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Evaluation of Oregon's Food Waste Recovery and Reintegration Policy Adoption
through Civic Capacity

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Introduction:

The US Food System is complex and multi-layered, containing many areas for improvement. This paper will focus specifically on the issue area of food waste. On a global and national scale mitigating food waste can seem too large to manage. Containing complexity across multiple sectors and with extended timelines for improvements, it is indeed a wicked problem. A problem which in its complexity is almost impossible to fully distinguish or address with one (or even multiple) solutions. (Rittel, 1973). However, when we look to local, place-based solutions we can develop more realistic and actionable plans. The state of Oregon is equipped to cut food waste loss by 50% within the next 10 years, but will need to tap into existing civic capacity to reach this intended goal. In the following, I offer critical evaluation and recommendation for the current Oregon Metro policy on local food waste recovery and reintegration. To evaluate the policy fully, I will explore the abilities of Oregon Metro to act as a centering-agent in helping support the regions' civic capacity towards implementing policy and successfully manage Sustainable Development Goals.

I will be referencing the three components of civic capacity theory as the social element needed for successful governance. put forth from Craig Shinn (1999), which includes civic capital, civic competency and civic enterprise as the framework for understanding how Oregon cities will be able to respond to policy addressing food waste. Civic capital, which refers to the network of institutions within a community (often the policy implementors), civic competency as the knowledge and expertise of the community, and civic enterprise as the historical tradition of collective action (Dent, 2008). I will be applying the concept of centering-agents and actors as referenced in the 2021 case study of Kai Whau from Garden et al. which provides evidence that organizations when acting as points of contact, dissemination and engagement, can help strengthen civic capacity and successful enabling effects with regards to food systems and policy (Garden,et al. 2021).

Food waste in context

Across the globe municipal solid waste has changed dramatically over the past few decades. Not only has collection, landfilling, and recovering changed, so has the

components of our waste. From the EPA's report data, in the United States, 30-40% of all food produced is never eaten and ends up as food waste- food waste loss . FWL occurs at every stage of the food chain, however 30% comes from the retail and consumer levels. As a result, FWL contributes to almost a quarter of municipal waste . The food waste that ends up in landfills produces high levels of methane gas as it decomposes, or carbon dioxide if incinerated. In Oregon 15% of the consumption-generated greenhouse gas emissions come from the food waste in landfills. There consequences of food wastage far beyond GHG emissions.

Environmental impacts, such as water loss from crop irrigation, deforestation, loss of ecological-diversity from monocropping, and soil erosion, can exacerbate climate impacts and extend into future abilities to navigate changing climates (FAO, 2014). Economic losses and burdens exist as well to support the presence of food wastage in waste systems, the organic material adding bulk and mass which increase transport and landfill capacity. The economic and environmental factors of growing crops that will never be consumed, present an almost moral responsibility to act on addressing FWL, and have have influenced local programs supporting the reduction of FWL in waste streams. While on a global and national scale the mitigation of GHG emissions from FWL has been the critical factor in garnering deserved attention from government agencies to build policy towards achieving our climate target goals.

Global and National Goals Influence Local Policy

The wicked problems within our food systems, like impressive amounts of FWL and its far-reaching negative impacts, are often handled through top-down multi-jurisdictional efforts. Newly set sustainability goals by United States Congress and other international governing bodies has placed pressure on more regional forms of government to meet goals by implementing policies.

In the fall of 2015, member states of the United Nations adopted the 17 Sustainable Development Goals (SDGs) as a part of the *Transforming our world: the 2030 Agenda for Sustainable Development*. The international community has been expected to be guided by these objectives, stimulating action on critical elements for humanity and the planet, while the 2030 Agenda as a whole “offers a vision of a fairer,

more peaceful world in which no one is left behind". The 2030 Agenda seeks to be as relevant to developing nations as it is for developed nations, representing the most intensive global agreement in history. The Paris Climate Agreement was an outcome of this multi-national and multi-stakeholder convening and the 17 SDGs now act as the main reference point for national development policies and programs (UN, 2015). People, planet, prosperity, peace, partnership are guiding principles of the 2030 Agenda. In many ways the goals produced and adopted by UN countries embody the goals of civic capacity and community resilience, I see this as an important element to carry through implementation of policy.

