WRI MÉXICO

Policy mechanisms to reduce single-use plastic waste:

Review of available options and their applicability in Mexico

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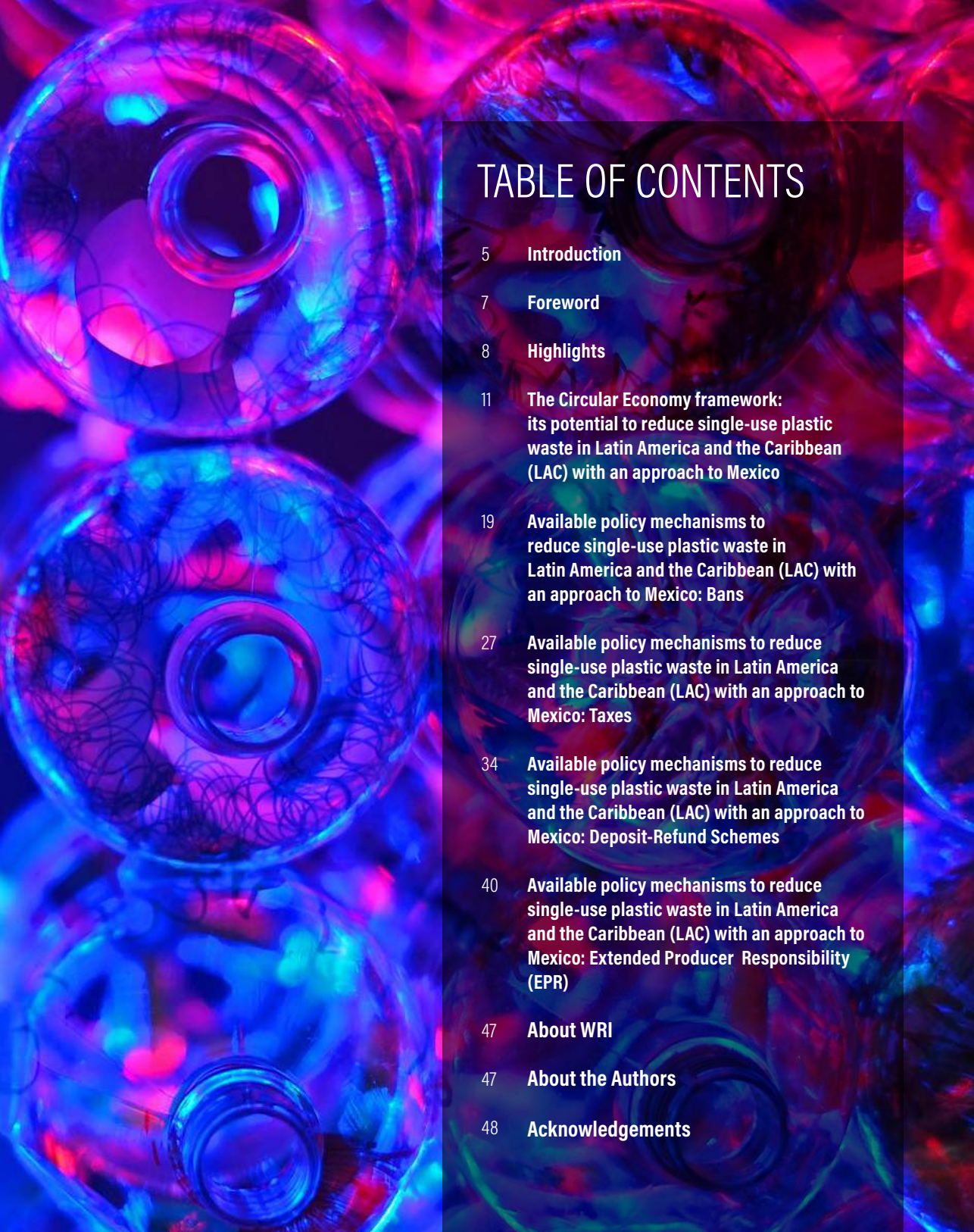

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Introduction

Post-consumption plastic waste is a worldwide problem shared across the value chain from producers to consumers, which is gaining growing attention by society and authorities. Plastic is a relatively new source of waste, since its production took off only around the 1950s. To date, there is still an apparent lack of information regarding effective policy strategies for addressing plastic waste management and optimizing systems for recycling, which is tailored for circumstances of different economies and geographies. In Mexico, waste management practices have evolved over recent decades, and currently, attention is focusing on policy options for plastics, particularly single-use ones.

