rooftop solar, energy efficiency resource standards, and cap carbon pollution. Among the key provisions in the VCEA was for the SCC to set specific energy storage targets. The VCEA required that Appalachian Power Company (APCo) and Virginia Electric and Power Company (Dominion) construct or acquire 400 MW and 2700 MW of energy storage by 2035.

Virginia's energy storage rulemaking provides an interesting case, given that it was conducted during the COVID-19 pandemic in the autumn of 2020. COVID-19 precautions prevented the PUC from conducting in-person hearings. In addition, there was not a single technical workshop or stakeholder meeting held in-person or virtually. According to one respondent, it is standard practice at the SCC not to hold technical workshops or stakeholder meetings during a rulemaking (VA Interview 001).

The legislative mandate granted the SCC quite a bit of discretion in how it conducted the rulemaking. However, it did include two important features that had an appreciable impact on the process regarding the timeline that the rulemaking had to be completed and the specification of targets for APCo and Dominion. First, the Commission's timeline was bound to the legislative mandate, which only granted them six months to establish and complete the rulemaking. In addition, the legislative mandate required the Staff to file a report on comments, proposals, or requests by November 16. Therefore, while this stipulation of the Staff report most likely was to ensure that stakeholder comments and proposals were given proper consideration, it also created a more aggressive timeline for stakeholders to submit comments for Staff to compile a report.

Second, the legislative mandate provided specific energy storage targets for each utility to meet. Therefore, even if Staff and the Commission were not supportive of energy storage targets, they had to implement a program and framework to meet the mandate. Both Staff and the Commission appeared apprehensive about implementing a stringent energy storage program given their concerns that there was not enough known about energy storage and its benefits.

There were only two comment periods throughout the proceeding. The first comment period directed APCo and Dominion to submit comments *and* "permit[ted] any other interested person or entity to submit comments" (Virginia SCC, Order Establishing Proceeding). During the initial comments on the energy storage regulation, the utilities (APCo and Dominion) requested an extension to submit comments and proposed regulations. The utilities requested, in all fairness, that the extension be extended to all commenters. The Commission granted the utilities an extension but maintained that other stakeholders submit their comments on the original date.

The second comment period requested stakeholders to comment on the proposed rules. The request for comments came on September 11, 2020. The utilities largely shaped the proposed rules. While Staff altered some aspects of the utility proposal, most of the key issues and language were the same. ESA and Delorean Power submitted proposed regulations but were unsuccessful in getting their proposed rules into the final rules.

On December 18, 2020, the Commission had adopted the final regulations, thereby closing the rulemaking. The Commission adopted the Staff Proposed Rules with only a few changes. The biggest change in the final order required utilities to provide bidders with access to relevant electric system data. This was one of the small concessions made to non-utility providers.

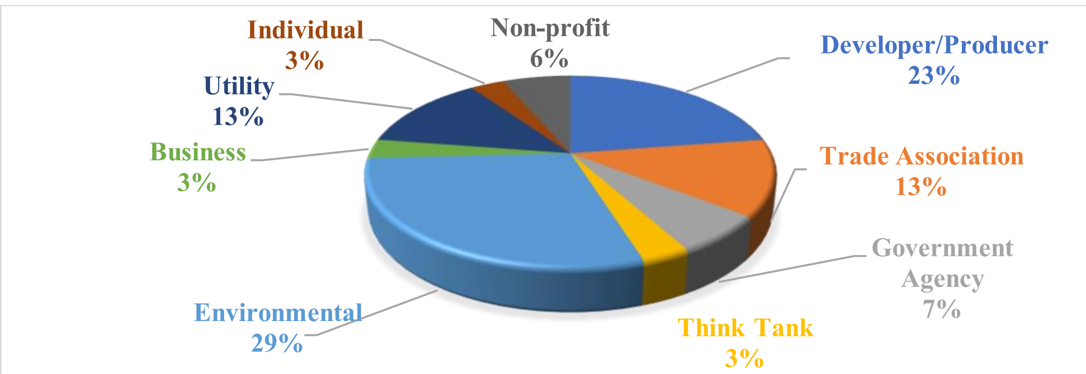
Ultimately, as the next section highlights, the environmental stakeholders involved in the rulemaking had little influence over the Final Rule.

Stakeholder Influence

The Virginia energy storage rulemaking brought together a wide array of stakeholders. Many of the stakeholders formed coalitions and submitted joint comments. There were four main stakeholder coalitions: solar stakeholders, the environmental stakeholders, energy storage stakeholders, and the utilities. In many cases, coalitions can be beneficial arrangements as groups are able to pool their resources and present a strong, unified position. However, joining forces with one another did not seem to help any of these coalitions.

While there were the usual stakeholder types of solar, energy storage, developer, and trade association groups involved in this rulemaking, there was also a large number of environmental stakeholders that intervened. There were eight environmental groups in the environmental coalition: the Southern Environmental Law Center, the Appalachian Voice, the Virginia Conservation Network, The Chesapeake Climate Action Network, the Virginia League of Conservation Voters, The Piedmont Environmental Council, Rappahannock League of Environmental Protection, and the National Parks Conservation Association. Chart 9.1 shows the composition of stakeholders involved in the energy storage rulemaking.

Figure 9.1 Virginia Stakeholders by Type



With the exception of the National Parks Conservation Association, the rest of these environmental groups were in-state or regional groups. The environmental groups were a mix of small and large groups. Capacity was an issue for some of these groups. In one instance, the attorney for an environmental group was a volunteer with previous SCC experience (VA Interview 001). There were simply not enough funds or expert staff to follow all the important issues.

Based on the final rules, it is apparent that many of the stakeholders were not influential throughout the proceeding. The raw scores were very low. The reason as to why the scores were so low is that the Commission's responses to the stakeholders were often in direct opposition to their comments. In the Commission's responses to stakeholder comments, the Commission almost always deferred to the utilities' preferences. Table 9.1 shows the influence scores for the stakeholders involved. The stakeholder in italics did not submit comments but were parties to the rulemaking.

Table 9.1 Virginia Stakeholder Influence Scores

Stakeholder	Fuzzy Score	Type
Joint Commenters (Dominion and APCo)	0.9	Utility
Data Center Coalition	0.6	Trade
Mitsubishi	0.6	Developer/Producer
VA Dept of Mines, Minerals, and Energy	0.6	Government
Virginia Legislators	0.6	Government
Sierra Club	0.4	Environmental
Environmental Advocates JOINT	0.4	Environmental
Solar Stakeholders	0.4	Trade
Glidepath	0.4	Developer/Producer
ES Stakeholders	0.1	Trade/Business
Delorean Power	0.1	Developer/Producer
Office of the Attorney General, Division of Consumer Counsel	0	Consumer Government
Able Grid Energy Services	0	Developer/Producer
Energy Storage Association	0	Trade
LS Power Development LLC	0	Developer/Producer
Virginia Oil and Gas Association	0	Utility
esVolta	0	Developer/Producer

Therefore, while it is not surprising that the two utilities (Dominion and APCo) were the most influential stakeholders involved, it is surprising that the majority of the other stakeholders were unsuccessful despite the type of stakeholder group they represented. The industry stakeholders (e.g., developers and trade groups) had a particularly difficult time making inroads with the Commission. In the other four energy storage proceedings, these types of groups had often, at a minimum, been received as an important source of industry knowledge. In general, there were very few points in which the Commission agreed upon that were not in favor of the utility position.

Discussion: Caution and Deferment

The Commission deferred much of the utilities' energy storage procurement process to their annual RPS Plan proceedings. There were few additional rules regulating utilities' proposal and bidding process, monitoring, or enforcement of energy storage projects. The final rules granted the utilities much discretion in their energy storage procurement process. The Commission defended the rules noting that utility construction of electrical facilities is encompassed in other statutes and does not need to be incorporated in the energy storage rules (Final Order, 2020, p. 13-14).

In contrast, approximately three-quarters of the rest of the Final Order pertained to third-party developers and non-utility-owned energy storage. The rules for third-party developers created what many stakeholders perceived to be an overly rigorous permitting process for small storage projects beginning at 1 MW or larger. In addition, stakeholders found the rules on the project approval process, notice requirements, and filing requirements, to create undue burdens for third-party developers. Six of the legislators behind the energy storage bill submitted comments that they were greatly disappointed that the final rules did not reflect the bill's original intent. The legislators noted, "It is critically important that Virginia develop its storage industry through competitive procurements that ensure the lowest costs to ratepayers, and bring a diverse, creative, and innovative industry to the Commonwealth" (State Assembly Comments, 2020, p. 2). However, the Commission highlighted,

> …the Commission has the duty to protect the reliability and safety of the electrical system to which these non-utility energy storage assets will interconnect. The Rules are intended to ensure developers seeking to operate within the Commonwealth will operate safely, will not negatively impact the reliability of the electrical power system, and will be ethically responsible in their interactions with Virginia consumers. (Final Order, 2020, p. 14)

There are two key takeaways from the division over the Final Order. First, the Commission saw the energy storage program as too new, with unproven technology. The Commission laid out the Final Rules to be a flexible groundwork for future energy storage. The Commission emphasized the newness of energy storage in its decision and advanced a framework that supported an incremental process. At the beginning of the Final Order, the Commission stated, "As experience is gained and lessons are learned, the Commission intends to update and revise these Rules as needed" (p. 3). The Commission reinforced this perception of energy storage by utilizing words such as "premature" (p. 11), "nascent stage" (p. 7, 12), "lack of experience" (p. 12) to describe stakeholder recommendations that sought a more stringent framework for evaluation and monitoring the energy storage program. While the Final Order did establish interim targets for the main IOUs, the overall framework of the program reflected a high degree of caution and incrementalism.

Second, the Commission deferred many non-utility stakeholder concerns to be deliberated by other programs such as the energy storage Task Force, the annual utility Renewable Portfolio Standard Plans (RPS), and FERC Order 2222. The Commission saw these other programs as an alternative stream to monitor and evaluate the utilities' energy storage target deployment progress.

The establishment of a Task Force was mandated by House Bill 1183 in the same 2020 legislative session as the energy storage bill. The bill directed the Commission to create a task force to evaluate and analyze the integration of energy storage resources in the Virginia electricity system and submit a report by October 1, 2021. The Commission noted that many of the stakeholder's concerns and comments could best be addressed by the Task Force, especially since the time frame of the energy storage rulemaking was too brief to consider these issues properly. The Commission believed that concerns about utility reporting could best be addressed in their annual utility RPS Plans. The VCEA required the utilities to include information on the progress of the deployment of their energy storage interim targets through their annual RPS Plans.

Finally, the Federal Energy Regulatory Commission (FERC) issued Order 2222 in September 2020, which directs RTO and ISOs to remove barriers to distributed energy resources (such as energy storage) to "level the playing field". The Commission recognized that Order 2222 would likely affect the deployment of energy storage in the state so concerns about distributed energy barriers should be addressed at a later date.

Time was a barrier that appeared to shape the decisions of the Commission and affect the behavior of the stakeholders. While it is standard for rulemakings to last for just six months, stakeholders felt rushed and pressed for time throughout this rulemaking (VA 001). Based on the way that the comment periods were set up, there was little time to collaborate with other stakeholders, formally or informally. Figure 9.2 below shows the timeline of events for the rulemaking.

Figure 9.2 Complete Timeline for Virginia Energy Storage Rulemaking

There was a lag between the first comment period in July 2020 and the second comment period in November 2020. The first round of comments came quickly after the OIR. On September 11, 2020, the Commission established an Order for Notice and Comment on the Proposed Rules, in which stakeholders had approximately under two months to submit comments. However, this long comment period on the Proposed Rules stymied the ability for stakeholders to participate in a meaningful way due to the original bill’s requirement for Staff to file a report by November 16 on stakeholder comments, proposals, or requests. While this requirement provided greater transparency and accountability of the SCC stakeholder process and the Staff, it constrained the stakeholder process when the second round of comments was scheduled too closely. Stakeholders could not deliberate or respond to other stakeholder comments on the Proposed Rules.

The Energy Storage Task Force

What is notable of the Virginia energy storage rulemaking is not the rulemaking, but the Task Force that came in its wake. Many important issues from the rulemaking were deferred to other programs or dates in the Final Rules. In particular, the energy storage Task Force was relegated many of those unanswered issues. The Task Force was established early in 2021. Throughout 2021, there were monthly meetings to discuss many of the issues that were not resolved in the rulemaking. The Task Force compiled stakeholder comments and submitted a report for the Commission in October 2021.

While it remains to be seen whether the Task Force will be effective in shaping future energy storage policy, the distinction between its stakeholder process and that of the SCC's energy storage rulemaking is critical. The SCC Staff led both the rulemaking and the Task Force, but the processes were quite different. The Task Force's stakeholder process provided participatory and inclusive opportunities for stakeholder engagement. The Task Force included over 100 members representing a diverse range of organizations. While many of the members of the Task Force were also involved with the energy storage rulemaking there were also many new groups that had not been involved during the rulemaking. These members met at thirteen meetings from February 2021 until September 2021. Members had the opportunity to join virtually or over the phone. Often stakeholders were divided into smaller groups to deliberate on key issues. The final report and recommendations were released on October 1, 2021.

The Task Force facilitated inclusive opportunities by allowing stakeholders to be a part of drafting recommendations and by prioritizing stakeholder consensus. The Task Force generated two types of recommendations for the legislature to consider and take action on consensus recommendations and non-consensus items. The range of consensus recommendations included improving energy storage permitting, provide incentives for behind the meter energy storage, develop an energy storage roadmap, ensure that the Integrated Resource Planning Process include energy storage as an issue, and continue to convene stakeholder groups such as the Task Force.

While advocates for energy storage were noticeably upset by the Final Rules of the energy storage rulemaking, the Task Force granted them a greater opportunity to share their input. The Staff's prioritization on expanding the Task Force to more stakeholders and facilitating meetings based on deliberation and consensus created a more meaningful outcome than the rulemaking. How the SCC and the Virginia Legislature act upon these recommendations will determine how effective the Task Force was in influencing the development of the energy storage program for the state. Currently, it seems like the Task Force Report is just a small, first step towards creating substantive policy. However, time will tell if the Task Force was the redeeming feature of the rulemaking or not.

Virginia Conclusion

The Virginia energy storage rulemaking met all the requirements of a rulemaking: timely notification, accessible comment periods, a six-month timeframe, and acknowledgment of comments. However, the rulemaking lacked inclusive mechanisms for participation. The energy storage Task Force facilitated a stronger inclusive process, but it only occurred after the energy storage rulemaking. Like the case of New York, it seems like regulators were set in their justifications for the manner in which the rulemaking was conducted.

The Commission, Staff, and the utilities emphasized the newness of energy storage and its unknown future. However, there was no time for meaningful deliberation of these concerns or providing opportunities for the Commission or the stakeholders to learn. The energy storage rulemaking in Virginia had the least amount of stakeholder opportunities to participate than any of the other states. There were not any stakeholder meetings or working groups throughout the proceeding. There were only two opportunities to comment on the rules, with no collaboration on the draft rules. It was only after the rulemaking that a Task Force was established for stakeholders to deliberate on key issues.

The most significant aspect of the energy storage rulemaking is the energy storage Task Force. The Commission deferred many important queries and clarifications to the Task Force. At the time, this appeared superficial and a way for the Commission to assuage stakeholders. However the Task Force created a stakeholder process that provided meaningful deliberation and engagement among diverse groups. Whether the

Commission will act on the recommendations of the Task Force remains to be seen. The stark differences in these two separate but interrelated stakeholder models require greater examination in future studies.

State Summaries Wrap-Up

Each of the five states display an array of contexts, processes, and stakeholders. However, these five state summaries reveal the importance of participatory *and* inclusive access points in the stakeholder process at PUCs.

To review, the fsQCA results uncovered that environmental and clean energy stakeholders were most influential over the final rules when,

(1) There was not a guiding document that framed the proceeding.

(2) They participated during the pre-proposal process.

(3) There were three or more stakeholder meetings.

(4) There were three or more comment periods.

(5) The group participated in the majority of the comment periods.

(6) The group was present for the entire process.

Environmental and clean energy groups were most successful in California, Oregon, and Nevada. In each of these states, the PUCs took time to overcome the issue ambiguity surrounding energy storage. The PUCs provided multiple opportunities for stakeholders to learn and deliberate as they, too, gained a greater understanding of how energy storage systems would fit into their state electric systems. The regulatory proceedings in each of these three states took approximately two years to produce the final rules or orders. In some instances, a lengthy proceeding may derail the original intent of the proceeding. However, in these three cases, the long timeline gave the PUCs and stakeholders time to come to a common understanding of energy storage and its uses.

California, Oregon, and Nevada's energy storage proceedings are defined for their emphasis on inclusiveness. Each state's stakeholder frameworks embodied the three criteria of inclusiveness (Quick and Feldman, 2011): multiple ways of knowledge, coproduction, and temporal openness.

First, multiple ways of knowledge were encouraged with stakeholder workshops and meetings. Each PUC hosted multiple stakeholder workshops, in which stakeholders were given the opportunity to share their perspectives on energy storage and also have access to energy storage experts to help come to a mutual knowledge of what energy storage embodies. Stakeholders were able to share multiple ways of knowledge through comments and reply comments.

It is important to emphasize that an environmental and clean energy stakeholder's level of influence over the final rules was dependent on their level of activity during comment periods. Stakeholders that were present for the entire rulemaking and commented at higher frequencies were likely to be more influential at shaping the final rules than stakeholders who were not present for the entire rulemaking and only commented half of the time or less.

Second, coproduction was fostered by including stakeholders during the pre-proposal phase of the process. In each of the energy storage proceedings, the PUCs granted stakeholders opportunities to coproduce documents that would be the foundation for the final rules or framework. In addition, the norm of stakeholder consensus motivated stakeholders to collaborate with one another.

Finally, the energy storage proceedings in California, Oregon, and Nevada were conducted over a longer time, allowing temporal openness. This extra time enabled stakeholders more opportunities to interact with one another and form connections that would have been difficult to do in more fast-paced proceedings. Also, in California, the CPUC promoted policy linkages, which encouraged stakeholders to participate in cross-policy meetings and groups. The aim of linking policy issues was to help foster greater collaboration and deliberation for current and future proceedings.

In contrast, New York and Virginia carried out very different stakeholder frameworks. Both of these states facilitated rulemakings that met most participatory criteria: there was sufficient notification, comment periods, and PUC responses to stakeholder comments. New York's energy storage rulemaking actually went beyond basic standards for participation. New York hosted three technical meetings. In addition, the DPS worked to provide better accommodation and access for stakeholders. Stakeholder technical meetings and public hearings were held on multiple days when most individuals would be able to meet. Stakeholders could also call into the meetings or submit comments through email if they could not attend. A public hearing transcript was also put on the record for anyone to access. Despite these participatory efforts for stakeholder engagement, the stakeholder frameworks in New York and Virginia were wanting.

With regards to New York, the diminished stakeholder participation by the end of the rulemaking highlights that stakeholders had realized that their efforts to influence the final rules were futile. In Virginia, stakeholders expressed their frustration outright that the energy storage proceeding was going against the original intention of the legislation. The tone in the final rules for both states also indicated that the commissions were not receptive to stakeholder input. While they addressed the stakeholder comments, there were few moments when the commissions agreed with non-utility and non-agency interests.

New York's energy storage rulemaking prioritized interagency coordination rather than stakeholder input. Government agencies (DPS and NYSERDA) were tasked to develop a roadmap for energy storage prior to the commencement of the rulemaking. The agencies conferred with other government agencies and consultants to create the Energy Storage Roadmap. In the final rules, the PSC continued to stress interagency coordination as they worked to vet utility energy storage projects. Some of the stakeholders that were successful in influencing the final rules were actually partner organizations of the agencies.

Virginia's energy storage rulemaking was devoid of any inclusive practices. There were not any stakeholder meetings or workshops, and most of the stakeholder comments were deferred to other proceedings or what became the Energy Storage Task Force. The Virginia energy storage rulemaking was purely procedural.

While it is impossible to predict what the energy storage rulemakings would have produced with greater stakeholder inclusivity in New York and Virginia, it is important to note that stakeholder engagement is at the core of PUC proceedings. The PUC stakeholder process exists so that the commission can receive the best range of information to inform their decisions. So, not investing in a robust stakeholder framework is a disservice to any commission. The energy storage rulemakings are no exception, especially since energy storage is a nascent technology and there remains uncertainty in how to incorporate them in the energy market.

As energy storage policies become more widespread, there will be a new influx of stakeholders at PUCs (i.e., energy storage developers and producers, environmental justice advocates, and environmental non-profits). It is important for the formation of effective and efficient policy to include the considerations of these stakeholders.

First, per the basis of this dissertation, environmental and clean energy groups are essential to a robust PUC stakeholder process. Given the inactivity at the international and national levels over the past decade, state PUCs are the new hub for climate change policies. While the calculus is more on economic benefits at PUCs, there is room for environmental and clean energy stakeholders to advance their agenda at state PUCs. As the PUCs in Washington D.C. and Connecticut have shown, it is likely only a matter of time until PUCs will be granted the authority to include environmental considerations in their decisions.

Second, equity and environmental justice issues are a growing concern with the rise of renewable and clean energy projects. The state, much less a city, cannot undergo a major clean energy revolution if it cannot also support the needs of communities from more diverse socioeconomic backgrounds. While issues of equity and environmental justice remain at the periphery of most PUC proceedings, it is important to begin to actively include these types of stakeholders in the process to prepare for the future.

Third, not considering the input from stakeholders such as developers puts the energy storage market at risk. Many developers involved in the New York stakeholder process expressed their concern about the uncertainty of the energy storage market under the recommendations of The Roadmap (e.g., Northern Power Systems, Fluence, Borrego, Enel, and Sunrun). If there are too many barriers and risks, developers are likely to move their projects to more developer-friendly areas. This can be detrimental to creating a competitive and innovative energy storage market.

Similarly, developers (in concurrence with many other stakeholder groups) in Virginia were deeply concerned that restrictive permitting and bidding rules would discourage third-party developers from attempting even to propose energy storage projects in the state. Given that the success of the energy storage programs relies on the building of energy storage projects and systems, it is important to take greater consideration of the concerns of the stakeholders that will actively participate in the program or market.