Policy development on food waste recovery, and reintegration is influenced by Sustainable Development Goal 12 as it seeks to *"ensure sustainable consumption and production patterns"*. Even more specifically the aim of SDG 12.3 *"By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses"* (UN, 2015). In response to the United States adopting the 2030 Agenda, the U.S. Department of Agriculture (USDA) and the Environmental Protection Agency (EPA) developed the *2030 Food Loss and Waste Reduction* goal, which aims to cut national food waste by 50% by 2030. (United States Environmental Protection Agency). In addition to mitigating the environmental costs associated with our FWL, the goal also seeks to improve food security and provide a cost savings for families and businesses alike. Efforts to work within communities are supported by the Food and Drug Administration in addition to the USDA and EPA. Here the stated intentions reflect the co-benefits which are possible with food waste recovery and redistribution. These co-benefits can be achieved utilizing elements which build civic capacity, such as principles of collaborative governance and polity leadership which will be outlined in the following policy benefits section.

In March of 2020, Governor Kate Brown issued Executive Order 20-04. The overall directive is for multiple agencies to cut GHG emissions. As an effort towards reaching that goal, Exec Order 20-04 explicitly calls for a 50% reduction of food waste by 2030. Within that goal, there was an ask to engage with stakeholders (brands, businesses, industry, jurisdictions) to develop strategies towards prevention and recovery of food waste. As the Oregon Department of Environmental Quality is directly

responsible for “*protecting and enhancing Oregon’s environment*” they are the agency responsible for implementing further goals for the state to develop policy and actions. Two months later, the DEQ presented the *Preliminary Work Plan to Reduce Food Waste*. This quick response was in part enabled by existing work done in the region towards reaching the same goal outlined in Exec Order 20-04. In 2017 DEQ had adopted a strategy or reducing wasted food in Oregon, meaning DEQ had spent years prior developing the framework and identified this as an issue area important to Oregonians.

The success of the food waste reduction plan can be also nested within other efforts from DEQ, such as their Air Quality efforts- Greenhouse Gas Reduction (POP 111). Which provides resources for implementing GHG reduction programs deemed essential for Oregon to meet reduction targets (DEQ). Additionally, DEQ has a broad commitment to environmental justice, for which specifics on how they interface with food waste reintegration I will address further on, however working to create more public participation and meaningful involvement of people impacted by DEQ’s decision-making directly engages with the concept of utilizing collaborative governance principles and acting as a centering-agent within the state. They also work with the Oregon Legislature budget development to assess potential funding areas that would help fulfill the mission “to be a leader in restoring, maintaining and enhancing the quality of Oregon’s air, land and water’ (DEQ). These nested and preexisting efforts that span a range of activities and programs indicate that Oregon, with agencies such as DEQ involving citizens as leaders, has a deeper well of civic enterprise to allow for more potential success in meeting aggressive food waste reduction goals.

Determining need for analysis

Within the issue area of food waste recovery and redistribution, support from high levels of government can lead to great success. However, in part what makes a problem wicked is how they are often prevented from meeting success by the difficulties which occur when multiple agencies are engaged in simultaneous, yet siloed efforts without engagement from the communities where the identified problems exist. Or if agencies implement policy too soon without understanding where the community is in their

current capacity in understanding and engaging with the problem area. In the context of engaging citizens on an issue that will require cultural changes, policy has a greater potential if thought of as a tool for ongoing civic encouragement and education, rather than as an output of a political machine (Siranni, 2009). Policy has even greater potential to achieve a goal if the goal is defined by the community (Green 2006, Garden 2021). Critical to local food waste recovery, composting, and redistribution, the impact of top-down governance could inhibit the support and adoption of this policy. Just as important as SDGs and identifying issue areas, governing bodies need to be asking if policies feed into current civic capacity and create a sense of accomplishment which helps the adoption of future policies.

