

# How a Right-to-Know Law Shifts Industry away from Chemicals of Concern: The Case of California's Proposition 65

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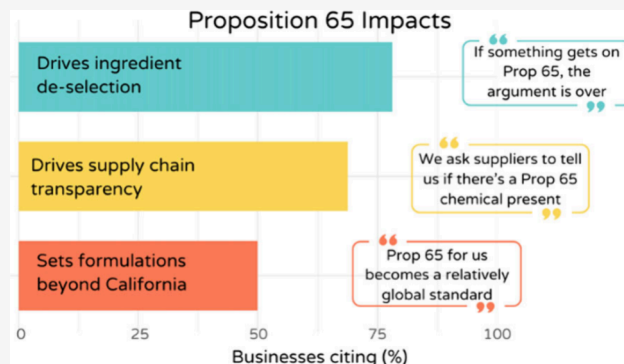
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**ABSTRACT:** Since enactment of the major federal environmental statutes of the 1970s, U.S. toxics policy has departed from a primary goal of controlling pollution to increasingly focus on information transparency. One of the most prominent right-to-know laws, California's Proposition 65, has been in force since 1986, yet there is scant literature on its systemic impacts. We conducted 32 semi-structured interviews with business leaders representing some of the largest actors in their sectors to investigate Proposition 65's impacts. We found that Proposition 65 prompts changes to consumer product ingredients and improves supply chain transparency. Businesses (re)formulated products for national and even international markets based on this state law, highlighting the leverage of environmental regulations in a large state like California. Information-forcing laws can thus protect public health in ways that transcend the immediate impacts of transparency with the public about product ingredients. Where Proposition 65 has prompted reformulation, however, there is no check on the safety of alternatives, aside from the incentive to avoid other Proposition 65-listed chemicals. In this study, semi-structured interviews gave insights into the less visible health benefits of a law that lacks built-in methods for quantifying impact and is often publicly disparaged by the businesses it governs.

**KEYWORDS:** Proposition 65, ingredient disclosure, environmental policy analysis, right-to-know, environmental enforcement, ingredient transparency



## INTRODUCTION

The 1986 passage of two key laws—the federal Emergency Planning and Right to Know Act (EPCRA) establishing the Toxics Release Inventory (TRI<sup>1</sup>), and California's Safe Drinking Water and Toxic Enforcement Act (commonly known as Proposition 65)—ushered in an era of information-forcing laws that now complement command-and-control statutes. Sometimes referred to as a “third wave” of environmentalism, these right-to-know laws are less inherently adversarial to business interests.<sup>2</sup> Upon their enactment, EPCRA and Proposition 65 quickly became the primary forces driving industry disclosure of information on toxic chemicals.<sup>3,4</sup> Although researchers have investigated how mandatory disclosure under EPCRA affects pollutant emissions, and there is literature on the outcomes of individual enforcement actions taken under Proposition 65,<sup>5,6</sup> there is scant literature on the systemic impacts of Proposition 65 on business behaviors, or more generally, the mechanisms through which right-to-know legislation affects public health.

Proposition 65 was enacted by two-thirds of California's voters at the ballot box, reflecting public frustration with government inaction on regulating toxic chemicals.<sup>7</sup> The law requires companies to warn the public about the presence of

chemicals that are known to the State of California to cause cancer or developmental or reproductive harm when exposures from consumer products, workplaces, or the environment exceed a specified risk level. California's Office of Environmental Health Hazard Assessment (OEHHA) is charged with maintaining the Proposition 65 chemical list, which currently includes approximately 900 substances. Proposition 65 enforcement mechanisms include private enforcement (“citizen suits”), and litigation by the California Attorney General or other public enforcers. Proposition 65 is seen as innovative because it reverses the burden of proof of safety (from the public to industry),<sup>8</sup> and financially incentivizes citizen suits to bolster the law's enforcement.<sup>9,10</sup>

While toxics right-to-know laws aim to promote actions that will reduce chemical exposure, they have been critiqued for relying primarily on industry self-reporting; being less effective

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**Table 1. Sector That Interviewees Represented and the Number of Interviews in Each Sector<sup>a</sup>**

| Sector                                  | Number of Interviews Across the Supply Chain | Number of Manufacturers by Sector (N = 16) | Number of Retailers by Sector (N = 3) | Number of Institutional Purchasers by Sector (N = 4) |
|-----------------------------------------|----------------------------------------------|--------------------------------------------|---------------------------------------|------------------------------------------------------|
| Cleaning                                | 6                                            | 6                                          | 0                                     | 0                                                    |
| Personal care                           | 6                                            | 6                                          | 0                                     | 0                                                    |
| Health and healthcare                   | 4                                            | 1                                          | 0                                     | 3                                                    |
| Electronics                             | 3                                            | 2                                          | 1                                     | 0                                                    |
| Pesticides                              | 3                                            | 3                                          | 0                                     | 0                                                    |
| Apparel and footwear                    | 3                                            | 2                                          | 1                                     | 0                                                    |
| Home improvement                        | 1                                            | 0                                          | 1                                     | 0                                                    |
| Chemicals and raw materials             | 1                                            | 1                                          | 0                                     | 0                                                    |
| Automotive                              | 1                                            | 1                                          | 0                                     | 0                                                    |
| Flooring                                | 1                                            | 1                                          | 0                                     | 0                                                    |
| Fragrances                              | 1                                            | 1                                          | 0                                     | 0                                                    |
| Education                               | 1                                            | 0                                          | 0                                     | 1                                                    |
| <b>Total N representation by sector</b> | <b>31</b>                                    | <b>24</b>                                  | <b>3</b>                              | <b>4</b>                                             |

<sup>a</sup>Total N (31) for representation by sector is different than the total number of interviews in our study (N = 32) as consultants (N = 5) and trade associations (N = 4) are omitted from this table, and several manufacturer interviews (N = 16) are representative of multiple sectors (e.g., cleaning and personal care, chemicals & raw materials and pesticides); interviews from manufacturing represent 24 sectors in total. We do not include consultants as they are often non-sector specific and omit trade associations for confidentiality reasons.

than regulations that restrict or ban chemicals outright; and failing to address the environmental justice implications of relying on individual purchasing decisions to reduce toxic exposures.<sup>11–13</sup> Moreover, the most visible feature of Proposition 65—its public-facing warnings—is prime fodder for industry and media attacks, who criticize the law as one that leaves consumers “over-warned” and “under-informed”.<sup>14–16</sup> Citizen suits have also been derided as incentivizing lawsuits for trivial violations because of the way the law financially rewards private enforcers.<sup>10</sup>

Nonetheless, by virtue of its status and its presumed de facto national reach given California’s enormous market, Proposition 65 may profoundly affect how industry approaches ingredients that the law identifies as toxic. Relatedly, the unique design of Proposition 65, in which information about the presence of toxic chemicals is communicated to the public via *warnings* rather than mere identification of the presence of relevant chemicals, has produced unique enforcement and marketplace dynamics.

