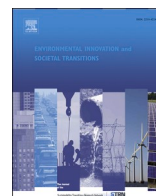


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Eliminating single use disposable foodware: An emerging and cascading norm

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ABSTRACT

Over the last few decades, varied policies have developed nonlinearly to reduce the amount of single use disposable (SUD) foodware generated and disposed of in the U.S. The increasing prevalence of such policies indicates a sustainability transition and the potentiality that this emerging norm is gaining societal embeddedness. The different types of policy mechanisms adopted both support SUD foodware alternatives and erode SUD foodware incumbents. To better understand the variety of policy mechanisms in the anti-SUD foodware norm emergence, I present a case study of the unprecedented Single Use Foodware and Litter Reduction ordinance adopted in Berkeley, California in 2019. I demonstrate that the anti-SUD foodware norm emergence is in the ‘cascade’ phase, in part due to the different types of policy mechanisms in place. By adding the policy mix framework to the norm emergence theory, I provide a quantification and comparability to policy analyses to progress policy-based sustainability transitions.

1. Introduction

Sustainability transitions are increasingly grounded in policy because of a policy’s ability to influence technological change (Rogge and Reichardt, 2016), the complexity and multiple actors in the system (Flanagan et al., 2011), and the difficulty of destabilizing incumbents (Köhler et al., 2019). One framework for analyzing policy transitions is norm emergence. Unlike other, more traditional policy transition frameworks that center discussions on the specific instruments (Flanagan et al., 2011), their ‘coherence’ (Huttunen et al., 2014), or their political dynamics and processes (Johnstone et al., 2017; Rogge and Reichardt, 2016; Uyarra et al., 2016), norm emergences include the wider context of informal rules and the reflective attributes of assessing progress and needs during the transition process from norm to policy codification (Huitema et al., 2018).

Single use disposable (SUD) foodware is experiencing a sustainability transition. SUD foodware has become a part of modern-day consumption across cultures, regions, income levels, and governance structures (Heidbreder et al., 2019). The consumption of SUD foodware is linked with prosperity (Morales, 2019), convenience (Risch, 2009), affordability (Freinkel, 2011), limited or nonexistent alternatives (Dilkes-Hoffman et al., 2019; Wozniacka, 2020), and hygiene (Thompson, 2020). Its development was both maniacal (Gies and Soto, 2013) and harmless (Meikle, 1997); it both eases pressure on natural resources (Freinkel, 2011) and it exploits natural resources (Hamilton et al., 2019). Foodware is only one category of SUDs: other categories include medical equipment like masks and gloves, cosmetics such as daily disposable contact lenses, and generalized packaging like what encases a toy.

The main materials associated with SUD foodware are glass, metals, plastics, cardboard, paper/fiber, and mixed or composite materials (Risch, 2009). These can be bottles, cups, cartons, pouches, boxes, clamshells, trays, wraps, utensils, bags, straws, stirrers,

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and napkins, to name a few. They can be provided by a retailer automatically or can be requested or picked up at a self-serve station. They might be recyclable or compostable, but only if approved by local waste service providers, of which standards vary substantially within the U.S. (Mouw et al., 2020). They also might be made from reclaimed materials. No matter their base material, or when or how they are provided, SUD foodware are defined by their intended number of uses: one. So, while some plastic forks and takeout containers can theoretically be washed and reused, that was not their purpose when designed, manufactured, and provided. I intentionally focus on all SUD foodware material types versus the more well-used category of anti-plastic because of the below mentioned proliferation of both SUD foodware items and anti-SUD foodware regulation across myriad materials.

This article outlines the emergence of an anti-SUD foodware¹ norm: a policy-based sustainability transition from previous wasteful practices toward the anti-SUD foodware social imaginary, which is a waste-free future, collectively defined by the zero waste (Zero Waste International Alliance, 2021) and circular economy movements (Ellen MacArthur Foundation, n.d.). Framing the transition through a norm emergence elucidates where we are on this pathway to more sustainable and just waste-free systems and thereby identifies what policies need to be enacted. This research uniquely furthers the quantification, and thus comparability, of the norm emergence theory by incorporating the policy mix framework. It also introduces the concept of categorizing an entire body of materials and products (anti-SUD foodware) to coalesce understanding, research, and action to progress the anti-SUD foodware norm emergence. As part of that analysis, I argue that the anti-SUD foodware norm emergence in the U.S. is in the ‘cascade’ phase. I substantiate that argument with a case study on Berkeley’s ordinance, which was one of the first multi-mechanism policies in the U.S., which are now being adopted across the country (Upstream, 2022). Such a detailed review of anti-SUD policy is rare and needed (Diana et al., 2022). While this case study and research are focused on the U.S., I initiate the opportunity to compare anti-SUD foodware policies across jurisdictions and geographical scales through the combined norm emergence theory and policy mix framework (e.g., the European Union’s Directive 2019/904). Or, as a way to inform components of the Global Plastics Treaty, which is presently under negotiation (UN Environment Programme, 2022).

In the next two sections I describe the theory, data sources, and method for analysis, including the policy mix framework and norm emergence theory. From there, I outline which policy mechanisms are used in the current U.S. anti-SUD foodware norm emergence. To contextualize that and to elucidate the norm to policy nuances, I dive deeply into an analysis of one specific anti-SUD foodware policy, the City of Berkeley’s (2019) Single Use Foodware and Litter Reduction ordinance (henceforth the “Berkeley ordinance”). I end with an examination of how the Berkeley ordinance elucidates the larger anti-SUD foodware norm emergence, examples of policy comparisons through the policy mix framework and norm emergence theory, and recommendations for anti-SUD policies and future research.