In this context, this work is published with the expectation of contributing to a better-informed debate and to more effective and balanced decision making, which we consider of high relevance, since policies at various levels are being implemented without full consideration of their potential feasibility and impacts. It consists of a collection and synthesis of available literature and stakeholders' views, presented in the form of factsheets.

They outline the current state of knowledge and implementation considerations of four policy measures that have been thought of to address plastic waste: 1) bans; 2) taxes; 3) deposit-refund schemes, and 4) extended producer responsibility. There is also a factsheet summarizing the framework around the concept of circular economy. These factsheets include a focus on delivery in countries in the Latin America and Caribbean region, with national emphasis in Mexico. A second phase of work will include a subnational approach, since many policies are being implemented at this level.

The factsheets summarize key factors including purpose, implementing infrastructure, and underlining conditions based on a review of illustrative studies of policies and topics evaluated within each publication examined. Their preparation included a couple of stakeholder workshops and various expert consultations, in which we made sure to include a broad range of views, with representation from the national and subnational governments, academia, businesses, chambers and associations, international cooperation agencies, civil society and waste management sector organizations. To ensure demonstrable rigor and independence, the factsheets utilize WRI's publications process, including internal and external peer review. By definition, this type of publication refrains from making any analysis, and in this case is limited by the fact that existing data and publications on the field, which are also relevant for the Mexican context, are still scarce.

The preparation and publication of these factsheets is the product of our initial work on a relatively new agenda at WRI Mexico, around the topic of circular economy of plastics. We are already planning the next one, which will likely contain three key elements: 1) analytical policy-relevant research, from which we can derive recommendations; 2) capacity building for policy practitioners, and 3) data compilation and visualization.

Foreword

There is a growing global concern about plastic waste, especially since shocking images of plastic pollution in rivers and the ocean have reached mainstream media and social networks. For us at the World Resources Institute (WRI), it is a topic of great interest, and one in which we have started doing research, as we perceive the need to inform policy and decision making with rigorous evidence.

In the case of WRI Mexico, we are glad to present our first publication on this topic. It is a set of factsheets that are the product of an initial literature review, complemented with stakeholder dialogues and expert consultations, from which we identified four key policies: bans, taxes, deposit-refund schemes, and extended producer responsibility. Reviewing the existing literature and cases in the Latin American and Caribbean region, we gathered the potential pros and cons of each one of these, what contexts they may be more effective at, and the most relevant implementation considerations. We also included a conceptual framework in regard to circular economy, as we see it as the paradigm the world should be aiming at.

Our expectation with this initial set of factsheets is to provide an overview of the key concepts and policy tools around the topic of circular economy of single-use plastics that have relevance in Mexico. We expect that this is the foundation of a new line of work for us.

I recognize the vast experience, capacity and body of work around waste management that exists in Mexico and globally. We hope to contribute to the understanding of this issue, and especially to promote a dialogue informed by solid evidence, and ultimately to the implementation of effective solutions.

Adriana de Almeida Lobo
Executive Director
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Highlights

Circular Economy Framework

Regulations and mandates on waste are looking for recent and effective methods to manage it efficiently and properly. Almost 70 percent of countries in the world have created, at the national level, institutions with responsibility for the development of policy and regulatory supervision in the waste sector. Nevertheless, their implementation differs by country and occasionally even by region. There is, to add complexity to the issue, the fact that, around the world, operations of solid waste management are a local responsibility.

Presently, around one-third of plastic waste is not picked up by a waste management system and end up as waste in land, rivers and oceans.

The traditional linear economy model has a waste management hierarchy where first resources are extracted, then made into products, and finally disposed of. A circular economy model, in contrast, is a restorative and regenerative one. It would minimize environmental impact across the life cycle such as reducing waste by increasing reuse, repair, refurbishment, remanufacturing, recycling and recovery of materials.

