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Association of Home Appliance Manufacturers

Standing Committee on Environment and Sustainable Development study on single-use plastics

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Summary

The concern about microplastics in waterways has prompted some environmental advocacy groups and lawmakers to call for the installation of filters on washing machines as a way to capture microfibers that shed from clothing and textiles during wash cycles.

The Association of Home Appliance Manufacturers, in an effort to assess the effectiveness of microfiber filters on clothes washers as a solution to the issue, contracted with NSF International to conduct testing of the filters. The testing results showed that the filters would be largely ineffective and that there are also a number of technical challenges to placing a filter on a washing machine. Filters that capture particles of this size (100 microns) will inevitably clog, creating the need for bypass that will render them useless. They also created a number of problems, including wasted water, increased energy use and unnecessary plastic use.

Any potential bans on plastic packaging must consider if the packaging material is essential to the proper delivery or functioning of the consumer product and if there are any alternatives that will work in all climates and in all circumstances, such as a product being delivered to a home, to a brick & mortar retailer or through e-commerce. Worker safety during transportation and at distribution centers must be considered.

There is no single recycled content target that is applicable to all appliances and circumstances. Setting an arbitrary and capricious blanket target can compromise the product function and negatively impact the health and safety of Canadians who use them. Product safety must be considered paramount when setting specific standards to avoid issues such as electric shock, injury, risk of fire, potential flooding in the home, and/or contamination though food contact. Finally, recycled plastic resins are not readily certified and available in the quantities that the industry needs to meet the proposed target.

The plastics used in appliances are often rigid mixed plastic, material for which there are limited end markets after it is recycled. In addition, some of the plastic contains flame retardants, which are necessary to comply with extensive and highly beneficial safety standards. The government should earmark funds to modernize and expand plastic recycling infrastructure and technologies in Canada.

Appliance Manufacturers: Leaders in Environmental Protection

The Association of Home Appliance Manufacturers (AHAM) represents manufacturers of major, portable, floor care home appliances and suppliers to the industry. AHAM's membership includes over 150 companies throughout the world. In Canada, AHAM members employ thousands of people and produce more than 95% of the household appliances shipped for sale. The economic impact of the appliance industry is close to 6 billion dollars annually. The home appliance industry, through its products and innovation, is essential to consumer lifestyle, health, safety and convenience. Home appliances are a success story in terms of energy efficiency and environmental protection. New appliances often represent the most effective choice a consumer can make to reduce home energy use and costs.

The home appliance industry has a history of implementing design changes and transitioning to the use of materials that lessen the environmental footprint of home appliances both in their use and management at the end of life. This includes the more environmentally friendly refrigerants, dramatically reducing the energy and water use, and recyclable materials in both appliances and appliance packaging.

In the past, the home appliance industry transitioned to refrigerants to improve energy efficiency, cost-effectiveness and safety, and reduce environmental impacts. The industry is currently transitioning away from very high-GWP (global warming potential) hydrofluorocarbon (HFC) refrigerants in refrigerators and freezers, room air conditioners, portable air conditioners and dehumidifiers.[1] The appliance industry will phase out the use of HFCs in full size refrigerators and freezers by 2022 (compact units in 2021 and built-ins in 2024) as mandated by several US state laws.[2] In addition, Environment and Climate Change Canada (ECCC) has issued regulations that will prohibit the use of HFC with global warming potential as a blowing agent or refrigerant in household refrigerators starting January 1, 2021 and January 1, 2025, respectively[3].

The home appliance industry is a leader in environmental excellence. Innovations over time have led to significant efficiency gains that have dramatically reduced the energy and water use of these products. Clothes washers now hold 20 percent more volume than they did in 2000 while using less water.[4] The average amount of water used in a dishwashing cycle is down more than 41 percent since 2005.[5] Many of today's refrigerators use less than half of the energy of models sold 25 years ago.[6]

Home appliances are a recycling success story. Major appliances are recycled at a high rate, driven by the market value of the metals used in their manufacturing. Recent consumer surveys that AHAM conducted show that major appliances have an average lifespan of 10 years with

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[1] *See* https://www.aham.org/AHAM/News/Latest_News/Home_Appliance_Industry_Sets_Goals_to_Eliminate_Use_of_HFC_Refrigerants.aspx.