In many instances, Proposition 65 has prompted product reformulations.<sup>3,17</sup> In particular, high-profile legal cases have targeted chemicals such as lead<sup>18</sup> and cocamide DEA,<sup>19</sup> and demonstrated how legal enforcement can trigger product reformulations after companies fail to warn about the presence of a Proposition 65 chemical. How Proposition 65 may influence company behavior independent of enforcement actions, however, is less well understood. Reports of business responses to Proposition 65 remain largely speculative or anecdotal, as there are no requirements for systematic reporting of non-litigation actions spurred by the legislation and, to our knowledge, no previous in-depth investigation into the ways that different industry sectors interact with the law.

We aimed to understand how Proposition 65 affects industries’ awareness of toxic chemicals in their products and manufacturing processes; whether it prompts businesses to reduce the use of known toxics; and whether it incentivizes industry to use safer chemicals. In other words, while the law conspicuously increases information disclosure to *individual* consumers, we investigated whether right-to-know laws can have more *systems-level* impacts on industry behaviors. Our

prior work has probed the law’s indirect effects, ranging from spurring other toxics laws to enhancing workplace safety regulation.<sup>20</sup> In this investigation, we examine more deeply one among these indirect effects: how Proposition 65 works independently of enforcement actions to drive product (re)formulations (i.e., how ingredients are selected). Companies might change formulations, for example, to avoid the duty to warn, or because they reference the Proposition 65 list in chemical selection. We also sought factors that complicate industry compliance, and factors that limit the law’s public health impacts.

Assessing Proposition 65’s impacts on company decision-making can reveal, more generally, any value that right-to-know laws offer beyond public transparency. While Proposition 65 is unique in its design — through its large list of chemicals, applicability across industry sectors, and allowance for citizen enforcement— there has been a proliferation of state-level ingredient disclosure bills, including for cleaning products in California and New York, cosmetics and professional salon products in California, menstrual products in New York and California, and children’s products in Maine, Washington, Minnesota, Vermont and Oregon.<sup>21,22</sup> Thus, an assessment of the value and limitations of right-to-know chemicals laws can inform future right-to-know initiatives.

## METHODS

We conducted semi-structured interviews with business leaders in a range of industry sectors and positions along the supply chain to determine Proposition 65’s influence on company behaviors, and to identify specific factors that drive reported changes. From August 2018 to April 2020, we conducted 32 interviews. Three interviews had two participants, and one interview had three participants, yielding a total of 37 interviewees. Frequencies reported below are based on how many interviews (i.e., N = 32), rather than the number of interviewees, that raised an issue or theme.

We recruited interviewees through (a) academic and nonprofit colleagues who have worked with industry; (b) conferences attended by industry, namely the Prop 65 conference<sup>23</sup> and BizNGO;<sup>24</sup> and (c) snowball sampling in

which interviewees recommended other potential interviewees in their sector or broader networks. We primarily sought interviews from large manufacturers and retailers who are highly recognizable in their sector, as these companies exert the greatest influence on supply chains and market trends. We identified key industry sectors a priori and, except for the food sector, our final sample included representatives from each of these key sectors (Table 1). We preferentially recruited more manufacturers than retailers since a key research question was how Proposition 65 influences product formulations. Our final sample included 16 manufacturers and 3 retailers. The three retailers are also specifiers of formulations for private label products; we classified them as retailers since that is their main role and they rely on third-party manufacturers for private brand formulations. In addition to recruiting from mainstream companies, we recruited interviewees from four alternative green businesses to understand how companies that publicly commit to avoiding toxics interact with Proposition 65. We designated as “green” a business that exclusively markets its products as safer alternatives to mainstream products. Interviewees were not recruited to represent the experiences and perspectives of all businesses, but rather to provide insights into the impact of Proposition 65 on some of the marketplace’s largest mainstream businesses and their prominent green competitors.

Interviewees from manufacturing and retail businesses had positions such as corporate director, vice president, or senior research staff, and worked in company areas such as sustainability, regulatory affairs and compliance, chemistry, and product stewardship.

In addition, our sample included 4 institutional purchasers from the education and health care sectors. We also interviewed representatives from top trade associations ( $N = 4$ ) and consulting firms ( $N = 5$ ) for their perspective on how Proposition 65 impacts entire sectors. These interviews further illuminated how trade associations and consultants advise businesses about the law.

Table 1 summarizes interviewees’ sector affiliation and position on the supply chain for manufacturers, retailers, and institutional purchasers; consultants are often not affiliated with a sector and, given the small number of trade associations for each sector and confidentiality protocols, we do not identify the sector affiliations of interviewees from trade associations.

55% of interviewees that we contacted agreed to participate (32 agreed of 58 individuals that we contacted); 17 potential recruits did not respond and 9 declined. For those that declined, the reason most typically cited was that they were unable to get the interview approved by their legal team. Nearly all participants agreed to interviews on the condition that their identities and that of their employers would be kept confidential. Our protocols therefore prohibit disclosure of company size and revenue. Many of the companies, however, were the largest ones globally in their sector by revenue. For example, for the cleaning products sector, three out of 6 six companies are in the top 10 by revenue in their sector<sup>25</sup> (with an additional two being leading green brands) and for the electronics sector, two out of three are manufacturers in the top 10 for revenue in their sector.<sup>26</sup> For the home improvement, automotive, and flooring categories, we only have one interviewee for each respective sector and all interviewees are in the top 10 per revenue for their sector.<sup>27–29</sup>

While our recruitment method does not provide a representative selection (as might be achieved through random sampling), our access to interviewees required referrals from trusted contacts in light of the considerable sensitivity of the information we hoped elicit from interviewees. Businesses are strongly disincentivized from sharing information about their behind-the-curtain decision-making as to inclusion of toxic ingredients in consumer products. They may, for example, fear providing useful information to their sectoral competitors; undermining any public statements or litigation positions of their company or trade association vis-a-vis Proposition 65; or increasing their vulnerability to tort litigation over instances in which they have quietly removed a chemical listed under Proposition 65 from their product, or otherwise reformulated to reduce exposure. These business-operational realities meant that we were unable to recruit interviewees outside of our professional and personal networks and referrals from recruited participants. We were, however, able to access highly recognizable manufacturers and retailers, and it is unlikely that they differ in substantive ways from others in their sector with regards to Proposition 65.

