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Comparative Analysis & Strategy: Policy Instruments for Renewable Energy in Oregon

Oregon's energy system is evolving to reflect the stated legislative priorities of decarbonization, decentralization, and diversification. This report outlines several policy instruments (Renewable Portfolio Standards, Net Metering & Interconnection Standards, Tax Incentives, Public Benefit Funds, and Energy Efficiency Standards) available to the state, their alignment with the stated goals of the state, their utilization and effectiveness in other states, and the political considerations surrounding their implementation in the State of Oregon. This report concludes with suggested policy package considerations to further these goals in the current political climate.

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Introduction

In 1975, the Oregon legislature established the Oregon Department of Energy with the statement, "It is essential that future generations not be left a legacy of vanished or depleted resources…" (ORS 469.010). This legislation established the following principles as the Department of Energy's core mandate (O.L. 1975 c.606 §1):

- "Provide leadership on energy conservation, renewable energy and protection of the Columbia River from radioactive waste at Hanford;
- Engage in energy planning and siting of energy facilities;
- Promote conservation and renewable energy projects through a variety of programs;
- Research emerging energy technologies; and
- Provide educational and technical assistance to industry professionals and the public."

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In the decades since, Oregon's energy policies have undergone rapid change, but these fundamental principles have continued to guide state energy policy. Generation has continued to be dominated by hydroelectric sources, but there has been significant movement towards a more sustainable and decentralized electric grid. The last decades have seen the closure of Oregon's nuclear generation facilities and an increase in natural gas and wind power. In 2016, the Oregon legislature passed SB 1547, requiring providers to discontinue purchasing of fossil fuel-based energy, and in 2020, the Boardman coal generation facility is scheduled for closure.

These developments have made Oregon a leader in sustainable energy, but much work remains if Oregon is to reach the goals established by the state to decarbonize, decentralize, and diversify Oregon's energy generation ecosystem.

As of 2018, hydroelectric power continues to be the largest generation medium in the state, accounting for roughly 40% of all energy generated. And while hydroelectric is a low-carbon source of energy, it is concentrated along the Columbia River, which makes it vulnerable to a plethora of exogenous shocks including the possibility of seismic events and terrorist threats (Chen et al 2012, 198). As such, while it is certainly a core component of a decarbonized energy ecosystem, but it does not aid the goals of decentralized and diversified energy mediums.

The Boardman coal power plant, despite accounting for around a third of all of Oregon's generation capacity, runs counter to all three of the stated goals. It is the largest single-point greenhouse gas source in the state. It is currently scheduled for closure in 2020 (Dooris 2019), but its loss leaves open questions as to where the imported energy that will need to fill the gap will come from.

Natural gas is the next largest generation medium at roughly 17%, and while certainly cleaner than its fossil fuel predecessors and more decentralized than Oregon's hydroelectric or coal facilities, it still creates carbon emissions in excess of the state's long-term limits.

Renewables currently make up about 8% of the state's generation capacity with 6.5% coming from wind power. This represents a 741% increase in wind energy since 2004 (Oregon Department of Energy 2018, 9). If trends continue, it will represent a sizable impact on statewide carbon emissions and diversity in Oregon's energy portfolio, but it is also at present largely isolated to the Columbia Gorge region.

Over the last 20 years, Oregon's energy generation ecosystem has become more diverse, more decentralized, and lower carbon-producing, but the state remains behind carbon goals and vulnerable to shock from its high reliance on the Columbia Valley for energy production. This report outlines several policy options available to the state, their alignment with the stated goals of the state, their utilization and effectiveness in other states, and the political considerations surrounding their implementation in the state of Oregon. For the purposes of this report, we will discuss the following energy policies:

- Renewable Portfolio Standards
- Net Metering & Interconnection Standards
- Tax Incentives
- Public Benefit Funds
- Energy Efficiency Standards

For the sake of this report, we will categorize these policies within the NATO typological framework established by Christopher Hood (1983) to help elucidate the formal mechanisms that enable the implementation of each. Under this framework, policies are codified into four distinct (but often overlapping) typologies. Typologies are either coercive or persuasive. The coercive powers of Authority (A) include regulation and prescriptive policies while Treasure (T) include fiscal incentives and penalties. The persuasive powers include Nodality (N), which refer to information-based power such as the formulation of scorecards, warnings, and labeling, and Organization (O), which includes coordinating and management tools.