[2] California, Vermont, and Delaware are just a few of the states setting regulations to mandate the HFC phase out.

[3] Ozone-depleting Substances and Halocarbon Alternatives Regulations (SOR/2016-137), https://laws.justice.gc.ca/eng/regulations/SOR-2016-137/index.html

[4] *See* https://appliance-standards.org/blog/new-spin-clothes-washer-efficiency-coming-january-2018.

[5] *See* https://appliance-standards.org/product/dishwashers

[6] *See* https://www.energy.gov/articles/proof-pudding-how-refrigerator-standards-have-saved-consumers-billions.

some variation based on product type. This data is consistent with previous studies.[7] At the end of life, major appliances take on new value as an important manufacturing raw material, including as scrap steel. In major appliances, ferrous material can account for 40 to 60% of the product's total weight. Furthermore, the most used materials, by weight, for appliance packaging are paper and wood, materials that are highly recyclable.

Over the past decade, AHAM embarked on an initiative to create a series of sustainability standards covering all of its products, and has published standards for refrigeration products, portable and floor care appliances, clothes washers, clothes dryers, kitchen cooking appliances (both microwave and cooktop/ranges), room air conditioners, and household dehumidifiers.[8] AHAM partnered with UL Environment, the CSA Group, and internationally recognized sustainability experts to develop the standards, which are based on a life-cycle analysis methodology. The goal of these standards is to provide manufacturers, consumers, retailers and other stakeholders with a technically-based methodology to assess the relative environmental impacts of home appliances. The standards were released over the course of several years, beginning in 2012, and AHAM and its partners are now in the process of updating those standards. AHAM also intends to publish an industry-wide environmental report in 2021 and began work on the project earlier this year.

[7] Burns & McDonnell, *Analysis of Appliance Recycling in the U.S. and Canada* (2017).
[8] The standards are available as the AHAM/UL/CSA 7000 series of standards.

MICROFIBERS

AHAM looks forward to being part of the solution on the issue of microfibers, a type of microplastic that has been found in waterways. As appliance manufacturers and other industries work together to find ways to address the issue, it is important that solutions effectively address originating sources and protect the energy efficiency gains that appliances have made through decades of innovation.

The concern about microplastics in waterways has prompted some environmental advocacy groups and lawmakers to call for the installation of in-line filters on washing machines as a way to capture microfibers that break off from clothing and textiles during wash cycles.

AHAM, in an effort to assess the effectiveness of microfiber filters on clothes washers as a solution to the issue, contracted with NSF International to conduct testing of the filters. The testing results showed that the filters would be largely ineffective. They also created a number of problems, including wasted water, increased energy use and unnecessary plastic use.

Testing found that filters did not capture microfibers efficiently and prevented only a fraction of microfibers from discharging into the drain line. Filters would also lead to a major step backward in energy efficiency. The testing showed that the filters caused washers to use up to 14 more gallons of water and increased run times by an average of 10-14 minutes. In the worst case, the washer ran longer and used more water than an entire extra cycle. The filters, which are made of plastic, would put more plastic into the environment than they would remove. It would take 13 years — longer than the average useful life of clothes washers — for one filter to collect the amount of plastic equal to what it took, and that does not take into account the plastic in the filters that need to be replaced throughout its use.

The filters present challenges for consumers, as well. The filters must be cleaned after every cycle or two, putting a burden on consumers to clean filters and dispose of the collected material in a way that does not lead to the material entering waterways. They could not be installed in small laundry areas that provide no room to mount the filter, which could lead a consumer to avoid using them altogether. Testing also showed the filters could create a flooding risk if a bypass were not included. However, with a bypass, the filters will likely be useless unless changed and cleaned after every few washes.

Finally, it is unclear that clothing and textiles are the major source of microfibers in waterways. Research by the San Francisco Estuary Institute and 5 Gyres Institute found 300 times more microfibers come from storm water than wastewater.[9] It would be more productive to focus on the various originating sources of microfibers to find ways to reduce microfibers in waterways.