Finally, it is critical to create an environment of trust and transparency for any agency. Without trust, a culture of animosity and cynicism can pervade the regulatory agency's relationship with its stakeholders. This will ultimately have a negative impact on the level of stakeholder participation and the quality of information that the commission receives. Therefore, in the long game for PUCs, inclusivity and participatory opportunities do matter for the quality of commission decisions and the relationships that agency members are able to maintain with stakeholders to ensure the best outcome.

The next chapter builds off of the five state case summaries. It explores the implications of when stakeholders and agency members are able to build collaborative and iterative relationships with one another. As Chapter 10 highlights, stakeholder network relationships greatly impact an individual's perception of influence and how they subsequently interact with other stakeholders during PUC proceedings. This perception of influence can create biases and heuristics that reflect facets of the balance of power among stakeholder groups. The findings on the perceived influence underscore the importance of creating inclusive and participatory opportunities for stakeholders.

Chapter 10 Implicit Influence

Introduction

In the first phase of this dissertation, stakeholder influence over the final rules was examined across five state energy storage target proceedings. The fsQCA results uncovered that environmental and clean energy stakeholders were most successful in states that facilitated a participatory and inclusive stakeholder framework. This dissertation now shifts to examine how participatory and inclusive mechanisms have a direct effect on the ability of interest groups to engage and influence the rulemaking process, the tactics interest groups employ to influence the process, the range of stakeholders involved in the process, and opportunities for collaboration throughout the process.

These energy storage proceedings are not occurring in a vacuum. Previous proceedings and interactions with other stakeholders inform individuals how to behave in the future and can even create bias in their perceptions of events and social interactions. In addition, there are multiple PUC proceedings occurring in a given period of time, which can shape a group's learning and issue linkages. The range of interactions and perceptions of the stakeholders are also fluid as often these types of PUC proceedings are learning experiences and networking.

This chapter takes an in-depth examination of the different facets of stakeholder influence by proposing a conceptual model of *implicit influence*. *Implicit influence* is defined as the summation of multiple individual and group factors that manifest into an individual's 'state' of influence. Interview data was analyzed with NVivo to understand the themes between a stakeholder's perceptions of influence for their group and for other stakeholders (Appendix B provides a greater discussion of the process for NVivo).

Due to limitations in interview data across the five states, this chapter focuses just on Oregon stakeholders. This analysis is descriptive and interpretative in nature. Yet, the findings from this chapter are important to the regulatory and interest group literature regarding the beneficial stakeholder dynamics that can flourish in an inclusive and participatory stakeholder framework. In addition, the model of implicit influence lays the theoretical and empirical groundwork for more specified and rigorous studies of stakeholder relationships in the future.

A Model of Implicit Influence

As indicated throughout this dissertation, Oregon was a unique case compared to the other four states. Oregon's energy storage proceeding was not a rulemaking. It was a contested case that began with a PUC proceeding that then split into two additional dockets to manage each of the two utilities' energy storage proposals. In addition to the procedural differences, the data collection for Oregon was more robust than in the other four states. The content of the Oregon interviews was distinct and provided rich content on network and interpersonal relationships.

The structure of the interviews and the subsequent content analysis of the interview data were guided by the key concepts and themes from this dissertation's codebook. The data analysis software, NVivo was useful for organizing the interview data and highlighting the main words and themes that were most prevalent from that data.

A meta-theme emerged from the interview data that the original theoretical and empirical groundwork had not anticipated: *implicit influence*. I*mplicit influence* is defined as the summation of multiple individual and group factors that manifest into an individual's state of influence. Implicit influence is a condition (noun) rather than an action (verb).

Influence can simultaneously be an *action* (verb) and a *state or condition (noun)*. In the first portion of the dissertation, influence is measured as an outcome and action. However, in the second part of the dissertation, influence is conceptualized as a state or a condition (noun). Influence as a noun is difficult to quantify because one knows it when you see it, but it is difficult to deconstruct and pin down for a model.

For example, when the President of the United States walks into the room, everyone immediately recognizes that she has influence. That immediate recognition of influence can stem from multiple facets: (1) the position of an individual or group; (2) the reputation of an individual or group; (3) the resources or capacity the individual brings with her; (4) expertise; (5) experience; and (6) networks. All of these facets of influence play into the actual *outcome* of her influence and the *perception* of her level of influence by other individuals. Therefore, when stakeholders begin to engage in a PUC proceeding, they bring with them varying levels of influence and perceived influence from the beginning. These facets of influence can be instrumental in their ability to influence the process. In addition, the concept of perceived influence helps explain the various heuristics that interview participants may utilize to describe network relationships and perceptions of other individuals and groups.

Implicit influence should not be mixed up with concepts such as reputation, clout, and power. The interest group literature has largely overlooked the operationalization and measurement of concepts such as organizational and individual reputation and clout because of their fluidity and difficulty in quantifying. The interest group literature recognizes reputation and clout as being an important characteristic of individuals and interest groups, but have not focused on it solely in the context of social and political phenomena. Most of the literature on organizational reputation exists within the corporate business literature (Ravis et al. 2018) and the public administration literature (Carpenter and Krause, 2012; Bustos 2021).

While there may be similar characteristics shared among these concepts, implicit influence is distinct from reputation and clout as it embodies an iterative social process that is the culmination of multiple moments and facets of the act of influencing. Therefore, reputation and clout may be distinct *components* that contribute to an individual's implicit influence, but they are not the same concept.

The meta-theme of implicit influence was supported by three key sub-themes on stakeholder influence that came from the interview data.

(1) Stakeholder perceptions of influential groups and individuals is shaped by personal connections relating to organizational and individual networks.

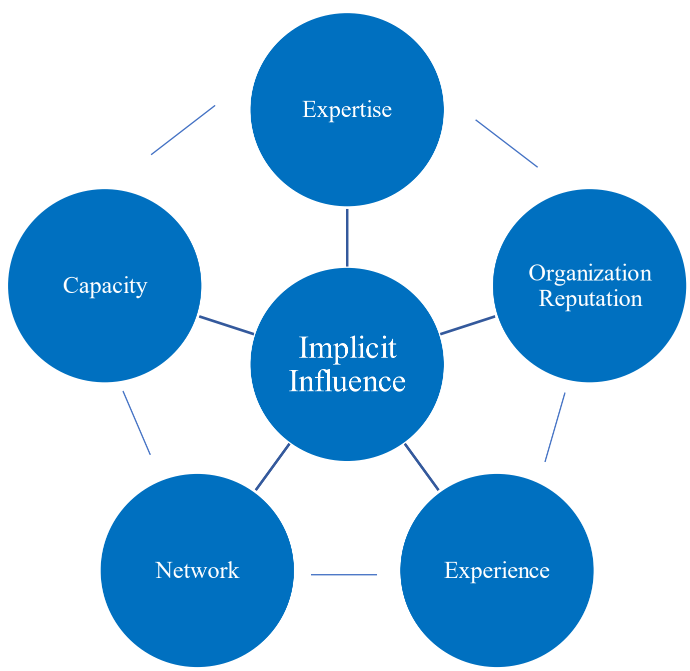
(2) Individual stakeholders representing their groups are perceived to be more influential due to a culmination of individual factors such as reputation, expertise, and experience at the public utility commission.

(3) Interest group reputation matters.

These three sub-themes from the interview data all circle around the theme of implicit influence, in which certain stakeholders are perceived to be more influential based on group and individual factors.

The NVivo analysis was utilized to analyze the following five facets of implicit influence: group capacity, organizational reputation along with an individual's expertise, experience, and network. These characteristics are generally fluid, although some such as organizational reputation are less so in the short term. Each of these five facets is distinct but can shape one another, too. For example, one's expertise on a specific policy issue can impact which policy network a stakeholder may turn to for information sharing and collaboration. Figure 10.1 provides a graphic of the different characteristics of implicit influence.

Figure 10.1 Implicit Influence Model



This dissertation does not attempt to quantify which facets are more valued or the magnitude of the connections among the five facets. Rather, this model provides a platform for understanding the relationships and dynamics among stakeholders in the Oregon energy storage proceeding. The next section provides the foundation for this dissertation's analysis of implicit influence by presenting the results from the interview data on stakeholder perceptions of influence.

Stakeholder Perceptions of Influence

The perception of influence can be just as important to explore as the "objective" outcome of influence because it uncovers hidden biases, heuristics, and a general understanding of the different social and networking dynamics of a group of stakeholders. Ultimately, the policy process is a social process. While the PUC commission seeks to remain neutral by relying on the record's content, the social interactions among stakeholders and PUC staff can still shape the process and content that goes into the docket record.

It should be noted that some participants' recollections of the energy storage proceedings were not as strong as others. The reliability and validity of participant responses is a critical disadvantage for most research. Taking this into account, interview questions were arranged so that the content of each question built upon the other to give a logical sequence of events. This way, participants had the opportunity to recall the proceeding and their interactions with other stakeholders. By the time that the final interview questions on stakeholder collaboration and perceived influence were reached, participants had established recollections of the proceeding and which stakeholders were involved during it.

However, there were still discrepancies in participant recollections by the end of the interview sessions. Participant memories had been affected by the passage of time. Three years had passed since the original docket establishing an energy storage program, and many of these participants had also been active in other OPUC proceedings during that time. Most professional stakeholders are active in dozens of regulatory proceedings over the course of a year.

Despite these potential problems of unreliability and validity, this portion of this dissertation is focused on *perceptions* of influence rather than purely objective outcomes. This potential unreliability of participants adds to the analysis of stakeholder heuristics and biases that shape their perceptions of the process and other stakeholders. In addition, the lack of memory on some of these issues points to a more interesting implication of these networks: pre-established perceptions of others may impact network interactions. Groups may be granted a more preferential position in the network when there is a stable level of respect and deference to specific members or organizations.

In the interviews, participants were asked to rank their organization's overall level of influence throughout the proceeding from low, moderate, and high. While there were specific calculations of "successful" and "influential" groups throughout the interview, the stakeholder recollections of influential groups were not embedded in statements relating to specific successful outcomes or actions.

Table 10.1 below shows the participants' self-reported levels of influence.

Table 10.1 Self-Reported Levels of Influence

Organization	Level Of Influence
Renewable NW (RNW)	Moderate to High
NW Energy Coalition (NWEC)	Moderate
Oregon Solar Energy Industries Association (OSEIA)	Low
Staff	High
Citizen's Utility Board (CUB)	High
Alliance of Wester Energy Users (AWEC)	Moderate
Northwest Intermountain Power Producers Coalition (NIPCC)	Low
Portland General Electric (PGE)	High
Pacific Northwest National Laboratory (PNNL)	High/low-moderate over utilities

From the groups that were interviewed, OSEIA and PNNL were only involved in the first docket (UM 1751), which set up the framework for the energy storage program. Renewable NW, the NW Energy Coalition, CUB, AWEC, PGE, and NIPCC were intervenors for all three dockets, although AWEC and NIPCC were less involved during the initial framework docket, UM 1751.

Participants were then asked to rank the level of influence of other stakeholder groups, with the rank of one being the most influential and then descending from thereon. Some participants only ranked a couple of stakeholders while others chose to rank all stakeholders. A few stakeholders were reluctant to name any groups and noted that most groups were influential to some degree.

Right away, it is clear that the utilities are perceived to have the highest level of influence. This is in line with previous literature on interest groups and regulatory processes (Yackee, 2006). The utilities were responsible for drafting up their energy storage proposals. As many respondents noted, the onus of power lies with utilities, and other stakeholders are simply reactive participants in a PUC proceeding. That is not to say that other stakeholders are not influential. As this dissertation has shown, non-utility stakeholders were able to influence the content and process of the energy storage proceedings, but the calculus ultimately lies with the utilities. Table 10.2 shows only the top three ranking of most influential stakeholders throughout the energy storage dockets.

Table 10.2 Perceived Influence of Groups

Organization	Perceived Influence Rank 1	Perceived Influence Rank 2	Perceived Influence Rank 3
Renewable NW	Staff and PNNL	Utilities	CUB
NW Energy Coalition	Utilities	CUB	AWEC
Oregon Solar Energy Industries Association	PNNL	Staff	No Rank Given
Oregon Public Utility Commission Staff	Utilities	Staff	CUB
Citizen's Utility Board	Utilities	Staff	PNNL
Alliance of Wester Energy Users	Indeterminant	Indeterminant	No Rank Given
Northwest Intermountain Power Producers Coalition	Utilities	No Rank Given	No Rank Given
Portland General Electric	Utilities	Staff	No Rank Given
Pacific Northwest National Laboratory	Utilities	PNNL	No Rank Given

The Staff was also noted as being highly influential. Staff is very influential throughout the process regarding leading the informational dockets, leading workshops and meetings, writing up docket findings, and making recommendations to the Commission for consideration. There were two particular staff members that were mentioned multiple times as being instrumental in leading the energy storage proceeding. Another influential organization was PNNL. PNNL was not a stakeholder or even a consultant (as they shared information and expertise for free). Yet, PNNL was still noted as a highly influential player in the energy storage proceeding due to their high expertise of energy storage in contrast to other stakeholders. PNNL helped OPUC staff with specific content relating to the energy storage cost, the evaluation of the energy storage program guidelines, and the procedures to file the utility proposal reports. PNNL was a source of expertise and was critical in helping OPUC Staff and stakeholders learn about energy storage and the major technical components of energy storage systems. However, as Table 10.3 shows, the ranking of other stakeholders is not consistent with the original QCA analysis of influence over the final order.

Table 10.3 Oregon Stakeholder Influence on the Final Order

Stakeholder	Raw Score	Fuzzy Score
Renewable NW and NW Energy Coalition	15	0.9
Interstate Renewable Energy Council	11	0.9
Northwest Power and Conservation Council	8	0.6
Community Renewable Energy Association	5	0.4
Oregon Solar Energy Industries Association	4	0.4
Energy Storage Association	4	0.4
Small Business Utility Association	-1	0.1
ITM	1	0.1
Northwest &Intermountain Power Producers Coalition	n/a	n/a
Citizen's Utility Board	n/a	n/a
Alliance of Western Energy Consumers	n/a	n/a

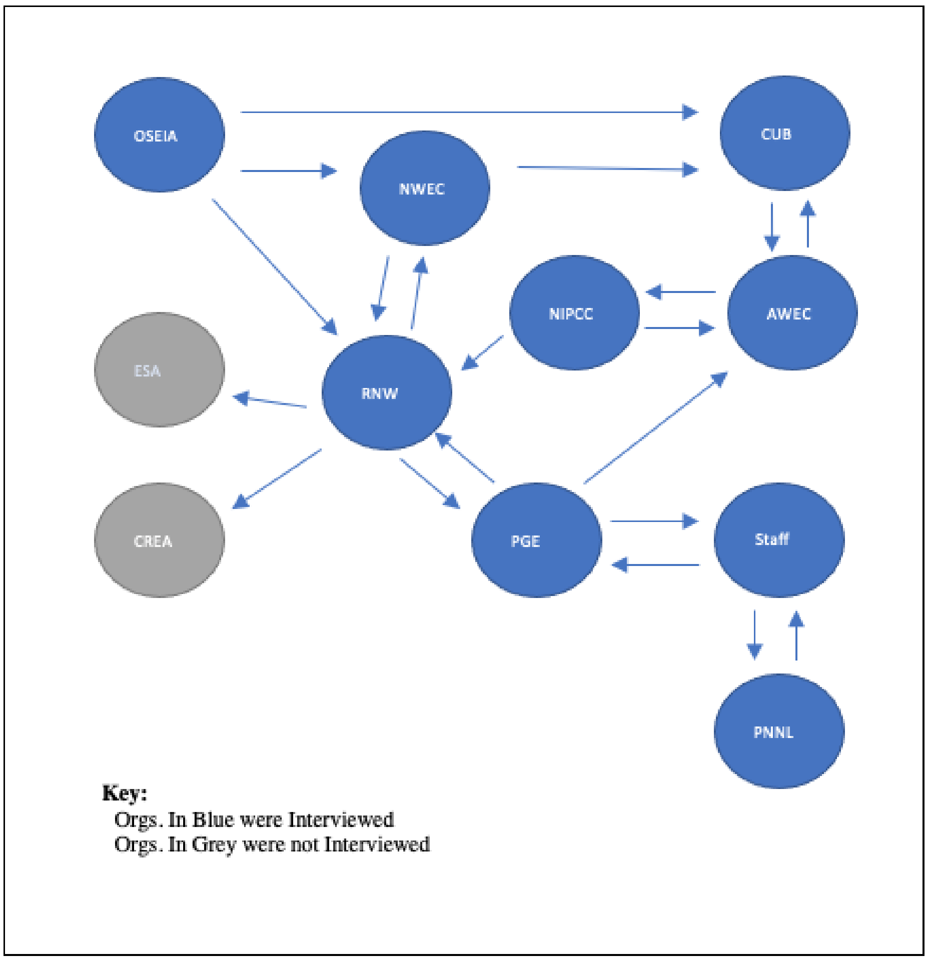
The three clean energy groups (RNW, NWEC, and IREC) were influential on multiple points in the final order and the utility energy storage proposal dockets UM 1856 (PGE) and UM 1857 (PacifiCorp). Yet, these clean energy groups were not noted as being the most influential in the interviews.

While some of the stakeholders could not be interviewed for various reasons, it is clear that out-of-state stakeholders were not as influential as their in-state counterparts. For example, the group IREC was an active participant during the proceedings and the comment period, but many participants were unable to remember the involvement of this group. It is important to note that even if stakeholders are not physically present for PUC meetings or conferences, it is common practice for stakeholders to read through other stakeholder comments and even reference them in their reply comments. Therefore, even if some of the stakeholders had not physically met with out-of-state stakeholders, they likely reviewed their comments at some point.

In addition, while respondents noted that NWEC and RNW had a strong history as intervenors at the PUC, they were not ranked high for the energy storage proceeding. Many stakeholders were unfamiliar with the trade group ESA, which has a stronger national presence. Respondents were also directed to discuss any other interest groups that they collaborated with during the energy storage docket.

One aspect that was unique to the Oregon interviews was the familiarity that stakeholders had with one another and the ease at which they had in listing individuals or groups that they had network linkages with. This was consistent during in-person interviews and over the phone. This ease of naming individuals may stem from the interviewer having a local connection. Yet, even in interviews across the other four states, stakeholders seemed reluctant to name specific individuals or elaborate on network connections. Figure 10.2. below shows the stakeholder self-reporting of collaborations with other groups.

Figure 10.2 Self-Reporting Stakeholder Collaboration Networks



Stakeholder Abbreviations: Renewable Northwest (RNW), Interstate Renewable Energy Council, Inc. (IREC), Northwest Energy Council (NWEC), Energy Storage Association (ESA), Community Renewable Energy Association (CREA), Portland General Electric, Northwest &Intermountain Power Producers Coalition (NIPCC), Citizen's Utility Board (CUB), Alliance of Western Energy Consumers (AWEC), Oregon Solar Energy Industries Association (OSEIA), Pacific Northwest National Laboratory (PNNL).

The stakeholder collaboration network highlights the alliances and interpersonal dynamics among the key stakeholders. As one can see from this figure, RNW was one of the most cited stakeholder groups that others collaborated with during the energy storage proceedings. Yet, this high level of network collaboration is not reflected in the perceived influence responses. There are clearly factors at play that have contributed to these discrepancies in responses of perceived influence of one's group, perceived influence of the most influential groups, and the scores for the level of influence over the final framework order.

Without reference to the entire interview data, these discrepancies in stakeholder perceptions appear counter to the fsQCA results from the previous chapters. However, patterns in each of the interviews underscore the connections between perceptions of influence and the following themes: (1) organizational reputation, (2) organizational capacities, (3) individual expertise, (4) individual experience, and (5) individual networks. Participants referred to these five themes across the interviews as they explained their perceptions of other stakeholders and their perceptions on how to be influential at the OPUC.

The following sections examine how participants employed these five themes to illustrate what this dissertation identified as an individual's implicit influence.

Interview Themes of Implicit Influence

Group Capacity

A group's financial and staffing capacity is important to implicit influence because it foremost enables a group to participate in what are usually time and resource-intensive processes and secondly, empowers groups to play the "long game". Not having adequate capacity greatly diminishes a group's ability to participate and influence the process and rules.

The interviews from Oregon stakeholders highlighted that financial and staffing capacity are critical barriers to overcome in order to participate in an OPUC proceeding. Out of the nine groups interviewed, six groups cited concerns about staffing and financial capacity. The three groups that perceived capacity as less of a concern to their participation were AWEC, PGE, and PNNL. It should be noted again that PNNL was not a stakeholder; they were an outside organization brought in for their expertise. Even then, PNNL is a federally funded research organization. It has a large number of resources and staff. In addition, AWEC is eligible to receive OPUC intervenor funds from the "matching" fund. The intervenor funds were instrumental in defraying the costs of participation (OR Interview 007).

Utilities are often regarded as having the upper hand during OPUC proceedings due to financial and staffing capacity. As one stakeholder noted, "At the PUC, utility is king. [The PUC] can have a utility and put 10 attorneys at the table." The participant continued, "I think if you look at any regulatory proceeding, and [sic] the industry will have a lot of resources, and a lot of firepower, and the public and the community will not.

[The non-profits] have really smart people, but will not have the capacity, so [non-profits] really have to pick and choose battles" (Interview OR 004).

While group capacity (finances and staffing) is a major participation obstacle for most interest groups, it is especially the case with non-profit environmental and clean energy groups. Many groups that are interested in participating do not have enough staff, finances, or time to participate. All of the clean energy and environmental groups interviewed throughout this dissertation highlighted this capacity barrier: "…as non-profits, we have very limited resources…" (Interview OR 001). This limited capacity forces environmental and clean energy non-profits to prioritize legislative and regulatory issues. "We can be a bit more selective, but on the other hand, we have very small staffs on this side, and you have to pick your targets" (OR Interview 003). Some stakeholders noted that it was apparent that less influential stakeholders were "stretched thin" due to staffing and other capacity factors (OR Interview 010).

Capacity was a major obstacle for one environmental group involved with the passage of the energy storage legislation but was not party to the energy storage docket. The participant noted that environmental groups often lack the capacity to engage fully in these matters. In addition, donors of these groups are less likely to fund regulatory procedures. Donors push for legislation that can continue to create momentum and roll over for stronger policies (Interview OR 002).

Capacity not only enables stakeholders to participate in the process, but also the extent that they are able to participate. With adequate funding and staff, some stakeholders were able to participate for the entire proceeding. One stakeholder highlighted the importance of having the capacity to participate from the beginning of the proceeding. “We were there from beginning to end…We dedicated a good amount of staff time and were able to move the Commission on a number of things that were important to us” (OR Interview 001). The fsQCA results showed that clean energy and environmental stakeholders were more influential when they had participated for the entire duration of the PUC proceeding.