2. Theory

Norms are shared behaviors that can be unwritten but are expected and socially enforced (Social Norms, 2001). They perpetuate values and guide social order, meaning they influence behavior with or without an individual’s awareness of that influence (Miller and Prentice, 2015). Norms do not emerge overnight and while they might be unwritten, they can be codified through policy. The translation from norm to policy is not linear nor necessarily replicable (Alger and Dauvergne, 2020; Clapp and Swanson, 2009; Loges and Jakobi, 2019). Some define the official adoption of norms – which are shared standards of appropriate behavior (Cialdini & Trost, 1998) – on the international scale, as the codification of it through international agreements (Bernstein, 2001); however, others argue that such adoption occurs at the national and subnational level (Clapp and Swanson, 2009).

According to Finnemore and Sikkink (1998), the typical journey from norm emergence to policy implementation has three phases. Norm emergence begins with ‘norm entrepreneurs’ bringing attention to a social or environmental issue. The actor frames the issue to convince norm leaders (political actors) to sponsor action to address the norm by putting it on their agenda. Once an ambiguously defined critical mass of norm leaders is reached, known as the ‘tipping point’, the norm is in the second phase of the lifecycle: the norm cascade. In this second phase, norm adoption occurs more quickly out of pressure to conform, obtain legitimacy, and enhance esteem; policies proliferate. The final stage of the norm lifecycle is norm internalization, where the norm becomes commonplace, taken-for-granted. U.S.-based examples Finnemore and Sikkink (1998) provide are the woman’s right to vote, the abolishment of legalized slavery, and medical personnel’s immunity during war.

In this article, I combine Finnemore and Sikkink’s (1998) framework with Clapp and Swanson’s (2009) framework of norm emergence and overlay Kivimaa and Kern’s (2016) policy mix framework to better understand the anti-SUD foodware norm. I focus on the second phase, the ‘cascade’ to apply the policy mix framework, then discuss the status and potential options for ‘internalization’. This is not a discussion on why the emergence occurred. It is instead an analysis on the overall norm lifecycle so we can learn from it and thereby strengthen it, especially amid times of disruption in the norm’s lifecycle, which caused fear, uncertainty, and empowered vested interests in a countermovement, as seen in COVID-19 (Heiges and O’Neill, 2020; Heiges et al., 2023b).

3. Material and methods

For this study, I apply the analytical framework of policy mixes for sustainability transitions to provide novel insight into the anti-SUD foodware norm emergence. The norm emergence theory, as described in more detail in the next section, does not contain the quantification of policy comprehension that policy mixes provide. I therefore propose and apply the integration of the policy mix

¹ ‘SUD foodware’ is a term especially associated with the City of Berkeley and its historic ordinance. This field of categorization and analysis is emerging, so the term is presently not widely used.

framework into the norm emergence theory to elucidate where the anti-SUD foodware emergence is in the norm emergence lifecycle.

There are numerous, disparate anti-SUD foodware policies across jurisdictions in the U.S. That array of policies can be described as a policy mix. Policy mixes are the myriad and complex multi-actor and multi-level policies (Flanagan et al., 2011) and how they interact with varying objectives, instruments, and processes (Köhler et al., 2019). Increasingly, policy mixes are associated with the ushering in of sustainability transitions due to their role of fostering innovation and destabilizing locked-in structures (Kivimaa and Kern, 2016); policy mixes create a reconceptualization of the instruments and their interactions, thus creating more deliberate sustainability transitions (Rogge et al., 2017). Further, policy mixes can inform policy design to integrate new policies into preexisting contexts and political landscapes because no policy is adopted in isolation (Kern and Howlett, 2009) without a “messy reality” (Kern et al., 2019, p.215). The anti-SUD foodware policy mix, which is cross-sector, cross-level, and cross-administrative domains, demonstrates governmental efforts to foster sustainability transitions, albeit in an uncoordinated manner. I therefore leverage a policy mix framework to better understand what anti-SUD foodware policies exist to inform the status of the norm in the norm lifecycle and clear opportunities for more coherent and consistent policymaking (Dijk and Kivimaa, 2020) to better support the anti-SUD foodware norm transition.

I apply Kivimaa and Kern’s (2016) policy mix as the framework for analysis. Kivimaa and Kern (2016) argue that there are two main categories of policies within a policy mix: creative and destructive. Creative policies are those that support localized innovations progressing toward sustainability, or in this case, toward an anti-SUD foodware social imaginary. Such policies transform or align toward a common goal and incentivize participation. Destructive policies aim to erode the incumbents and other contributing factors of the stable, preexisting locked-in system of unsustainable SUD foodware production, consumption, and disposal. Those are policies that restrict usage of a SUD foodware item or reduce support for the producer-dominant regime.

Kivimaa and Kern (2016) take a wide perspective on the definition of policy and include items that foster change, such as voluntary agreements, even if they are not specifically codified into legislation. Bernstein (2001) might argue that this lack of translation to direct policy is not representative of codification, however, I align with Clapp and Swanston’s (2009) position that fostering formal or informal change is a demonstration of the norm diffusion, specifically at a norm lifecycle’s ‘tipping’ point.