Studying and developing policy to mitigate FWL is a relatively new policy area. Only in 2018 did the EPA include new methodologies for measuring flows of food and food waste, finally capturing more accurate accounting for how much FWL there is in the national food system. Most research which has been done is to quantify how much food waste there is and what that translates to as far as GHG emissions. Less research has been done on other areas outside of food production- such as food recovery and reintegration of finished recovery product (compost) (cite). This means there is a large gap for policy-makers to draw on for the potentials of composting where it can help cities lessen their climate impacts and build future climate resiliency. Current literature and policy focus areas are missing the opportunity to create more sustainable systems as they work towards SDGs. Fortunately, for regions and locales where existing efforts for food waste recovery and reintegration have been implemented prior to recent national goals, there is a wealth of information and practices on alternative methods towards more sustainable practices. Which further demonstrates the need for community-led practices to develop before top-down policy comes into a region. For regions not working on SDGs of FWL and GHG reduction, having top down goals could inspire action within the community or create an opportunity for regional governments to act as a centering agent in leading education and focus towards future policy.

Policy Assessment

Oregon Metro (Metro) is an elected regional government, spanning three counties (Clackamas, Multnomah and Washington) and oversees solid waste and recycling systems, including the development of the Regional Waste Plan. The City of Portland's solid waste management is contracted by Metro. Meaning these two governing agencies must work together to develop future waste plans and Metro often provides financial and infrastructure support for future projects. Food waste recovery and reintegration is not new to Oregon, Metro has been workshopping ideas since 1993 to recover Oregon's solid waste. There has been ample voluntary participation, however only 14% of waste has been recovered or redirected from landfill (Personal Interview). In 2018 plans with the aim to reduce food waste by 50% by 2030, initiated a more aggressive approach to significantly increase food waste recovery and redirection. In 2018 Metro Code 5. 10 was amended to include a mandatory Business Food Waste Requirement, wherein food businesses producing more than 250lbs of food scrapes per week are required to compost. Two years later, in January 2020, Resolution No. 20-5067 is passed: *Setting An Effective Date Of January 2025 For Prohibiting The Landfill Disposal Of Commercially-Derived Food Waste Generated Within The Region* (Porter et al., 2014).

The large scale food businesses which are most impacted by the Metro policy are the largest contributors to food waste (commercially) and therefore produce the largest carbon footprint by sending food waste to landfills (Personal Interview). Designed to be a tiered implementation, with the largest food waste generators going first through getting up to code. These businesses include institutions, grocery stores, sporting venues, and corporate food services. They typically have the means to secure additional composting services and provide supports to staff for training. There is a multiple year roll out of the plan, with businesses producing the most food waste mandated to operate within policy requirements in the first year and businesses that produce less are included in later years of policy roll out.

Overall, this policy aims to do just as it states, banning food waste from landfills. Important to note, Resolution No. 20-5067 leaves ample room for *how* businesses approach disposing of their food scraps. The open interpretation creates space for other actors to enter and come up with new solutions to meet what will be a significant need.

This is the current version of policy that cities and counties within Metro are responding to with their own programs and community support. Some cities are further along in their response and adoption.

The City of Portland has been aware of the need to address food waste prior to global goals, 1999 was the first time Portland considered a mandated food scrap collection program. In 2005 Portland implemented a food scrap collection program. These early initiatives are signals that the city is ready to have a policy to codify action (Dunn, 2018). They are also indicators that Portland possess shared values and reputation for being known as a sustainable city, with culture of DIY and innovations; these values showcase elements of civic enterprise (Shinn 1999). As policy-makers from higher levels of government look to implement policy in regions, being aware of civic enterprise will allow for greater chances of success.

While Portland and other cities within the Metro area already support and participate in voluntary composting programs, having a mandatory composting program creates a push effect for cities that are not already participating. Although, the one size fits all approach across Metro's region is not going to move the ultimate goals of the policy forward. Metro's role in cities that are not as far along will be different than the support role it plays with Portland. Metro's ability to take different approaches across the region they support is an important factor in acting as a centering agent, helping to create resilient communities who are ready to adopt new policy goals. Taking a varied approach and building deep relationships with community brings co-benefits beyond target GHG reductions. Working with a diverse ranges of communities provides Metro with an expansive range of perspectives and knowledge held by locals. Which can then be added to Metro's arsenal of expertise for future adaptation and response to challenges.