Countries around the globe have implemented various policy mechanisms to reduce and manage single-use plastic waste and promote circular economy, including bans, taxes, deposit-refund schemes, and extended producer responsibility.

Bans

Bans are a prohibition of a product, its material content, its production, importation, use, sale, and/or possession. As of 2018, globally 91 countries had some type of ban or restriction at a national level on the production or manufacture, retail distribution and importation, of plastic bags, six of which are from Latin America and the Caribbean (LAC).

Concerns about environmental and social harms of single-use plastics have, in recent years, driven a surge in national and international laws and policies

designed to control their production and use; however, global production and consumption of single-use plastics remains high.

Plastic bags are the most common target of existing national bans, which generally focus on bags of a certain thickness or material content, and typically used only once or a limited number of times. Other single-use plastics are banned to a lesser extent. Bans, to be effective, require consistent enforcement; otherwise they are generally ignored.

In the case of Mexico, there are no federal provisions to date in regard to plastics, although there are 22 initiatives presented by the Senate and other 16 initiatives presented by the Chamber of Deputies to ban plastics and to improve waste management.

Taxes

Taxes are market-based instruments, in which economic agents are required to pay a compulsory contribution to state revenue, levied by the government or an environmental body, in this case, in order to minimize or 'offset' the potential environmental damage of plastic products. By 2018, 29 countries have established certain kind of tax on single-use plastics, either in the form of higher excise taxes or as a special environmental tax, fees or charges on waste disposal. Of them, seventeen are in Europe; next comes LAC with five.

Taxes on single-use plastics must be precisely determined in terms of which products will be taxed and which exempted from the tax. The most commonly applied tax on single-use plastics is on plastic bags.

An initiative was presented at the Mexican Chamber of Deputies to establish a fee of $0.10 Mexican pesos for sold or imported plastic straws (per straw). There is an additional initiative to reform the General Law for the Prevention and Integral Management of Solid Waste, so that it incorporates circular economy principles and concepts, including incentives to the use of recycled materials. A further initiative in Congress proposes the creation of the "Law of the Federal Tax for Single-Use Plastic Bags."

Deposit-Refund Schemes

Deposit-refund schemes are intended as broad instruments that combine a tax or disposal fee (deposit) when purchasing a (plastic) product with a recycling subsidy (refund) when the product is collected and/or recycled. As of 2018, twenty-three countries had requirements for taking back single-use plastic products through deposit-refund schemes. Europe led the way with fifteen countries, whereas the Asia-Pacific region had five countries, followed by LAC with three countries.

Deposit-refund approaches combine incentives and disincentives, by imposing an initial financial penalty but then reimbursing that cost after some compensatory behavior occurs. They are based on one to one relations between a consumer and a retailer.

In Mexico, in March 2018, reforms were proposed to the Special Tax on Production and Services Law and the Fiscal Coordination Law, in order to significantly reduce the final waste disposal and open-air dumping of plastic containers, recognized to cause severe damage to the environment. However, these reforms were rejected in October 2018 by the Chamber of Deputies. As of September 2019, another legislative proposal was presented to promote that the government, in collaboration with the chambers of commerce, adopt appropriate policies and programs that discourage the

Source: https://www.ecologiaverde.com/un-supermercado-sin-envases-la-propuesta-mas-sostenible-para-comprar-420.html

use of disposable plastic bags, through exchangeable economic incentives for merchandise and/or promotional items.

Extended Producer Responsibility

The Extended Producer Responsibility (EPR) principle is an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle. This form of regulation shifts the responsibility partially or fully; physically and/or economically, away from the municipalities and toward the manufacturer, offers incentives to the manufacturers to integrate environmental aspects in their product design (waste prevention and reduction), reduces the volume of waste going for final disposal and increases rates of recycling. As of 2018, forty-three countries had included elements or characteristics of EPR for plastic bags within legislation.