Anti-SUD foodware policy data were gathered from two main sources: The Nicholas Institute for Environmental Policy Solutions at Duke University’s Plastic Policy Inventory and Upstream’s (2022) Policy Tracker. These two institutions have independently monitored and compiled waste reduction policies. The Nicholas Institute for Environmental Policy Solutions at Duke University, a research institute, created the Inventory through a rigorous methodology, including reviewing legal databases, scientific search engines, gray literature, and Google News (Diana et al., 2022). Upstream, a U.S.-based nonprofit, has not published their Policy Tracker methodology, but is known as a preeminent institution in tracking and advocating for policy that promotes reuse and source reduction. Beside the rigor and transparency in methodology, the main difference between the two databases is the Plastic Policy Inventory focuses on plastic policy (Karasik et al., 2022) and while the Policy Tracker is material agnostic, it focuses only on anti-SUD foodware policy in the U.S. (Upstream, 2022).

To gain contextual perspective, I supplemented these databases with industry news (e.g., Waste Dive, Resource Recycling, Restaurant Business) and gray literature, which provided timely updates on relevant policies in the U.S. There is a known lack of rigorous assessments of waste reduction policies (Diana et al., 2022). The studies that provide such insight are an examination of a specific product – microbeads (Dauvergne, 2018), bags (Clapp and Swanston, 2009; Taylor and Villas-Boas, 2016), straws (Wagner and Toews, 2018) – and how a policy has influenced waste tonnage (Brooks et al., 2018; Heiges and O’Neill, 2022) or the development of other policies (Alger and Dauvergne, 2020; Clapp and Swanston, 2009; Dauvergne, 2018; Wagner, 2017, 2020). I introduce the categorization of all SUD materials and products associated with food and beverage consumption – SUD foodware – because of the increase in policies that are material and product agnostic (Karasik et al., 2022; Upstream, 2022). I examine these policies as they relate to preexisting and emerging policies versus waste tonnage because of the inherently complex, obfuscation, and incompatible tonnage data. Further, while there is one study on SUD plastic bags as a norm emergence, there is only that one study, and it was released in 2009 (Clapp and Swanston, 2009). So, while some publications give important historical insight into anti-SUD foodware policy (Alger and Dauvergne, 2020; Clapp and Swanston, 2009; Dauvergne, 2018; Wagner, 2017, 2020), in general, publications were not an appropriate source of data, methods, or theory on the developing, introduced, and recently enacted anti-SUD foodware policies in the U.S.

To obtain results, I assessed the data gathered from the different sources, first through the policy mix analytical framework. Based on the specifics of each anti-SUD foodware policy, I categorized them across the creative and destructive policy types, and provided examples. I used that quantitative assessment to translate results into the qualitative norm emergence theory, thus substantiating my argument on the current standing of the anti-SUD foodware norm emergence.

To validate this approach, I applied it to a specific multi-mechanism anti-SUD foodware policy: the Berkeley ordinance. The case study begins with a detailed examination of the components necessary to the policy’s adoption (norm emergence) then examines the components of the multi-instrumental policy (policy mix). For the case study, I gathered data from interviews and by reviewing documents produced by the city and coalition who mobilized to create and pass the policy. I interviewed six people over four years.

These individuals were all part of the coalition, holding different politically and societally influential roles.² All interviews were open-ended, focused on better understanding the actors, conditions, and strategies to create and pass the policy. All interviews were 30 min to one hour. I interviewed each person at least once, and one person 15 times. The city and coalition documents reviewed were City Council meeting minutes, the City's Zero Waste Commission meeting minutes, reports compiled by the Zero Waste Commission, drafts of Berkeley's ordinance, coalition meeting minutes, and the Ecology Center's (one of the coalition members) new online toolkit of their process in developing and passing the Ordinance (Ecology Center, 2023). All documents are publicly available and cited accordingly.

4. Results

The second phase of the norm life cycle is the norm cascade. The cascade is reached after a 'tipping' point: an ambiguous threshold of "broad norm acceptance" or when "a critical mass of relevant state actors adopt the norm" (Finnemore and Sikkink, 1998, p.895). This scenario, also known as norm diffusion (Dauvergne, 2018), is the proliferation of policies that aim to codify the emerging norm. That translation of a norm into policy varies spatially and temporally and is never linear (Alger and Dauvergne, 2020; Clapp and Swanston, 2009; Loges and Jakobi, 2019).

Norm cascades are a temporal phenomenon and the reason for the norm to translate into policy can vary substantially. Between the 1970s and 2000s, anti-SUD foodware policies emerged for specific foodware items or materials. For instance, Clapp and Swanston (2009) give the example of anti-SUD plastic bag policies – arguably a 'norm cluster' (Winston, 2018) within the anti-SUD foodware norm emergence. The policies in high income countries were predominantly taxes adopted from global public pressure stemming from public health and safety concerns. In lower income countries, SUD plastic bags were mostly banned due to local environmental concerns exacerbated by limited municipal solid waste (MSW) infrastructural capacity. This uncoordinated geographical difference is common, often a result of the inconsistent translation of norm to policy based on local politics, cultures, and economic factors (Alger and Dauvergne, 2020). However, scattered policies can coalesce. As Dauvergne (2018) notes, that can come "when scientific evidence of harm is consolidating, when activism is intensifying, and when political and corporate resistance is relatively weak" (p.1). That appears to be what happened with the anti-SUD foodware movement: increased research on the harms of SUD foodware production, consumption, and disposal; the rising prominence of activist organizations campaigning against SUD foodware; government representatives championing anti-SUD foodware progress; and the rare weakness of corporate resistance to those campaigns and measures.

Even with the clear increase of opposition to SUD foodware, the status of the anti-SUD foodware norm emergence within the norm lifecycle has not been critically analyzed. Below I conduct that analysis by examining current anti-SUD policies in the U.S., with relevant examples, categorized as creative or destructive policies. I exclude the policy mix categories that do not have an anti-SUD foodware policy in the U.S. Through this framework I demonstrate that the norm is in the cascade phase. A summary of the policy mechanisms with examples is shown in Table 1.