AHAM acknowledges that microfibers are a problem that needs to be addressed and is willing to

[9] *See* https://www.sfei.org/sites/default/files/biblio_files/Microplastic%20Levels%20in%20SF%20Bay%20-%20Final%20Report.pdf.

work toward that goal. However, in-line clothes washer filters are ineffective, inefficient and will be a step backward in the pursuit of cleaner waterways and greater efficiency.

MANAGING SINGLE-USE PLASTIC

Appliance packaging is made up of recyclable materials

Plastics' benefit to society is indisputable, but reducing its environmental footprint requires sound public policy. AHAM recognizes the importance of finding solutions on this important environmental issue. The home appliance industry has a history of transitioning to the use of materials that lessen their environmental footprint in both their everyday use and management at their end of life. This includes using recyclable materials in both appliances and appliance packaging.

A study done on appliance recycling by Burns and McDonnell dismantled packaged appliances and analyzed their material composition.[7] Appliance packaging consists mostly of recyclable materials (86%) such as corrugate, boxboard and paper laminates and recyclable plastics such as expanded polystyrene. This study found the following results for major appliance packaging, on average:

- 55% was corrugated cardboard
- 24% was wood pallets / crates
- 9% was expanded polystyrene
- 7% was paperboard / cellulose
- 6% was other plastics

Major appliance packaging is designed to protect products during storage, transport, and delivery. This packaging protects the product from the time it leaves the manufacturing facility, overseas, across the country, through the logistics and retail value chains until the moment it arrives at a customer's home. Our member companies vigorously test the packaging in laboratory settings using comprehensive test methods such as drop, compression and vibration tests to ensure that the products arrive to the customer's home undamaged. Typically, the company delivering the appliance removes the packaging and takes it away for recycling.

Worker safety

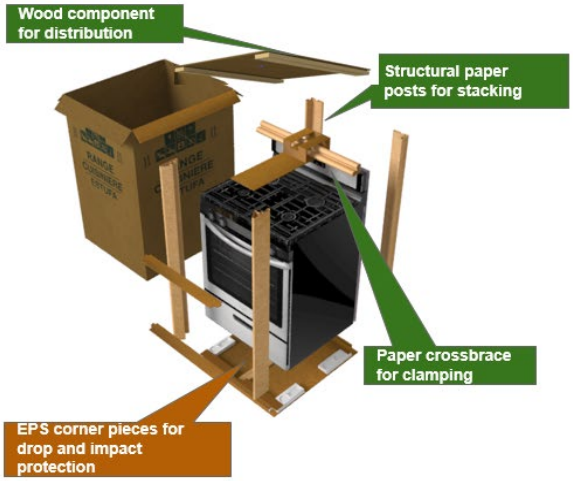
Worker safety during transportation and at distribution centers must be considered especially when dealing with large appliances such as refrigerators, freezers, dishwashers, cooking ranges, washers and dryers.

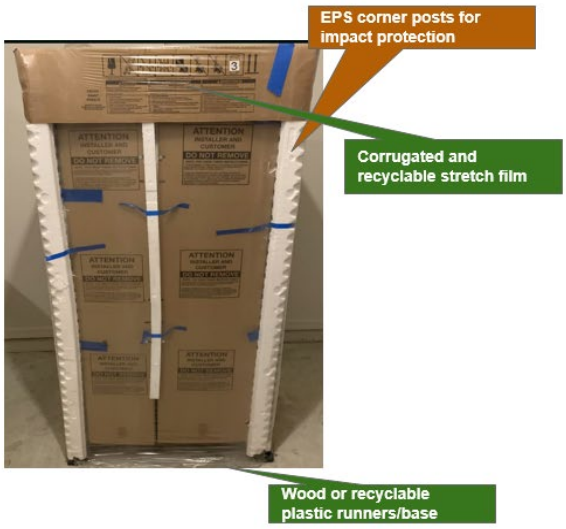
Expanded polystyrene (EPS) is used around the edge of a large appliance to protect it during transport because it is lightweight, will withstand multiple impacts and will maintain its integrity in humid conditions. Polystyrene is necessary to protect worker safety when dealing with large appliances such as refrigerators, freezers, dishwashers, cooking ranges, washers and dryers. After being assembled, major appliances are often packaged and stored and moved in very large warehouses or distribution centers. These facilities often have limited climate control and can experience extreme temperature and humidity changes and packages are often tested from (-29^{o}C to 63^{o}C). Low temperatures can cause packaging materials to become brittle while humidity and heat can affect the packaging's structural integrity and limit the effectiveness of adhesives or the strength of products that are made from fiber. The structural strength of packaging is necessary to maintain for safety purposes, particularly with respect to major appliances that are housed in