Benefits

Beyond creating more local resilience there are many benefits which are possible through policy which addresses food waste. Focusing on the reintegration element shows just how great the potential benefits can be, as acknowledged by DEQ. Finished product from composting facilities provides multiple environmental benefits as compost

can improve soil tilth and fertility by storing nitrogen and carbon in the soil. Keeping carbon in the soil reduces atmospheric carbon- another method to cutting GHG emissions. It also reduces soil compaction and increases water storage capacity. These factors are the building blocks of regenerative agriculture, which Metro supports across Oregon's agricultural land, including on Metro owned farmland.

In the past few two decades of research, compost processes and finished provided had provide to be a technology which can be utilized in environmental remediation, significantly reducing the cost associated with cleaning up brownfield sites (SWER, 1998.) As addressed above, DEQ has a broad commitment to environmental justice, which includes the environmental remediation of brownfield sites. This objective alone supports building a market for the reintegration of food waste as compost.

In my exploration of Metro acting as a centering agent in supporting civic capacity to allow for a more successful adoption of food waste policy, the co-benefit of a strong reintegration element of Resolution No. 20-5067 extend far beyond the food waste hierarchy. Such as the utilization polity leadership, with the common goal at the center and multiple actors across sectors coming together to build supports and solutions based on community input (Morgan, 2015). Metro has the networks and influence to act as a hub where organizations can strengthen their collaborative efforts with each other and leading community members, increasing their civic capital.

Barriers

While much of the prework leading to Resolution No. 20-506 was co-produced with city and community input, challenges still exist within the policy. This specific resolution faces barriers which could prevent reaching target goals and potentially harm civic capacity of region. The main barriers and challenges were similarly posed throughout my literature review. I found them to be most insightful and qualitatively addressed during my interviews with the Community Engagement with Oregon Metro, and the Sustainability Manager for food services at a leading corporation. Both identified market and infrastructure supports, and educational components, as the largest barriers to food waste recovery and reintegration policy. Food waste is only compostable if there is a composting system to support the process. As it stands currently, with these

barriers, the regional policy is not supported by a system of resiliency. There is limited assurance that the food waste collected will end up as a quality product. Those efforts have yet to be widely established within the full region.

The region is lacking transfer facilities that process the food waste into compost. There are additional facilities which process food scraps for animal feed and bio gas, however these in partnership with composting facilities are not yet prepared to take on the amount of food waste produced by regional businesses once all are participating in Metro estimated the cost of constructing a new anaerobic digester with 65,000-ton capacity at between \$30 and \$50 million. Within the city of Portland *Clean Energy Plan*, staff noted that there needs to be an established, steady supply of food scraps in order to fund building a new processing facility. It is important to consider how is whether they actually build the facility first, and in the interim laying out a policy without capacity or market, does Metro risk losing the trust of citizens and impacting civic capacity? If acting as a centering agent, Metro would find more innovative solutions besides governmental funding that comes much later and use additional elements polity leadership to open partnerships to non-profit sector in addition to the private sector.

During the interview with the Sustainability Manager, they noted how much time it takes to ensure her staff, of over 200 people, knew how to properly divert food scraps from their waste streams. They estimated 65% of their job is building out educational plans, materials, and facilitating trainings. This committed effort has produced a 98% divergence rate for their facilities covering a large corporate campus and multiple eateries. The part of implementation is critical to ensuring that there is a quality finished product ready for value added use, such as farmland supporting regenerative agriculture and in remediation efforts.

During the interview with the Community Engagement with Oregon Metro, they emphasized the importance of market supports. How will these facilities make money from selling the processed food waste, especially if additional technical labor is required to sort through city compost from businesses that do not have as robust of an understand on how to compost as the Sustainability Manager describes above. Finding value add market helps to keep the collection and processing side of composting financially sound for the waste contractors, all private businesses. For large scale

buyers, who would be the majority of the market, there needs to be an incentive to purchase this organic matter. Prices must match non-organic materials or subsidies can be implemented, just as exists with chemical fertilizers.

Policy Alternatives

Focusing on the reintegration of food waste has become a focus in policy agenda. Looking to other regions to inspire our policies and codes is a centering act that can increase our civic competencies. I will showcase two alternative policy below, one from a similarly situated socio-cultural region, and the other with similar multi-jurisdictional governing structure.