By 2018, sixty-three countries had EPR regulations for single-use plastics, considering product take-back, deposit-refunds, and recycling objectives. Europe had thirty-eight countries, followed by LAC with nine. There is no single harmonized approach to creating EPR systems across the globe and there are differences between countries, at state and city levels. EPR policies have focused primarily on: (i) relieving municipalities and taxpayers of the costs of packaging and managing products at the end of their useful life, (ii) decreasing the quantity of waste designated for final disposal, (iii) increasing recycling rates of specified packaging and products.

Mexico's Constitution establishes that environmental damage and degradation will generate responsibility for those who cause them. Although EPR is not explicitly mentioned in current legislation, it may be associated to the "principle of shared responsibility" between the government, society and industry, which is defined in the General Law for the Prevention and Integral Management of Solid Waste. EPR has been mentioned and included in some proposed bills or initiatives presented in 2019 by legislators of different parliamentary groups.

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FACTSHEET

THE CIRCULAR ECONOMY FRAMEWORK: ITS POTENTIAL TO REDUCE SINGLE-USE PLASTIC WASTE IN LATIN AMERICA AND THE CARIBBEAN (LAC) WITH AN APPROACH TO MEXICO

Countries around the globe have implemented various policy mechanisms to reduce and manage single-use plastic[a] waste. This factsheet presents a general overview of the **Circular Economy** framework and material composition aspects. It highlights ongoing national initiatives within the LAC region when possible.

WASTE MANAGEMENT (AN OVERVIEW)

- Regulations and mandates on waste are looking for recent and effective methods to manage it efficiently and properly, however, application varies by country and occasionally even by region[1].
- Largely around the world, operations of solid waste management are a local responsibility[2].
- Almost seventy percent of the countries in the world have created at a national level, institutions with responsibility for the development of policy and regulatory supervision in the waste sector[2].
- Nearly two-thirds of the countries in the world have established regulations and legislation designed for solid waste management, although implementation varies[2].
- The Organization for Economic Co-operation and Development (OECD) has estimated that annual flow of materials through manufacturing, transportation, acquisition, processing, use and disposal, are up to now the cause for more than 50 percent of greenhouse gas emissions[3,4].

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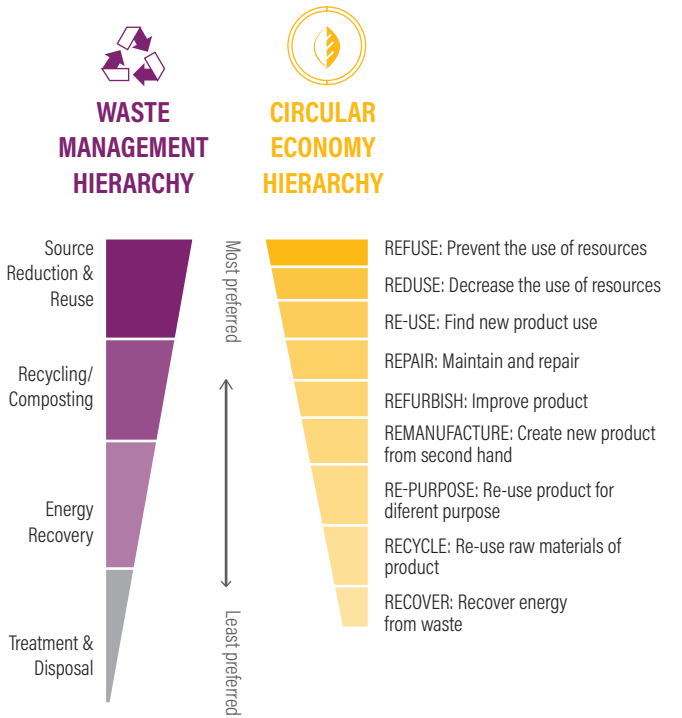
- Around one-third of plastic waste is not picked up by waste management systems and end up as waste into natural landscapes[4]. Every year, more than eight million tons of plastics reach the ocean, this amount is comparable to the contents of one garbage truck being dumped into the ocean every minute[5].