4.1. Creative policies

For the knowledge creation, development and diffusion (C1) category, *educational policies*, used to create 'pro-environmental behavior', are an information tool that requires little to no government involvement and stresses the importance of the individual's active role in the aggregate to achieve collective change (Oosterveer and Spaargaren, 2012). If educational policies focus on informing the consumer, *knowledge creation policies* focus on informing policymakers. These policies might include the creation of commissions or research consortiums by allocating resources to better understand emerging systems or the detriments of preexisting ones.

Another component of knowledge creation is *generated and disseminated resources* for food businesses to increase and improve their anti-SUD foodware practices. These resources are often guides – mandated by policy and created by government staff – to reduce additional work needed by food businesses to comply with policy and to standardize information and practices across a jurisdiction. Examples include procurement guides that list SUD and reusable foodware that are compliant with the jurisdictional anti-SUD foodware policy.

Finally, *data transparency* policies aim to correct asymmetrical information between consumers, producers, waste service providers, and government representatives to inform action and preferences (Silva et al., 2021). Examples include publicizing data on export material type(s), amount(s), and destination(s).

The aim of establishing market niches/market formation (C2) policies is to provide additional and sometimes necessary support to increase demand for niche-innovations. That can be through "shielding, nurturing and empowerment" of niche-innovation development (Smith and Raven, 2012, p.1025); fostering greater ease for an innovation to enter the supply chain, join the social, political, economic, and institutional network, and benefit from or contribute to knowledge (Jacobsson and Bergek, 2011); or by making an emerging technology price comparative with the existing technologies through 'price-performance improvements' (Kivimaa and Kern, 2016).

Economic policy instruments focus on providing incentives for consumers to engage in less-wasteful practices. One example is

² The roles of the six interviewees were an elected City of Berkeley official, a City of Berkeley staff member, a City of Berkeley Zero Waste Commissioner (voluntary role), and three employees (from individual contributor to executive director) from three separate organizations focused on SUD foodware reduction policy and action. The three organizations span their focus from Berkeley to the entire U.S. All interviewees were guaranteed anonymity per the interview contract and stipulations in the University of California, Berkeley's Center for Protection of Human Subjects. The approved protocol is #2020-01-12895. The author conducted these interviews.

Table 1

This table represents policy mechanisms that are part of the anti-SUD foodware norm emergence, which have been enacted in the U.S. These are local or state policies, not federal policies.

Policy Mix	Example(s) of Policy Mechanism in the Anti-SUD Foodware Norm Emergence within the U.S.
<i>Creative Policies</i>	
Knowledge creation, development and diffusion (C1)	Educational; knowledge creation; generated and disseminated resources; data transparency
Establishing market niches/market formation (C2)	Economic policy instruments; public procurement mandates
Entrepreneurial experimentation (C4)	Diversifying offerings and capabilities; financial investments
Support from powerful groups/legitimation (C6)	Third-party verifications or certifications
Influence on the direction of search (C7)	Non-binding goals and voluntary actions; demonstrations
<i>Destructive Policies</i>	
Control policies (D1)	Command-and-control; market-based; choice architecture (nudges); quantity limits; material requirements
Significant changes in regime rules (D2)	Take-back; right-to-repair; shared responsibility; bring your own schemes; pool system
Changes in social networks, replacement of key actors (D4)	Remove incumbent actors

discounts for consumers when they use their own reusable bag, cup, or food container (Slafter, 2019). Another example is deposit return schemes where customers pay a deposit then receive the value of the deposit once it is returned. A third form of new market formation policies require governments to purchase specific items under *public procurement mandates*. These policies aim to aid the creation of a new market by providing a steady and substantial stream of revenue.

The entrepreneurial experimentation (C4) category are policies releasing government funding to diversify offerings and capabilities in preexisting firms and encourage niche-innovations. Most resources for entrepreneurial experimentation are not specific to anti-SUD foodware initiatives but indirectly support the norm emergence. *Diversifying offerings and capabilities* in preexisting firms means financial support for new MSW infrastructure or technology. *Financial investments* encourage niche-innovations through grants and loans. They specifically support alternative systems, like reusable container pilot programs, versus expand or diversify preexisting firms.

Support from powerful groups/ legitimation (C6) is a grouping of policies that leverages outside sources to bring credibility to the norm. The main instrument in which to do so is *third-party verifications or certifications*. Adoption of verifications and certifications by producers help quantify components of a product that might be less environmentally harmful (Prakash and Potoski, 2006) and thus inform consumers about their consumption's environmental (and sometimes social) impact (Brach et al., 2018); however, they can also be used to create product differentiation and additional marketing opportunities (Chen et al., 2018), or nefariously used as green-washing (van der Ven, 2019).

Some policies seek to influence the direction of search (C7). Norms are not always translated into policy but do result in informal actions (Clapp and Swanston, 2009; Kivimaa and Kern, 2016). Those actions can be from industry, such as non-binding goals and voluntary actions. Actions can also be from consumers and activist organizations, such as demonstrations. *Non-binding goals and voluntary actions* are private actors declaring noncommittal goals about improvements they will make with a long-term horizon. In the past decade there has been a proliferation of non-binding goals and voluntary actions from large corporations in the SUD foodware supply chain. Consumer- and activist organization-lead influences on the direction of search are through *demonstrations*, such as large boycotts, buycotts, marches, beach cleanups (Schnurr et al., 2018), and communication campaigns that create two-way conversation with companies to encourage the elimination of SUD foodware practices (Howard, 2016).