Looking at California Senate Bill 1383 provides a policy example that addresses the barrier of market supports. CA SB 1383 was designed and implemented as an effort to address short-lived climate pollutants (SLCP), similar to global and national goals to cut GHG emissions. Its goal is more aggressive than Metro- seeking to reduce FWL 50% by 2020 and then to 75% by 2025 (California, 2020). The method used to address market supports, was to require government agencies to purchase the collected FWL in its final product form, either as composted material or biogas. This present as large markets, as it covers all publicly funded institutions. This is seen as supporting local climate action plans by taking advantage of the environmental benefits of food waste reintegration. SB 1383 also addresses and offers support with enforcement, reporting, and other technical assistance to ensure program success. CA SB 1383 that is a state wide policy, which does mean there is more room for each municipality to structure its own approach, posing both a potential area for harm as there has been trouble connecting compost to farms across the state, or possibility for locally tailored solutions, like in regions who have already been working on this type of system (Wozniacka, 2022).

Half way across the globe South Korea provides an aspirational food waste recovery and reintegration scheme. They possess the highest municipal solid waste recycling rates globally, diverting 84.4%. In the city of Seoul, with 10.5 million people, there is a 100% recovery rate for food waste (World Bank, 2016). These results are from a series of policy enactments, which began in 2005 with the banning of food waste

to landfills. Only seven years later was a full recovery and reintegration plan implemented. Similar to the United States, the central government of South Korea established development goals, and promotes across the nation, in addition to prioritizing research and technology development. Then the Seoul Metropolitan Government further establishes city goals and policy implementation. This specific goal was heavily funded in South Korea, navigating around the barrier present in Oregon with lack of infrastructure. Large investments for high-tech bins to be placed around the city for ease of pay-as-you-go use, in addition to treatment facilities have already begun to pay off as market economy grows and environmental impacts lessen (cite).

Recommendations and Discussion

Regional composting policy presents an informative area of study, showcasing how policy addressing food waste and build towards additional environmental goals and climate resilience amongst regions with strong market supports, infrastructure, and technical assistance. Movement towards this end, can also support communities who are more resilient in the future, with an increased sense of accountability and achievement through reaching goals on a policy with multifaceted co-benefits.

Critical for achieving regional policy goals as intended by Oregon Metro, I would make the following recommendations:

1. Building-in market supports within the policy, such as requiring public agencies to purchase finished products, either as compost or biogas. Offer incentives for farmers to purchased finished products those above, as well as animal feed. Offer incentives to corporations who invest significantly in the critical technical supports needs for employee training.
2. If federal government cannot offer the relational supports that a regional government can offer, it can provide the monetary and financial support needed to fund critical components such as infrastructure and more technical supports. Financial investments in waste processing technologies that is easy to use on the consumer side, as well as local enough to be useful.

In addition to the above recommendations, there is a mindset approach that was apparent when speaking with Metro representatives, which must be overcome to move forward with food waste recovery and reintegration. When asked about civic inquiry on FWI management regional, the interviewee stated not many folks are interested in composting programs anymore, most are focusing on more upstream areas of our food systems and food waste, including loss prevention. Unfortunately if we are looking at composting as an outcome of the food waste hierarchy, it is seen as a downstream effort. However composting can be an innovative solution for future environmental work and community resiliency. Metro can help individuals orient themselves and show how they are connected to the broader community, their city, region and state. Changing the common the mindset to think of circular systems of innovation versus a one-way flow of impact. They can help encourage an individuals political responsibility in the senes of an accountability to take part in collective public action on a timely issue area.

Adaption and adoption of policy is linked to multiple factors and we need to be diligent about implementing circular composting problems as this is the adaption to the 21st century and climate needs. This issue area possess timeliness and importance, however additional factors must exist within the community to adopt policy and the community effects of policy might create additional issue areas or extend into other issue areas. True adoption of policy that changes our lifestyles and culture requires sustained engagement and efforts. Oregon Metro has responsibility to orient individuals of a community to see how they are connected to a larger problem (and solution), leading the individuals within the community to take a political responsibility and accountability for moving with collective action towards climate resilient futures. I would assert these climate resilient futures contain strategies for food waste reintegration and robust composting systems. That is the true crux of Oregon Metro's role as a centering-agent in the implementation of food waste recovery and reintegration, to build the awareness and to the impacts of FWL on climate change as well as its role in preventing further impacts. To empower all stakeholders within the region with holistic policy measure today so we are stronger against future vulnerabilities and climate impacts.