Each interview lasted approximately 1 h and consisted of semi-structured questions followed by probes designed to seek responses on key issues not addressed by open-ended responses. Interview questions focused on business’ responses to the Proposition 65 list and were tailored according to position on the supply chain (please see interview guides provided in Supporting Information). Key questions focused on whether manufacturers had decreased their use of listed chemicals or opted to warn instead; whether and how the Proposition 65 list induces reformulation; and whether manufacturers and retailers incorporate the Proposition 65 list into their company’s Restricted Substances Lists (“RSLs,” which control the presence of restricted substances in finished products) or Manufacturing RSLs (“MRSLs,” which restrict the use of chemicals in manufacturing processes). Our interviews also investigated how Proposition 65 influences product availability in the consumer marketplace, such as by causing companies and institutions with large purchasing power to craft purchasing specifications that affect options available to competitors.

Interviews were recorded, transcribed, and then analyzed using Dedoose, a qualitative data management and analysis tool. Coding consisted of two phases: we first generated a priori codes based on the specific questions and the broader conceptual themes in our interview protocol. Next, we examined interview transcripts, creating new codes for themes that emerged directly from the interview material. We used the same codebook for all interviews due to the relevance of many themes across supply chain positions; this includes whether Proposition 65 serves as an authoritative source list of chemicals to avoid, how the law impacts ingredient disclosure, how it compares to other toxics legislation, and suggestions for improvement. Manufacturer interviews, however, were also coded for additional trends such as whether they themselves have reformulated because of Proposition 65, and we had additional codes for retailers and institutional purchasers related to Proposition 65’s influence on purchasing practices and the warnings they provide in retail or institutional spaces. Our study protocols were approved by the Institutional Review Board of the University of California, Berkeley (protocol # 2017–08–10197). Nearly all participants requested that their

Table 2. Key Impacts of Proposition 65 (N = 32)<sup>a</sup>

| Impacts                                                                                                                                                                              | Illustrative Quote                                                                                                                                                                                                                                                                                                                           | Number of Interviewees that cited an impact (percentage of interviews in brackets) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Prompts reformulation of products                                                                                                                                                    | "If a product that we acquire has a Prop 65 chemical, we actually do formulate them on out."                                                                                                                                                                                                                                                 | 25 (78%)                                                                           |
| Promotes ingredient disclosure and supply chain transparency                                                                                                                         | "Because of the enforcement threat, everybody there is learning about their supply chain. So that's a good thing."                                                                                                                                                                                                                           | 22 (69%)                                                                           |
| Impacts product formulations beyond California                                                                                                                                       | "California has pretty much set the national standard with Proposition 65."                                                                                                                                                                                                                                                                  | 16 (50%)                                                                           |
| Promotes elimination of Proposition 65-listed chemicals instead of (re)formulations to below safe harbor levels (i.e., exposure levels that do not require a Proposition 65 warning) | "Typically we do not use Proposition 65 materials. And the reason for that is even though there is an allowable level, the burden of litigation, the complexity with customers, it's really not worth the effort to use them. So typically what we do is we ban Proposition 65 materials from use. We've been doing that for over 20 years." | 13 (41%)                                                                           |
| Drives selection of suppliers                                                                                                                                                        | "We don't formulate with Prop 65 chemicals in place, and we evaluate our raw materials. And if a potential vendor has a Prop 65 chemical in a product as an impurity, we'll simply not choose that as an appropriate vendor."                                                                                                                | 9 (28%)                                                                            |

<sup>a</sup>We include all interviews as interviewees often spoke to trends they've witnessed outside own position on the supply chain or as a result of their advisory positions (e.g., participants from manufacturing, retail, consulting, and trade associations cited impacts on reformulation).

interviews be deidentified, so we have omitted names, position titles, and affiliations where requested.

We also analyzed industry and nonprofit documents that address how companies comply with Proposition 65, and observations from industry presentations at the annual meetings of the Proposition 65 Clearinghouse (consisting of lawyers and regulators focused on Proposition 65) and the BizNGO group (consisting of business and environmental leaders collaborating to promote the use of safer chemicals).

## RESULTS

**How Proposition 65 Shapes Consumer Product Formulations.** Several key impacts of Proposition 65 were frequently cited by interviewees (Table 2), including that it prompts (re)formulations to avoid warnings and promotes elimination of Proposition 65-listed chemicals in products. Companies reported incorporating the Proposition 65 list into MRSLs, RSLs, and purchasing specifications, and relying on third-party certification programs that prohibit Proposition 65-listed chemicals. They also reported using the list to obtain chemical ingredient information from suppliers as a step toward creating safer product formulations. Interviews further highlighted several elements that amplify the impact of Proposition 65 beyond California's borders.

**Proposition 65's Chemical List Influences RSLs and Purchasing Specifications, And Informs Third Party Certification Programs.** 81% of interviewed manufacturers, from both mainstream and green companies, said they use the Proposition 65 list as an authoritative list of hazardous chemicals to avoid when formulating products or making purchases from raw material suppliers (N = 13 out of 16 interviews with manufacturers). Two out of three retailers and three out of four institutional purchasers also indicated that Proposition 65 is embedded in their RSLs (including for their private brands) and purchasing specifications. Several interviewees described relying on industry-wide RSLs and third-party certification programs that reference the Proposition 65 list, demonstrating how these industry-wide voluntary standards and third-party certifications amplify the law's impact by embedding the list in the internal policies of individual companies.

As one interviewee described, "what Prop 65 and a lot of these market lists have done is they really force the manufacturers to know and be responsible for the substances that are in their product." Another interviewee from a large

flooring company explained, "[Proposition 65] works as a fairly clear signal to at least us, and maybe other product manufacturers, of which chemicals we should avoid having in our formulations."