stacks that are three or four appliances high. Furthermore, these appliances are often moved around by clamp truck and the packaging must withstand the force of the clamps in order to be moved efficiently. Other paper alternatives such as cardboard, molded pulp or honeycomb can only handle a single impact and loses its integrity in hot and humid environments.

Warehouse Stacking and Clamp Truck

Need for Structurally Sound Packaging





Avoid breakage during transport

Appliance packaging must also maintain its integrity for the final transport by truck so that it can be delivered safely to the home. Our member companies vigorously test the packaging in laboratory settings using comprehensive test methods such as drop, compression and vibration tests to ensure that the products arrive to the customer's home or to the store undamaged.

Manufacturers of consumer products need flexibility in choosing appropriate materials for packaging their products to avoid situations that cause product breakage and damage during transport. One example, is the **clear polyethylene film,** which is used as a protective film on stainless steel appliances to protect them from scratches during manufacturing and delivery. There are currently no viable alternatives that can serve the same function. For example, there is no paper-based product that could serve this function because paper is abrasive and it scratches the surface, leading to damage and returns.

Packaging for small appliances is also a challenge because of the requirements that brick and mortar retail are often different from those of e-commerce, and yet the packaging must often satisfy both streams of commerce. In both instances, EPS often improves the consumer experience. Consumers generally prefer to have minimal assembly required. EPS can be molded to minimize any assembly requirements because it can be shipped in as close to a fully assembled state as possible.

E-commerce packages are designed for seventeen or more touchpoints or drops and products sold in traditional retail often experience five touchpoints or drops. EPS is often a preferred packaging material because of its light weight and resilience to multiple shocks or collisions during transportation, which paper-based materials lack. In other cases, pulp serves the technical needs that EPS fills, but it increases the volume and the weight of the packaging, leading to additional GHG emissions during transportation and delivery. AHAM members have looked into alternative, non-plastic or non-EPS materials to replace those that are in current use. Common barriers that these materials face include technical limitations, limited availability, and cost.

Packaging also plays a different role in smaller products, sometimes as a requirement by the retailer. In brick and mortar settings, the packaging communicates directly to the consumer and the packaging may have to serve that function while also being resilient enough to withstand the stresses of e-commerce. Furthermore, retailers can impose packaging requirements on manufacturers to reduce theft.

SETTING RECYCLED PLASTIC CONTENT TARGETS

Plastics in products offer advantages over other materials due to their versatility and high mechanical resilience. Many appliance manufactures already use recycled plastics in their products; however, there are multiple technical challenges to overcome before recycled content requirements can be more widely applied. In addition, at this time there is not a sufficient supply of certified, reliable, high-quality feedstock available for manufacturers to meet specific targets for products distributed throughout Canada and the US. For companies using recycled materials in their products, a key concern is understandably that materials meet the right technical criteria in terms of performance, robustness, and safety, with availability in sufficient quantities. Now and in the future, manufacturers must be allowed to determine the design of their products and to find the correct balance between the use of primary and secondary plastics while also meeting product safety requirements and ensuring that the product performs to its intended application over the course of its lifespan.

Canada's Action Plan on Zero Plastic Waste states that, by 2030, at least 50% of plastic used in products must be of recycled content. This one-size-fits-all approach does not take into account the wide range of engineered uses of plastic in home appliances. There is no single recycled content target that is applicable to all appliances and circumstances, and such an arbitrary and capricious blanket target will compromise the product function and negatively impact the health and safety of Canadians who rely on these products.