Finally, a discussion of energy policy packages would not be complete without a discussion of the actors and interests relevant to each policy tool. While the direct institutional actors include the Governor and the Department of Energy in the Executive Branch as well as the state legislature, each policy tool also has unique impacts on various interest groups and actors which may affect their feasibility within the Oregon socio-political ecosystem. These more specific policy actors will be addressed for each policy tool and summed in the final section on strategic considerations.

Policy Instruments

Renewable Portfolio Standards

Renewable Portfolio Standards (RPS) establish targets for renewable energy, either in generation or in consumption. Oregon's RPS was established by SB 838 in 2007 and updated by SB 1547 in 2016. It mandates that investor-owned utilities derive 50% of their energy from renewable sources by 2040 (25% by 2025 for consumer-owned utilities). As a coercive Authority-based tool, it leverages the power of regulation to distort market functions to realize goals.

Carley (2011b, 269) notes that RPS does generally achieve the stated goals of decarbonization, decentralization, and diversification, though not often all three at once. In the case of diversification, results tend to be quite dependent on enforcement and policy stability. Decentralization likewise tends to be dependent on concurrent policy in other dimensions, such as tax-credits for small-scale generation. RPS policies do tend to lead to a higher percentage of power generation from low-carbon sources as long as the incentives and penalties are strong enough to drive compliance.

Most states currently have RPS regulations on the books. However, they can vary widely in terms of both goals and effectiveness. Much of this variation can be attributed to variability in policy design, implementation, and enforcement. Some states have seen a tremendous amount of success when the policy has strict enforcement procedures and a stable political environment. Those states that have light enforcement, significant carve-outs, or frequent change or alteration to their RPS policies have generally been less effective at achieving their sustainable goals.

In general, RPS is the low-hanging fruit of sustainable energy policy. It shows a high amount of political feasibility since RPS policies come without upfront price tags and have time horizons that allow for ramp-up effects, lowering the burden (and therefore political backlash) at the time of policy consideration. Further, instead of increasing the cost of existing energy products, they tend to decrease the cost of renewable sources in the long run as energy providers increase renewable generation.

In the specific case of Oregon, the policy has likely been successful so far as renewable production has consistently increased and thus far seen relatively little political pushback. Further, with the closing of the Boardman coal plant, energy companies will likely increase their energy purchasing and production from low-

carbon sources, reducing long-run costs for those energy mediums. Finally, Oregon's geography and historic power mix creates a distinct advantage in this area. The Columbia River Gorge is a viable source of significant wind power; the geography east of the Cascades presents ample opportunity for commercial solar projects; and the state has a long history of utilizing hydroelectric power throughout the state. It is worth noting however that not all hydroelectric power is eligible for the state's Renewable Energy Certificates. Only new small hydroelectric facilities or electricity from older facilities attributable to efficiency upgrades after 1995 or from those that have been certified as low-impact facilities after 1995 (Oregon, n.d.) can be counted towards RPS figures. This policy instrument also has few opposing interests and broad electoral support, creating a stable and positive political environment.

Net Metering & Interconnection Standards

Oregon established net metering and interconnection standards in 2005, allowing Oregon residents and companies to generate distributed energy on-site and sell it back to the utility during generation surpluses. Both are coercive Authority-based instruments that mandate that utility providers offer bidirectional meter installation at no charge and purchase power from distributed sites if their production exceeds consumption.