Several interviewees discussed how incorporating the Proposition 65 list into their company's MSRLs or RSLs triggered comprehensive product ingredient inventories to identify and eliminate listed chemicals. As an interviewee from a large electronics company stated,

*We had a team of expert chemists, material scientists and other relevant parties and we literally walked through every single chemical on the [Proposition 65] list. What is it? Where is it used? Is there any possible way that it could be in our products? How could we verify that? It took me a team of eight or ten people the better part of the year.*

While only large companies may have the capacity to systematically surveil their product ingredients, interviewees indicated that their purchasing power and procurement practices can influence the composition of products on the market more broadly. As an interviewee from a healthcare organization explained,

*It's a relatively small world of healthcare suppliers... The way that we do a lot of purchasing is through a group purchasing organization. They have contracts with suppliers. So then, when they adopt our standards... that then makes those same products available to other healthcare systems.*

An interviewee from another large healthcare institution described embedding the Proposition 65 list in their environmentally preferable purchasing standard, with a company goal of 50% of products not containing Proposition 65 chemicals by 2025, and indicated this could significantly alter the materials available to every purchaser in the healthcare sector.

Third-party certification programs also serve as intermediaries, effectively (if indirectly) introducing the Proposition 65 list into the purchasing practices of large businesses. For example, several major U.S. healthcare institutions encouraged their suppliers to use certifications such as Green Seal, a designation that prohibits Proposition 65-listed chemicals in the cleaning products it certifies.<sup>30</sup> As an interviewee from the healthcare sector stated about suppliers:

*I think it's very hard for them [to just respond to us], quite frankly, which is why we try, to the degree that we can, to push things to some kind of third-party certification... so that [the suppliers] are not just answering the question [of how to create safer products] for us, but they're answering the question that would then work for everybody.*

Likewise, a large electronics company described prohibiting from manufacturing processes any chemicals designated as Benchmark 1 (highest hazard) by the GreenScreen for Safer Chemicals, a third-party chemical hazard screening method that designates any Proposition 65-listed chemical as Benchmark 1.<sup>31</sup> This interviewee reasoned that, as one of the largest electronics manufacturers, their purchasing decisions also influence what suppliers provide to other companies in the sector. Interviewees relied on other influential third-party certifications that draw on the Proposition 65 list, including Cradle to Cradle Certified<sup>1</sup> and the Zero Discharge of Hazardous Chemicals (ZDHC) Foundation's MRSL.<sup>2</sup>

**Proposition 65 Enables Manufacturers and Retailers to Push Their Suppliers for Both Ingredient Information and Safer Formulations.** Our interviews illustrated how Proposition 65 can promote ingredient disclosure and supply chain transparency for manufacturers, retailers, and institutional purchasers. These end users of chemicals often describe their supply chains as opaque, recounting little ability to access detailed information on the chemical composition of the materials they receive from suppliers. Interviewees described using Proposition 65 to request ingredient information from their upstream suppliers or request product formulations that are aligned with their safer chemical policies. In doing so, these industry representatives can also increase suppliers' awareness of regulatory requirements.

A majority of interviews (69%; N = 22 of 32 total interviews) discussed this information-forcing element of Proposition 65. One stated that Proposition 65 is on "every supplier disclosure declaration that we send out." Another representative from a large health care institution explained that most criteria on its environmentally preferable purchasing standard are aspirational, while, in contrast, the legal duty to warn established by Proposition 65 *compels* suppliers to share information: "[Proposition 65] helps our decision-makers maybe push harder back on their suppliers because they understand that it puts [legal] requirements on us."

Further, companies report using the law to obtain information on all Proposition 65-listed chemicals irrespective of concentration, even though Proposition 65 compliance only requires that companies know (and warn) if a Proposition 65 chemical would expose users to a concentration exceeding a "safe harbor level".<sup>3</sup> As a representative from a large electronics company explained: "We require our suppliers to report *any* Prop 65 chemicals at detectable levels that end up in our products. It's a [reporting requirement], it's not a safe harbor determination."

Many interviewees described unintentionally playing the role of Proposition 65 ambassadors: by requiring information disclosure from suppliers about Proposition 65 ingredients, they educate their suppliers about the law, often triggering more comprehensive ingredient evaluations. An interviewee from a large health care institution illustrated this point:

*[W]hat I found really interesting is that the fact that we have put this criteri[on] into our standards seems to be making more [suppliers] aware of the requirements. Of all the questions they should be able to answer, it should be "Does your product have Prop 65 listed ingredients?" because they're already required by law to know the answer to that question. I probably spend more time on that particular aspect of our [approximately one dozen] chemical questions than any other thing, answering: "What triggers the requirement? Is this particular chemical on the list? Tell me more about safe harbor levels." I just find it really interesting that [our Prop 65 question is] what gets their attention more than the fact that it is already an existing law.*

In addition to prompting suppliers to reformulate away from Proposition 65 listed chemicals, some interviewees described dropping suppliers who were not responsive to requests to change a product formulation. As one interviewee elaborated: *[Suppliers] have to disclose [if their products contain Proposition 65-listed chemicals] to us, and then, once that information is available to us, we can drive them to eliminate it or work with other suppliers to find alternatives.*

In this sense, Proposition 65 prompts not only the deselection of Proposition 65 ingredients in products, but also the deselection of suppliers that fail to provide sufficient information or safer formulations.

While interviewees noted Proposition 65's effect on increased transparency, some interviewees still identified persistent information gaps, particularly given complex international supply chains. One interviewee said this has prompted them to call for additional regulation of the supply chain because "no matter how hard we push our suppliers, we still feel like we're a little bit at their mercy."

**Proposition 65 Prompts Companies to Voluntarily Reformulate to Align with RSLs and Purchasing Specifications, And to Avoid Duty to Warn.** Manufacturers unanimously (N = 16 out of 16 manufacturer interviews) said their business had reformulated products to reduce or eliminate Proposition 65 chemicals. One interviewee qualified this by saying they thought the instances where it has prompted reformulation were limited, whereas another initially said that it had not prompted reformulation but then conceded it had after the interviewer asked them about an enforcement case that required reformulation as part of a settlement. Most manufacturing companies, however, spoke about voluntary reformulation to avoid the duty to warn or to design safer products. Consultants and trade association representatives also attested to witnessing that trend, with one consultant emphasizing "many, many of our customers have standard policies not to use Prop 65 materials." Overall, 78% of all interviewees (N = 25 of 32 interviews) indicated that Proposition 65 has encouraged ingredient avoidance, either through discussing their own company's (re)formulations or through speaking to trends they have witnessed in the industry. One underscored the effectiveness of Proposition 65 in this regard by stating "If something gets on Proposition 65, the argument is over."