LINEAR VS. *CIRCULAR* ECONOMY

- The traditional **linear economy** model has a waste management hierarchy where first resources are extracted, then made into products, and finally disposed of[6].
- A **circular economy** model, in contrast, is a restorative and regenerative one: it is grounded in life-cycle considerations to identify interventions that would minimize environmental impact

Figure 1 | **Circular Economy Hierarchy[8]**



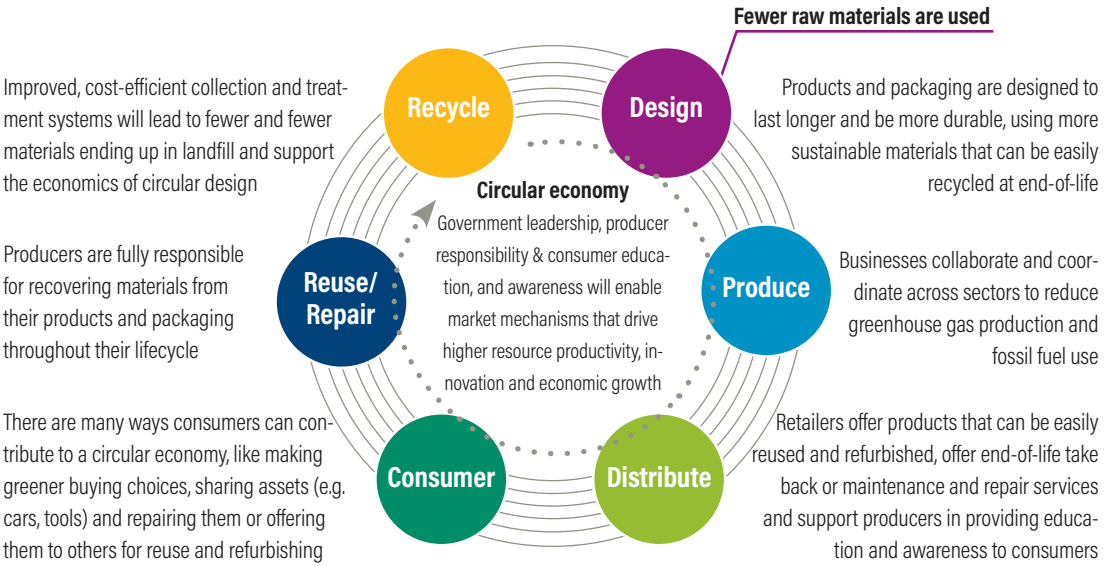
Source: Centre of Expertise on Resources

NOTES

[a] **Single-Use Plastics:** or disposable plastics, are commonly items intended to be used only once (such as plastic packaging, cups, straws, etc.) before they are disposed of or recycled.

Single-Use Plastics include two types of polymers— thermoplastics and thermosets— the main difference is their malleability when heat is applied. Thermoplastics can be melted down and reshaped after setting, in contrast thermoset plastics can only be shaped once. The most common single-use plastic waste items are thermoplastic polymers, such as Polyethylene Terephthalate (PET), Polypropylene (PE), Low Density Polyethylene (LDPE), High Density Polyethylene (HDPE), Polystyrene (PS), Expanded Polystyrene (EPS), Polyvinyl-chloride (PVC), Polycarbonate, Polypropylene (PP), Polylactic acid (PLA), and Polyhydroxyalkanoates (PHA)[13].

Figure 2 | **Overview of a Circular Economy**[11]



Source: Ontario Government. 2017. Strategy for a waste-free Ontario. Building the circular economy.

across the life cycle such as reducing waste by increasing reuse, repair, refurbishment, remanufacturing, recycling and recovery of materials[7,8]. All this while reducing costs to third parties, for example, reducing local, regional or global pollution[7,9,10].

- A circular economy **hierarchy** optimizes the use of materials as resources by extending the life span of products and by obtaining their optimal value, at the time they're discarded to transform them into new products[8]. The bottom line is to shift from 'waste disposal' to 'waste management' and from 'waste to resources'[1]. Under a circularity hierarchy, public policies addressing plastics would demonstrate, through a life cycle-based analysis, solutions that maximize circularity to the greatest extent possible considering environmental and economic factors[8].

DRIVING FORCES AND LIMITATIONS FOR CONSIDERING CIRCULARITY

- The circular economy helps to reduce the economic impact of resource scarcity. Organizations and governments have begun to look at the circular economy model as a tool for growth and innovation and not only as a hedge against resource shortage[12].