Net metering and interconnection standards do help achieve the primary goals directly. However, even cumulatively, their impact may be relatively low. Of the three, their greatest impact is to the goal of decentralization. By creating a profundity of micro-generation points, the whole system is less vulnerable to negative impacts including cascading effects. However, the amount generated is small and requires an appropriate distribution network from the wheel-and-spoke system typical of large-point generation. These policies also tend to create greater diversity in power generation. While many are photovoltaic arrays utilized by single homes or commercial facilities, biomass is also common. And since most distributed power generation is photovoltaic (slightly less than 50% compared to less than 1% of utility production), it is generally low carbon.

While net metering and interconnection standards are broadly common among states today, these distributed systems account for a very small percentage of total power demand, and even that varies widely state to state. Forsyth (2002, 12) found that net metering and interconnection standards were generally not enough in and of themselves to promote the production of such distributed systems and that complementary policies were a primary factor in the efficacy of such programs. Limits on the size of such systems (bottom or top) can drastically affect

the propagation of distributed systems (NNEC 2008, 8 and 21), as can fees and tax-incentives that make barriers to distributed system production higher or lower.

In Oregon's case, an array of policy packages has addressed these systems, from the 2005 legislation to various grant and subsidies established at both state and local levels to incentivize both private residents and commercial facilities to install on-site power generation. The primary advantage of net metering and interconnection standards is that the costs are primarily placed on utility providers and not state coffers, but this advantage comes with additional implicit costs if it is to be effective.

In addition to its relatively low impact on overall energy generation, additional incentives often must accompany such initiatives. Grants and tax incentives for the capital costs of installation of such systems are expensive relative to the impact, and narrow in regard to the number of people able to take advantage of them. Further, depending on structure, such policy packages can engender antipathy from powerful utilities and taxpayers who pay for the programs while those that directly benefit from them are few, generally wealthier, and distributed widely across the state.

Tax Incentives

Tax incentive regimes have a multitude of configurations, from small-scale residential subsidies to large capital subsidies and cap and trade configurations. By leveraging the persuasive Organization and coercive Treasure powers of the state, such instruments have a range of applications and effects. As Treasure powers, the state can create incentives for particular activities and investments within the market, and with the Organization powers, the state can create new market mechanisms that organize and direct market effects.

Oregon currently has a number of tax incentives on the books, ranging from property tax abatements to capital subsidies for energy projects, both small-scale and local as well as large-scale utility projects. Further, the state has been considering a more profound tax incentive program in the form of cap and trade, though that was defeated in 2019.

Though generalizations about tax incentives are difficult given their diversity in both scale and typology, they can help meet all three goals if formulated well. By incentivizing renewable power generation at any scale, they theoretically align with decarbonization goals. However, there are risks including leakage (where the price for high-carbon generation falls due to falling demand, only to be purchased out of state) (Bushnell et al 2007, 10) and free-rider issues (where those

that might have purchased renewable technologies anyway take advantage of subsidies (Geller 2002, 60). If formulated correctly, they do deliver decentralization when the incentives are targeted at small-scale projects and diversity when they target renewable and alternative energy sources.

According to Carley (2011b, 277), tax incentives are most effective when paired with other policy tools, so their efficacy in other states shows wide variability depending on supporting policy environments. However, their smaller and controllable costs can make them efficient tools.

In Oregon, subsidies for renewables and other incentives are generally popular, though larger programs such as cap and trade have experienced significant political pushback, especially from the industrial and manufacturing sectors. In order to produce the desired effects within the market, they are better targeted in ways that make their costs transparent and capped as opposed to profound reconfigurations of the state energy market.

Public Benefit Funds

Public Benefit Funds are programs intended to drive revenue to renewable power or energy efficiency projects. Energy Trust of Oregon is this state's public benefit fund, which was instituted by SB 1149 in 1999 and created a 3% surcharge on electric-utility bills. From this revenue, various energy efficiency programs, small-scale renewable projects, and low-income and K-12 school energy-conservation programs are funded.

At present, there is not enough research to draw conclusions as to the efficacy of these programs towards the goals of decentralization or diversification, as most are targeted towards the marketplace side and vary widely in their policy contours, goals, and directives. These programs were most effective at increasing energy efficiency, which might lower-high carbon energy source demand, but this only bears on decarbonization depending on utility energy mix in any given jurisdiction.