Although many products on the marketplace still contain Proposition 65-listed chemicals (as evidenced by successful lawsuits over failure to warn), all our interviewees from manufacturing companies said their business would prefer to reformulate products rather than issue warnings. An interviewee from a company that produces consumer products and

pharmaceuticals stated that the company will “formulate and reformulate wherever and whenever possible to avoid putting that warning on a product.” Another interviewee from a large electronics company stated, “We did a lot of work to make sure that we wouldn’t have to label because of phthalates,” and discussed how they replaced DINP and DEHP in cables and materials with another, unlisted plasticizer, DINCH.<sup>4</sup> Similarly, interviewees from companies producing apparel, footwear and personal care products stated that it is rare to see a Proposition 65 warning in these product categories in part because the significant industry players have formulated away from Proposition 65-listed chemicals.

Consultants and industry groups confirmed the tendency of large businesses to reformulate away from Proposition 65 chemicals. One interviewee summed up this trend stating, “Most will [reformulate if they can] find a material that’s not on the Prop 65 list, and that allows them to not label.” Another consultant described producers’ decision-making process as, “it’s not about should we have a label or not. It’s if we have a label, what do we have to do to get rid of that label.”

Several interviewees said their companies avoid the duty to warn by monitoring impending new Proposition 65 chemical listings and adjusting their formulations accordingly. Although companies have one year from the listing date before being liable for failure to warn, some interviewees described trying to anticipate future listings and reformulate in advance. Interviewees also mentioned reformulating during the period before a final listing:

*There were fragrance components that were proposed for Prop 65 listing, and we felt that it was very likely that they would be listed. So we had the fragrance houses revise those fragrances for us ahead of time so that we would just be out of the Prop 65 component before it got listed.*

To avoid the duty to warn, some companies ensure that any listed chemicals in their products are present below the safe harbor levels that would trigger the warning requirement. Although companies can (re)formulate to just below a safe harbor level to circumvent the duty to warn, our interviewees consistently revealed that the Proposition 65 list has also stimulated companies to eliminate a chemical entirely. As one stated, “Prop 65 by design is a risk-based standard. The way that it’s being treated is as a hazard-based standard largely. Companies are trying to avoid [listed chemicals] even if they might be able to use them in a way that it complies with the law.” While for some this may stem from relying on the Proposition 65 list as an authoritative list of chemicals to avoid, for others it is because of the threat of litigation. As one, stated,

*Particularly in the consumer products and cosmetics space, they’re just not interested in having the threat of litigation for Proposition 65. They would prefer to avoid the use rather than allow some use and then have to debate whether they appropriately warned, did they manage their use levels, all these sorts of issues.*

Rather than seek out substitute chemicals that serve the same function, interviewees described instances of Proposition 65 prompting them to reevaluate whether chemical ingredients are essential and to eliminate any functionally unnecessary chemicals from their products.

While not all manufacturers were comfortable sharing the chemicals that they had reformulated away from, chemicals and chemicals classes that were cited by interviewees include listed phthalates, benzene, toluene, fragrance components,

Bisphenol A (BPA), benzophenone, diethanolamine, chromium, as well as heavy metals like lead and cadmium.

*Forces that Magnify the Impact of Proposition 65.* Interviewees revealed several forces that amplify Proposition 65’s impact, including the size of California’s market, companies’ reluctance to create geographically specific product lines, the influence of large companies on shared supply chains, purposeful harmonization among companies in the same market sector, and other legislation referencing the Proposition 65 list.

50% of all interviewees (N = 16 of 32 interviews) commented that Proposition 65’s reach extends far beyond California given Proposition 65’s national role as an authoritative list of chemicals to avoid and because California’s economy is among the world’s largest. Specifically, 56% of manufacturers (N = 9 of 16 manufacturer interviews) noted that Proposition 65-triggered reformulations influence the composition of their products sold outside of the state. Interviewees emphasized that most large companies do not formulate products differently based on geographic area, with one calling that scenario a “sourcing and logistical nightmare.” As another explained, “We’re a global company so we take the strictest requirements and apply that to all of our products.” Related, many interviewees stated that although they thought Californians might not take Proposition 65 warnings seriously given the frequency with which they may encounter warnings, companies nonetheless reformulated to avoid warnings being encountered by individuals outside California. As one industry representative stated:

*It’s certainly driving reformulation because most people don’t want to put that warning on their product because they don’t just sell in California. How do you sell a cleaning product or an air freshener that [says it] contains a chemical that basically is going to kill you?*

Interviews also illustrated the role that large companies play in shifting the market, either through influence over shared supply chains or through deliberate coordination with other companies in the same market sector. In these instances, large companies shifting their business practices in response to Proposition 65 can have effects that reverberate throughout the marketplace. As one representative from a large flooring company ventured, “[I]t’s entirely possible that in some cases, due to our size, that the raw materials supplier, rather than carry multiple versions of the same product, provides that same formulation to our competitors even though our competitors may not have asked for it.” This is similar to the healthcare sector’s group purchasing organizations, which tend to harmonize purchasing standards sector-wide. As one healthcare representative described, “Our whole strategy has been trying to get everybody in healthcare asking the same questions, including the Prop 65 questions, so that we get better information from our suppliers and hopefully drive the markets to meet our criteria.”

Manufacturers also formed coalitions to collectively pressure suppliers to shift toward safer chemicals, including by adopting sector-wide RSLs that reference the Proposition 65 list. An interviewee from a major footwear company described developing the RSL for the AFIRM Group,<sup>32</sup> an organization of apparel and footwear companies collaborating on chemical management, to create uniform standards for the sector and exert group influence over shared suppliers:

**Table 3. Interviewee Stances: Aspects of Proposition 65 That Make Compliance Difficult, Or Critiques with the Design and Implementation of the Law (N = 32)**