Canada is a net importer of home appliances, with the United States and Mexico being the predominant trading partners. This larger market increases consumer choice and maximizes economies of scale driving down costs. If the government moves forward with setting recycled plastic content targets alone, Canada will be an outlier in the North American marketplace. Regulatory alignment is critical and strongly encouraged in CUSMA to avoid unnecessary double testing and barriers to trade, while maximizing consumer product choice. Canada needs to assess industry and consumer impacts and economic costs of this commitment.

Choosing the material content for products, including whether or not to use recycled materials, should remain in the hands of design and safety engineers and managed through the long-time effective use of standards and conformity assessment methods.

Health and Safety Risks

Appliance manufacturers must adhere to technical and safety standards requirements when designing products. These requirements are set to protect the health and safety of consumers and include maximum acceptable percentages of recycled plastic regrind that can be used in the product. That limit lies between zero and 25% unless the results of a separate investigation indicate acceptable performance for the specific part[10]. The limit also varies by plastic type, its design intent and the part's function.[11] Plastics that are for more general use and not for structural use can incorporate higher percentages of regrind content.

Importantly this current safety allowance was created for in-house reground plastic and not recycled plastic. Regrind is defined as non-contaminated product or scrap such as sprues and

[10] UL 94 with respect to flammability requirements and UL 746D for fabricated parts. CSA C22.2 No 0.17.
[11] ibid.

runners that have been reclaimed by shredding and granulating for use in-house.[12] In contrast, recycled plastics are those plastics composed of post-consumer material or recovered material only, or both, that may or may not have been subjected to additional processing steps of the types used to make products such as recycled-regrind, or reprocessed or reconstituted plastics.[13] Any level of post-consumer recycled material in the plastic needs to be tested and evaluated before use.[14]

Recycled plastic resins often do not have the same physical properties as virgin plastic. Engineered plastic must meet stringent physical requirements for durability, strength, impact resistance, and flame retardancy to maintain the safety, quality, and lifespan of the product. Parts made of plastics must be durable and not susceptible to breaking, shattering, cracking, or other physical failure as required by established product safety standards. High percentages of recycled content undermines these physical properties and could reduce the lifetime of the product, thus resulting in that the entire product goes into the waste stream prematurely.

Manufacturers have set design requirements that prevent any recycled or regrind content in certain applications such as clear crisper drawers in a refrigerator or cosmetic consoles and control panels. The physical property characteristics of recycled plastics are insufficient to achieve the functionality required in some mechanical designs to ensure a reliable, safe, and long lasting component is produced (example: gears and gear boxes which are often machined into shape vs. molded). Manufacturers allocate significant resources to minimizing safety risks such as electric shock, injury, risk of fire, potential flooding in the home, or contamination though food contact as well as maximize safety through fire containment safety standards. Any regulations regarding packaging materials made of plastic should receive separate consideration from those for plastic applications in appliances due to these safety requirements, as well as their long operational lifespan.

Safety Standards in Canada

Manufacturers must adhere to CSA product safety standards in Canada and these standards limit the ability to use recycled plastics, including requirements for flammability, electrical insulation, UV exposure, electrical resistance, temperature resistance, and failsafe switches/circuits (CSA End product and material standards).

Food safety is an additional consideration when using plastics in food contact applications. The main safety concerns with the use of recycled plastic materials in food-contact articles are:

1) that contaminants from the post-consumer material may appear in the final food-contact product made from the recycled material,
2) that recycled post-consumer material not regulated for food-contact use may be incorporated into food-contact packaging, and

[12] UL 746D or CSA C22.2 No 0.17
[13] Ibid.
[14] Section 10 of UL 746D

3) that adjuvants in the recycled plastic may not comply with the regulations for food-contact use.[15]