4.2. Destructive policies

The first category of destructive policies is control policies that internalize environmental costs (D1). Bans are *command-and-control* mechanisms that directly regulate behavior by reducing consumer choice. Examples of such anti-SUD foodware policies include bans on material type (e.g., plastic) or on foodware type (e.g., films) (Slafter, 2019). Taxes and fees are *market-based* mechanisms that incentivize behavior change through raised prices which maintain consumer choice but can decrease consumption because heightened prices mean some people are no longer able to afford it³ or it dissuades people to purchase at the higher price (Halliday, 2015). Bans on certain SUD foodware types are often considered cheaper to monitor but criticized for limiting consumer freedom of choice and only displacing consumption instead of decreasing it (Taylor and Villas-Boas, 2016). Some taxes are presented at the point of sale, while other fees and charges are posted before consumption decisions are made, such as on bulletins, menus, or the sticker (or shelf) price. Another way to approach direct regulation, but without substantial pushback from consumers, is through *choice architecture (nudges)* (Wagner, 2017). Nudges aim to alter behavior through preferential selection versus outright bans. For instance, providing paper bags automatically and only providing plastic bags if the consumer asks for them (Wagner, 2017).

Quantity limits are policies that limit production by capping a pollution quantity or price. This mechanism is often harder to implement because the crucial information to determine those amounts are usually unknown, such as consumer demand elasticity and the pollution damage from one item in question (e.g., a plastic bag) (Taylor and Villas-Boas, 2016).

³ Since some consumers are no longer able to afford an item at the heightened price, it is unclear if consumer choice is maintained in all market-based mechanisms.

Finally, a control policy that internalizes environmental costs are *material requirements* which can come in two forms: the recycled content amount and the material used in SUD foodware. For recycled content amount, that means the amount of post-consumer recycled (PCR) content used in a paper bag or water bottle, for instance. Material requirement policies often stipulate the minimum amount of PCR, only Biodegradable Products Institute (BPI) certified or Compost Manufacturing Alliance (CMA) certified compostable material, or SUD foodware without per- and polyfluoroalkyl substances (PFAS).

There are a few policies that aim to create significant changes to regime rules (D2). Regime rules are the underlying social, political, and institutional rules that govern a regionalized society (Geels and Schot, 2007). Examples of anti-SUD foodware policies that aim to significantly change regime rules include take-back or right-to-repair structures, shared responsibility policies, Bring Your Own (BYO) mandates, and pool systems.

Take-back or *right-to-repair* structures are those that empower the consumer to send back their broken item to the corporation for them to fix it or for the consumer to fix their broken item (or pay someone to fix it) via manuals and tools (O'Neill, 2019).

Shared responsibility policies aim to reduce and shift the burden of waste management from local jurisdictions and consumers to producers. This includes extended producer responsibility (EPR) policies that require producers to financially contribute to a fund based on the amount of a specified material they produce. That fund is then distributed to jurisdictions to support their waste management practices.

BYO schemes are systems change policies that require customer action and participation. BYO relies on the customer to bring their own cup, food container, bag, utensils, etc. to prevent packaging waste. The food business refills the customer's item, but may reject it (e.g., if it is too dirty) or not touch it (e.g., customers bag their own groceries).

A similar policy to BYO in that it fosters the reuse of an item, but one that does not rely on customers remembering to bring their own, is a *pool system*. A pool system is a third-party or in-house system that manages the collection, washing, and redistribution of reusable items. The system can be managed (operated by a governmental entity), unmanaged (operated by a private entity), or individual (operated in-house).

In the final grouping of policies – changes in social networks and replacement of key actors (D4) – the aim is to *remove incumbent actors* from key decision-making and influential roles, so there is greater support and opportunity for niche-innovations. The lack of government sanctioned organizations or networks charged with systems change in the anti-SUD foodware space has caused the vacuum for activist organizations to mobilize. Such mobilization includes research and policy advocacy.

The policy mix framework demonstrates all policy types represented in a norm codification, most specifically where a norm to policy translation might be overweighed or underrepresented in certain policy types. However, a policy mix does not demonstrate the nuances within each policy type, which can impact that individual policy's effectiveness and/or the effectiveness of the policy category at large. Schmidt and Sewerin (2019) address this shortfall through analyzing the policy's intensity. A policy's intensity is how structurally sound the policy is, conveyed through a coding-based approach of its objectives, scope, integration, budget, implementation, and monitoring (Schaffrin et al., 2015).

5. Discussion

5.1. Case study: the City of Berkeley's Single Use Foodware and Litter Reduction Ordinance

Within the anti-SUD foodware norm emergence, I have now established the mix of creative and destructive policies. Below I analyze the policy mechanisms through a case study approach to put the framework and theory into context, especially as it pertains to the hyper-local and nonlinearity of norm codification. The case study is of Berkeley, California's Single Use Foodware and Litter Reduction ordinance. It is a case study of norm emergence and norm cascade; how norm entrepreneurs coalesced to create a comprehensive and historic anti-SUD foodware policy, including how and why specific mechanisms were included in the enacted policy. While this is a single policy at the local level, it is representative of the anti-SUD foodware policies introduced and enacted in the U.S. in the early 2020s (Karasik et al., 2022; Upstream, 2022).