- The circular economy concept is gradually being adopted by local and national governments, and could drive the development of targets and investments[2].
- Moving towards a circular economy generates a challenge by itself, as it requests shifting the approach of managing waste. Two of the main drivers towards a circular economy are resource efficiency and prevention[1].
- The unique characteristic of the circular economy comes from two interconnected ideas, the approaches of 'design to re-design' and the closed-loop economy, representing new concepts of economy, systems, value, production and consumption[1].
- Non-financial barriers to circular economy include (i) social factors (for example, the necessity for policymakers and companies to identify and capture circular economy opportunities); (ii) market failures (such as unidentified externalities and incomplete information), and (iii) unintended outcomes of current regulations[7].
- Not all circular solutions can and should be implemented – life cycle analysis must be the foundation for decision-making[8].

SPECIFIC POLICY ELEMENTS OF A CIRCULAR ECONOMY FOR PLASTICS

MATERIAL COMPOSITION

- Product design standards can require manufacturers to make plastic products more reusable or less harmful after they have been used[6]. Manufacturing and import regulations generally include governing the thickness and material content (percentage or content of recycled material; biodegradable and/or compostable) of allowable plastic bags[13].
- As of 2018, forty-one countries have instituted some form of national regulation on the material composition of plastic bags. Of these countries, thirty-eight imposed bans or phase-out non-biodegradable plastic bags, or incentivized the production, import, or use of biodegradable and/or compostable bags[13].
- As an example, in Denmark, the Ministry of Environment and Food identified that a paper bag needs to be reused forty-three times as a minimum, for some of the environmental impacts of its use to be equivalent to or less than that of a regular disposable plastic bag used only one time[7,14]. Other studies indicate that presumed permanent alternatives such as “bags for life” have resulted in the substantial increase in plastic bags[15].

RECYCLING

- Recycling targets are often included as part of Extended Producer Responsibility (EPR) systems. Complementary legislation can include the use of taxes to create additional achievement incentives[6].
- EPR systems adapt in the same way that new products are designed to guarantee increased recycling rates, minimum costs, and a robust shift to a circular economy[2].
- Supporting the market for recycled plastics requires ensuring that recycled material can compete against virgin plastic, that is, have approximately the same or lower cost per use. Mandatory and enforceable recycling targets in legislation are one way to ensure a market for recycled products, ensuring that recycled material can compete

against virgin plastic which are often cheaper to source[6].

- Challenges in recycling targets in legislation are: (i) monitoring and reviewing over time; (ii) setting different targets for specific types of plastic; (iii) regulating household collection vs. commercial waste collection for recycling; (iv) toxicity of plastics, and (v) import and export controls[6].
- It should be noted that while recycling is part of the circular economy hierarchy, whether investment in recycling is needed, in fact, the best decisions must be based on a life cycle analysis of alternatives. From a resource perspective, recycling is merely effective, if the resources needed for recovery and recycling are not more than those needed for extraction and disposal[16,17].

CURRENT STATUS ON RECYCLING

- With particular focus on recycling, as of 2018, fifty-one countries in the world were found to have explicit national regulatory mandates beyond general policy objectives. Twenty-six countries include specific recycling targets and nine countries provided fiscal incentives to promote recycling activities[13].
  - Out of the fifty-one, the following number of countries per region have instituted recycling mandates and objectives of some type at national level: twenty-nine in Europe, eight in Africa, seven in the Asia Pacific region and seven in LAC[13].
- As of 2018, sixteen countries have explicitly encouraged reusable plastic bags of some kind, providing them to consumers or end-users, either free of charge or for a fee, and in some cases exempting them from the ban or tax on plastic bags[13].