Similarly, Health Canada has Guidelines for Determining the Acceptability and Use of Recycled Plastics in Food Packaging Applications.[16]Having to evaluate and certify recycled plastics to those same levels creates additional burden and the supply chain has not been able to demonstrate they can achieve certifications to these food-grade levels, as well. Food grade recycled resin is commercially available but the challenge is that large consumer packaged goods companies have already bought and reserved that supply. This illustrates the problem that recycled plastic supply is impediment to the recycled content mandate.
AHAM recommends that recycled content be assessed using a standards process in coordination with standards development organizations. The UL746 Series of standards sets material standards for North America.[17] CSA C22.2 No 0.17 is similar but is not harmonized and has not been revised as recently as the UL series related to recycled plastics. The knowledge about the molecular chain breakdown during each thermal processing cycle of the product using the plastic and its effects on the physical properties is well established. Section 8 of UL 746D (Fabricated Parts) and Section 48 of UL 746A (Regrind Evaluation) already considers this aspect during the evaluation of repeated blending of regrind materials along with virgin in the test program. The same concept has not been considered for recycled plastics used in electrical and electronic applications, possibly due to longer field-service of engineered plastics used in these applications. Commodity plastics, by comparison, have a relatively shorter field service. Repeated recycling of engineered thermoplastics was not a concern in the past, but now it is an issue as the Circular Economy model takes hold. North America material standards in the United States and Canada need updates to reflect this, but manufacturers must comply with existing standards until those updates are completed.

Current Quality and Supply of Resin Supplies are Inadequate

Beyond the clear safety risks, the certification, quality, and availability of secondary raw materials are major concerns for companies trying to integrate recycled content into products. Recycled plastic resins are not readily certified and are unavailable in the quantities that the industry needs to meet the proposed target.

The lack of availability of certified recycled plastics is a known global issue. The capability and capacity of the reverse logistics process, sorting, separating, and re-processing into viable engineered recycled plastics is extremely limited. Achieving the batch certification of the material is expensive. While solutions may exist in the future, the significant scale required

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[15]FDA Government https://www.fda.gov/food/packaging-food-contact-substances-fcs/recycled-plastics-food-packaging#:~:text=FDA's%20main%20safety%20concerns%20with,food%2Dcontact%20use%20may%20be

[16] https://www.canada.ca/en/health-canada/services/food-nutrition/legislation-guidelines/guidance-documents/guidelines-determining-acceptability-use-recycled-plastics-food-packaging-applications-1996.html

[17] UL 746 –Polymeric Materials: Use In Electrical Equipment Evaluations

- UL 746A, Polymeric Materials: Short-Term Property Evaluations
- UL 746B, Polymeric Materials: Long-Term Property Evaluations
- UL 746C, Polymeric Materials: Use in Electrical Equipment Evaluations
- UL 746D, Polymeric Materials: Fabricated Parts

across the plastics resin spectrum to support the demand required of high-recycled content plastics across a wide assortment of products does not exist.

Due to the complex mix of materials, their aging, and contamination, manufacturers often find it difficult or impossible to find a compliant, reliable, and steady supply. Improving collection and sorting of materials is key to ensuring a better quality, quantity and purity of output materials. Each thermal cycle a plastic resin receives breaks down its molecular structure and affects its physical properties. After a few thermal cycles, recycled plastic is no longer viable for a number of end uses as virgin plastic.

Flame retardants, glass fillings, elastomers, and other additives to plastics ensure meeting physical and safety requirements, but also affect plastic recyclability. These additives result in recycled plastic with fewer viable applications because these materials cannot be separated once formulated into the plastic. Use of recycled plastic with these additives are problematic since the recycled plastics have unique physical properties that may result in defects or consumer dissatisfaction that will lead to premature scrapping of the product.

Improvements in recycling technologies and material formulation are therefore essential to help drive the quality and supply of recycled plastics to meet the demands of manufacturers who wish to increase recycled content in their products.

Customer concerns

Customers demand products that are both functional and aesthetically pleasing. Plastics with recycled content cannot be reliably reproduced with consistent color and texture without access to a reliable supply chain of high quality recycled resins. The use of recycled plastics may also result in acoustic and odor concerns. This may be acceptable for internal components; however, cosmetic external surfaces with consistent color and finish are not possible with plastic materials with a high-recycled content.

Inability to validate claims

Primary and secondary materials that meet the same plastic specifications are physically or chemically indistinguishable and there are currently no analytical methods available for directly measuring the recycled material content in a product. Supply chain tracking, like block chain technology, is the only way to record this. The development of certification methods and standards is underway, but in the absence of consensus standards, neither manufacturers nor market surveillance authorities have a reliable way to verify or enforce recycled content claims or recycled material specifications.