In 2016, after Donald Trump was elected U.S. President, a coalition of community-based anti-SUDs activists met to generate local momentum based on fear of potential environmental regulation rollbacks (Ecology Center, 2023). That coalition was comprised of local nonprofits (Global Alliance for Incinerator Alternatives, Greenpeace, Plastic Pollution Coalition, Surfrider Foundation, The Story of Plastic, and Upstream), community members, one of the city's recycling service providers (the Ecology Center), and government representatives (a City of Berkeley staff member, the Zero Waste Commission, and Councilmember Sophie Hahn). The coalition – spearheaded by Martin Bourque, the Executive Director of the Ecology Center⁴ – decided to focus on combating SUD foodware items due to their rising prevalence as litter and thus city and county expense for abatement, as well as their harm to environmental and human health. The coalition took aim in the City of Berkeley, California, home to the University of California at Berkeley and a historically liberal and pro-environmental action city, where curbside recycling got its start in 1973, expanded polystyrene (Styrofoam) was banned in 1990, and SUD plastic bags were banned in 2012 (Ecology Center, 2023). They felt that if an unprecedented, large-scale anti-SUD foodware regulation were to be tested anywhere, the highest likelihood of adoption was in a city known for being the bellwether of environmental activism in the U.S.

⁴ The Ecology Center is not only one of the city's recycling service providers but also manages curbside composting, has a zero waste store and seed library, oversees the city's farmers markets and statewide nutrition assistance benefits program at farmers markets, and conducts community education and outreach events

Over the years, members of the coalition saw the successes of the anti-expanded polystyrene and anti-SUD plastic bag regulation through reduced prevalence of both items (City of Berkeley, 2019; Hahn, 2018). The anti-SUDs norm was therefore already established in the city. However, the coalition noticed that both regulations fostered the use of alternative SUD materials: for expanded polystyrene, that meant more SUD polyethylene terephthalate (PET) cups and food containers, for SUD plastic bags, that meant more SUD paper bags. The coalition did not want a regulation that prompted the use of a different SUD material, it wanted the reduction – and ideally elimination – of SUD materials. It therefore focused on promoting reusable foodware (City of Berkeley, 2019).

To create the anti-SUD regulation, the coalition met with Councilmember Sophie Hahn who positioned her election campaign on environmentalism. The aim of this collaboration was to gain her as the government representative norm entrepreneur: have her embody and promote regulation that aligned with the anti-SUD foodware norm. Pragmatically, that initially entailed the coalition to better understand the potential pushback, needed regulatory components, and proper processes to develop and pass a regulation that they hoped would become a ‘model ordinance’ for other jurisdictions to adopt.

In the interviews, coalition members mentioned anticipated pushback from the plastics industry (producers) and large food chains (food businesses) because of the divestment in products and added operational expenses, respectively. Neither anticipated pushback gained substantial ground. This is potentially because (1) Berkeley has few large food chains after a decades-long permitting prioritization of small, locally owned businesses; (2) no individual can donate more than \$250 to an election campaign, meaning wealthier residents do not have an outsized relationships with government; (3) the coalition met with food business managers and owners to better understand their concerns and adjusted the ordinance accordingly; (4) Councilmember Hahn met with a few food business owners to influence her revisions to the regulation; and (5) while Berkeley might be a bellwether of environmental activism, it is still a relatively small city so such policies do not necessarily pose a threat to the plastics industry or large food chains (Ecology Center, 2023). Without the unanticipated pushback, the anti-SUDs norm-to-policy process made progress early on.

Then, however, there were two large unanticipated pushbacks: from the disability justice community (activist organizations) and from some local food businesses (Ecology Center, 2023). In the late 2010s, there was a California- and nation-wide movement gaining momentum: the removal of SUD plastic straws from cafes and restaurants. The anti-SUD plastic straw campaign proliferated through grassroots, social media-based campaigns centering the video of a turtle harmed from a plastic straw stuck in its nostril (Mosquera, 2019). This launched campaigns such as #mylaststraw that shamed consumers and food businesses from accepting or providing SUD plastic straws (Adell, 2020). The disability justice community coalesced in response, opposing these restrictions because straws are a needed tool for them to consume and not providing straws, providing them for a fee, or requiring individuals to request them further marginalizes individuals and accentuates accessibility disparities (Kessler, 2019). As for the other unanticipated pushback – from some local food businesses – in 2018 Berkeley adopted a new minimum wage of \$15, meaning all employees, regardless of their position, must earn at least \$15 an hour if they work more than two hours in one calendar week. According to an interviewee, the added costs associated with the anti-SUD foodware ordinance seemed prohibitive in combination with the increased labor costs.

These unanticipated pushbacks stalled the progress of the ordinance’s development. The coalition and Councilmember Hahn slightly adjusted course by meeting with individuals and representatives specifically on these topics (City of Berkeley, 2019). The policy was revised to allow SUD plastic straws on a request-only basis (versus being provided automatically) and hardship waivers and

Table 2

An analysis of the different policy mechanisms that are or are not part of Berkeley’s Single Use Foodware and Litter Reduction ordinance.