In addition, a consistent stream of adequate funding and staff enables stakeholders to play the “long game” and participate in more proceedings. The “long game” is important because it helps groups become visible to the OPUC and other stakeholders, gives the group more experience with the OPUC, and reinforces the group’s commitment to the OPUC process. Thus, the more a stakeholder participates in the proceedings, the greater likelihood that stakeholder will become more influential. As this stakeholder noted,

> …the groups that have influence over the process or the groups that are there all the time that are familiar, that show that they have a real commitment to the process and are really interested in the issues…there may be lots of groups out there that you could say […] basically don't have the financial resources to participate in every case all the time…It's a high barrier to entry, simply because it's an arcane process and there's a ton of dockets and, you just have to do this all the time. (OR Interview 007)

This is in line with Roundtree and Baldwin (2018), who note that stakeholders will continue to participate in regulatory proceedings despite failures because they are playing the long game, in which they are working to position themselves to influence multiple policies over the long term.

The interviews highlighted that group capacity has a major role in a stakeholder's ability to participate and influence regulatory dockets. In addition, many of the participants were familiar with capacity issues of other stakeholders and how that may or may not have affected their ability to participate or be influential. This shared knowledge of capacity issues points to the larger theme of implicit influence. Some groups such as AWEC and the utilities were known across the respondents as having much greater capacity to participate at the OPUC. Respondents were aware that having more money and staff to participate at the OPUC gave these groups an advantage over groups that often struggled with funds and staff. Therefore, there is implicit influence in having the capacity to be an active stakeholder.

Group Reputation

Group reputation has a strong impact on the implicit influence of an individual with regards to recognition of a group and the of past interactions with said group. The group that an individual represents is important and can immediately open doors. Less known groups will have to work harder to be noticed and taken seriously.

For example, most of the key intervenors were in-state organizations. However, there were a few notable out-of-state intervenors, too, such as the Energy Storage

Association (ESA) and Interstate Renewable Energy Council (IREC) that have a strong presence in other states. While these out-of-state organizations were influential to some level (based on the fsQCA analysis), many of the key stakeholders were unfamiliar with them and did not recall them having a strong influence throughout the proceeding. As one stakeholder noted,

> This kind of docket where you bring in industry, people like the ESA and other groups that have significant experience in other states, they've got their own depth of membership in that particular area, they can have a pretty important impact as well, but there's no question until you then [sic]-- If you start showing up in a few dockets in the state and people start to get to know you, that will increase your influence. Really, I don't think they have been involved in Oregon much before that. (OR Interview 003)

Similarly, another stakeholder highlighted that they were not taken as seriously until their organization had established themselves as credible intervenors at the OPUC after years of participating in OPUC dockets.

Another key aspect of group reputation is the norms that dictate how groups interact with one another. In Oregon, the regulatory community is small, and groups often have a long history of interacting with many of the same groups. This has led to the institutionalization of norms that guide stakeholders’ behavior towards one another. These norms contribute to the reputation of each group which extends to how other stakeholders react and treat them in later proceedings. While there is not a concrete list of norms to follow, all of the stakeholders interviewed were aware of certain norms regarding civility, collaboration, and deliberation that guided their interactions with one another, which also shaped their perceptions of each other. One respondent noted,

> I don't know that we have them written down, but obviously we have professional [norms]. We try to respect the other party, understand where they're coming from, try to work with them to the extent that we can, you know, obviously sometimes we know what we want out of something and there are things we can get and things we can't get, we try to work with them then. (OR Interview 009)

Respondents emphasized the importance of maintaining good relations with one another. It was not worth it to create divisions and contention even when opposing sides disagreed with one another. One respondent stressed the importance of these norms for maintaining positive relationships with other stakeholders.

> I think that the other one is taking the organization approach, the [] approach to engage in advocacy issues, to try to be pragmatic and positive […] we do value our long-term relationships. I really think it is a key factor for our success in the regulatory arena. It's the same people. There's a core group you are going to be seeing: the same people tomorrow, and the next day, and the next day. Being rude or mean or non-diplomatic is not particularly helpful. (OR Interview 001)

More so, some respondents emphasized that these norms were unique to the region. "[T]he culture in the northwest is fight when you have to but when you don't have to, you don't, and you try to be more collaborative. [It's] just different than what it is in other states" (OR Interview 005). Another respondent expressed, "I've always liked that about the Oregon PUC process. The expectation is for negotiation…[w]hen people aren't doing that, then "Portland polite" or "Oregon nice" wins over…" (OR Interview 004).

Ultimately, these norms affect how groups interact with and perceive other groups. In-state groups that have a long history together will have formed certain perspectives on one another. These perspectives culminate into a stakeholder's assessment of the group's reputation. When asked questions about collaborations with other groups and assessing the level of influence of a group, respondents will likely revert to their assessments of group reputation as a heuristic. Groups that the respondent knows more about and has had specific interactions with will likely be at the forefront of their mind.

In contrast, respondents will be less likely to recollect newer groups and out-of-state groups since there are few reputational heuristics to refer to. That is not to say that concrete recollections of the energy storage proceeding are not processed by the respondent. However, a group's reputation will be a major factor in the respondent's cognitive assessments.

Implicit influence is largely shaped by group reputation, as it embodies positive or negative perceptions of a group and its staff based on repeated interactions and events together. A group's reputation blends into an individual's level of experience, which is also another important facet of implicit influence.

Individual Experience

Experience is another key facet of implicit influence. Experience in the policy community and at the OPUC were highlighted as important to being influential at the OPUC. Many of the respondents had been in the Oregon regulatory and policy community for upward of twenty years. This experience over a long period of time has impacts on an individual's network, reputation, institutional knowledge, and policy knowledge.

Experience with the OPUC is integral to a stakeholder's success. One concern about PUC participation is that its technical nature makes it difficult for lay individuals or groups to become involved. The OPUC has worked to open up the process more to other types of stakeholders and provides learning resources for new stakeholders. Yet, intervening at the OPUC (much less any state public utility commission) remains a challenge for most stakeholders. Participants highlighted the major undertaking that new stakeholders faced.

> Lots of process, it really takes a big effort to get to where you can have an effect on the process. Everybody can be involved in these processes, there's no limit…Anybody can walk into the workshop, can send in the comments to the Commission, can call people on the phone, and talk about it. That's important because if you get that, it provides a way for the commission to make better decisions because they're getting better input…That said, not many people just come wandering off the street to say, "Hey, I'm here for your storage workshop". (OR Interview 003)

Other participants noted that it is difficult for inexperienced stakeholders to overcome the OPUC's technical barriers. There is a sharp learning curve at the OPUC that may discourage inexperienced stakeholders to participate. As one participant observed,

> Now, I see a lot of other groups coming in and they absolutely should be at the table, but that also means that they need to one, figure out how to play. As the old saying goes, you've got to know the rules before you could break them. Then they have to do the work. They want to do something different, great. It just doesn't happen, and that's a hard process. A really hard process. (Oregon Interview 004)

Possessing experience at the OPUC is an integral aspect of implicit influence because it captures not only an individual's ability to successfully navigate the many technical and legal processes, but is also a embodies the wealth of knowledge and institutional and policy history of the OPUC. One stakeholder observed of themself, "there's a couple of decades of knowledge and experience. It does give me a bit of an advantage in some of these things" (OR 006).

As experience builds up, so does implicit influence. Experience also shapes other group and individual facets of implicit influence. For example, an individual's experience at the OPUC also complements their group reputation as they become associated with their group's success (or failures). As the next section shows, experience can also lend itself to an individual's expertise.

Expertise

Stakeholders noted throughout the interviews the importance of expertise as being a key determinant for stakeholders that were influential versus those that were not. The PUC model is based on stakeholders providing information and expertise to the Commission. Commissioner's root their decisions based on the docket record, which usually consists of stakeholder comments and, in some cases, witness testimony for contested cases. Therefore, a high level of expertise on the issue at hand is crucial to an individual's implicit influence.

There were three sub-themes on expertise from the interview data: (1) the bar is set high for groups to demonstrate their technical and legal expertise at the OPUC to be perceived as credible and influential; (2) there are a limited number of interest groups that possess the technical and legal expertise to intervene at OPUC proceedings effectively; and (3) individuals and groups that are perceived to have greater expertise on an issue will often take the lead for an array of other potential stakeholder groups.

First, as groups participate in more and more PUC proceedings, they gain greater credibility to come to the table, especially as they are able to demonstrate that they have the technical expertise to engage in PUC proceedings constructively. One participant emphasized that, "[It was] our ability to be able to consult with, and check in with, and bring along with our own knowledge of the technology also the thinking of the industry" (OR Interview 001).

Another participant noted that their group had previously been a "fringe" group until it was able to demonstrate its technical expertise on certain issues and skills on how to engage with other stakeholders at the same playing level (OR Interview 004). After that particular docket, industry stakeholders perceived the group as a credible intervenor.

A second theme that emerged from the interviews centered around the question of broadening OPUC participation. The OPUC report on SB 978 noted the importance of broadening the OPUC process to include environmental justice and under-represented minority interest groups. Respondents were asked whether they knew of any groups that should be part of the process but did not participate due to extenuating circumstances. Most respondents did not note any major groups that they believed should be part of the process that were excluded. One respondent noted, "I think given the nature of the docket, it had the stakeholders that needed to be there for that type of docket…" (OR Interview 001).

The general consensus on the question of diverse stakeholder engagement points to the underlying theme that it is important that stakeholders have a minimum level of expertise on the policy issue and that they are able to offer a particular perspective or source of information that adds value to the OPUC proceeding. Commissions (across all states) expects intervenors to provide a unique perspective that is supported by information and expertise. Commissions do not want an avalanche of information that cannot provide meaningful information to the record.

> [A] participant should come with something more than "yay renewables". For example, [this organization] sometimes comes in and says "yay, renewables" and that's not what staff is looking for, [they are] looking for help…*how you participate matters* (emphasis added). There are a couple

> NGO's who know how to participate at that level…when they're fully staffed and focused…but then there's this other range of NGO's who either don't participate at all or do so very delicately. (OR Interview 005)

Third, participation is often predicated on weighing the importance of the proceeding and whether a group believes that they would be able to provide a viable contribution or not. If there was a group with greater expertise and stake in the proceeding, stakeholders appeared to take a step back from participating more fully in the proceeding.

Multiple stakeholders emphasized that there was often a stakeholder group lead for each major issue or perspective. As one participant noted, "If you don't have the time to do it yourself, you can join or be active as an organization that does, that has that as its purposes…there are both indirect and direct ways to be active in these kinds of dockets" (OR Interview 003). Another respondent highlighted the importance of a lead group.

> We all pick and choose where we get involved and you try to work with, informally, with other groups to see where you're going to be more active on that docket, so I don't have to be as much. That's certainly true with the storage docket because we knew that [another organization] was going to be effectively in the lead for all these advocacy groups on that docket. (OR Interview 003)

The stakeholder interviews emphasized the importance of individual expertise as a critical component of a group's influence over OPUC proceedings. Individual expertise has a central role in the perception of a stakeholder's implicit influence. Individuals or groups that possess expertise on certain issues will be perceived as potentially more influential.

Networks

An individual's professional and personal network has a strong impact on their implicit influence in that they can build beneficial relationships with other stakeholders. These relationships can create opportunities for learning, information sharing, policy collaborations, and a stronger foundation to reach a consensus when there are contentious issues. An individual's network contributes to how other stakeholders perceive their level of influence and even how an individual perceives their own level of influence. A highly connected individual will appear to be more influential than an individual with just a few network contacts.

The policy world in Oregon is small and tight knit. Many of the offices are located in downtown Portland. There are cases in which organizations even share office space with similar groups. The interviews highlighted that many of the key stakeholders had a long history with one another, which benefitted their professional work. As one stakeholder put it, "You build that relationship. There are people that I sit across the table from and worked with for a long time. We can start with better conversations. And a better relationship" (OR 004). In addition, in some cases, there were cross-organizational relationships as many of the key players had moved through multiple organizations and events with one another.

Professional and personal networks are especially important when a stakeholder is considering the “long game”. For stakeholders in it for the “long game”, each PUC proceeding builds upon the next, and influence can accumulate over time. Over time, stakeholders are able to have a stronger understanding of other stakeholders’ preferences and behaviors which can lead to more optimal outcomes and negotiating.

> Once you figure out what's driving somebody or what somebody needs out of that, then you can get some stuff done. It's all about motivation. If you can crack what's motivating people, you can do cool stuff. A lot of times, at [the organization], we always said, you're always litigating the next docket. Yes, there's things that are being debated. We need to get into the docket, but there's always something that's leftover, so if you can stick in it and stick to it long enough, that's when you can really [get things accomplished]. (OR 004)

Individuals with large networks are at an advantage with regards to being able to communicate and deliberate with a wide array of stakeholders, especially informally. While the docket does provide a large amount of information about stakeholder meetings and comments, it cannot highlight informal interactions. Many of the interactions among stakeholders were informal and not always in the setting or context of the energy storage proceedings.

Yet, these informal interactions with stakeholders’ networks were important opportunities to share information, learn, and strategize comment submissions.

They engage more than the comments they tell (sic) would suggest. Sometimes they would have had comments, but they would talk to us. We would get on the phone with them or submit questions to them and they would provide some assistance, in terms of understanding ethical and technical issues that were outside of our depth. (OR Interview 001).

Network benefits can also extend to OPUC staff. There are not any *ex-parte* rules against talking to staff.[12] As the perceived influence results highlight, staff is very influential throughout the PUC process. It should be noted that talking to staff is not the same as trying to influence or control the agency or the commission. Many stakeholders noted that they would often talk to staff and had a comfortable familiarity with them. “I have informal conversations with them all the time. I text with them every once in a while. [It’s] a good way to get information on issues if your sort of behind the eight ball” (OR Interview 007).

Newer and less experienced stakeholders did not have as many interactions or familiarity with staff as more experienced stakeholders did. Many established stakeholders worked closely with staff at certain points in the process.

So there's (sic), we always have a relationship with staff. We always have a shared interest and, and sort of those, sometimes we disagree with them…they're the closest ally we'll work with… coordinating some stuff in settlement to sharing knowledge and expertise to just sometimes calling

[12] In Oregon, there are only *ex-parte* rules governing stakeholders meeting with commissioners for certain types of cases (i.e., contested cases).

> them up before a docket….to see what they think and how we can move the policies along. (OR Interview 006)

This familiarity with staff gives some stakeholders greater influence or at least the perception of influence. As was noted, nothing undue is occurring in these interactions. These interactions are based on information sharing about the content and the process of the proceedings. Nonetheless, being able to possess that information and that network contact is perceived as being invaluable.

Implications

The stakeholder interviews provide an illuminating glimpse into the network relationships at the OPUC and how these connections shaped individuals' perceptions of influence. Implicit influence is an important finding in this dissertation because it explains discrepancies between the data on group influence and perceptions of influential groups by interview respondents. These findings are important to consider when observing stakeholder dynamics at PUCs.

An individual's implicit influence can predispose other stakeholders' actions towards them, which can have beneficial consequences in later PUC proceedings or interactions. From the interview data, it became clear that there was a distinction drawn between insider (expert) stakeholder groups and outsider (lay) stakeholder groups (Crow, Albright, and Koebele, 2016; 2020; Roundtree and Baldwin, 2018). Insider stakeholders are regulars around the PUC and have high levels of the five facets of influence (experience, expertise, group capacity, group reputation, and networks). These stakeholders are often representing industry groups that have a history of participating at the PUC and understand the formal and informal mechanisms to succeed in PUC proceedings (Crow, Albright, and Koebele, 2020). These insider stakeholders have a reputation that has been accrued over the years due to interactions with other stakeholders and agency members. Often insider stakeholders will be familiar with PUC staff due to working closely with them over the years. These reputational, experience, and network factors can give expert stakeholders an advantage at the PUC.

In contrast, outsider or lay stakeholders are often from advocacy groups, non-profit, or citizens that have low levels of the five facets of influence (expertise, experience, capacity, reputation, and network). These stakeholders often have little experience with the PUC. They will often lack the expertise and capacity to participate to level that expert stakeholders can participate.

From the interview data, it was clear that insider stakeholders had a higher level of implicit influence, mainly stemming from their experience and familiarity with the OPUC and the professional networks that they had acquired during their long tenure engaging at the OPUC. Many of the interviewees had strong ties to one another. These interviewees had worked together at the OPUC for many years (decades in some circumstances). Some of the interviewees even considered some of the other stakeholders as long-time friends they would see during their free time.

These congenial relationships benefit the regulatory process by promoting a constant informal communication and deliberation stream among the stakeholders. Many of these stakeholders are likely to cross paths with one another in their off time, given how “small” the policy and social circles are in the Portland-Salem metro areas. Most importantly, these relationships enable stakeholders to find productive ways to overcome conflict when they have opposing views. As many of the stakeholders emphasized, maintaining constructive, professional relationships at the OPUC was a priority. While disagreements are a natural part of any stakeholder process, there was no room for antagonism or fighting. Therefore, these long-term relationships highlight how implicit influence can promote a more cooperative and efficient PUC process.

In contrast, stakeholders with a low implicit influence were newer to the process or had not engaged frequently with the OPUC. Possessing a low level of implicit influence may inadvertently lead other stakeholders to leave them out of key informal discussions or negotiations. These obscure stakeholders will miss out on opportunities to influence the process and the outcome. In addition, possessing a low level of implicit influence may lead other stakeholders to perceive them to be not as influential as they truly are. This perception of not being influential can carry over to future proceedings and interactions, which may negatively impact a stakeholder’s ability to be effective.

There are substantial disadvantages to having a low level of implicit influence. As the state rulemaking literature has noted (Crow, Albright, and Koebele 2016; 2020; Roundtree and Baldwin, 2018), there is a stark difference in success between insider and outsider stakeholders. Experience matters and can open access to other opportunities at the regulatory agency. Therefore, individuals with a low level of implicit influence will need to overcome the following barriers: (1) organizational reputation, (2) organizational capacities, (3) individual expertise, (4) individual experience, and (5) individual networks. Figure 10.3 summarizes some of the advantages and disadvantages of an individual's implicit influence.

Figure 10. 3 Implicit Influence Dynamics

High Implicit Influence

- Coordination increases with networks and reputation
- Knowledge of PUC process and PUC staff
- Similar group norms
- Information sharing
- Expertise due to years intervening at PUC

Low Implicit Influence

- Small in-state network
- Less capacity
- Low group reputation
- Low experience with PUC culture and PUC staff
- Less informal coordination and information sharing

These differences between individuals with high levels of implicit influence versus low implicit influence are important implications as PUCs bring in newer stakeholders. While many PUCs (especially the OPUC) help newer stakeholders to become familiar with PUC processes, it remains a sharp learning curve that cannot be overcome in a short amount of time. Becoming a professional stakeholder is time, resource, and experience intensive, which explains why there are fewer established stakeholders during the regulatory phase than in the legislative phase. However, it is better to be at the literal and metaphorical "table" than not at all.

Conclusion

This chapter expands upon the concept of influence by examining how an individual's implicit influence is built from a set of individual and group factors. While this chapter relies on descriptive and preliminary inferences on implicit influence, it provides a promising foundation for future research. Most importantly, the findings on implicit influence highlight how facilitating inclusive and participatory stakeholder frameworks can lead to a tight-knit policy community. However, these findings also indicate that outsider stakeholders that do not have high levels of implicit influence will likely face multiple barriers to effectively participating at the same level as their counterparts.

It is important to be cautious on the potential use of the model of implicit influence, given that it might have captured social phenomena unique only to Oregon or political communities that are smaller. The model of implicit influence was generated among a tight-knit group of individuals and groups within a small policy space and distinct setting (i.e., formal proceedings at the OPUC). The interview data was robust and represented a large proportion of the stakeholders involved. As noted at the beginning of this chapter, interviews in the other four states did not uncover this unique socio-political phenomenon (although only a few interviews were conducted in those four states, and a saturation point was never achieved). Interviewer familiarity with state politics and interviewer state affinity may sway respondents to open up more or respond differently to questions being asked.

Despite these unique circumstances, it is also quite reasonable to assume that these social phenomena exist in other states or agencies. The model of implicit influence *should* be tested in other political and social contexts to explain individual perceptions, biases, and heuristics. However, it is important to stipulate some boundaries for using the model of implicit influence.

Foremost, it is important to emphasize that the model of implicit influence analyzes the *individual* and the social dynamics that the individual experiences in a formal (and informal) setting. The model in its current form is not meant to be scaled to groups and countries.

The model of implicit influence should only be employed in settings in which there is a:

(1) Defined set of individuals and their groups.

(2) Common issue or reason that brings these individuals together.

(3) Defined formal space or setting that these individuals meet with one another.

(4) Consistent and iterative interactions within the formal settings (e.g., meetings, hearings, conferences).

In the case of this dissertation, there were defined individuals from organized interest groups that were brought together to participate in the energy storage proceedings at their state public utility commission. These individuals had consistent and iterative interactions throughout the regulatory process in stakeholder meetings, PUC commission hearings, public hearings, and comment periods. It is important for this model that there is some level of familiarity among the individuals based on previous interactions or at a minimum, knowledge of the interest group.

Given that this model is in its infancy, it should first be tested in research designs with similar cases and contexts. If the model's validity can be established across these similar contexts, the model could then be applied to other issue areas and disciplines. The model of implicit influence could then be utilized across public policy, public administration, political science, and sociological frameworks. Most organized entities would satisfy the first criterion as long as there was a common formal space where they interacted with one another. For example, defined formal spaces may include regulatory agencies, legislative sessions, or other institutional spaces. A school board meeting could even meet this criterion as long as there were defined and established roles among key individuals and groups.

The next chapter is the Conclusion. The Conclusion reviews the major findings and implications of this dissertation. The final section of the Conclusion reflects on future research and the value of these dissertation findings to the larger challenge of creating state energy policy to support national climate change goals.

Chapter 11 Conclusion

In their seminal book on interest groups and influence, Baumgartner and Leech (1998) reflected that their research question should not have been on whether interest groups are influential, but rather "when, why, and to what extent they are powerful on what types of issues" (p. 134). Nearly twenty-five years later, few studies have taken on this challenge. This dissertation has attempted to meet Baumgartner and Leech's (1998) call to researchers by providing a rich analysis of the events, processes, contexts, drivers, and actors involved in energy storage proceedings across five public utility commissions in the United States.