| Issue                                                                                                   | Illustrative quote                                                                                                                                                                                                                                                                                                                                                                                                                             | Number of interviews that mention an issue (percentage of interviews in brackets) |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lack of safe harbor levels for many listed chemicals                                                    | "Out of the hundreds of Prop 65 chemicals, OEHHA has only developed [safe harbor levels] for a subset of them. Because we do have PhD and board-certified toxicologists, we can develop our own safe harbor levels based on quantitative risk assessments... Small companies would really struggle if they know there's a Prop 65 chemical. Even if they could do risk assessment on exposure, there's no safe harbor level to compare it to." | 14 (44%)                                                                          |
| Citizen suit provision leads to "fishing expeditions" by private enforcers or frivolous lawsuits        | "We'll get these mass letters where we are one of 50 company names there and you know they are just fishing but all they got to do is hit one out of 10."                                                                                                                                                                                                                                                                                      | 10 (31%)                                                                          |
| Lack of information on relative potency of listed chemicals; inclusion of naturally occurring compounds | "The hardest things are the fact that, when Prop 65 was first created and they first started listing chemicals, the chemicals they listed were generally known as being nasty chemicals... That list is now 800 [or] 900 chemicals [and includes] chemicals that are more debatable whether they're really toxic or not, or they're coming down with chemicals that naturally are present."                                                    | 10 (31%)                                                                          |
| Lack of guidance on potentially safer chemical substitutes                                              | "You really have to have a little bit of a broader perspective to make sure [that if] you're getting rid of something problematic, that you're replacing it with something better... I could get rid of a Prop 65 chemical and replace it with plutonium, and that would be totally fine."                                                                                                                                                     | 8 (25%)                                                                           |
| Insufficient supply of capable Proposition 65 compliance consultants                                    | "There's actually a cottage industry of folks who do nothing but provide that kind of service to companies that don't have the ability to do it in the first place... And the number of people that are really good at doing that is fairly limited, and as a result they charge an awful lot for it."                                                                                                                                         | 5 (16%)                                                                           |
| Omits important health endpoints, such as neurotoxicity or endocrine disruption                         | "It's just two end points that are considered, cancer and reproductive/developmental. But what about all of the other end points?"                                                                                                                                                                                                                                                                                                             | 5 (16%)                                                                           |
| Limited guidance as to which chemicals on the large list are relevant to different product sectors      | "[A] challenge is that the list of chemicals, many of them are not even relevant to our industry. So somebody needs some guidance on which ones should they be actually looking into."                                                                                                                                                                                                                                                         | 5 (16%)                                                                           |
| Preference for concentration limits in materials over safe harbor levels                                | "We can comply so much easier with the material threshold... What I would really like is 'In this application, in this material, this is the limit of what you can have', as opposed to the safe harbor."                                                                                                                                                                                                                                      | 5 (16%)                                                                           |

*Every supplier is making products for Nike, Adidas, Puma [who] all have adopted the same RSL standards. [W]e needed to simplify how we were messaging across our supply chain. That's why we decided after 10 years, let's harmonize and create one standard that takes into consideration REACH, Prop 65, KC Mark testing in Korea...*

Another force that magnifies Proposition 65's impact is other legislation that explicitly references the Proposition 65 list. For example, when California adopted a Cleaning Product Ingredient Right to Know Act (Senate Bill 258) in 2017, companies negotiated a five-year delay specific to disclosure of any Proposition 65-listed chemicals to discourage litigation during that time frame. As explained by one representative from a large consumer products brand that was part of the negotiations, this delay gave cleaning product companies time to identify and eliminate Proposition 65-listed chemicals, even those present below the concentration that would trigger a warning requirement:

*Basically, if we disclose a Prop 65 chemical on our label or website without a commensurate Prop-65 warning statement, we are inviting bounty hunter lawsuits. The 5 years was to give us time to investigate if any existed (primarily within the fragrance) and then either reformulate, put a warning statement on, or prepare for potential challenge... If a chemical was found, we would most likely opt to remove it.*

Similarly, another interviewee stated the Proposition 65 list helps "define the world of chemicals of concern" for other U.S. and international legislation, noting how New York State also passed a law that requires the disclosure of ingredients in cleaning products and references the Proposition 65 list as one source of chemicals that must be disclosed. As the interviewee

described, "deep statutes define priority chemicals, which if present in a product a consumer should know about. Prop 65 is one of those and it's actually the biggest contributor list source."

In addition to being referenced by other laws, the Proposition 65 list informs the efforts of advocacy campaigns, which in turn amplify the law's impact. Our interviews included companies that were targeted by the Breast Cancer Prevention Partner's Campaign for Safe Cosmetics,<sup>33</sup> which publicly advocates for the removal of Proposition 65-listed chemicals from beauty products and uses Proposition 65 listing as evidence of a chemical's toxicity when generating campaign materials. Some interviewees targeted by these campaigns described the influence of public pressure by these advocacy groups in shifting toward safer products.

**Difficulties Ensuring Proposition 65 Compliance, and Critiques of the Law's Design.** Beyond illuminating how Proposition 65 reduces the use of listed chemicals, interviews highlighted aspects of the law that limit its ability to achieve its public health goals. These included the observations that the law does not prevent problematic substitutions; addresses just three health endpoints (carcinogenicity, mutagenicity, and reproductive toxicity); creates incentives for potentially unfounded lawsuits; and provides little guidance for companies in translating safe harbor levels into threshold limits for chemical concentrations in products (Table 3). Interviewees also described external factors that complicate compliance with the law, including concern over the array of consultants who advertise Proposition 65 compliance testing but may not be competent to perform it.

When expressing a wish for a “green list” of chemicals to use rather than simply a “red list” of chemicals to avoid, some interviewees pointed to U.S. EPA’s Safer Chemical Ingredients List<sup>34</sup> or regulatory approaches such as California’s Safer Consumer Products program<sup>35</sup> as sources of such guidance.<sup>5</sup> Relatedly, some interviewees mentioned that Proposition 65 is a “lagging regulation” with regards to chemical inclusion; as one lamented “there are a lot of chemicals of high concern that aren’t on the list.” For example, only a handful of per- and polyfluoroalkyl substances (PFAS) chemicals are listed on Proposition 65’s list. Interviewees also argued that Proposition 65’s listing approach could be improved by indicating the relative potency of listed chemicals or distinguishing among exposure routes. For example, many cleaning products contain a Proposition 65-listed chemical, ethanol, that is primarily hazardous when ingested rather than inhaled or absorbed through skin contact. Also, with respect to exposure routes, some interviewees requested more guidance from California’s Proposition 65 science agency, the Office of Environmental Health Hazard Assessment (OEHHA), about which Proposition 65-listed chemicals are likely to be found in different types of products.

Many (44%, N = 14) interviewees described how safe harbor levels established by OEHHA help companies resolve ambiguity and reduce their liability, including when responding to lawsuits, and hoped OEHHA could set more levels. Smaller companies in particular lack in-house capacity to determine safe harbor levels on their own. Some interviewees described working with industry groups to establish safe harbor levels in the absence of OEHHA-specified limits. One interviewee from an electronics brand was skeptical about this approach, however, describing a scenario in which economic self-interest influenced the safe harbor level that industry generated:

*The industry [first] came out with theirs, which was basically, “You can eat it in your breakfast cereal,” and we were like, “No.” The capacity of industries to do good peer review is extremely limited. You need independent people looking at it.*

Many interviewees did, however, emphasize that they preferentially eliminate Proposition 65-chemicals rather than reformulate to below safe harbor levels. As one succinctly said, “by eliminating the hazard, you eliminate the need to assess exposure.” An interviewee from a consulting firm described when advising companies, he will “start with the ingredients themselves and say, ‘if I can eliminate this hazard from my product, I won’t have to create an exposure control for it because it won’t be there.’”