Works Cited:

California, S. of. (2020). <https://www.calrecycle.ca.gov/organics/slcp>. California's short-lived climate pollutant reduction strategy. Retrieved March 15, 2022, from <https://www.calrecycle.ca.gov/organics/slcp>

Dent. (2008). Civic Capacity and Community Response to Government Action: The Endangered Species Act and State Water Law in the Methow and Walla Walla Basins in

the Pacific Northwest. *International Journal of Public Administration*, 31(3), 262–276.
<https://doi.org/10.1080/01900690701590439>

Department of Economic and Social Affairs Sustainable Development, United Nations. “Transforming Our World: The 2030 Agenda for Sustainable Development | Department of Economic and Social Affairs.” United Nations, United Nations, 25 Sept. 2015, <https://sdgs.un.org/2030agenda>.

Dunn. (2018). *Public policy analysis : an integrated approach*. Chapter 3 - Structuring Policy Problems (Sixth edition.) . Routledge.

FAO. *Societal Costs of Food and Agriculture Organization*. Food and Agricultural Organization of the United Nations, 2014, <https://www.fao.org/3/i3989e/i3989e.pdf>.

From Farm to Kitchen: The Environmental Impacts of U.S. Food Waste, U.S. Environmental Protection Agency Office of Research and Development , https://www.epa.gov/system/files/documents/2021-11/from-farm-to-kitchen-the-environmental-impacts-of-u.s.-food-waste_508-tagged.pdf.

Garden, Walters, V. M., & Chamberlain, K. (2021). Reasserting food in place: the case of Kai Whau. *Social & Cultural Geography*, 22(7), 936–955.
<https://doi.org/10.1080/14649365.2019.1672776>

Green, O'Brien, John, Moore, Henry, & Duncan, Dan. (2006). *When people care enough to act : ABCD in action*. Inclusion Press.

Morgan, Green, Richard T, Shinn, Craig W., & Robinson, Kent S. (2015). *Foundations of public service* (Second edition.). Routledge.

Porter, J.R., L. Xie, A.J. Challinor, K. Cochrane, S.M. Howden, M.M. Iqbal, D.B. Lobell, and M.I. Travasso, 2014: *Food security and food production systems*. In: *Climate*

Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 485-533.

Rittel, & Webber, M. M. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences*, 4(2), 155–169. <https://doi.org/10.1007/BF01405730>

Shinn. (1999). Civic Capacity: Theory, Research and Practice¹. *Administrative Theory & Praxis*, 21(1), 103–119. <https://doi.org/10.1080/10841806.1999.11643352>

Sirianni. (2009). *Investing in democracy engaging citizens in collaborative governance*. Brookings Institution Press.

Solid Waste and Emergency Response (SWER), An Analysis of Composting As an Environmental Remediation Technology (1998). Retrieved from https://www.epa.gov/sites/default/files/2015-09/documents/analpt_all.pdf.

United Nations. “United Nations Official Document.” United Nations, United Nations, https://www.un.org/ga/search/view_doc.asp?symbol=A%2FRES%2F70%2F1&Lang=E.

United States Environmental Protection Agency . “United States 2030 Food Loss and Waste Reduction Goal.” EPA, Environmental Protection Agency, <https://www.epa.gov/sustainable-management-food/united-states-2030-food-loss-and-waste-reduction-goal>.

World Bank. (2016). Sustainable Financing and Policy Models for Municipal Composting. Retrieved March 16, 2022, from <http://documents1.worldbank.org/curated/en/529431489572977398/pdf/113487-WP-compostingnoweb-24-PUBLIC.pdf>

Wozniacka, G. (2022, March 3). A new California law will create a lot more compost-but will it make it to farmland? Civil Eats. Retrieved March 15, 2022, from https://civileats.com/2022/03/02/california-compost-law-food-waste-produce-farmers-brown-gold-soil-health-climate-agriculture/?utm_source=Verified%2BCE%2Blist&utm_campaign=e0d5eba8c7-EMAIL_CAMPAIGN_7_3_2018_8_13_COPY_01&utm_medium=email&utm_term=0_aae5e4a315-e0d5eba8c7-294418167