In this conclusion, I review the main findings from this dissertation's case studies. I then present the major theoretical and policy implications of this dissertation. I conclude with some final thoughts for future research.

Major Findings

This dissertation began with two questions. First, what participation mechanisms at public utility commissions lead to greater influence among environmental and clean energy groups? Second, what effect do the social dynamics among stakeholder groups have on shaping a stakeholder's ability to be influential?

This dissertation advanced a model of stakeholder access points and influence that emphasized the importance of the *quantity* and *type* of access points throughout PUC proceedings. This dissertation discovered that clean energy and environmental stakeholders are most influential when public utility commission proceedings provide participatory *and* inclusive opportunities for stakeholders. In particular, it was the presence of inclusive opportunities that enabled clean energy and environmental stakeholders to be more influential due to greater opportunities for learning, deliberation, and consensus.

The fsQCA results showed that environmental and clean energy stakeholders were successful at influencing the final rules when,

(1) They participated during the pre-proposal process.

(2) There were three or more stakeholder meetings.

(3) There were three or more comment periods.

(4) The group participated in the majority (90 percent) of the comment periods.

(5) The group was present from the beginning until the end.

(6) There was not a guiding document

The fsQCA findings are notable because they identify the necessary and sufficient combination of conditions that explain environmental and clean energy stakeholders' ability to be highly influential. Necessary and sufficient conditions are important to identify because they provide a causal explanation that is generalizable to similar contexts or cases (Ragin 2000, p. 91). Also, when proven relevant, necessary conditions provide practical information that can "have very powerful policy implications" (Ragin, 2000, p. 203). The following sections will discuss the generalizability of these necessary and sufficient conditions in detail.

In addition to addressing complex causality, this dissertation constructed the model of implicit influence, which seeks to explain stakeholder interactions and perceptions of influence among one another. The model of implicit influence revealed how various facets of influence (i.e., expertise, experience, capacity, reputation, and network) contribute to an individual's implicit influence. Implicit influence explains why some individuals are perceived to be more influential than others, even if their actual effectiveness of changing the outcome was less consequential. Similarly, implicit influence can imbue individuals with a "natural" sense of command and influence towards which others will instinctively be responsive.

The following sections review the major findings in this dissertation regarding (1) stakeholder influence; (2) issue ambiguity; (3) inclusive and participatory access points; (4) barriers to participation; and (5) the implicit influence and its effect on stakeholder dynamics at state PUCs.

Stakeholder Influence

This dissertation uncovered which stakeholders were influential and at what points in the regulatory process these stakeholders were influential. First, at the basic level, the findings of this dissertation confirm previous literature's conclusions that utilities and expert stakeholders dominate public utility commission PUC proceedings (Baumgartner et al., 2009; Golden, 1998; Rosenthal, 2001; Yackee and Yackee, 2006). In addition, utilities continue to be among the most influential groups throughout the regulatory process. This is not surprising given that many PUC proceedings are utility-driven: utilities are tasked to submit plans, timelines, and proposals. For most non-utility stakeholders, participation is therefore reactive. Non-utility stakeholders are often responding to the agenda that utilities and other powerful stakeholders set.

Despite the strong influence that utilities maintain during these PUC proceedings, this dissertation also confirmed that environmental and clean energy groups can also be influential throughout the process. This is a major contribution to the interest group and regulatory literatures as previous federal literature on interest group influence has been mixed (Baumgartner and Leech, 1998; Rosenthal 2001; Burstein and Linton, 2002; Yackee and Yackee, 2006 Berry and Wilcox, 2008; Baumgartner et al., 2009; Hojnacki et al. 2012; Yackee, 2011, 2015) and there have only been a few state rulemaking studies (Rinfret, Cook, and Pautz 2014; Crow, Albright, and Koebele, 2016, 2020; Roundtree and Baldwin 2018). These findings put into question the viability of the regulatory capture model and whether future research should reconceptualize what influence actually looks like in the context of a more diverse stakeholder framework.

Second, this dissertation uncovered key access points during the regulatory process. In particular, this confirmed that the pre-proposal stage is a critical stage for influence in which stakeholders can shape and define the agenda. Again, this is in line with previous federal and state literature (Yackee, 2011; 2015; Rinfret, Cook, and Pautz, 2014; Crow, Albright, and Koebele, 2016, 2020). This dissertation discovered that environmental and clean energy stakeholders were more successful at influencing the final rules or order when they had access to the process from the beginning of the pre-proposal stage at state PUCs in California, Oregon, and Nevada.

In some instances (i.e., New York), the majority of the final rules were established even before the formal start of the rulemaking. In these cases, only a few industry stakeholders had "access" to setting and framing the agenda, which bodes poorly for stakeholders that want to be at the table to set the agenda from the very beginning of the pre-proposal stage.

However, these findings should not necessarily be perceived as a complete loss as this dissertation showed that the comment period is also a key point of influence. Non-utility stakeholders can still influence the content of the rulemaking at these points, especially when they are involved during the pre-proposal phase and there are multiple opportunities for stakeholder meetings and comment periods.

It is important to note that a stakeholder's ability to be influential during the final rules was contingent on their level of participation during the comment period. The fsQCA analysis identified that a stakeholder's participation during the comment period was a necessary condition. A stakeholder's level of participation is an important finding as it shows that if a stakeholder wants to be influential, they will need to engage at a high level during the comment period. Stakeholders will need to commit a high level of resources and time into their submitted comments. This finding is supported by interviewee responses that highlighted that the expertise and quality of stakeholder comments were integral to being successful at state PUCs. As the next section highlights, this has implications for how stakeholder frameworks at PUCs should be organized.

Access to Inclusive Opportunities

The findings from this dissertation show that inclusive access points provide more meaningful opportunities for stakeholders. Much of the regulatory literature has focused on PUC practices and procedures that promote participation (Golden, 1998; Furlong and Kerwin, 2004; Woods, 2009, 2015; Baldwin 2019a, 2019b). While participatory opportunities bring in a wide array of stakeholders and provide them opportunities to be part of the process, this dissertation discovered that stakeholder processes focused on inclusiveness engendered more meaningful opportunities for traditionally less influential stakeholders (e.g., environmental and clean energy stakeholders). Inclusive opportunities provided stakeholders opportunities for multiple ways of knowledge, coproduction, and temporal openness (Quick and Feldman, 2011). Inclusive opportunities included stakeholder workshops and technical meetings, working groups, and an emphasis on norms such as consensus. These inclusive opportunities provided stakeholders a more substantive role at the metaphorical and literal "table."

For example, in the case of New York, the DPS provided multiple participatory opportunities for stakeholders. The DPS facilitated stakeholder technical meetings and public hearings that spanned multiple locations around the state that were also scheduled at convenient times. There were also two public comment periods in which commenters could easily submit their comments online. Despite these participatory opportunities, the stakeholder process was not as meaningful because the agenda had already been set far before the rulemaking had begun.

In contrast, in the case of California, the California Public Utilities Commission (CPUC) provided distinct participatory *and* inclusive opportunities for stakeholders: there were multiple comment periods, over a dozen stakeholder meetings, access to the pre-proposal stage, stakeholder workshops, and policy linkages. Stakeholders who had the capacity to remain engaged in the stakeholder process during this period were able to shape the agenda from the beginning. There was time for stakeholder learning and deliberation. In addition, the CPUC was genuinely interested in conducting a rulemaking that included stakeholder input and expertise since California was the first state to implement an energy storage program.

This dissertation also discovered that there are instances in which smaller stakeholder frameworks can lead to more meaningful participation and thereby opportunities to influence the process. PUC proceedings that emphasized consensus and deliberation only included a select number of stakeholders. The size of the stakeholder processes was likely reflective of the smaller sizes of the state and the PUC. Nonetheless, it is during these smaller proceedings that environmental and clean energy groups have been able to exert the highest level of influence over the final comments.

For example, there was only one environmental group in Nevada, Western Resource Advocates (WRA). However, WRA took the lead during the energy storage proceedings due to the group's experience working at PUCs and its ability to have a staff member on location. Similarly, a limited number of clean energy groups were involved in Oregon's energy storage proceeding. Renewable NW (RNW) was able to take the lead to represent the interests of multiple environmental and clean energy groups. Therefore, facilitating smaller stakeholder proceedings may provide more meaningful opportunities and time for stakeholders to participate than in stakeholder proceedings that have a large number of stakeholder groups involved.

These findings highlight that while it is important to continue broadening participatory opportunities for stakeholders, it is even more critical to provide inclusive opportunities.

Issue Ambiguity, Learning, and the Role of Experts in Shaping the PUC Agenda

This dissertation revealed the role that issue ambiguity can play in shaping the scope and context of the stakeholder process at PUCs. In addition, issue ambiguity created an opportunity for environmental and clean energy interest groups to influence the final rules. Energy storage was a new issue for each of the five states. Little was known about energy storage regarding its multiple uses, how it would be valued, and how it would be integrated into the traditional electric grid and the energy market. Each of the PUCs sought to overcome energy storage's issue ambiguity in different manners, which ultimately shaped the stakeholder process and the following final rules.

First, the issue ambiguity around energy storage prevented the formation of oppositional coalitions, which gave environmental and clean energy groups a greater opportunity to influence the process. Since there was so much ambiguity around energy storage, it was difficult for interest groups to coalesce around a common definition, set of uses, and what its benefits were. Environmental and clean energy stakeholders were able to capitalize on the uncertainty and diverse preferences of traditionally, more powerful groups (i.e., utilities). This is in line with Faulkner's (2008), business conflict model which advanced that conflict and discord among business and industry stakeholders can weaken their power position, thus providing an opportunity for environmental policies to develop independently of the full pressure of the opposing coalition. Similarly, Stokes (2015) discovered that renewable energy policies have often been enacted during times of crisis when opponents are either distracted or divided.

It is important to note that many environmental and clean energy groups also had opposing views. These groups had a similar experience struggling to find common understandings and preferences for energy storage just as much as utility and industry interest groups. However, the traditionally powerful collaboration of utility and business interests was not solidified as it has been for other issues that were more salient and transparent. In addition, environmental and clean energy groups typically made up a small proportion of the total stakeholders, thereby making it easier to avoid the group discord and divisions of larger factions.

Some of the later energy storage proceedings (i.e., New York and Virginia) did have interest group coalitions: environmental, utilities, energy storage industry, and power producers. It is possible that the utility and industry coalitions were more influential in these proceedings because they had a stronger, common understanding of energy storage than the utilities involved in the first few energy storage proceedings. In addition, the energy politics in each of these states imposed unique contexts that may have empowered certain stakeholders more than others. Nonetheless, issue ambiguity continued to be a challenge even in Virginia in 2021, as stakeholders and the SCC were still uncertain how it would be defined and managed.

Second, *how* each PUC chose to "learn" about energy storage ultimately impacted the stakeholder process. State energy storage proceedings that primarily relied on third-party studies to frame the rulemaking were less stakeholder intensive than state energy storage proceedings that facilitated stakeholder learning and deliberation. For example, in New York, the New York Energy Research and Development Authority (NYSERDA) and the New York Department of Public Service (DPS) directed the framework of the Energy Storage Roadmap with the help of consultant groups. The following energy storage rulemaking was framed purely by the content of the Energy Storage Roadmap, leaving little room for stakeholder input or deliberation.

Issue ambiguity had a large effect on how each of the five PUCs employed experts to overcome this information challenge. Experts ranged from research institutions, energy storage consultants, and energy storage developers. Given that energy storage was such a new issue, the need for experts was integral to each of the energy storage proceedings. Experts were utilized in two ways: to first inform stakeholders and the commission, and secondly to craft the agenda and content of the final rules. Experts were brought in during stakeholder meetings to encourage learning. Many stakeholders had a rudimentary understanding of energy storage, especially in the case of California and Oregon.

Experts were also brought in to help provide the technical knowledge to craft the agenda and, in some cases, a large portion of the content for the final rules. There were instances in which a couple of the PUCs relied on bureaucratic agencies to collect the majority of the information in collaboration with research institutions and industry groups. In other cases, the PUCs requested a third-party study conducted on their behalf. In all of these cases, the PUC relied heavily on outside experts to inform the content of the proceeding.

There are advantages to bringing in third-party experts at various phases of the regulator process. First, third-party experts or consulting groups provide the commission with legitimate information that can inform the process and content. The whole point of stakeholder participation is to ensure that the commission receives diverse information and perspectives to make the best possible determinations in the customer's interest.

Second, a third-party consultant group or expert helps make the process more transparent as often the study and models underpinning the report are open access. This is in contrast to utility reports, which often include calculations based on proprietary knowledge about their systems and practices. The lack of transparency was a common complaint in the Oregon case with the utility, PGE. PGE used a production cost model called the Resource Optimization Model (ROM) to simulate annual reviews of its system and its annual IRP analysis. PGE utilized ROM to make forecasts of energy storage, which often clashed with the models and assessments of other stakeholders. Stakeholders were unable to access information about these modeling outcomes, which exacerbated the uncertainty of energy storage.

Finally, the practice of turning to a third-party consultant or expert for information provides a small window of opportunity for stakeholders to be there from the beginning to shape the agenda. This was the case in California with the California Energy Storage Association (CESA). Given its superior knowledge of energy storage, CESA was integral in shaping the scope and content of the rulemaking in which very few stakeholders knew that much about the issue. These findings highlight an important access point to influence the process, especially when there is little issue salience and much issue ambiguity.

Issue ambiguity had a large role in shaping each state's energy storage proceedings. However, power dynamics may likely shift in future energy storage proceedings as energy storage becomes more salient and common definitions and practices become established. State PUCs may spend less time conducting stakeholder-intensive processes as they gain greater knowledge of implementing energy storage programs in their states.

Barriers to Participation

This dissertation discovered that there is a resource barrier for groups that do want to participate at the PUC. There have been mixed results within the interest group and regulatory literatures on the effects of finances on an interest group's ability to be influential. At the federal level, some studies have highlighted that an interest group's finances were ineffective on their ability to be influential over the outcome (Baumgartner et al., 2009). In contrast, other findings that showed how finances were crucial to a group's ability to participate and thereby be influential in the process (Rosenthal 2001; Crow, Albright, and Koebele, 2019).

While the fsQCA portion of the dissertation had mixed results on the relationship that group capacity had on participation, the stakeholder interviews emphasized that capacity was a determining factor for many stakeholders' decision to participate in the PUC proceeding or not. As previous literature has noted (Roundtree and Baldwin, 2018; Albright, Crow, and Kobele, 2019, 2020), there is a major technical gap between professional stakeholders and lay stakeholders. Interviews with key stakeholders and interest groups that were not involved highlight that knowledge of the PUC is a crucial barrier to many interest groups participating in the PUC. Many environmental and clean energy groups are unaware of PUC procedures or even how to participate.

Many clean energy and environmental groups do not have the finances, time, and staff to participate in all of the PUC dockets that they would want to participate in. These groups must prioritize issues and only participate in PUC proceedings that they can contribute the most value towards. In addition, some PUC proceedings require the expertise of an attorney (e.g., rates cases and contested cases), which many groups do not have the resources to maintain within their organization or even contract. Therefore, many interest groups that might have a meaningful perspective or information to share are unable to tackle the immense technical and resource barriers to participate at PUCs.

However, opening up intervenor compensation to advocacy and environmental groups may help create a more level playing field for resource-strapped interest groups that want to participate but do not have the resources. The case of California is a prime example of how intervenor compensation could be used successfully to support environmental and advocacy groups that would not have been able to participate otherwise. Some interviewees in California noted that additional funds enabled them to contract out third parties to conduct studies, information gathering, or even hire additional staff (e.g., environmental attorney) (CA Interview 3; CA Interview 4; CA Interview 6). These additional resources helped support the group's position and their comments at the PUC.

Since its energy storage proceeding, Oregon, too, has opened its intervenor program to environmental and environmental justice interest groups. Therefore, it will be interesting to see whether intervenor compensation will positively impact participation at the Oregon PUC and how that may impact a group's level of influence.

Implicit Influence

Finally, this dissertation's findings culminated with the model of implicit influence. The model of implicit influence provides a compelling approach to understanding how individuals construct their perceptions of others. The model of implicit influence advances that individuals construct their perceptions of influence based on five facets: expertise, experience, capacity, reputation, and network. Previous literature has not addressed the concept of implicit influence because of its fluidity and the difficulty in pinning down various facets of influence. Yet, these findings on implicit influence are meaningful because they provide a deeper examination into the stakeholder dynamics at state PUCs.

Implicit influence was an important finding in this dissertation because it explained discrepancies between data on group influence over the final order and perceptions of influential groups by interview respondents. As this dissertation has shown, an individual's implicit influence can predispose other stakeholders' actions towards them, which can have beneficial (or harmful) consequences in later PUC proceedings and interactions with other stakeholders. The perception of influence can be almost more powerful than the actual act of influence.

The model of implicit influence is particularly important when explaining stakeholder dynamics between insider stakeholders (individuals with high levels of implicit influence) and outsider stakeholders (individuals with low levels of implicit influence). As the state rulemaking literature has noted (Crow, Albright, and Koebele 2016; 2020; Roundtree and Baldwin, 2018), there is a stark difference in success between insider and outsider stakeholders.

Insider stakeholders possess years of individual experience and expertise at the PUC. In addition, insider stakeholders have nurtured professional relationships with other stakeholders and agency members. All of these factors connect to an individual's level of implicit influence. Possessing a high level of implicit influence can give insider stakeholders advantages with regards to,

(1) gaining information about the process and the positions of other stakeholders

(2) being invited to help shape the rules or the agenda by staff members,

(3) understanding the agency culture,

(4) having common norms of engagement,

(5) greater opportunities to collaborate with other stakeholders.

In contrast, outsider stakeholders will have lower levels of implicit influence as they are often newer to the process and have less experience with the PUC. Outsider stakeholders will also have fewer network ties with other stakeholders. Many outsider stakeholders are from non-profit, advocacy, or environmental and clean energy groups. These groups traditionally have fewer resources (e.g., staff and finances), making it more difficult to engage at the PUC as the PUC process is time, resource, and knowledge intensive.

Possessing a low level of implicit influence is a disadvantage as there may be fewer informal opportunities to shape the rules and coordinate with other stakeholders. In addition, individuals with a low level of implicit influence may not be perceived as influential, even when they have achieved measurable successes. Therefore, a low level of implicit influence is a major barrier to being influential during the regulatory process.

As PUCs continue to work to bring in diverse stakeholders, new stakeholders will need to consider how to overcome these barriers to participate and influence the process effectively. The stakeholder process will not be effective if insurmountable power imbalances exist between insider stakeholders (high implicit influence) and outsider stakeholders (low implicit influence).

Implications for Theory and Policy

Theoretical Implications

Much of this dissertation confirmed previous literature on federal and state rulemaking regarding: the influence of industry groups in rulemakings (Baumgartner et al. 2009; Golden, 1998; Rosenthal, 2001; Yackee and Yackee, 2006), issue definition

(Kamieniecki, 2006)), the pre-proposal phase (Yackee, 2011, 2015; Rinfret, Cook, and Pautz, 2014; Crow, Albright, and Koebele, 2016), the importance of the notice and comment period (Yackee, 2005), and stakeholder motivations for participation (Golden, 1998; Furlong and Kerwin, 2004; Woods, 2009; Baldwin and Roundtree, 2018; Albright, Crow, and Koebele, 2019, 2020).

However, this dissertation adds to this body of literature by examining these phenomena across five state PUCs, in detailed case studies that analyzed the contexts (i.e., legislative mandates and issue ambiguity) and the drivers (i.e., participatory and inclusive access points for stakeholder engagement) that shaped each of the PUC stakeholder frameworks.

First, the context of these cases is important for future theoretical work. Each of the five state studies provides distinct information about the PUCs, procedures, and the social dynamics with major stakeholders. These state studies can be a preliminary step towards building a greater bank of knowledge on state PUCs and stakeholder frameworks within the state regulatory literature.

Second, this dissertation's fsQCA results provided a causal combination of sufficient conditions that could be the basis for future theoretical work on regulatory access points. The fsQCA results confirmed the importance of the pre-proposal and comment phases at state PUCs. This is a meaningful theoretical contribution to the state regulatory literature, as there has not been as much scholarship at this level.

Third, the findings on inclusive access points for stakeholder engagement are notable contributions to theory. Most of the regulatory literature has focused primarily on participatory access points (e.g., notification and comment period and bringing in more diverse participants). Inclusive opportunities are just as important, if not more so, than participatory opportunities. The findings on inclusive access points should be applied to other states and PUCs to understand better how inclusive stakeholder frameworks can shape stakeholder relationships and processes.

Finally, this dissertation provides a novel approach to studying stakeholder perceptions of influence through the model of implicit influence. This is an important finding for the interest group and regulatory literatures because it highlights the heuristics that individuals employ to assess other stakeholders. While the implicit influence model is more conceptual than theoretical, the findings from the interviews provide a strong foundation to apply it to future research studies in other disciplines such as sociology and political science.

However, it is important to emphasize that caution should be used before employing the model of implicit influence. Foremost, the model of implicit influence is framed for individuals, not groups or countries. Therefore, in order to maintain the model's integrity, future research should just use it to examine interactions among just individuals or groups of individuals. In addition, the model is bound by four other requirements,

(1) Defined individuals and set of groups.

(2) Common issue or reason that brings these individuals together.

(3) Defined formal space or setting that these individuals meet with one another.

(4) Consistent and iterative interactions within the formal settings (e.g., meetings, hearings, conferences).

The first test of the model should be to see whether it is generalizable to other state PUCs across other energy issues. If the model's validity can be established across these similar contexts, the model could then be applied to other issue areas and disciplines. The model of implicit lays a promising theoretical foundation for analyzing the social dynamics of individuals in group settings.

Policy Implications

There are a few policy implications that state PUCs and clean energy and environmental interest groups should pay particular attention to from this dissertation. Regarding state PUCs, if state PUCs are serious about opening up the stakeholder process to new stakeholders, they will need to also consider including inclusive opportunities for stakeholders to access. Broadening and diversifying participation is important, but the emphasis on increasing participation in the PUC stakeholder processes is misplaced. This statement does not mean to dispel the importance of participatory measures. Participatory measures that seek to broaden participation, notification, and transparency remain at the core of the stakeholder process.