Several interviewees raised the issue of naturally occurring compounds in complex chemical mixtures. Some of these—such as acrylamide in coffee, or heavy metals like lead that can contaminate mineral makeup and food—can be hard for companies to eliminate. Others, such as beta-myrcene in fragrances derived from citrus, were the source of tension as companies reported trying to balance the signal from Proposition 65 listing with consumer demand for natural fragrances over synthetic alternatives.

Around a third of interviewees critiqued the citizen suit provision of Proposition 65 as allowing for “fishing expeditions” by private enforcers, and several indicated that “everybody just settles” rather than going to court. Some interviewees, however, were less critical of private enforcement suits, framing the provision as giving “teeth” to Proposition 65 in the face of limited government enforcement. As one said,

“citizen lawsuits put the fear of God into most companies because it creates a reputational risk as well as a financial risk.” Another emphasized that the citizen enforcement mechanism “places a higher burden on companies to make sure that they’re using chemicals appropriately because it doesn’t rely on what are often ineffective enforcement mechanisms given to federal and state agencies.”

Interviewees did point out (and examination of the Attorney General’s database of Proposition 65 private enforcement actions confirms) that citizen suits typically cluster around a small number of chemicals that are readily lab-detectable, well established as toxic, and broadly publicized. As one stated, “[With the private enforcers], it is always about the easy hits and targets, so the heavy metals, the phthalates... the easy things for the headhunters to go after.” Given this, and given that Proposition 65 does not differentiate the level of hazard among listed chemicals, some interviewees emphasized that Proposition 65 does not always incentivize removing the most toxic, high-volume chemicals. This leaves unrealized the law’s broader potential to protect public health.

## DISCUSSION

Interviewees identified a pervasive positive impact of Proposition 65 that is generally hidden from public view: the law motivates companies to deselect hazardous chemicals on its list. In sectors from electronics to healthcare, our in-depth interviews confirmed that companies frequently reformulate products to remove Proposition 65-listed chemicals or request alternatives from suppliers. As the most extensive and influential among ingredient disclosure laws, Proposition 65 is often maligned for generating overabundant warnings and citizen lawsuits. While those issues did arise in our conversations with industry representatives, multiple interviewees indicated that, because of Proposition 65-influenced reformulations, it is now rare to see warnings in many consumer product sectors (e.g., household cleaning, personal care, apparel, and footwear). In this way, the warning provision of Proposition 65, along with the implied threat of its enforcement, may affect businesses more significantly than the consumers it more conspicuously informs.

Related, while Proposition 65 is typically framed as a *right-to-know* law aimed at the public, it also drives the *ability-to-know* within industry. Proposition 65 has brought the issue of supply chain complexity and opacity to the fore, prompting companies to push for more transparency within their sectors. As a result of Proposition 65, suppliers are increasingly aware of the ingredients in their supply chain, and frequently share information about listed chemicals with downstream product manufacturers, retailers, and institutional purchasers. Supply chain transparency, however, still remains a significant challenge across sectors, and more direct regulatory solutions are needed.<sup>36,37</sup>

Although companies can theoretically circumvent the duty to warn by (re)formulating to just below a safe harbor level, our interviews revealed that the Proposition 65 list acts as a flag that often prompts businesses to avoid listed chemicals entirely, increasing the public health impact beyond what the law requires. Multiple interviewees emphasized that companies are incentivized under Proposition 65 to eliminate hazardous chemicals rather than reducing overall risk by more simply reducing exposure. Furthermore, while in some cases interviewees made clear that decreasing or removing listed chemicals required significant effort in some product lines to

find a suitable substitute (e.g., phthalates in consumer electronics), this was not a universal theme. In some instances, interviewees indicated that removing toxics from their products had no overall impact on product functionality. This suggests that Proposition 65 has eliminated some easy-to-remove or easy-to-substitute toxics, appropriately focusing industry on low-hanging fruit in efforts to detoxify the product marketplace. Proposition 65 has pushed manufacturers to consider the necessity of both a specific chemical ingredient in a product and the function performed by that chemical. For example: must a specific product be scented at all, or with a particular fragrance, and if so, is the Proposition-65-listed chemical essential to the fragrance? These voluntary actions under Proposition 65 predate recent shifts toward chemicals policies that move manufacturers to demonstrate the “essentiality” of hazardous chemicals as a condition of market access (for example, as in the European Commission’s Chemicals Strategy for Sustainability).<sup>38</sup>

More generally, interviews revealed key factors that can amplify the salutary effects of any consumer product legislation. These include the supply chain influence of large manufacturers and the purchasing power of large retailers and institutions, both of which can ultimately influence whole sectors. Importantly, although Proposition 65 is a California-based law, it takes on *de facto* national and international significance given that many manufacturers avoid reformulating for a single jurisdiction and are particularly keen to avoid warnings on products sold beyond California’s borders. In the absence of comprehensive federal U.S. leadership on chemicals regulation, including limits in the original and amended Toxic Substances Control Act,<sup>39–42</sup> and the more general congressional paralysis that makes enactment of major legislation difficult, this underscores the important role that states, especially populous ones, can play in environmental health protections. While state bills targeting ingredient disclosures are increasingly common, the language of Proposition 65 warnings that explicitly link chemical exposures to health effects, coupled with routinely used enforcement mechanisms such as citizen suits, appears to be particularly effective in prompting manufacturers to reformulate. In this way, Proposition 65 functions not only as a transparency law for consumer decision-making but also as a means of reducing hazardous chemicals in consumer products. Right-to-know laws can thus have broader impacts beyond increasing information transparency if designed in a way that encourages industry action.

Interviewees identified another factor that amplifies Proposition 65’s salutary effects, citing Proposition 65’s incorporation into other laws. A study conducted by some of our team likewise previously found that the scientific expertise produced to support Proposition 65 listings has prompted new state chemical laws around toxics such as heavy metals and phthalates, as well as strengthened occupational safety standards, and Proposition 65 has informed multiple other California and out-of-state laws and programs.<sup>43</sup>

While industry objections to Proposition 65 reflect real pain points for companies, some stem from broader challenges in the field of chemicals policy rather than problems with Proposition 65 specifically. For example, interviewees called for a “green” list of safer alternatives, a resource that could indeed instigate a quantum leap toward safer products and materials. Here, the nascent state of materials science may hinder efforts to achieve this for many Proposition 65 chemicals. While

another California-based toxics reduction effort, the Safer Consumer Products program, is designed more intentionally with respect to encouraging the use of safer chemicals in consumer products, it is significantly more limited in scope than Proposition 65, with the program aiming to address only 3–5 specific chemical-product combinations per year,<sup>44</sup> and in some years having tackled even fewer.