Recycled plastic content for packaging

It is important that post-consumer recycled content requirements for packaging must not degrade packaging quality, performance, and safety, or lead to burdensome cost increases. Increasing the amount of post-consumer content in packaging materials requires an adequate market to incentivize use of these materials. The current market does not support adequate supply or quality of many recycled packaging materials.

EXTENDED PRODUCER RESPONSIBILITY

The plastics used in appliances are often rigid mixed plastic, material for which there are limited end markets after it is recycled. In addition, some of the plastic contains flame retardants, which are necessary to comply with extensive and highly beneficial safety standards. Enhancing or investing in new technologies such as chemical recycling could help address mixed plastics and improve the quality of the recycled resins. However, these technologies have yet to demonstrate commercial viability.

Plastic recycling infrastructure must be modernized and expanded so that various and more challenging plastics can be more effectively recycled. Achieving increased diversion rates requires investment in additional capacity and technology across all recovery options. Currently, in Canada, only 9% of plastics are recycled at their end-of-life[18]. As is the case throughout North America, Canada's recycling infrastructure needs to be significantly improved and expanded in order to deal with increased volumes of all types of plastics and to manage harder to recycle plastics.

[18] Environment and Climate Change Canada, "Economic Study of the Canadian Plastics Industry, Markets and Waste," 2019. [Online]. Available: http://publications.gc.ca/collections/collection_2019/eccc/En4-366-1-2019-eng.pdf

RECCOMENDATIONS:

1) Microfiber filters on clothes washers is not a viable solution at this time as the technology is largely ineffective. They also created a number of problems, including wasted water, increased energy use and unnecessary plastic use.

2) Any potential bans on plastic packaging must consider if the packaging material is essential to the proper delivery or functioning of the consumer product and if there are any economically viable alternatives that will work in all climates and in all circumstances, such as a product being delivered to a home, to a brick & mortar retailer or through e-commerce. Worker safety during transportation and at distribution centers must be considered as well as theft in a retail store or a package waiting on a doorstep.

3) Manufacturers of consumer products need flexibility in choosing appropriate materials for packaging their products to avoid situations that cause product breakage and damage during transport as well as to deter theft of smaller, high value electronics from retail establishments.

4) Any regulations regarding packaging materials made of plastic should be considered separately from guidelines for plastic in durable goods due to the different technical and safety requirements as well as the long operational lifespan of the durable good.

5) The wide variety of products available on the market needs to be taken into consideration. Rather than imposing overall requirements for all appliances, any proposed regulation should consider the specific product category and their respective function.

6) Manufacturers must be allowed to determine the design of their products and to find the correct balance between the use of primary and secondary plastics while also meeting product safety requirements and ensuring that the product performs to its intended application over the course of its lifespan. Choosing the material content for products, including whether or not to use recycled materials, should remain in the hands of design and safety engineers.

7) Recycled content in products should be assessed using a standards process in coordination with standards development organization including the CSA and UL.

8) Product safety has to be considered paramount when setting specific standards to avoid issues such as electric shock, injury or risk of fire and or contamination though food contact.

9) Appliances with food contact plastic applications should also be considered separately because contaminants from the post-consumer recycled material could appear in the final food-contact product unless the plastic is recertified for food contact. The supply chain has not demonstrated this is feasible yet.

10) The government should assess the industry and consumer impacts and economic costs of this commitment and communicate theses to the public. The government should also

look to expand the opportunities for regulatory cooperation, alignment and harmonization through the Regulatory Cooperation Council or through trade agreements.

11) The government should earmark funds to modernize and expand plastic recycling infrastructure in Canada so that various and more challenging plastics can be more effectively recycled. Investment in both infrastructure to collect and sort, but also investments in technologies to process and produce a higher quality material is needed. Achieving a 90% diversion target in 2030 requires investment for additional capacity across all recovery options.

12) Additional research and development investments are needed in the area of mechanical and chemical technologies that could enhance the supply of recycled plastics of a high quality, in sufficient quantity and at a competitive price.

13) The government should look for ways to incentivize companies to use recycled plastic content such as tax incentives and innovation programs rather than penalties.