However, there are implications from this dissertation that show that the addition of more stakeholders is not always the most beneficial arrangement. As stakeholders noted, the PUC process is about ensuring that the commission receives robust information and facts about the policy issue. The commission does not want the same points to be brought up: the *quality* of each stakeholder's contributions matters. If new stakeholders do not find the process to be meaningful, they will likely not participate in the future.

Thus, PUCs should work to provide more inclusive opportunities for stakeholders to be involved in. In particular, the pre-proposal stage should be open to all stakeholders, as this is the critical stage for framing and defining the agenda. If state PUCs truly care about ensuring that the record and the content have the best information, they should ensure that there is a diverse range of perspectives and facts represented at the pre-proposal stage.

In addition, there should be greater inclusive opportunities for stakeholder workshops and meetings in which stakeholders can interact and deliberate with one another. While hosting stakeholder meetings is time-consuming, the learning, deliberation, and networking at these meetings are indispensable for future proceedings and interactions among stakeholders.

When possible, state PUCs should emphasize the inclusive norm of consensus. The norm of consensus compels stakeholders to actively work together to achieve a satisfactory outcome for most parties involved. Informal negotiating and deliberation can help stakeholders form greater relationships to come to a more advantageous outcome for all groups. At a minimum, stakeholders become more familiar with other stakeholders' perspectives and policy interests. The commission also benefits by overseeing a more efficient, orderly, and collaborative proceeding.

In addition to policy implications for state PUCs, this dissertation has several implications for environmental and clean energy interest groups. This dissertation discovered that traditional advocacy strategies by environmental groups and lay interest groups will likely not be effective at state PUCs. Technical and resource barriers make participation difficult for many of these lay interest groups. In particular, experience and expertise were found to be integral factors for successful stakeholders at state PUCs.

It is important to include these environmental and advocacy positions. However, the manner in which those perspectives are presented matters. State commissions are looking for information that will inform the record and their final decision. Commissions want analytical arguments that consider the economic impact that certain policies will exact. While safety, health, and environmental factors may be taken into consideration in commission decisions, there needs to be credible facts to support why certain policies will be unsafe. Lay stakeholder comments that lack technical and expert opinions will likely not be received with the same amount of attention as those by professional stakeholders.

Therefore, advocating to broaden participation and make the process more accessible to inexperienced interest groups is insufficient for stakeholder engagement reforms at state PUCs. Environmental and clean energy groups will need to find other ways to engage in the PUC process. Rather than remaining on the fringe, environmental and clean energy groups may want to consider creating more formal network coalitions that work consistently to support innovative policies at state PUCs. While there are informal networks amongst environmental groups around PUC issues (i.e., Oregon and

Virginia cases), there does not seem to be a formalized process or coalition in any of the states. Many trade groups and some clean energy groups already have member associations. However, it does not seem that local environmental groups have established formal coalitions to advance a shared perspective at the PUC.

A formalized environmental coalition would provide a compelling force to solidify the environmental perspective while mitigating the technical and resource barriers that most groups face at state PUCs. It is important to note that this formal coalition would not be the same type of coalition seen across some of the energy storage proceedings in this dissertation (New York, Virginia, and California). Those coalitions were loosely organized and mainly consisted of joint comments.

The distinguishing features of the formalized coalitions that I have advanced would emphasize,

(1) an enduring coalition that would last longer than a few PUC proceedings

(2) a general fund that all groups would contribute to

(3) actively use funds to elevate the content and information of the comments they submit to the PUC (e.g., hire consultants, experts, modelers, or attorneys).

There are obvious issues with the concept of a formalized environmental coalition. Not all environmental or clean energy groups will have the same interests. As the energy storage proceedings showed, there was a wide range of preferences across environmental and clean energy groups. However, given that state PUCs will continue to see an increase in environmental and clean energy issues in the near future, it is advantageous for environmental groups to recognize that their efforts at the legislative phase are only good if they follow them through to the regulatory phase. As the case of Virginia highlighted, the commission was able to greatly weaken the content and the scope of the energy storage target program from what the original legislators had intended. Therefore, the regulatory phase is crucial to ensuring that the rules and regulations are not diminished due to opposing interests.

Future Research

This dissertation initially began as an examination of environmental and clean energy stakeholder influence at PUCs. As I was able to gain a greater understanding of the cases and the context, this dissertation grew into something more than I would have predicted when I first started this process. Nevertheless, there is always more that can be done to advance future research on stakeholder engagement at state PUCs.

In hindsight, there are a few methodological issues that I would have liked to have approached differently. First, while there were obvious challenges to conducting interview data from all five states, future research should work to bridge this interview data gap. The insights from the interview data that I did collect from Oregon and California were invaluable to understanding stakeholder actions and the culture of the state PUCs. A more expansive interview data set across all types of stakeholders would help build a more comprehensive understanding of PUCs across the country. In addition, it is important to continue to include interviews of interest groups that did not participate in order to understand the initial barriers to participation.

Second, while this dissertation was concerned with explaining just environmental and clean energy groups' influence, future research should use the fsQCA model to examine influence for all of the stakeholder groups across the five states. Broadening the eligible cases would provide a more rigorous test of the model of stakeholder access points. In addition, it would likely illuminate important differences among stakeholder groups.

Third, future research should develop a more advanced method of calculating influence. As this dissertation has shown, it is difficult to calculate influence as it is fluid and varies over time. However, that does not mean it is impossible. The fsQCA measurements of influence over the final rules were more detailed than previous literature but were still rough measurements and relied heavily on the quality of the PUC record and the staff responses to stakeholders. The measurements for influence were unable to calculate influence during the pre-proposal phase. Future research should find a method for calculating influence during the pre-proposal phase that finds a balance between interview responses and content analysis of comments.

Fourth, it would be fruitful for future research to have a more rigorous method for determining the scope of network connections. While I used participant responses to construct a rough analysis of network relationships, it only skimmed the surface. A more advanced network analysis model could explore stakeholder relationships and interactions in finer detail.

Fifth, future research should test this dissertation's models of stakeholder access and influence and stakeholder implicit influence to see how they convey to other states.

Energy storage policy has, until recently, received little mainstream attention. As more states pass energy storage target legislation, there will be a greater amount of data and cases to observe whether the contexts (legislative mandates and issue ambiguity) and drivers (inclusive and participatory access points) of stakeholder influence change or remain consistent.

Future studies on energy storage rulemakings should continue to examine how state PUCs handle issues of ambiguity and whether the stakeholder process will change as energy storage becomes an established technology. Environmental and clean energy stakeholders may have less influence in future energy storage proceedings as PUCs take less time to learn and deliberate about energy storage.

In addition, the model for stakeholder access points and influence is a useful starting point for gaining a greater understanding of state PUCs. While there is an emerging white paper literature on state PUCs, little is known about the culture, process, and norms of state PUCs in the academic literature. Research on state PUCs is particularly important given that PUCs are fast becoming the hub for renewable energy, clean energy, and distributed energy policies.

Finally, the model of implicit influence is a promising approach for examining the construction of stakeholder influence. While traditional interview methods have highlighted the disadvantages of participant biases and inaccuracies, the model of implicit influence embraces these heuristics and inaccuracies to explain stakeholder relationships and power dynamics. The concept of implicit influence should not be perceived as detrimental to interview research methods but appreciated for explaining the complexity of social interactions among stakeholders.

Final Thoughts: Addressing the Challenge of Climate Change

While most of this dissertation shifted to examine the stakeholder process at state PUCs, one would be remiss not to address how this dissertation's findings can exact positive change for state and national climate change goals. The premise of this dissertation noted the inactivity of meaningful climate change policies at the international and national levels over the past decade. While international agreements such as the Paris Agreement have been signed by most of the world's countries, there have not been substantial changes to national policies. Carbon emissions continue to rise despite these international agreements and country leaders posturing on the importance of climate change.

It is really at the state level that visible climate change goals are being implemented through renewable and clean energy policies. Many of these policies are related to transitioning states to renewable energy systems and to creating an updated, resilient energy grid. Therefore, state PUCs must carry the onus of overseeing the complete overhaul of the traditional electric grid.

The majority of state PUCs are coming to terms that their statutory authority to oversee the economic regulation of utilities is insufficient to meet the policy demands of the 21st century. For example, PUCs in Washington D.C. and Connecticut have made it so that they will need to also take into account environmental considerations in addition to just economic ones. In addition (as is the focal point of this dissertation), state PUCs are working to increase participatory and inclusive mechanisms to accommodate the influx of new stakeholders. However, as this dissertation showed, not all stakeholder frameworks are equal.

Inclusive mechanisms promoting multiple ways of knowing, coproduction, and temporal openness can enable previously disenfranchised environmental and clean energy groups to be more influential in shaping the final rules. Therefore, the findings from this dissertation are important to ensure that groups that have environmental and clean energy interests are being invited to the table continually and have equal opportunities to shape the process and content of the proceeding. It is through these institutional changes that environmental and clean energy groups can begin to advance policy that supports climate change goals.

Bibliography

Andersen, Glen, Laura Shields and Jeremy Twitchell. (2021). "Energy Storage for a Modern Electric Grid: Technology Trends and State Policy Options". National Conference of State Legislatures. https://www.ncsl.org/research/energy/energy-storage-for-a-modern-electric-grid-technology-trends-and-state-policy-options.aspx

Anderson, Jake. (March 2, 2019). "Batteries Are a Scalable Energy Storage Technology". ASES. https://ases.org/batteries-are-a-scalable-energy-storage-technology/

Andris Abele, Ethan Elkind, Jessica Intrator, Byron Washom. (2011). "2020 Strategic Analysis of Energy Storage in California, California Energy Commission". Publication Number: CEC-500-2011-047.

Aneke, M., & Wang, M. (2016). Energy storage technologies and real-life applications–A state of the art review. *Applied Energy*, *179*, 350-377.

Anzia, S. F. (2019). Looking for influence in all the wrong places: How studying subnational policy can revive research on interest groups. *The Journal of Politics*, *81*(1), 343-351.

Bade, Gavin. (November 9, 2018). "Storage will replace 3 natural gas plants as PG&E nabs approval for world's largest batteries". *Utility Dive*. https://www.utilitydive.com/news/storage-will-replace-3-california-gas-plants-as-pge-nabs-approval-for-worl/541870/

Baldwin, E. (2019a). Exploring how institutional arrangements shape stakeholder influence on policy decisions: A comparative analysis in the energy sector. *Public Administration Review*, *79*(2), 246-255.

Baldwin, Elizabeth. (2019b). Why and how does participatory governance affect policy outcomes? Theory and evidence from the electric sector. *Journal of Public Administration Research and Theory*. 365-382.

Baldwin, E. (2020). Why and how does participatory governance affect policy outcomes? Theory and evidence from the electric sector. *Journal of Public Administration Research and Theory*, *30*(3), 365-382.

Baumgartner, Frank R., & Leech, B. L. (1998). *Basic interests*. Princeton University Press.

Baumgartner, Frank R., and Jones, Bryan. 2009. *Agendas and Instability in American Politics*, 2nd ed. Chicago: University of Chicago Press.

Baumgartner, Michael. (2015). "Parsimony and Causality". *Qual Quant* **49,** 839–856 https://doi.org/10.1007/s11135-014-0026-7

Berry, M.J., Laird, F.N., & Stefes, C.H. (2015). Driving energy: the enactment and ambitiousness of state renewable energy policy. *Journal of Public Policy, 35*, 297-328.

Berry, J. M., & Wilcox, C. (2008). *The Interest Group Society*. Routledge.

Berton, Hal. (November 9, 2018). "After I-1631, What's Next for Trying to Put A Price on Fossil Fuels In Washington state?" *The Seattle Times*. https://www.seattletimes.com/seattle-news/politics/after-another-election-failurepricing-fossil-fuel-pollution-faces-an-uncertain-future-in-washington-state/

Billimoria, S., Shipley, J., and Guccione, L. (2019, March). Leading utility regulatory reform: Process options and lessons from Oregon. Montpelier, VT, and Basalt, CO: Regulatory Assistance Project and Rocky Mountain Institute.

Bloomberg NEF. (2021). "Energy Transition Investment Trends: Tracking global investment in the low-carbon energy transition". Bloomberg NEF. https://assets.bbhub.io/professional/sites/24/Energy-Transition-Investment-Trends_Free-Summary_Jan2021.pdf

Braun, V., and Clarke, V. (2006). "Using thematic analysis in psychology". *Qualitative Research in Psychology,* 3(2), 77. doi:10.1191/1478088706qp063oa

Bromley-Trujillo, Rebecca, Butler, J.S., Poe, John, & Davis, Whitney. (2016). "The Spreading of Innovation: State Adoptions of Energy and Climate Change Policy". *Review of Policy Research*, 33(5), 544-565.

Burck, Jan, Franziska Marten and Christoph Bals. (2014). "Climate Change Performance Index, 2014). German Watch. https://ccpi.org/download/climate-change-performance-index-2014/

Burwen, Jason. (April, 24 2020). "Energy Storage Goals, Targets, Mandates" What's the Difference?" Energy Storage Association. https://energystorage.org/energy-storage-goals-targets-and-mandates-whats-the-difference/

The Business Council for Sustainable Energy. (2021). "Sustainable Energy in America 2021: Factbook". The Business Council for Sustainable Energy. https://bcse.org/factbook/

California State Auditor. (2013). “California State Auditor Report 2012-118”. The California State Auditor. https://www.bsa.ca.gov/pdfs/reports/2012-118.pdf

California Legislative Information. (2019). “AB 2514 Energy Storage Systems). California Legislative Information. https://leginfo.legislature.ca.gov/faces/billHistoryClient.xhtml?bill_id=200920100AB2514.

Carley, Sanya. 2009. “State Renewable Energy Electricity Policies: An Empirical Evaluation of Effectiveness.” *Energy Policy,* 37(8), 3071–81.

Carley, Sanya. 2011. “The Era of State Energy Policy Innovation: A Review of Policy Instruments.” *Review of Policy Research,* 28(3), 265–94.

Carley, S., & Miller, C. J. (2012). Regulatory stringency and policy drivers: A reassessment of renewable portfolio standards. *Policy Studies Journal*, 40(4), 730–756.

Carpenter, Daniel & Moss, David. (2013). *Preventing Regulatory Capture: Special Interest Influence and How to Limit It*. Cambridge: Cambridge University Press.

Chandler, J. (2009). “Trendy solutions: Why do states adopt sustainable energy portfolio standards?” *Energy Policy*, 37(8), 3274–3281.

Climate Group. (April 2017). “California’s Energy Storage Procurement Mandate”. The Climate Group. https://www.theclimategroup.org/sites/default/files/downloads/etp_californiacasestudy_apr2017.pdf

Cooper, Phillip. (2006). *Public Law and Administration*. (4th ed). Cengage Learning.

Cooper, Phillip and Vargas, Claudia María, (2004). *Implementing Sustainable Development: From Global Policy to Local Action*. Rowman & Littlefield.

Cross-Call, Dan, Cara Goldenberg, and Claire Wang. (2019). *Process for Purpose: Reimagining Regulatory Approaches for Power Sector Transformation*, Rocky Mountain Institute. https://rmi.org/insight/ process-for-purpose/.

Crow, Deserai A., Elizabeth A. Albright, & Elizabeth Koebele. (2016). "Environmental Rulemaking Across States: Process, Procedural Access, and Regulatory Influence". *Environment and Planning C: Government and Policy*, 34(17), 1222-1240.

Crow, Deserai A., Elizabeth A. Albright, & Elizabeth Koebele. (2017). "Evaluating Informational Inputs in Rulemaking Processes: A Cross-Case Analysis". *Administration and Policy*, 49(9), 1318-1345.

De Martini, P., C. Brouillard, M. Robinson, and A. Howley. (2016). *The Rising Value of Stakeholder Engagement in Today's High Stakes Power Landscap*e. ICF. https://www.icf.com/insights/energy/the-rising-value-of-stakeholder-engagement

Duncan, Jake and Klee, Robert. (June 23, 2020). "Transforming Utility Regulation to Address Climate Goals". *IMT*. https://www.imt.org/transforming-utility-regulation-to-achieve-climate-goals/

Dunn, Bruce, Kamath, Haresh, & Tarascon, Jean-Marie. (2011). "Electrical Energy Storage for the Grid: A Battery of Choices". *Science*, 334 (6058), p. 928-935.

Falkner, Robert. (2003). "Private Environmental Governance and International Relations: Exploring the Links." *Global Environmental Politics.* 3(2), 72-87.

Federal Energy Regulatory Commission. (2020). “What Is FERC”. Federal Energy Regulatory Commission. https://www.ferc.gov/about/what-ferc/what-ferc-does

Fitzgerald, Garrett, James Mandel, Jesse Morris, Hervé Touati. (2015). “The Economics of Battery Energy Storage: How multi-use, customer-sited batteries deliver the most services and value to customers and the grid”. Rocky Mountain Institute. https://rmi.org/wp-content/uploads/2017/03/RMI-TheEconomicsOfBatteryEnergyStorage-FullReport-FINAL.pdf

Fortnightly. (2015). “2015 Regulators Forum”. *Fornightly*. http://mag.fortnightly.com/publication/?i=279899&article_id=2317998&view=articleBrowser#{%22issue_id%22:279899,%22view%22:%22articleBrowser%22,%22article_id%22:%222317998%22}

Furlong, Scott R, and Kerwin, Cornelius M. (2004). “Interest Group Participation in Rule Making: A Decade of Change”. *Journal of Public Administration Research and Theory*, 15(3), 353-370.

Furlong, S. R. (1997).” Interest group influence on rule making”. *Administration & Society*,(*29)*, 325-347.

Golden, M. (1998). “Interest groups in the rule-making process: Who participates? Whose voices get heard?” *Journal of Public Administration Research and Theory*, (*8)*, 245-270.

Gray, Virginia & Lowery, David. (1998). “To Lobby Alone or in a Flock: Foraging Behavior Among Organized Interests”. *American Politics Quarterly*, 26(1) 5-34.

Gormley Jr, W. T. (1982). Alternative models of the regulatory process: Public utility regulation in the states. *Western Political Quarterly*, *35*(3), 297-317.

Groom, Nichola. (May 2 2018). "Clean Energy Sector Swings Republican With U.S. Campaign Donations". *Reuters*. https://www.reuters.com/article/us-usa-election-solar/clean-energy-sector-swings-republican-with-u-s-campaign-donations-idUSKBN1I31DZ

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field methods*, *18*(1), 59-82.

Guest, G., Namey, E., & Chen, M. (2020). A simple method to assess and report thematic saturation in qualitative research. *PloS one*, *15*(5), e0232076. https://doi.org/10.1371/journal.pone.0232076

Hojnacki, Marie, Kimball, David C., Baumgartner, Frank R., Berry, Jeffrey M., & Leech, Beth L. (2012). "Studying Organizational Advocacy and Influence: Reexamining Interest Group Research". *Annual Review of Political Science*, 15(3) 7-99.

Intergovernmental Panel on Climate Change. (2007). *The IPCC Assessments of Climate Change and Uncertainties Climate Change 2007.* Working Group I: The Physical Science Basis. https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch1s1-6.html

Intergovernmental Panel on Climate Change. (2014). *Climate Change 2014: Synthesis Report, Summary for Policymakers*. Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf

Kahwati, L., & Kane, H. (2020). *Qualitative comparative analysis in mixed methods research and evaluation*. SAGE Publications, Inc. https://www.doi.org/10.4135/9781506390239

Kamieniecki, Sheldon. (2006). *Corporate American and Environmental Policy: How Often Does Business Get Its Way?* Stanford, CA: Stanford Law and Politics.

Kerwin, Cornelius M. and Furlong, Scott R. (2011). *Rulemaking: How Government Agencies Write Law and Make Policy*. (4th ed.). Washington D.C.: CQ Press

Klüver, Heike. (2011). "Lobbying in Coalitions: Interest Group Influence on European Union Policy-Making". Nuffiled's Working Papers Series in Politics.

Laver, M., Benoit, K., & Garry, J. (2003). Extracting policy positions from political texts using words as data. *American Political Science Review*, *97*(2), 311-331.

Lin, Janice. (2012). "California's AB2514: Storage Policy in Action". *Energy Storage Journal* [Online]. Retrieved from http://www.energystoragejournal.com/2012/11/26/californias-ab-2514-storage-policy-in-action/

Jewell, Christopher and Bero, Lisa. (2007). Public Participation and Claimsmaking: Evidence Utilization and Divergent Policy Frames in California's Ergonomics Rulemaking, *Journal of Public Administration Research and Theory*. 17:4, 625–650.

Jones, David. (n.d.) Curbing Utilities' Political Influence". Virginia Conservation Network. Retrieved from https://vcnva.org/curbing-utilities-political-influence/

Karlin, Rick. (June 11, 2021). "With Work Ahead, Public Service Commission at Full Strength Even Amid Critics". Time Union. https://www.timesunion.com/business/article/With-work-ahead-Public-Service-Commission-is-at-16241976.php

Kovaleski, Dave. (September 14, 2018). NY Public Service Commission Approves Environmental Review of Energy Storage Roadmap". Daily Energy Insider. https://dailyenergyinsider.com/news/14811-ny-public-service-commission-approves-environmental-review-of-energy-storage-roadmap/

Laird, Frank N. and Stefes, Christoph, (2009), "The Diverging Paths of German and United States Policies for Renewable Energy: Sources of Difference". *Energy Policy*, 37: 7, p. 2619-2629.

Lowery, D. (2013). Lobbying influence: Meaning, measurement and missing. *Interest Groups & Advocacy*, *2*(1), 1-26.

Lyon, T.P. and Yin, H. (2010). Why do States Adopt Renewable Portfolio Standards? An Empirical Investigation. *The Energy Journal*. 31 (3).

Maloney, Peter (December 14, 2018). "New York Sets 3 GW Storage Target, Doubles Efficiency Goals for Utilities". Utility Dive. Retrieved from https://www.utilitydive.com/news/new-york-psc-sets-states-energy-storage-target-at-3-gw-by-2030/544371/

Matisoff, Daniel C. 2008. "The Adoption of State Climate Change Policies and Renewable Portfolio Standards: Regional Diffusion or Internal Determinants?" *Review of Policy Research,* 25(6), 527–46.

McKay, Amy & Yackee, Susan Webb. (2007). "Interest Group Competition on Federal Agency Rules". American Politics Research. 35:3: 336-357.