Policy Mix	Analysis of the Policy Mechanisms of Berkeley’s Single Use Foodware and Litter Reduction Ordinance
<i>Creative</i>	
Knowledge creation, development and diffusion (C1)	YES - The City must create and maintain a list of acceptable SUD foodware types on its website.
Establishing market niches/market formation (C2)	YES - public procurement, labeling
Price-performance improvements (C3)	NO - while there are grants to support the transition toward compliance, and one local nonprofit funded a pilot of a reusable beverage service, no funding came from the City to support R&D to make innovations price-comparative with incumbent technologies
Entrepreneurial experimentation (C4)	YES - reduced uncertainties for testing bio-based SUD beverage and food containers by providing a market with such purchasing requirements
Resource mobilization (C5)	NO - there are no resource mobilization components in the policy; however, in conjunction with the policy, technical assistance grants are available to food businesses for up to \$\$ to support their transition to compliance
Support from powerful groups/legitimation (C6)	YES - public procurement, labeling; required compliance from large food businesses thus signaling the ability to transition to smaller food businesses and other businesses in other locations
Influence on the direction of search (C7)	YES - voluntary agreements and goals; while not directly outlined in the ordinance (these either predated the ordinance or happened concurrently), the ordinance helps realize such agreements and goals
<i>Destruction</i>	
Control policies (D1)	YES - the ordinance has both a ban (on fossil fuel-based plastics) and a fee (on SUD cups); there is also a ban on all SUD foodware items for on-site dining
Significant changes in regime rules (D2)	YES - all food businesses that have a bussing station for customers to self-bus their waste must have all three waste bins (compost, recycling, landfill); all SUD foodware accessories must be provided by request only or at a self-serve station
Reduced support for dominant regime technologies (D3)	NO - the ordinance does not change the preexisting support for incumbent technologies (fossil fuel-based plastic)
Changes in social networks, replacement of key actors (D4)	NO - the ordinance does not influence the social network, replace key actors, or form new organizations or networks

technical assistance grants were included to give food businesses two extra years to comply with regulations and up to \$500 to purchase reusable dishware, a dishwasher, or any other one-time compliance-based purchases (Hahn, 2018). Further, to ease transition difficulties and constraints, the policy included a three-phase approach, meaning different components of the policy were implemented across three time periods and they were not enforced until one year after each component was enacted (City of Berkeley, 2019).

The ordinance, as a single policy, has numerous mechanisms, making it uniquely comprehensive. The three phases of the policy are (1) all food businesses with bussing stations must have all three waste bins (compost, recycling, landfill) accessible to the customer, plus the City or any City-sponsored event must purchase BPI-certified compostable foodware; (2) all food businesses must only provide BPI-certified compostable foodware, all food businesses must put a \$0.25 charge on all SUD cups, all food businesses must display the SUD cup charge on individual menus, menu boards, ordering platforms, and receipts, as well as verbally inform if order is placed over the phone; and (3) all food and beverage orders consumed on-site must be in reusable foodware. In total, the policy includes five creative and two destructive mechanisms (see Table 2).

The Berkeley ordinance was unanimously approved by all nine City Councilmembers (including the City's mayor) on January 22nd, 2019. Phase one went into effect immediately. Phase two went into effect on January 1st, 2020, then phase three was supposed to go into effect on July 1st, 2020. In March 2020, the City of Berkeley declared a public health emergency due to COVID-19, which included a stay-at-home mandate. Food and beverages were only allowed for take-out and delivery, customers' personal mugs were not accepted at food businesses, and while in 2019 a local nonprofit initiated a reusable cup pilot program in the absence of a city sponsored program, that shut down. This meant all orders from food businesses were in SUD foodware items. The city triaged its personnel and budget to support COVID-19 and while the ordinance was never official paused, it no longer received personnel, budget, or resources.

5.2. What's next for Berkeley and the anti-SUD foodware norm emergence?

The nonlinearity and unanticipated support and pushback from stakeholders in codifying the Berkeley ordinance exemplifies such tendencies across the entire anti-SUD foodware norm emergence. Pre ordinance, Berkeley, California, would have been considered fertile grounds for such environmentally progressive legislation. Yet, the policy required years of stakeholder engagement and numerous iterations of the policy's language; it bred conflict between heterogeneous priorities and values, and still produced a policy that stalled in implementation due to the weakening of the anti-SUD foodware norm in association with COVID-19 (Heiges and O'Neill, 2020; Heiges et al., 2023b). The Berkeley ordinance was illustrative of the difficulties in codifying emerging norms.

The Berkeley anti-SUD foodware policy is just one policy amid the larger anti-SUDs norm emergence, however, it gives important insight into the larger anti-SUD foodware norm emergence. It demonstrates the strengths and weaknesses of a multi-mechanism policy approach and the context in which it can be developed. The Berkeley ordinance's strengths are that it had a robust team of norm entrepreneurs and that it has numerous policy mechanisms that are both creative and destructive. Furthermore, the norm entrepreneurs – the coalition – went to great lengths to preempt pushback by conducting substantial community involvement initiatives and policy co-development. The norm entrepreneurs also aptly managed unanticipated pushback. The Berkeley ordinance came with significant press, where it was positively featured on major industry and public news outlets (Karidis, 2019; Los Angeles Times Editorial Board, 2019), and a reference point for zero waste practitioners (CalRecycle, 2023; U.S. Environmental Protection Agency, 2022; Upstream, 2023). That press likely contributed to the anti-SUD foodware social imaginary: it gave a clear vision and goal of what type of anti-SUD foodware policy mechanisms were possible to pass at the local level.

The above case focuses on the creation and passing of the Berkeley ordinance, and since its passing four years ago, it is clear that there are a few weaknesses to the structure of the policy. One way to quantify a policy's structural strength is through policy intensity (Schmidt and Sewerin, 2019), which is not an analysis framework currently integrated into the policy mix framework or norm emergence theory. The Berkeley ordinance's intensity is minimal: there was a lack of framework; while budget was allocated, it was not executed; implementation ceased with the onset of COVID-19; and there was no enforcement (Heiges et al., 2023a). The shortfall of the policy's intensity undermines the robustness of the policy's multi-mechanism balance because without a stronger policy intensity, the policy has effectively not been enacted. Increasing the Berkeley ordinance's policy intensity as well as the intensity of any future policies based on it, will strengthen the progression and resiliency the anti-SUD foodware norm emergence.