Whereas the previous three policy instruments have been widely tested in various state contexts, these funds exist in only 18 states plus Washington, D.C., and within those jurisdictions, they vary widely. The benefits of these programs are a notable efficacy in increasing energy efficiency and the fact that they are generally funded by users, not through taxes. However, in order to be effective, administrative efficiency has tremendous bearing as does the propensity for these funds to be "raided" for other uses. In Oregon, the Energy Trust program is generally seen as a success, or at least generates very little political opposition.

However, significant increases in the scale of the program could engender increased opposition as users see increased direct costs.

Energy Efficiency Standards

Energy Efficiency Standards (EES) mandate utilities enact strategies to increase energy efficiency. Depending on language, these tools are both coercive and persuasive in nature, incorporating typological elements of Authority, Nodality, and Organization. Oregon implemented an EES strategy in 2010, mandating an approximately 1.3% increase in energy efficiency by Oregon utilities (ACEEE 2019, 7). This program is administrated by the Energy Trust of Oregon.

Since these programs operate at the utility level, their impact on decentralization and diversity is entirely dependent on the utility-level operations. However, like Public Benefit Funds, they do have a modest impact on decarbonization by reducing energy demand generally, especially when adherence is mandated instead of voluntary.

There is limited information on their efficacy in various state contexts as they are a relatively novel instrument. Nadel (2006, 41) did show however that states that had implemented them performed well compared to those that did not (especially those with mandated adherence instead of voluntary).

The primary political benefit of these programs is that the onus is entirely on utilities for compliance with no tax funds necessary and utilities are often favorable as these programs lower their delivery costs in the long run, making them highly political feasible.

Strategic Considerations & Policy Package Recommendation

The fact that Oregon has successfully implemented all of these policies in some form or another over the last few decades speaks both to the State's position as a leader in sustainable energy and to its political will for enacting sustainable energy practices. There is a foreseeable limit though given the animosity that has arisen around the state's attempt to implement a cap and trade program. However, it is reasonable to infer that much of the opposition to that legislation was related to the perceived increases in energy and compliance costs, especially in rural Oregon and among Oregon's industrial sectors, as opposed to opposition to pricing carbon emissions per se. Further, there is evidence that Oregon is reaching a point of diminishing returns. In parts of the state, existing infrastructure for distributed solar power and net metering is reaching its capacity limits (Profita 2020).

As such, at this time it would be reasonable for the State of Oregon to proceed incrementally, tweaking the existing policy program by increasing renewable and distributed generation tax-incentives or increasing energy efficiency standards as opposed to wholesale changes until infrastructure capacity and social dynamics catch up. Further, with the closure of Boardman imminent, there may be unforeseen pitfalls ahead that could complicate new measures, especially more ambitious ones, until the fallout of that event is better understood. Looking at the political energy landscape, the best opportunities may be through increased tax incentives or modest increases in Public Benefit Fund contributions. These targeted investments could be aimed at increasing distributed generation, both in Oregon's cities, where it is politically congruent as well as more rural areas, where it could decrease transmission infrastructure dependence and vulnerability all the while incentivizing self-sufficiency where that ethos is most encouraged.

Large utility-scale increases in renewable energy will be more difficult in the near-term as increased wind power is increasingly facing opposition (as well as saturation in the Columbia Gorge), nuclear power is broadly considered dangerous (though this conception is debatable), and large-scale solar still remains less than ideally cost-effective, infrastructure capacity-limited, and geographically limited to the eastern half of the state.

In sum, while Oregon has long been a leader in renewable energy, it is reaching a point of diminishing returns, where major improvements will be harder to come by, more expensive, and require major infrastructure investments. Profound, far-reaching legislation such as cap and trade or the reintroduction of nuclear power may not be broadly popular or politically feasible at this particular moment in time. However, by focusing on smaller projects that remain popular and relatively cost-effective, Oregon can meet its stated goals of a more diverse, decentralized, and decarbonized energy environment until the evolution of the political landscape unlocks the potential for more structural changes to the state's energy policy.

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