Merchant, Emma Foehringer. (July 23, 2019). The Battle for Virginia's Corporate Renewables Market Heats Up". Greentech Media. Retrieved from https://www.greentechmedia.com/articles/read/virginias-corporate-renewables-battle-heats-up

National Technology & Engineering Sciences of Sandia, LLC (NTESS). (2021). “Department of Energy Global Energy Storage Database”. https://www.sandia.gov/ess-ssl/global-energy-storage-database/

Nelson, David & Yackee, Susan Webb. (2012). “Lobbying Coalitions and Government Policy Change: An Analysis of Federal Agency Rulemaking”. *The Journal of Politics*, 74(2) 339-353.

Nelson, Hal T. (2008) “Planning implications from the interactions between renewable energy programs and carbon regulation”. *Journal of Environmental Planning and Management*, 51(4), 581-596,

Nicholson-Crotty, S. (2009). The politics of diffusion: Public policy in the American states. The Journal of Politics, 71(1), 192–205.

Nicholson–Crotty, S. C., Woods, N. D., Bowman, A. O., & Karch, A. (2014). Policy innovativeness and interstate compacts. Policy Studies Journal, 42(2), 305–324.

North Carolina Clean Energy Technology Center. (April 2020). “The 50 States of Grid Modernization: 2020 Review and Q1 2020 Quarterly Report”. North Carolina Clean Energy Technology Center . https://nccleantech.ncsu.edu/wp-content/uploads/2020/04/Q12020_gridmod_exec_final.pdf

Nownes, Anthony J., & DeAlejandro, Krissy Walker. (2009). “Lobbying in the New Millennium: Evidence of Continuity and Change in Three States”. *State Politics and Policy Quarterly*, 9(4), 429-455.

NREL. 2021. “Using Distributed Energy Resources: A How-To Guide for Federal Facility Managers”. NREL. https://www.nrel.gov/docs/fy02osti/31570.pdf

Oregon Department of Energy. (2018). “Electricity Mix Oregon”. Oregon Department of Energy. Retrieved from https://www.oregon.gov/energy/energy-oregon/Pages/Electricity-Mix-in-Oregon.aspx

Oregon Legislative Information. “HB2193”. (2020). Oregon Legislative Information. Retrieved from https://olis.leg.state.or.us/liz/2015R1/Measures/Exhibits/HB2193

Peterman, Carla. (October 8, 2018). “Regulation at California’s Distribution Edge: CPUC Efforts to Integrate, Value, and Monetize Distributed Energy Resources”. Energy Seminar, Stanford University. https://www.youtube.com/watch?v=v6pVyyQb7-0

Peterman, Carla. (October 26, 2018). “Achieving Beneficial Electrification: Lessons Learned from the CPUCs Clean Energy Programs”. UC Davis Energy. https://www.youtube.com/watch?v=Uo58dK6OwLQ

Pitroni, Andrea. 2014. “How to Measure Interest Group Influence: Evidence From Italy”. ECPR Joint Sessions of Workshops 2014.

Pope, Michael Lee. (August 22, 2012). “Shedding Sunshine on the Secret World of Regulation in Virginia Advisory panel rejects effort to open records of the State Corporation Commission”. Retrieved from http://www.connectionnewspapers.com/news/2013/aug/22/shedding-some-sunshine-secret-world-regulation/

Pyper, Julia. (June 16, 2017). “Nevada’s New Solar Law is About Much More Than Net Metering”. GreentechMedia.

https://www.greentechmedia.com/articles/read/nevadas-new-solar-law-is-about-much-more-than-net-metering

Quick, K. S., & Feldman, M. S. (2011). Distinguishing participation and inclusion. *Journal of planning education and research*, *31*(3), 272-290.

Quick, K. S., & Feldman, M. S. (2011, June). Boundaries and inclusive public management. In *Public Management Research Association Conference, Syracuse, New York*.

Rabe, Barry G. (2006). *Race to the Top: The Expanding Role of U.S. State Renewable Portfolio Standards*. Arlington, VA: Pew Center on Global Climate Change.

Rabe, Barry G. (2011). "Contested Federalism and American Climate Policy". *Publius: The Journal of Federalism*, 41(3), 494-521.

Ragin, Charles, C. (1987). *The Comparative Method : Moving Beyond Qualitative and Quantitative Strategies.* Berkeley: University of California Press.

Ragin, Charles, C. (2000). *Fuzzy-Set Social Science*. Chicago: University of Chicago Press.

Ragin, Charles, C. (2008). *Redesigning Social Inquiry: Fuzzy Sets and Beyond*. Chicago: University of Chicago Press.

Ragin, Charles, and Sean Davey. 2017. *fs/QCA [Computer Programme]*, Version 3.0. Irvine, CA: University of California. http://www.compasss.org/software.htm.

Rankin, Sarah. (February 16, 20201). "Virginia Senate Democrats Kill Electric Rate Reform Bills". NBC Washington. Retrieved from https://www.nbcwashington.com/news/local/virginia-senate-democrats-kill-electric-rate-reform-bills/2574882/

Rihoux, B. & Ragin, C.C. (2012). *Configurational Comparative Methods: Qualitative Comparative Analysis (QCA) and Related Techniques*. Thousand Oaks: SAGE Publications, Inc.

Rinfret, Sara, Cook, Jeffrey J., & Pautz, Michelle C. (2014). “Understanding State Rulemaking Processes: Developing Fracking Rules in Colorado, New York, and Ohio”. *Review of Policy Research*, 31(2), 88-104.

Rivera, Alfredo, and Kate Larsen, Hannah Pitt, and Shweta Movalia. (2022). “Preliminary US Greenhouse Gas Emissions Estimates for 2021”. Rhodium Group. https://rhg.com/research/preliminary-us-emissions-2021/

Rosenthal, A. (2001). *The Third house: Lobbyists and lobbying in the States*. Washington D.C.: CQ Press.

Rountree, V., & Baldwin, E. (2018). State-level Renewable Energy Policy Implementation: How and Why Do Stakeholders Participate? *Frontiers in Communication*, *3*, 6.

Rountree, V. (2019). Nevada's experience with the Renewable Portfolio Standard. *Energy Policy*, *129*, 279-291.

Rueb, Emily. (February 2017). “How New York City Gets Its Electricity”. The New York Times. https://www.nytimes.com/interactive/2017/02/10/nyregion/how-new-york-city-gets-its-electricity-power-grid.html

Sabatier, Paul. 1975. "Social Movements and Regulatory Agencies: Toward a More Adequate and less Pessimistic—Theory of 'Clientele Capture'." *Policy Sciences* 6, p. 301-342.

Slapin, J. B., & Proksch, S. O. (2008). A scaling model for estimating time-series party positions from texts. *American Journal of Political Science*, *52*(3), 705-722.

Squires, Paula C. (March 29, 2018). Electric utility reform: New law paves way for investments in the grid and renewable energy, but does it provide enough oversight?". https://www.virginiabusiness.com/article/electric-utility-reform/

St. John, Jeff. (August 31, 2018). "California Passes Bill to Extend $800 Million in Incentives for Behind-the-Meter Batteries". GreenTech Media. Retrieved from https://www.greentechmedia.com/articles/read/california-passes-bill-to-extend-incentives-for-behind-the-meter-batteries#gs.lfin8s

St. John, Jeff. (March 06, 2020) "Virginia Mandates 100% Clean Energy by 2045". https://www.greentechmedia.com/articles/read/virginia-100-clean-energy-by-2050-mandate-law

Stevens, Pippa. (August, 25, 2021). "Extreme Weather Events are Pushing Consumers to Solar and Residential Storage". CNBC. https://www.cnbc.com/2021/08/25/extreme-weather-pushing-consumers-to-solar-and-residential-storage.html

Stigler, G. J. (1971). The Theory of Economic Regulation. *The Bell Journal of Economics and Management Science*, *2*(1), 3–21. https://doi.org/10.2307/3003160

Stokes, L. C. (2015). *Power politics: Renewable energy policy change in US states* (Doctoral dissertation, Massachusetts Institute of Technology).

Thiem A. Beyond the Facts: Limited Empirical Diversity and Causal Inference in Qualitative Comparative Analysis. *Sociological Methods & Research*. November 2019. doi:10.1177/0049124119882463

Thomas, Sharon. (December 15, 2020). “Storage As a Transmission Asset is Gaining Traction in Many RTOs/ISOs”. ESA. https://energystorage.org/storage-as-a-transmission-alternative-is-gaining-traction-in-many-rtos-isos/

U.S. Energy Information Administration. (February 2021). “Profile Analysis-California”. U.S. Energy Information Administration. https://www.eia.gov/state/analysis.php?sid=CA

U.S. Energy Information Administration. (February 2021). “Profile Analysis-Nevada”. U.S. Energy Information Administration. https://www.eia.gov/state/analysis.php?sid=NV

U.S. Energy Information Administration. (October 2021). “Profile Analysis-New. York”. U.S. Energy Information Administration. https://www.eia.gov/state/analysis.php?sid=NY

U.S. Energy Information Administration. (January 2021). “Profile Analysis-Oregon”. U.S. Energy Information Administration. https://www.eia.gov/state/analysis.php?sid=OR

U.S. Energy Information Administration. (November 2021). “Profile Analysis-Virginia”. U.S. Energy Information Administration. https://www.eia.gov/state/analysis.php?sid=VA

U.S. Energy Information Administration. (2018). “State CO2 Emissions” EIA https://www.eia.gov/environment/emissions/state/2.

Energy Information Administration. (2020). New York. Energy Information Administration. https://www.eia.gov/state/analysis.php?sid=NY

Energy Information Administration. (2021). Energy-Related CO2 Emission Data Tables. Energy Information Administration. https://www.eia.gov/environment/emissions/state/

Energy Information Administration. (2021). Electricity Sales and Revenue. Energy Information Administration. https://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf

U.S. Energy Information Agency. (11/3/2021, 7 p.m. EDT.). “Hourly Electric Grid Monitor”. EIA. https://www.eia.gov/electricity/gridmonitor/dashboard/electric_overview/US48/US48

U.S. Energy Information Administration, Form EIA-860M, Preliminary Monthly Electric Generator Inventory; U.S. Energy Information Administration, Form EIA-860, Annual Electric Generator Report.

U.S. EIA, Electricity Data Browser, Net generation for all sectors, Oregon, All fuels, Conventional hydroelectric, Annual, 2001-19. U.S. EIA, Electric Power Monthly (February 2020), Tables 1.3.B, 1.10.B.

Van Voorhis, Scott. (August 24, 2021). "Historic Drought Slashes Hydropower Generation in California, other Western States". *Utility Dive*. https://www.utilitydive.com/news/historic-drought-slashes-hydropower-generation-in-california-other-western/605421/

Walker, Jack L. 1969. The Diffusion of Innovations among the American States. *American Political Science Review,* 63(3), 880–99.

Warren, Kenneth F. (2004). *Administrative Law in the Political System*, 4th ed. Boulder, CO: Westview.

Wesoff, Eric. (June 7, 2011). "Assembly Member Nancy Skinner, Author of Pioneering Energy Storage Law, at ESA". Greentech Media. Retrieved from https://www.greentechmedia.com/articles/read/assembywoman-nancy-skinner-author-of-pioneering-energy-storage-law

West, W. F., & Raso, C. (2013). Who shapes the rulemaking agenda? Implications for bureaucratic responsiveness and bureaucratic control. *Journal of Public Administration Research and Theory*, (*23*), 495-519.

Wiener, J.G., & Koontz, T.M. (2010). Shifting Winds: Explaining Variation in State Policies to Promote Small-Scale Wind Energy. *Policy Studies Journal, 38*, 629-651.

Winifield, Mark, Shahab Shokrzadeh, and Adam Jones. (2018). Energy Policy Regime Change and Advanced Energy Storage: A Comparative Analysis. *Energy Policy*. 115, 572-583.

Woods, N. (2009). Promoting participation? An examination of rulemaking notification and access procedures. *Public Administration Review*. *69*, 518-530.

Woods, N. (2015). Regulatory democracy reconsidered: The policy impact of public participation. *Journal of Public Administration Research and Theory*. 25. 571-596.

World Bank. (September 26, 2018). "World Bank Group Commits $1 Billion for Battery Storage to Ramp Up Renewable Energy Globally". World Bank. https://www.worldbank.org/en/news/press-release/2018/09/26/world-bank-group-commits-1-billion-for-battery-storage-to-ramp-up-renewable-energy-globally

Yackee, J. W., & Yackee, S. W. (2006). A bias towards business? Assessing interest group influence on the U.S. bureaucracy. *Journal of Politics*, (*68)*, 128-139.

Yackee, S. W. (2006). Sweet-Talking the Fourth Branch: The Influence of Interest Group Comments on Federal Agency Rulemaking. *Journal of Public Administration Research and Theory*, (*16)*, 103-124.

Yackee, S. W. (2012). The Politics of Ex-parte Lobbying: Pre-proposal Agenda Building and Blocking During Agency Rulemaking. *Journal of Public Administration Research and Theory*, (*22*), 373-393.

Yackee, S. W. (2013). "Assessing Regulatory Participation by Health Professionals: A study of state health rulemaking". *Public Administration Review*, (*73*), 105-114.

Yackee, S. W. (2013) "Reconsidering Agency Capture During Regulatory Policymaking" in Carpenter, Daniel & Moss, David. (2013). *Preventing Regulatory Capture: Special Interest Influence and How to Limit It*. Cambridge: Cambridge University Press.

Yackee, S. W. (2015). Invisible (and Visible) Lobbying: The Case of State Regulatory Policymaking. *State Politics and Policy Quarterly*, 15(3) 322-344.

Yin, Haitao, & Powers, Nicholas. (2010). Do State Renewable Portfolio Standards Promote In-State Renewable Generation? *Energy Policy* 38 (2), 1140–49.

Appendix A Codebook

Measuring Conditions

A. Outcome Condition: Measuring Stakeholder Influence

Analyze interest group comments at traditional notice and comment period.

In addition, it is important to note that each states addresses party comments in different manners, in which the protocol for measuring influence has to be modified to accommodate those differences. For example, in Oregon, the OPUC provides definitive comments of the Commission's concurrence or objection to stakeholder comments. In other states, such as Virginia and California, the final decision provides a written summary of stakeholder comments, but does not provide a definitive determination of the Commission's favor or disfavor of comments. One must examine the final decisions to determine stakeholder positions and the final position of the document.

PUC response: Levels of influence will range from a negative (-2) to positive (+2):

- (+2) Staff agrees and supports action (adopt, recommend)
- (+1) Staff agrees (recognizes, shares, etc.).
- (0) No objection or No response
- (-1) Staff disagrees, no action
- (-2) Staff disagrees and proposes to support the opposite

In cases in which the Commission or Staff do not directly indicate "agree" or "disagree", I will assess influence the following manner:

(1) If document does directly note the stakeholder (but does not indicate agree or disagree), I will assess whether the final decision lined up with the position of the stakeholder or not. This was the case with the majority of the documents in New York.

In cases of concurrence, I will then afford them a (+1) unless they are the only stakeholder mentioned in the section, in which case they will receive a (+2) since their comment was the only one recorded. In cases in which the document mentions multiple stakeholders with the same view, I will give them a (+1) as their comments were helpful, but not unique to the final decisions. In cases in which stakeholders submitted intervenor compensation forms, the onus of showing influence is on the stakeholder. The stakeholder must show that they were able to provide a substantial contribution to the decision. I will determine the level of influence based on the Commission's notation of "verified" as being highly influential (+2). In instances in which the Commission notes others contributed to the decision, the stakeholder will receive a (+1).

In cases when the Commission disagrees with the stakeholder, I will give them a score of (-2) if the Commission makes a decision counter to them. On more miniscule points of discord, I will give them a score of (-1).

(2) If the document does not mention the stakeholder, the stakeholder will receive a 0, as their comments (or lack thereof) did not receive enough attention by the PUC for recognition in the documents.

1. Influence through submitted Comments

In cases in which interest groups are not mentioned directly in the Staff response to comments, I will assess the comments and the key issues at stake for that specific interest group. I will then analyze the final rules to determine whether the final rules changed in favor of that interest group or not. The level of influence (as calibrated on a 4 scale, will be relegated to a lower rung since the interest group was not directly mentioned in the comments).

2. Rationale for not using weights on issues

I have decided not to use weights for each issue win. Given the complex and technical nature of the dockets, it seemed like providing weights for each issue would impart too much researcher bias. In addition, in some cases such as definitions, a simple change or addition of a word might have larger implications than the researcher might be aware of at the time. Therefore, assigning no weights to the issues saves the work from further bias.

3. Calibration of scores into fuzzy scores

I calibrate influence by adding up the scores for each stakeholder. Since influence is a relative concept, I assume that the highest score is the most influential and then calibrate the rest of the scores relative to the maximum score, midpoint, and minimum scores. I set the mid-point score as also being the midpoint for membership, in which the case is neither fully in membership nor fully out of membership. Please see Table 1 on the next page for the results of the score breakdown for each state.

Appendix A. Table 1. State Influence Scores

California

Verbal Score	Raw Score	Fuzzy Score
Full Influence	16+	1
High	13 to 15	0.9
Moderate	8 to 12	0.6
A little	3 to 7	0.4
Not much	2- to 2	0.1
No Influence	-3	0

Nevada

Verbal Score	Raw Score	Fuzzy Score
Full Influence	4+	1
High	1 to 3	0.9
Moderate	neg 2 to 0	0.6
A little	neg 5 to neg 3	0.4
Not much	neg 8 to neg 6	0.1
No Influence	no mention	0

Oregon

Verbal Score	Raw Score	Fuzzy Score
Full Influence	8+	1
High	6 to 7	0.9
Moderate	4 to 5	0.6
A little	2 to 3	0.4
Not much	0 to 1	0.1
No Influence	-1	0

Virginia

Verbal Score	Raw Score	Fuzzy Score
Full Influence	5+	1
High	0 to 4	0.9
Moderate	neg 3 to 0	0.6
A little	neg 7 to neg 4	0.4
Not much	neg 10 to neg 8	0.1
No Influence	no mention	0

New York

Verbal Score	Raw Score	Fuzzy Score
Full Influence	14+	1
High	10 to 12	0.9
Moderate	6 to 9	0.6
A little	2 to 5	0.4
Not much	neg 1 to 1	0.1
No Influence	no mention	0

B. Assessing Nevada's Level of Influence

Nevada's rulemaking is unique because it relied heavily on informal stakeholder sessions and that there was a small number of stakeholders involved in the process. Another interesting aspect of the stakeholder process was that there is a hearing officer involved throughout the process.

The Commission expects the stakeholders to largely come to a consensus prior to commission hearings. Therefore, stakeholders must work together to mitigate their differences in formal and informal workshops and interactions.

Thus, there were few documents that I could rely upon to determine the level of influence of the key stakeholders involved. The first order went through the key positions of the stakeholders, but the final order did not. Therefore, I was able to discern the key issues at stake for each order and use the reply comments to assess whether the stakeholder's position was reflected in the final order or not.

During the second half of the proceeding, stakeholders were able to come to consensus on the majority of issues withstanding five issues:

(1) the definition of an energy storage target
(2) the final storage target amount
(3) the biennial target amounts
(4) requirements for sub-categories of the energy storage procurement target
(5) additional requirements for data and project solicitation

The utilities had the upper hand as they were the ones who wrote up the draft regulation. Other stakeholders were able to contribute to the document and come to a consensus over the key issues not listed above.

There were additional issues that were important to stakeholders that were also introduced throughout the comments. During this comment period, there were issues of greater consensus than others. The consensus for the targets, which was a major issue, was generally agreed upon by most stakeholders. However, there was discord over the strictness of some of the follow through mechanisms and the subcategories for the targets (e.g., carveouts). While the influence scores are low, this does not accurately describe the entire process and the level of influence throughout it.

Please contact the researcher for the full notes on the stakeholder positions and ensuing influence score.

C. Dichotomous Variables

For the majority of these variable, I just needed to research the context and history of the energy storage legislation and regulatory process. The majority of these conditions are dichotomous, in which it is either is ‘yes’ and fully in membership or ‘no’ and fully out of membership.

1. Target Mandate (TARMAN)

Some of the state legislation mandated specific energy storage targets whereas other states did not. Including this condition seeks to examine whether participation was more robust in states that did mandate a target or not. The rationale behind this is to see whether participation increased when there was a greater opportunity to influence the imposition of a mandate and to what level that mandate might aspire to.

(1) Energy storage target was mandated in the legislation
(0) Energy storage target was NOT mandated in the legislation

2. Rulemaking (RULEM)

The case type is important for participation because some cases such as rulemakings, are less formal than other case types (i.e. contested case and evidentiary hearings). More formal hearings often require that stakeholders hire attorneys to represent their interests.

(1) Case was a rulemaking
(0) Case was NOT a rulemaking

3. Consumer Advocate (CONADV)

Berry (1984) noted the importance of a consumer intervenor in regulatory procedures. This is important to this day given that consumer advocates represent the interests of consumers, which weighs heavily with PUCs interests. A consumer advocate is an institutional check on the PUC and is usually indicative that non-utility interests are being considered. Not all states have a consumer advocate group. Some states have non-profit consumer advocate groups (i.e. Oregon) and government consumer advocate agencies (i.e. California).

(1) A consumer advocate participated in the proceeding
(2) A consumer advocate did not participate in the proceeding

4. Rule review (RView)

Sobel and Dove (2016) find some evidence that reviews done through legislative branch, or an independent agency tend to be more effective than reviews conducted by other entities such as state Executive Offices.

Including conditions for review is important because it indicates that the content of the rules is either pre-drafted or directed from external sources to the regulatory process. Therefore, the ability of interest groups to influence the process is diminished, especially for groups such as environmental groups that do not have greater power coming to the table.

The condition of rule review therefore indicates whether the final rules were required to be vetted by an independent agency or not.

(1) Final rules vetted by independent agency
(0) Final rules NOT vetted by an independent agency

5. Working Groups (WORKG)

This condition seeks to examine whether the pre-existing PUC working groups had a relationship with stakeholder participation and influence over the final rules or orders. The rationale behind this was that working groups would facilitate greater deliberation and collaboration among stakeholders which would carry over into the energy storage proceedings.

(1) There were working groups on energy storage or similar issues
(0) There was NOT a working group on energy storage or similar issue

6. Governor Led (GOV)

The rationale behind this condition is that the PUC stakeholder process would be streamlined in states in which the governor was spearheading the energy storage policies.