The anti-SUD foodware norm emergence is in the cascade phase, but there must be more policies if it is to reach norm internalization. The Berkeley ordinance helped propel the anti-SUD foodware norm codification, and continues to gain nationwide attention plus be the basis for other anti-SUD foodware policies (Ecology Center, 2023; Upstream, 2022). Since the Berkeley ordinance was adopted in January 2019, 17 cities across the U.S. adopted similar policies (Upstream, 2022). Some of those policies are slightly altered, where supermarkets are required to display, sell, or receive refillable beverage containers; or instead of charging \$0.25 for a SUD cup, food businesses provide a discount for reusable cups. They all directly or indirectly manifested from Berkeley's policy: through policy development based on conversations with the Berkeley coalition or through leveraging the ordinance language and other resources. Further, all previously paused local anti-SUD foodware policies due to COVID-19 have resumed and all previously delayed policies are either implemented or being introduced (Upstream, 2022). Additionally, a few states have enacted anti-SUD foodware policy, including unprecedented EPR instruments for this sector (Heiges and O'Neill, 2021). The federal government is considering a few plastics reduction policies, such as public purchasing agreements, mandatory recycled content minimums, and infrastructure grants (Quinn and Rosengren, 2022).

Outside of the U.S., there are many anti-SUD foodware policies introduced or enacted (Karasik et al., 2022; Upstream, 2022). Most notably there is the European Union's Directive 2019/904 (The European Parliament and the Council of the European Union, 2019). It

is part of, but also separate from, the anti-SUD foodware norm emergence because it does not focus exclusively on SUD foodware – though those are the majority of items covered – and it only focuses on plastic – which is just one of the SUD foodware materials. It is notable because it is a regional Directive, with 27 Member States. The case study for this study was a local policy because such action is exceedingly difficult in the U.S. at a level above the County; however, the European Union successfully passed a regional Directive in the same year Berkeley's ordinance was enacted. Further, the Directive places material restrictions on the Member States, through upstream and downstream reduction methods, such as EPR, design requirements, bans, and collection infrastructure. This, like the Berkeley ordinance, is a multi-mechanism policy approach to both aid niche-innovations and erode unsustainable incumbents. The Directive has not been thoroughly researched through the policy mix framework or the norm emergence theory so it is difficult to further compare the two.

At the global level, the United Nations General Assembly began negotiations in late 2022 to create the Global Plastics Treaty, including consideration for a full lifecycle approach, which examines the harms generated from product design to disposal to better inform strategies and policies for plastic and pollution reduction (UN Environment Programme, 2022). This step toward globalized policy codification is another indication of the cascading anti-SUD foodware norm.

5.3. Future research

I recommend future research in three arenas: anti-SUD foodware norm emergence, the policy mix framework, and the norm emergence theory.

For the anti-SUD foodware norm emergence, with the rise of policies with numerous mechanisms, it will be important to better understand the critical components and how they can harden to future macro-level disruptions (e.g., pandemic, change of political leadership). Further, it is essential to understand if it is more effective in reducing SUD foodware waste to base policies on multiple foodware items (versus a singular item which was done in the past) and on multiple material types (versus a singular material item which is still common).

The policy mix framework is valuable in analyzing a suite of policies, but more cumbersome in analyzing a specific policy, as indicative in the analysis of Berkeley's ordinance. Each of the eleven categories are quite broad with numerous mechanisms within it. Those mechanisms can vary in their scope and some policies contain numerous mechanisms within one category or multiple categories. The representation of one mechanism in one category is therefore not necessarily comparable to another policy with that same category represented. To better compare between policies and to better analyze the strengths and gaps within one policy, it is imperative that the policy mix framework adopts a weighting system to refine comparisons and analyses. I recommend integrating the policy intensity (Schmidt and Sewerin, 2019) framework to assess the structural integrity of the policy and applying a weighting system by coding questions, values, aggregated value, and range (Schaffrin et al., 2015).

Finally, for the norm emergence theory, more research is needed to assess the resilience of a norm during the different phases of its emergence. Greater evaluation of the aspects that foster or erode resilience could help inform development pathways regarding which policies to support. Resiliency also includes scalability because for norms to cascade and internalize, scale is needed. It is therefore critical to review if the challenges – such as producer and interest group pushback – are fundamentally different across scales to strategize for heightened resiliency. Finally, examining, and potentially quantifying, resilience might also help define the ambiguous phases of norm cascade and internalization, thus contextualizing the development of the norm and its available opportunities.

6. Conclusion

SUD foodware are undergoing a policy-based sustainability transition that encompasses formal and informal policies, and is thereby better categorized as an emerging norm: the anti-SUD foodware norm. The three phases of a norm emergence are norm entrepreneurs, norm cascade, and norm internalization. Historically the norm emergence theory has failed to quantitatively capture when an emerging norm is in one phase versus another. I therefore proposed, and applied, the policy mix framework to the theory to provide that means of phase quantification. I first applied the framework with the various anti-SUD foodware policies in the U.S. Then I validated this approach by applying the framework to a specific policy in the U.S.: Berkeley, California's Single Use Foodware and Litter Reduction ordinance.

The disparate, non-linear adoption of anti-SUD foodware policies spans myriad SUD materials and items, from the local to global level. It is essential to coalesce them under one umbrella – SUD foodware – to increase understanding, research, and action, and thus progress, toward a waste-free future. The proliferation of anti-SUD foodware policies in the U.S. range from creative policies (supporting anti-SUD foodware innovations) to destructive policies (eroding SUD foodware incumbents). By coalescing these policies and by analyzing them through the policy mix framework, I demonstrate that the anti-SUD foodware norm is in the cascade phase and that the norm can be strengthened to progress toward norm internalization.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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Data availability

No data was used for the research described in the article.

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