Similarly, some industry representatives preferred legislation like the E.U.’s Restriction of the use of certain Hazardous Substances (RoHS) that specifies allowable concentrations of a chemical in an electronic material, rather than Proposition 65’s exposure-based limits (i.e., safe harbor levels), which are harder for them to operationalize. Generating allowable concentrations of each Proposition 65 chemical in all types of products would require government resources orders of magnitude greater than OEHHA’s current funding. It is important to consider that Proposition 65 covers many more substances than does RoHS, and applies to all products, not just electronics. When OEHHA provides a safe harbor level, it applies to all product types. For example, a phthalate could be present in an electrical cord at much higher concentrations than in a child’s rubber duck, but the rubber duck could cause higher exposures because of its use conditions. The allowable material concentrations would differ between the two products, but a safe harbor level would not vary, making Proposition 65’s safe harbor levels both elastic (applicable to many different materials) and scalable (covering many products).

While Proposition 65 is unique in its broad reach and the enforcement “teeth” of citizen suits, the limitations inherent to Proposition 65, and interviewees’ reliance on other influential legislation, underscores the importance of a diverse landscape of state, national and international environmental legislation. This includes laws that are more specific to certain chemicals or product sectors. For example, state laws banning classes of chemicals, such as PFAS, in consumer products, are gaining momentum,<sup>22</sup> and, in contrast to right-to-know laws, these outright chemical bans may more effectively and justly protect public health by mandating actions beyond warning and avoiding shifting responsibility to individual consumers. Moreover, Proposition 65 does not sufficiently address risks from exposure to mixtures of different chemicals or aggregate exposures to the same chemical from multiple sources. Our team previously found that even a single product type can contain more than a dozen different Proposition 65-listed chemicals and that some individual chemicals are present in many types of products, raising total exposures.<sup>45</sup> The varied regulatory approaches can thus work in concert, including ones that more directly address cumulative risk, enact class-based chemical restrictions, and implement workplace protections.

Our study has several limitations. First, our analysis relies on interview data to identify industry responses to Proposition 65 in the absence of any required reporting on how companies avoid or eliminate listed chemicals. While there is limited data on industry response to Proposition 65, we see several cases where Proposition 65 listing likely prompted manufacturers to deselect specific toxic chemicals. This was evidenced by biomonitoring data from the U.S. Centers for Disease Control and Prevention that revealed decreasing exposure to certain chemicals listed under Prop 65, but increasing exposures to chemicals that are structurally related and toxic but as yet unlisted under Prop 65.<sup>46</sup>

Second, we selectively interviewed representatives from large businesses and lack direct insights into whether small and medium-sized businesses similarly tend to eliminate Proposition 65 chemicals from their manufactured or purchased products. Although we cannot extrapolate our findings from large companies, our interviews indicated that large businesses shifted supply chains away from listed chemicals and that likely trickles down to smaller companies. Moreover, while we invested efforts in sampling across a wide number of industry sectors and supply chain positions, some sectors, such as food, and some supply chain positions, such as retail, are less represented among our participants. Finally, the small number of interviewees in individual categories makes it difficult to analyze differences across sectors.

Overall, we found that the indirect effects of Proposition 65 are possibly even more far-reaching and market-influential than the direct mechanisms (i.e., consumer-facing warnings) through which Proposition 65 most visibly operates. Interviewees identified multiple aspects of Proposition 65 that potentially reduce exposures to toxics significantly beyond what could be accomplished by individuals avoiding retail products containing listed chemicals. While some large companies have publicly announced their commitment to transitioning away from Proposition 65 chemicals, our interviewees included others who have taken a quieter approach to compliance by proactively reformulating products behind the scenes. As such, Proposition 65 has permeated the consumer product marketplace, but since its key influences occur inside the decision-making processes of private companies, the law's true impacts can be hard to systematically assess. To our knowledge, this is the first study using in-depth interviews with representatives from diverse industry sectors to understand the influence of Proposition 65 on internal corporate decision-making. The interviews underscore the importance of this methodological approach for elucidating mechanisms of influence of a law that lacks metrics for quantifying progress toward its goal. This behind-the-scenes view complements—and, in many cases, counters—the often-disparaging and oversimplified narratives that companies' public statements tell about Proposition 65.

## ■ ASSOCIATED CONTENT

### SI Supporting Information

The Supporting Information is available free of charge at <https://pubs.acs.org/doi/10.1021/acs.est.4c07495>.

(S1–S7) Interview Questions for Manufacturers, Retailers, Institutional Purchasers, and Consultants (PDF)

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## Notes

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## ■ ADDITIONAL NOTES

<sup>1</sup>Cradle to Cradle Certified covers a broad range of products and considers five categories of sustainability performance, one of which evaluates chemicals used in the product for human health and environmental concerns. <https://c2ccertified.org/the-standard>

<sup>2</sup>The ZHDC MRSL, published by ZHDC foundation, is a nonregulatory list of chemical substances banned from intentional use in the processing stages in the textiles, apparel, and footwear industry for brands who opt in to the certification scheme. Unlike other chemical restrictions, which may focus on finished products, the MRSL is also meant to protect workers, local communities, and the environment. <https://mrsl.roadmaptozero.com/>

<sup>3</sup>A safe harbor level identifies a level of exposure to a listed chemical that does not require a Proposition 65 warning.

<sup>4</sup>DINCH is viewed as a safer alternative to phthalates but is classified as a GreenScreen Benchmark 2 chemical. Benchmark 2 chemicals are preferable to Benchmark 1 chemicals (which are to be avoided) and are meant to be used as transitional chemicals while safer alternatives are investigated. <https://chemsec.org/app/uploads/2019/09/Replacing-Phthalates-%E2%80%93-ChemSec-190911.pdf>

<sup>5</sup>U.S. EPA's Safer Choice program does, however, prohibit Proposition 65-listed chemicals as intentionally added ingredients and California's Safer Consumer Products populates its candidate chemicals list (i.e., chemicals subject to regulation) from the Proposition 65 list.

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