(1) Energy storage legislation was part of the state governor's executive agenda
(0) Energy storage legislation was NOT part of the state governor's executive agenda

7. Framing Document

The rationale of a framing document is that the content and framework of the regulatory rules had largely been established states by a framing document (e.g., roadmap, energy storage study). Therefore, the stakeholder process and deliberations on the proposed rules would be scaled down since the rules had essentially already been written by a third party or agency. In energy storage proceedings in which there was NOT a framing document, the stakeholder process would be more robust since there would be greater opportunities to create and modify the proposed rules and framework. Given the directionality of the outcome variable (influence over the final rules), I modified the direction of this condition to ensure its logical consistency.

(1) Did NOT have a framing document
(0) Did have a framing document

8. Pre-proposal Period

States that had a distinct pre-proposal period would provide greater access for stakeholders to influence the rules and process. State PUCs are not required to have a pre-proposal phase, so when there is a pre-proposal period, it is indicative that the PUC welcomes stakeholder expertise and participation to help shape the content of the rules and process.

(1) PUC proceeding did have a pre-proposal phase
(0) PUC proceeding did NOT have a pre-proposal phase

9. Stakeholder's Presence Throughout Proceeding (PALL)

(1) Stakeholder was present throughout the entire proceeding, from beginning to end
(0) Stakeholder was NOT present throughout the entire proceeding; they were absent for some portion of the proceeding.

10. Intervenor Compensation

(1) Stakeholder received intervenor compensation during the proceeding
(0) Stakeholder did NOT receive intervenor compensation during the proceeding

D. Fuzzy Variables

1. Access to Stakeholder Meetings

(1) 5 workshops or meetings led by agency

(.8) 4 workshops or meetings led by agency

(.6) 3 workshops or meetings led by agency

(.4) 2 workshops or meeting led by agency

(.1) 1 workshops or meeting led by agency

(0) No formal workshops or technical meetings

2. Opportunity for Stakeholder Comments

There are 4 main junctures that stakeholders could have the opportunity to comment: pre-draft regulation or the order instituting a rulemaking (OIR), Draft Proposal, Proposed Decision, Final Order.

(1) More than 4 comment periods
(.67) 3 comment periods
(.33) 2 comment periods
(0) 1 comment periods

3. Stakeholder Participation During the Comment Period

(1) Commented for over 90 percent of the comment periods.
(.8) Commented for the majority (75 percent) of comment periods
(.6) Commented for at least half (50 percent) of comment periods
(.4) Commented for at least a quarter (25%) of the comment periods
(.1) Commented less than a quarter (25%) of the comment periods
(0) Did not make any comments

4. Group Financial Capacity

Total Net Revenue

I looked up groups on ProPublica and GuideStar's website where I was able to find their total net revenue on the groups' 990 tax forms. I used GuideStar's categorization of a non-profit's revenue into small, medium, and large: (1) Grassroots, less than 1 million (2) Small, 1-5 Million, (3) Mid-size, 5.1 to 10 Million, (4) Large, 10 to 50 Million, and Economic Engine 50 Million to 5 Billion. I then took the average of total revenue over the period of time of the PUC proceeding. I attempted to include the years preceding the docket and the year thereafter to encompass the overall financial overview of the group. In some cases, I was not able to find up to date financial information for the group. For example, in Virginia, the proceeding occurred in the year 2020, but I was unable to access the 990 forms for 2020.

Key			
Category	Raw Score	Score	Fuzzy Score
Grassroots	Less than 1 Million	1	.2
Small	1-5 Million	2	.4
Mid-Size	5.1 to 10 Million	3	.6
Large	10 to 50 Million	4	.8
Economic Engine	50 to 5 Billion	5	1

5. Employee Capacity

I originally looked up employee information on the groups' 990 forms on ProPublica and GuideStar's website. I then calibrated cut-offs to distinguish between groups that had a small, mid-size, and large number of staff: (1) Small, 10 and less full-time employees, (2) Mid-size, 11-100 full-time employees, and (3) Large, 100 and more full-time employees.

However, the national or state levels for employees did not seem to be a consistent indicator of how they prioritized or valued the proceeding. So I calibrated employee strength based on the following two factors:

(1) how many employees were assigned to the proceedings
(2) whether an attorney from outside the organization was hired

First, the number of employees assigned to the proceeding highlights whether they had enough capacity to have more than one on the case. If at least two employees were assigned the case, that seemed like a stronger indicator of the prioritization they placed for the case.

Second, the presence of an outside attorney indicates two factors: that the organization prioritized the case enough to hire legal representation and expertise, and second that the organization had the financial capacity to contract an attorney.

Often rulemakings are very technical and require a strong understanding of legal issues that are under the purvey of attorneys.

Employee Capacity fuzzy score

(1) Had five or more staff members assigned to the case (could include contracted attorneys, consultants, or researchers).
(.67) Had at least three staff members assigned to the case (could include contracted attorneys, consultants, or researchers).
(.33) Contracted an outside attorney OR had at least 2 fulltime staff members assigned to the case
(.1) Had at least one fulltime staff member assigned to the case
(0) No staff or attorney assigned

E. Conditions That Were Considered but Not Included

1. Age and Issue of Non-Profits:

This condition does not seem to convey well to QCA. Empirically, while it does seem that some newer types of non-profits will be better suited to address clean energy issues due to more niche focuses on renewables and clean energy, other non-profits can still have a large presence, too. Some non-profits have been able to keep pace with renewable issues more so than others. Again, the mission, board, and scope of the non-profits needs to be considered, too. This was not included in the final QCA analysis, but it was considered in the preliminary set up of the matrix.

(1) Historic
(2) Traditional
(3) Second Wave
(4) New

2. Determinants of Policy Adoption and Change

The policy histories and implementation of these states are varied. Initially, there are not many factors that tie these states with one another. Geographically, these states are dispersed, with differing energy resource mixes and renewable energy potentials. In addition, most of these states are regulated by differing energy jurisdictions. However, the majority of these states share similar state ideology and environmental activism, which has been shown to be major determinants of climate change and renewable energy policy adoption in the literature (Carley and Miller, 2012, Berry et al. 2015, Trujillo et al. 2016).

I was originally thinking of analyzing state level data from datasets from the Database for State Incentives for Renewables and Efficiency (DSIRE), the Energy Information Administration EIA), and the Bureau of Economic Analysis. Data was extracted for the years that the regulatory proceeding was occurring.

(1) Examine CO2 emissions per state capita (EPA) as a measure of fossil fuel industry interest group strength
(2) average real state price of electricity (EIA)
(3) Total state renewable energy potential (DSIRE)
(4) Government and Citizen Ideology (Berry et al., 2015)

However, as I began to look at these factors, it became clear that this was not necessary for the context of my research question and analysis. However, this is something interesting to know more about for future research that may have a different research design than mine.

Appendix B NVivo Codebook

A. Interview Codes

1. Experience
2. Group Capacity
3. Participation
4. Barriers to Participation
5. Perceptions of Fairness During Proceeding
6. Formal and Informal Group Tactics
7. Interest Group Collaboration, Coalitions, and Conflict
8. Perceived Influence
9. Stage When Group Was Most Influential

B. Definitions of Codes

Code	Definition
1. Influence of Group	A group's noted ability to control or shape the process, rules, specific point in the proceeding, and person or group.
2. Influence of Individual (self)	A group's noted ability to control or shape the process, rules, specific point in the proceeding, and person or group.
3. Expertise	Specific knowledge or observable proficiency in an issue or topic.
4. Experience	Number of years and familiarity with the process of specific agencies, policy networks, or groups.
5. Group Reputation	A group's perceived set of skills, traits, and history.
6. Collaboration with Others	Working with other groups or individuals in a formal or informal alliance to achieve a mutual outcome.
7. Capacity	The financial, staffing, and timing resources to participate.
8. Norms of Civility	Informal behavioral practices that are recognized as being standards for behavior in specific settings.
9. Network Contact	A professional relationship within an individual's line of work.
10. Staff Familiarity	An individual's knowledge and personal experience with agency staff members.

3. Data Driven Codes

Code	Description	Example
1. Influence of Group	Respondent states groups that were influential with affirmations such as “yes” or “they were influential”.	“I think that we were influential in the development of the stipulation terms”.
2. Influence of Individual (self)	Respondent directly refers to self or another individual by name as being influential.	“Have you talked to [individual]? If I credit anybody for really keeping the fire lit on this…I'd pin it on him”.
43. Expertise	Respondent makes affirmations of their familiarity or expertise with energy storage or clean energy topics.	“I feel that based on the number of times I'm asked to speak about it, I am considered an expert…”
4. Experience	Respondent describes how many years he/she has been involved in line of work makes specific affirmations of familiarity or experience with OPUC.	“So I've been practicing for the PUC for 20 years.”
5. Group Reputation	Respondent directly refers to a group’s standing, reputation, or specific characteristic of that group.	There are a couple of NGOs who know how to participate at that level. [anonymous groups] can do it when they're fully staffed and their focused.
6. Collaboration with Other	Respondent notes specific collaborations or working with another group or individual (by name).	“We worked with them and had a good relationships with both of those groups and continue to on those sorts of things possibly…we would've sort of been sharing and talking with those folks as we are going through the docket.”

7. Capacity a. General b. Financial c. Staff d. Participation	a. General: Respondent notes the group's level of resources or overall status (e.g., strained, weak, strong, full). b. Financial: Respondent addresses the state of the group's financial resources (e.g., strained, weak, strong, full). c. Staff Respondent notes the state of the group's staffing (e.g., understaffed, strained, did not have enough staff to cover all of their activities, was fully funded). d. Participation Respondent notes that group was unable to participate because of lack of resources or capacity.	"Sometimes it's given that when timelines are very ambitious, they often overcome our ability to participate because as non-profits, we have very limited resources…" "PacifiCorp's procurement was so small that we couldn't really justify dedicating much staff time to it, but PGE's was a little more significant and so we fully staffed it." "Over the last three or four years they have been stretched to the breaking point, I think."
8. Norms of Civility	Respondent uses words such as "tradition", "norm", and "practice" to depict an informal, but recognized standards or practices of behavior.	"…the culture in the northwest is fight when you have to but when you don't have to, you don't, and you try to be more collaborative."
9. Network Contact	Respondent provides a specific name of an individual that they have worked with or have great familiarity with (e.g.,	"He and I were colleagues at [interest group] for a long time, and are still friends."

	recounts a story of a shared experience).	
10. Staff Familiarity	Respondent provides a specific name of a staff member that they have worked with or have great familiarity with (e.g., recounts a story of a shared experience). Respondent discusses past experiences with the OPUC.	"I mean, the problem with commission staff is that, um, they have, they have turnover you know, maybe more than, and so you can get different people involved. Um, the commission staffer on that one, I remember it was a newer person at the time. He actually works for PGE now."

Appendix C Oregon Interview: Notes and Interview Questions

Note on Interview Process: Response Rate and Issues with Interviews During the COVID-19 Pandemic

The original intention of the interviews was to conduct a wide range of interviews across all five states. However, there were major obstacles with potential participants agreeing to be part of the dissertation from states such as New York, Virginia, and Nevada. While the responses from California were more positive, it was difficult to track down enough participants due to the passage of time. Surprisingly, Oregon responses were more positive, and I was able to reach a high saturation point with regards to content.

Response Rate

1. *Case of Oregon*
Active cases YES (response rate 61 percent out of eighteen requests)

2. *Case of California*
Active cases YES (response rate 57 percent out of fourteen requests)

3. *Case of New York*
Active cases (response rate 16 percent out of six requests)

4. *Case of Nevada*
Active cases YES (response rate 33 percent out of three requests)

5. *Case of Virginia*
Active cases YES (response rate 25 percent out of four requests)

6. *Case of Massachusetts*
Was unable to find a list of stakeholders that participated, and agencies involved were unable to find requested documents (stakeholder documents and list serv) associated with that proceeding. Was able to get in touch with one stakeholder involved, but they did not have a list of other stakeholders.

List of Interviews by State

Participant Code	Date Interviewed	In-person or Telephone	Signed Consent
OR 001	09/20/2019	Telephone	Yes
OR 002	08/27/2019	In-person	Yes
OR 003	09/26/2019	Telephone	Yes
OR 004	10/03/2019	In-person	Yes
OR 005	12/09/2019	In-person	Yes
OR 006	02/21/2020	Telephone	Yes
OR 007	03/11/2020	Telephone	Yes
OR 008	02/18/2020	Telephone	Yes
OR 009	02/25/2020	In-person	Yes
OR 010	11/06/2019	In-person	Yes
OR 011	10/09/2020	Telephone	Yes

Participant Code	Date Interviewed	In-person or Telephone	Consent Form
CA 001	11/24/2019	Telephone	Yes
CA 002	11/06/2019	Telephone	Yes
CA 003	11/20/2019	Telephone	Yes
CA 004	11/22/2019	Telephone	Yes
CA 005	12/04/2019	Telephone	Yes
CA 006	12/18/2019	Telephone	Yes
CA 007	01/10/2020	Telephone	Yes
CA 008	03/10/2020	Telephone	Yes

Participant Code	Date Interviewed	In-person or Telephone	Consent Form
NY 001	03/06/2020	Telephone	Yes
NV 001	07/07/2021	Telephone	Yes
VA 001	07/19/2021	Telephone	Yes
MA 001	08/14/2021	Telephone	Yes

Oregon Interview Questions

I. Questions on Organization/Background Information

Q1. What type of organization do you represent?

Q2. How much work experience do you have relating to energy storage policy?
(1) none, (2), a little, (3) moderate, (4) high

Q3. How many full-time equivalent employees in your organization handle energy storage policy?

Q4. To what level was your organization willing to devote time and resources (financial, staffing, etc.) to the energy storage rulemaking? (1) none, (2), low amount, (3) moderate amount, (4) high amount, and (5) number one priority.

Q5. What were your objectives/goals coming into the rulemaking?
(1) provide information, (2) shape policy, (3) other

Q6. Did those objectives/goals change at all throughout the process? If so, why?

Q7. How important is the rulemaking process for your organization in shaping policy? (1) not at all, (2), low amount, (3) moderate amount, (4) high amount, and (5) number one priority

II. Institutional Participation: Perception of Agency Procedures for Stakeholder Participation

Q11. Was your organization directly contacted by the agency to participate/be informed of the proceedings?

Q12. Did you participate in any working groups or pre-draft workshops prior to the advanced notice of the proceedings?

If Yes,

(a) How many of these meetings did you take part in?

(b) To what degree did you feel that you were able to influence the content of the rules during these meetings? (1) none, (2) a little, (3) moderately, (4) extremely, (5) unsure

(c) Do you consider pre-draft meetings to be more important that the comment period?

Q13.

To what extent do you agree or disagree with each of the statements below?	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I found that it was easy to participate during all stages of the process.					
I found that it was easy to participate ***just*** during the notice and comment period.					
I found that it was easy to participate during the rulemaking just during the pre-draft meetings.					
The process was inclusive to stakeholder groups					
The OPUC was responsive to my comments and participation.					
The process was fair and open to all stakeholders.					
The process helped create a greater level of trust between my organization and the agency.					

Q14. Do you feel that there were specific groups that were left out of the process that should have been involved?

III. Administrative Procedures: Perception of Regulatory Agency and Its Role During Proceedings

Q8 (perception of regulatory procedures in rulemaking)
Were there any administrative constraints or procedures that negatively impacted your participation throughout the proceedings?

(a) Lack of opportunities to participate?
(b) Poor communication with stakeholders of participation opportunities?
(c) Poor notice of meetings?
(d) Poor timing of meetings?
(e) Poor timelines/unrealistic timelines for rulemaking?

If Yes, How responsive was the regulatory agency in mitigating these concerns?

Q9 (perception of agency). Did the regulatory agency have sole discretion over the procedures? (1) not at all, (2) a little, (3) somewhat, (4) very much, (5) extremely

Q10 (perception of agency).
Do you agree with the following statements and why?

a. The OPUC and Staff were receptive to outside influence by other organizations or interest groups.
b. The OPUC and Staff were instrumental in shaping the content of the Final Framework.
c. The OPUC and Staff had too much influence over the content of the Final Framework.

IV. Group Tactics: Invisible and Visible Lobbying

Q15. *Only Visible Lobbying*:
(1) Please tell me whether or not you were involved with this rule in each of the following ways. Did you testify at a hearing? Yes or No.
(2) Did you submit written comments to the agency? Yes or No".

Q16. *Invisible Lobbying*: In addition to your participation through the hearing testimony or formal written comments, did you have any contact with state agency officials outside of the formal proceedings? Yes or No

Q17. *Perceived Influence of Invisible Lobbying*: How much, if any, did these contacts influence the content of this rule? (1) not at all, (2) a little, (3) somewhat, (4) very much, (5) extremely"

Q18. *Both Visible and Invisible Lobbying*:
How many of these contacts were face-to-face meetings? (1) none, (2), a few, (3) some, (4) most, and (5) all.
How many of these contacts were telephone calls? (1) none, (2), a few, (3) some, (4) most, and (5) all.
How many of these contacts were by email? (1) none, (2), a few, (3) some, (4) most, and (5) all.

Q19. *Effective Negotiation*: Were there any times throughout the process that you felt that you were personally able to negotiate a specific rule or stipulation that became part of the Final Rule? Please give an example if possible.

Q20 (other group tactics). Did you employ another other tactics in your efforts to influence the content or process of the rulemaking? (e.g., protests, letter writing campaigns, etc.)

V. Interest Group Interactions and Collaboration

Q21. What was the duration of your organization's relationship with the following stakeholders? Please indicate whether your organization has a collaborative relationship with any of the stakeholders listed below.

Interest Groups	1-2 Years	2-5 Years	5+ Years	None	Collaborator
Renewable Northwest					
Northwest Energy Coalition					
Energy Storage Association					
NIPCC					
Alliance of Western Energy Consumers					
Citizen's Utility Board of Oregon					
Pacific Northwest National Laboratory (PNNL)					
PacifiCorp					
Portland General Electric (PGE)					
Oregon Department of Energy					

Q22. *Repeated Interactions with Other Groups*: Are there any groups that you have had repeated interactions with before this rulemaking? (Yes or No)

If Yes,
(a) would you characterize your relationship with them as conflictual, collaborative, or neutral?
(b)Can you describe an example to support your answer?

Q23. *Coalition Building*: Was there a time throughout the process that you sought to build a coalition or collaborative network with any of the other stakeholders involved?

Q24. *Collaboration with Other Stakeholders*: Did you have any other outside contact with other stakeholders about this rule? Yes or No

If Yes,
(a) Can you please elaborate on the frequency and type (informal or formal meeting) of these interactions?

(b) Did these interactions with other stakeholders strengthen your organization's relationship with them? Please provide a relevant example.

(c) Did these interactions impact the content of the Final Rule?

(d) How likely will your organization be to interact with this stakeholder in the future after this rulemaking?

Q25. Were there any stakeholders that your organization had an adversarial or competitive relationship with?
If Yes, How did these groups constrain or aid your organization's ability to influence the rulemaking?

VI. Perceived Influence

Q26. Below is a list of advocacy groups, industry groups, citizen groups, and NGOs that have been identified as important to Oregon's energy storage docket. Please rank a minimum of five of the groups with the most influence over the rulemaking process (1 being the most influential and 5 being less influential).

Interest Groups	Ranking
Renewable Northwest	
Northwest Energy Coalition	
CREA	
Alliance of Western Energy Consumers	
NIPCC	
Citizen's Utility Board of Oregon	
Pacific Northwest National Laboratory (PNNL)	
PacifiCorp	
Portland General Electric (PGE)	
Oregon Department of Energy	
OPUC Staff	

Q27. How influential do you feel that your organization was during the proceedings.

(1) strongly agree
(2) somewhat agree
(3) neither agree nor disagree
(4) somewhat disagree
(5) strongly disagree

Q28. At which stages do you feel that your organization's influence was highest?

(1) pre-draft period
(2) draft period
(3) comment period
(4) none

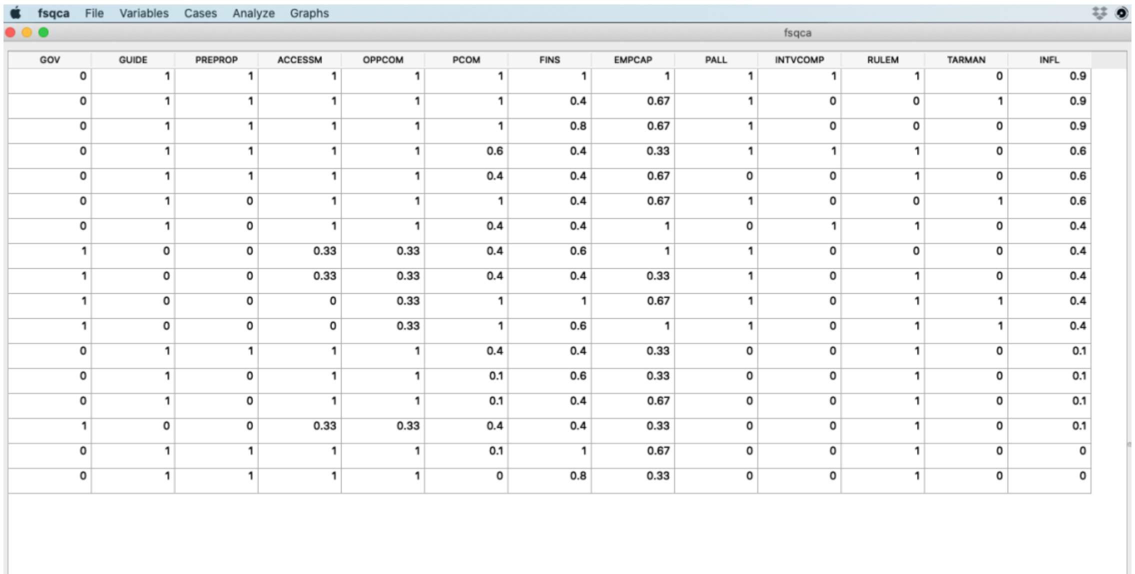
Q29. Do you agree with the following statement: "Industry groups had an undue influence on the process".

(1) strongly agree
(2) somewhat agree
(3) neither agree nor disagree
(4) somewhat disagree
(5) strongly disagree

Appendix D fsQCA 3.0 Steps

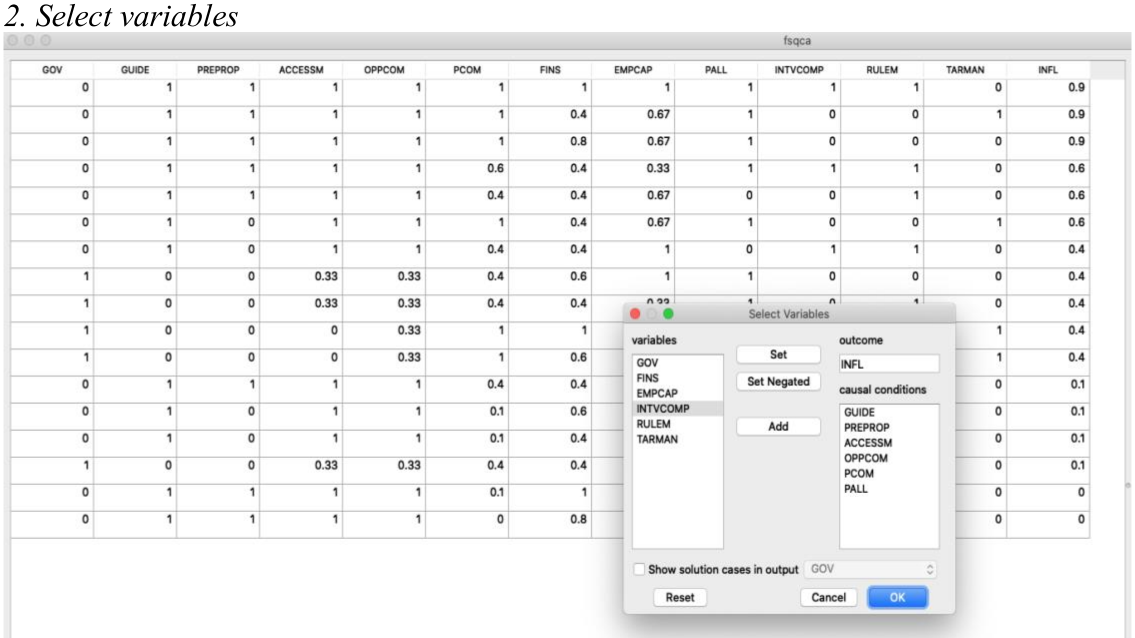
Five State fsQCA Analysis with Pictures

Step 1: Analyze the Truth Table Algorithms



GOV	GUIDE	PREPROP	ACCESSM	OPPCOM	PCOM	FINS	EMPCAP	PALL	INTVCOMP	RULEM	TARMAN	INFL
0	1	1	1	1	1	1	1	1	1	1	0	0.9
0	1	1	1	1	1	0.4	0.67	1	0	0	1	0.9
0	1	1	1	1	1	0.8	0.67	1	0	0	0	0.9
0	1	1	1	1	0.6	0.4	0.33	1	1	1	0	0.6
0	1	1	1	1	0.4	0.4	0.67	0	0	1	0	0.6
0	1	0	1	1	1	0.4	0.67	1	0	0	1	0.6
0	1	0	1	1	0.4	0.4	1	0	1	1	0	0.4
1	0	0	0.33	0.33	0.4	0.6	1	1	0	0	0	0.4
1	0	0	0.33	0.33	0.4	0.4	0.33	1	0	1	0	0.4
1	0	0	0	0.33	1	1	0.67	1	0	1	1	0.4
1	0	0	0	0.33	1	0.6	1	1	0	1	1	0.4
0	1	1	1	1	0.4	0.4	0.33	0	0	1	0	0.1
0	1	0	1	1	0.1	0.6	0.33	0	0	1	0	0.1
0	1	0	1	1	0.1	0.4	0.67	0	0	1	0	0.1
1	0	0	0.33	0.33	0.4	0.4	0.33	0	0	1	0	0.1
0	1	1	1	1	0.1	1	0.67	0	0	1	0	0
0	1	1	1	1	0	0.8	0.33	0	0	1	0	0

2. Select variables



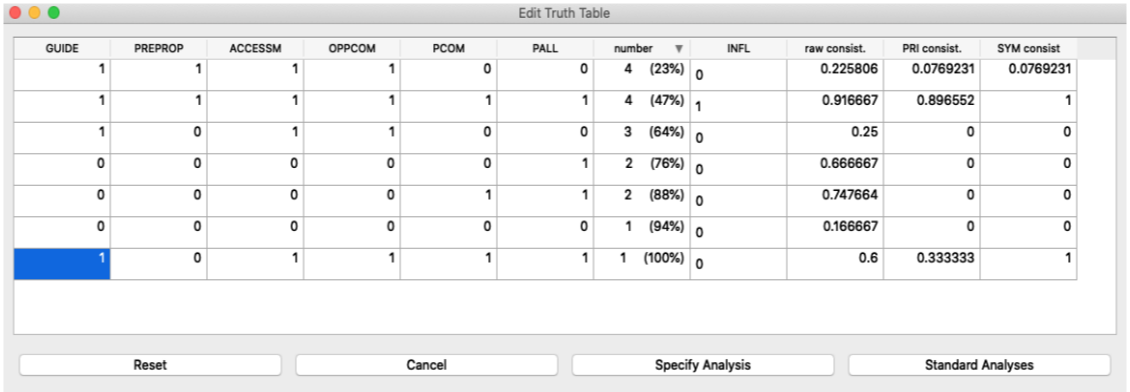
Step 3: Edit the Truth Table. Threshold is <0.9 for raw consistency

Edit Truth Table

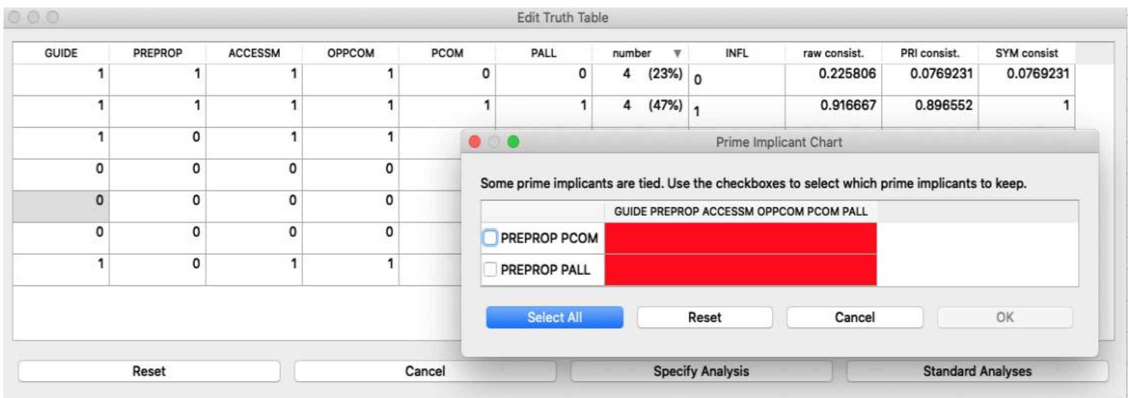
GUIDE	PREPROP	ACCESSM	OPPCOM	PCOM	PALL	number	INFL	raw consist.	PRI consist.	SYM consist
1	1	1	1	0	0	4 (23%)		0.225806	0.0769231	0.0769231
1	1	1	1	1	1	4 (47%)		0.916667	0.896552	1
1	0	1	1	0	0	3 (64%)		0.25	0	0
0	0	0	0	0	1	2 (76%)		0.666667	0	0
0	0	0	0	1	1	2 (88%)		0.747664	0	0
0	0	0	0	0	0	1 (94%)		0.166667	0	0
1	0	1	1	1	1	1 (100%)		0.6	0.333333	1
1	0	0	0	0	0	0 (100%)				
0	1	0	0	0	0	0 (100%)				
1	1	0	0	0	0	0 (100%)				
0	0	1	0	0	0	0 (100%)				
1	0	1	0	0	0	0 (100%)				
0	1	1	0	0	0	0 (100%)				
1	1	1	0	0	0	0 (100%)				
0	0	0	1	0	0	0 (100%)				
1	0	0	1	0	0	0 (100%)				
0	1	0	1	0	0	0 (100%)				
1	1	0	1	0	0	0 (100%)				
0	0	1	1	0	0	0 (100%)				
0	1	1	1	0	0	0 (100%)				
0	0	0	0	1	0	0 (100%)				
1	0	0	0	1	0	0 (100%)				
0	1	0	0	1	0	0 (100%)				
1	1	0	0	1	0	0 (100%)				
0	0	1	0	1	0	0 (100%)				
1	0	1	0	1	0	0 (100%)				
0	1	1	0	1	0	0 (100%)				

Reset | Cancel | Specify Analysis | Standard Analyses

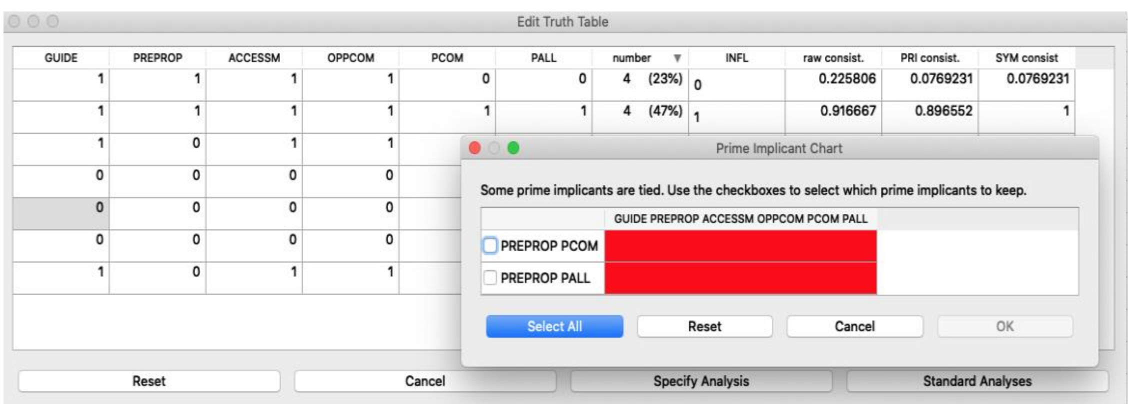
Step 4: Results after coding 1s or 0s on the output (INFL)



Step 5: Determine which prime implicants to keep if any exist.



Step 6: Determine when the conditions should contribute to the intermediate outcome if they are present or absent.



7. Output From the Truth Table Analysis

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/FINI.csv
Model: INFL = f(GUIDE, PREPROP, ACCESSM, OPPCOM, PCOM, PALL)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.916667
                                            raw       unique
                                          coverage   coverage
consistency
                                         ---------- ----------
----------
GUIDE*PREPROP*ACCESSM*OPPCOM*PCOM*PALL    0.478261   0.478261   0.916667
solution coverage: 0.478261
solution consistency: 0.916667


**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/FINI.csv
Model: INFL = f(GUIDE, PREPROP, ACCESSM, OPPCOM, PCOM, PALL)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.916667
                    raw       unique
                  coverage   coverage   consistency
                 ---------- ---------- ----------
PREPROP*PCOM     0.550725   0.0724638  0.844444
PREPROP*PALL     0.478261   0          0.825
solution coverage: 0.550725
solution consistency: 0.77551


**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/FINI.csv
Model: INFL = f(GUIDE, PREPROP, ACCESSM, OPPCOM, PCOM, PALL)
Algorithm: Quine-McCluskey

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.916667
Assumptions:
                                            raw       unique
                                          coverage   coverage
consistency
                                         ---------- ----------
----------
GUIDE*PREPROP*ACCESSM*OPPCOM*PCOM*PALL    0.478261   0.478261   0.916667
solution coverage: 0.478261
solution consistency: 0.916667
```

8. Check Subset /Superset Analysis

Outcome: INFL

	consistency	raw coverage	combined
GUIDE*PREPROP*ACCESSM*OPPCOM*PCOM*PALL	0.916667	0.478261	0.681112
PREPROP*ACCESSM*OPPCOM*PCOM*PALL	0.916667	0.478261	0.681112
GUIDE*PREPROP*ACCESSM*PCOM*PALL	0.916667	0.478261	0.681112
GUIDE*PREPROP*OPPCOM*PCOM*PALL	0.916667	0.478261	0.681112
PREPROP*ACCESSM*PCOM*PALL	0.916667	0.478261	0.681112
PREPROP*OPPCOM*PCOM*PALL	0.916667	0.478261	0.681112
GUIDE*PREPROP*PCOM*PALL	0.916667	0.478261	0.681112
PREPROP*PCOM*PALL	0.916667	0.478261	0.681112
OPPCOM*PCOM*PALL	0.881757	0.756522	0.843285
ACCESSM*OPPCOM*PCOM*PALL	0.866920	0.660870	0.779744
ACCESSM*PCOM*PALL	0.866920	0.660870	0.779744
GUIDE*ACCESSM*OPPCOM*PCOM*PALL	0.847826	0.565217	0.709256
GUIDE*ACCESSM*PCOM*PALL	0.847826	0.565217	0.709256
GUIDE*OPPCOM*PCOM*PALL	0.847826	0.565217	0.709256
GUIDE*PCOM*PALL	0.847826	0.565217	0.709256
GUIDE*PREPROP*ACCESSM*OPPCOM*PCOM	0.844444	0.550725	0.700104
PREPROP*ACCESSM*OPPCOM*PCOM	0.844444	0.550725	0.700104
GUIDE*PREPROP*ACCESSM*PCOM	0.844444	0.550725	0.700104
GUIDE*PREPROP*OPPCOM*PCOM	0.844444	0.550725	0.700104
PREPROP*ACCESSM*PCOM	0.844444	0.550725	0.700104
PREPROP*OPPCOM*PCOM	0.844444	0.550725	0.700104
GUIDE*PREPROP*PCOM	0.844444	0.550725	0.700104
PREPROP*PCOM	0.844444	0.550725	0.700104
OPPCOM*PCOM	0.828387	0.930435	0.894524
OPPCOM*PALL	0.825949	0.756522	0.801900
GUIDE*PREPROP*ACCESSM*OPPCOM*PALL	0.825000	0.478261	0.637591
PREPROP*ACCESSM*OPPCOM*PALL	0.825000	0.478261	0.637591
GUIDE*PREPROP*ACCESSM*PALL	0.825000	0.478261	0.637591
GUIDE*PREPROP*OPPCOM*PALL	0.825000	0.478261	0.637591
PREPROP*ACCESSM*PALL	0.825000	0.478261	0.637591
PREPROP*OPPCOM*PALL	0.825000	0.478261	0.637591
GUIDE*PREPROP*PALL	0.825000	0.478261	0.637591
PREPROP*PALL	0.825000	0.478261	0.637591
GUIDE*ACCESSM*OPPCOM*PCOM	0.819672	0.724638	0.780189
GUIDE*ACCESSM*PCOM	0.819672	0.724638	0.780189
GUIDE*OPPCOM*PCOM	0.819672	0.724638	0.780189
GUIDE*PCOM	0.819672	0.724638	0.780189
ACCESSM*OPPCOM*PCOM	0.812412	0.834783	0.827358
ACCESSM*PCOM	0.812412	0.834783	0.827358
ACCESSM*OPPCOM*PALL	0.805654	0.660870	0.731645
ACCESSM*PALL	0.805654	0.660870	0.731645
GUIDE*ACCESSM*OPPCOM*PALL	0.780000	0.565217	0.646731
GUIDE*ACCESSM*PALL	0.780000	0.565217	0.646731
GUIDE*OPPCOM*PALL	0.780000	0.565217	0.646731
GUIDE*PALL	0.780000	0.565217	0.646731
PCOM*PALL	0.743243	0.797101	0.714244
PCOM	0.720430	0.971014	0.743961
PALL	0.611111	0.797101	0.368113
GUIDE*PREPROP*ACCESSM*OPPCOM	0.500000	0.579710	0.170251
PREPROP*ACCESSM*OPPCOM	0.500000	0.579710	0.170251
GUIDE*PREPROP*ACCESSM	0.500000	0.579710	0.170251
GUIDE*PREPROP*OPPCOM	0.500000	0.579710	0.170251
PREPROP*ACCESSM	0.500000	0.579710	0.170251
PREPROP*OPPCOM	0.500000	0.579710	0.170251
GUIDE*PREPROP	0.500000	0.579710	0.170251
PREPROP	0.500000	0.579710	0.170251
OPPCOM	0.484982	0.959420	0.195900
ACCESSM*OPPCOM	0.458814	0.863768	0.160975
ACCESSM	0.458814	0.863768	0.160975
GUIDE*ACCESSM*OPPCOM	0.433333	0.753623	0.150362
GUIDE*ACCESSM	0.433333	0.753623	0.150362
GUIDE*OPPCOM	0.433333	0.753623	0.150362
GUIDE	0.433333	0.753623	0.150362

9. Check Set Coincidence

```
File: /Users/kruser23/Documents/FINI.csv
coincidence(GUIDE,PREPROP,ACCESSM,OPPCOM,PCOM,PALL) = 0.219512
coincidence(GUIDE,PREPROP,ACCESSM,OPPCOM,PCOM) = 0.296053
coincidence(GUIDE,PREPROP,ACCESSM,OPPCOM,PALL) = 0.244948
coincidence(PREPROP,ACCESSM,OPPCOM,PCOM,PALL) = 0.219512
coincidence(GUIDE,PREPROP,ACCESSM,PCOM,PALL) = 0.219512
coincidence(GUIDE,ACCESSM,OPPCOM,PCOM,PALL) = 0.280488
coincidence(GUIDE,PREPROP,OPPCOM,PCOM,PALL) = 0.219512
coincidence(GUIDE,PREPROP,ACCESSM,OPPCOM) = 0.586081
coincidence(PREPROP,ACCESSM,OPPCOM,PCOM) = 0.296053
coincidence(PREPROP,ACCESSM,OPPCOM,PALL) = 0.244948
coincidence(GUIDE,PREPROP,ACCESSM,PALL) = 0.244948
coincidence(GUIDE,PREPROP,ACCESSM,PCOM) = 0.296053
coincidence(GUIDE,PREPROP,OPPCOM,PCOM) = 0.296053
coincidence(GUIDE,PREPROP,OPPCOM,PALL) = 0.244948
coincidence(GUIDE,ACCESSM,OPPCOM,PALL) = 0.306185
coincidence(PREPROP,ACCESSM,PCOM,PALL) = 0.219512
coincidence(GUIDE,ACCESSM,OPPCOM,PCOM) = 0.401316
coincidence(ACCESSM,OPPCOM,PCOM,PALL) = 0.320732
coincidence(PREPROP,OPPCOM,PCOM,PALL) = 0.219512
coincidence(GUIDE,PREPROP,PCOM,PALL) = 0.219512
coincidence(GUIDE,ACCESSM,PCOM,PALL) = 0.280488
coincidence(GUIDE,OPPCOM,PCOM,PALL) = 0.280488
coincidence(PREPROP,ACCESSM,OPPCOM) = 0.586081
coincidence(GUIDE,PREPROP,ACCESSM) = 0.615858
coincidence(GUIDE,ACCESSM,OPPCOM) = 0.879121
coincidence(GUIDE,PREPROP,OPPCOM) = 0.586081
coincidence(PREPROP,ACCESSM,PCOM) = 0.296053
coincidence(PREPROP,ACCESSM,PALL) = 0.244948
coincidence(PREPROP,OPPCOM,PCOM) = 0.296053
coincidence(ACCESSM,OPPCOM,PALL) = 0.346601
coincidence(PREPROP,OPPCOM,PALL) = 0.244948
coincidence(ACCESSM,OPPCOM,PCOM) = 0.466447
coincidence(GUIDE,ACCESSM,PALL) = 0.306185
coincidence(GUIDE,ACCESSM,PCOM) = 0.401316
coincidence(GUIDE,PREPROP,PALL) = 0.25
coincidence(GUIDE,PREPROP,PCOM) = 0.296053
coincidence(GUIDE,OPPCOM,PCOM) = 0.401316
coincidence(GUIDE,OPPCOM,PALL) = 0.306185
coincidence(ACCESSM,PCOM,PALL) = 0.320732
coincidence(PREPROP,PCOM,PALL) = 0.257143
coincidence(OPPCOM,PCOM,PALL) = 0.360976
coincidence(PREPROP,ACCESSM) = 0.615858
coincidence(GUIDE,PCOM,PALL) = 0.280488
coincidence(PREPROP,OPPCOM) = 0.586081
coincidence(ACCESSM,OPPCOM) = 0.951648
coincidence(GUIDE,PREPROP) = 0.666667
coincidence(GUIDE,ACCESSM) = 0.923788
coincidence(PREPROP,PALL) = 0.307692
coincidence(PREPROP,PCOM) = 0.351562
coincidence(ACCESSM,PCOM) = 0.466447
coincidence(ACCESSM,PALL) = 0.346601
coincidence(GUIDE,OPPCOM) = 0.879121
coincidence(OPPCOM,PALL) = 0.387018
coincidence(OPPCOM,PCOM) = 0.509868
coincidence(GUIDE,PALL) = 0.3125
coincidence(GUIDE,PCOM) = 0.401316
coincidence(PCOM,PALL) = 0.678899
************************
```

10. fsQCA Truth Table Analysis without California

```
**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/FINAL ANALYSIS.csv
Model: INFL = f(GUIDE, DRAFT, ACCESSM, OPPCOM, PCOM, PALL)
Algorithm: Quine-McCluskey

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.9
                                            raw        unique
                                          coverage    coverage   consistency
                                         ----------  ----------  ----------
GUIDE*DRAFT*ACCESSM*OPPCOM*PCOM*PALL     0.439024    0.439024    0.9
solution coverage: 0.439024
solution consistency: 0.9


**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/FINAL ANALYSIS.csv
Model: INFL = f(GUIDE, DRAFT, ACCESSM, OPPCOM, PCOM, PALL)
Algorithm: Quine-McCluskey

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.9
                 raw        unique
               coverage    coverage   consistency
              ----------  ----------  ----------
DRAFT*PCOM    0.439024    0.439024    0.75
solution coverage: 0.439024
solution consistency: 0.75


**********************
*TRUTH TABLE ANALYSIS*
**********************

File:  /Users/kruser23/Documents/FINAL ANALYSIS.csv
Model: INFL = f(GUIDE, DRAFT, ACCESSM, OPPCOM, PCOM, PALL)
Algorithm: Quine-McCluskey

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.9
Assumptions:
                                            raw        unique
                                          coverage    coverage   consistency
                                         ----------  ----------  ----------
GUIDE*DRAFT*ACCESSM*OPPCOM*PCOM*PALL     0.439024    0.439024    0.9
solution coverage: 0.439024
solution consistency: 0.9
```