Figure 3 | **Countries with National Mandates for Reusable Bags within LAC[13]**

Figure 4 | **LAC Distribution of Countries with Recycling Mandates at a National Level[13]**

Table 1 | **Examples of LAC Countries Recycling Mandates**[13]

COUNTRY	RECYCLING MANDATE
Bolivia	"Any recyclable container or packaging that is produced must be identified with the corresponding recycling symbol and coding, under technical standards issued by the Ministry head of the sector. Recovery and commercialization of waste - The waste that is recovered for its use must be incorporated into the recycling chain"
Panama	Law No. 6 of February 6th, 2018 "Which establishes integrated waste management in public institutions" orders public institutions to sort their waste and undertake recycling schemes for paper, plastic bottles, Tetra Pak containers and aluminum cans
Peru	Goal: institutions of the public sector must utilize plastics with at least eighty percent recycled content. Law: Supreme Decree 011-2010-MINAM; Ministerial Resolution 021-2011-MINAM

Table 2 | **Countries in LAC that Require Recycling within the Regulation of Plastic Bags**[13]

COUNTRIES
Bolivia
Brazil
Paraguay (laws in the country also promote the use of re-usable bags)
Uruguay

Table 3 | **LAC Distribution and Type of Plastic Bag Material Composition Requirement**[13]

COUNTRY	MATERIAL COMPOSITION REQUIREMENT
Colombia	Plastic bag must be made up of a minimum of forty percent of post-industrial or post-consumer recycled material proved in accordance with technical standards
Paraguay	Gradual replacement of polyethylene bags with biodegradable bags

Box 1 | The Case of Mexico / Laws on Circular Economy – Plastics

As of 2019, twenty-three (23) local governments have enacted local-level legislation for regulating and/or prohibiting plastic bags or single-use plastics. A State-level initiative exists for a circular economy law, however, there is not a specific national legislation regarding circular economy or plastics regulation.

Additionally, there is an initiative for a General Law on Circular Economy being presented by the Mexican Senate that challenges the linear economy principles: It incorporates, among others, the concepts of circular economy, unnecessary single-use plastics, extended responsibility of the producers, reverse logistics, and progressive reduction of products that generate waste. It also encourages the promotion of reusable products and establishes the possibility of introducing tax incentives to those who use recycled materials[18].

Besides, in accordance with Mexico's General Law on Waste Prevention and Waste Management (LGPGIR)[19], the Federal Government is responsible for issuing *Official Mexican Standards* that establish, among other, environmental and technological efficiency criteria that applies to materials and products, including containers, packaging and packing materials of plastics and expanded polystyrene, that once discarded, become waste. In terms of the management of these products, the rules must consider the principles of reduction, recycling and reuse[20].

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FACTSHEET

AVAILABLE POLICY MECHANISMS TO REDUCE SINGLE-USE PLASTIC WASTE IN LATIN AMERICA AND THE CARIBBEAN (LAC) WITH AN APPROACH TO MEXICO: BANS

Countries around the globe have implemented various policy mechanisms to reduce and manage single-use plastic[a] waste. This factsheet includes findings at a national level on **Bans** as a policy mechanism, highlighting ongoing initiatives within the LAC region when possible.

OBJECTIVE

Bans are a prohibition of a product, its material content, its production, importation, use, sale, and/or possession[1]. Bans are as a rule not absolute, as they can contain exceptions for certain products, materials, uses or in particular contexts[2]. Bans of certain plastic goods are being applied to products or materials and/or regulating specific activities[3].

CURRENT STATUS

- As of 2018, ninety-one countries had some type of ban or restriction at a national level on the production or manufacture, retail distribution and importation of plastic bags, six of which are from Latin America and the Caribbean. The region with the greatest number of countries adopting this approach is Africa, with thirty-four countries[2].
- Eighty-nine countries, as of 2018, have enacted one or more forms of partial bans or restrictions on plastic bags, mostly in terms of thickness or material composition requirements, and production volume limits[2].

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CURRENT OVERVIEW OF SINGLE-USE PLASTIC INITIATIVES

- Concerns about environmental and social harms of single-use plastics have, in recent years, driven a surge in national and international laws and policies designed to control their production and use; however, commonly this legislation is not comprehensive and, overall, global production and consumption of single-use plastics remains high[4].
- The European Union issued a *Single-Use Plastic Directive,* to be in place by July 3, 2021, to adopt national legislation banning certain single-use plastic products, and to reduce consumption of multiple-use plastics, improving design, and labelling, as well as improving waste management[5].
- A series of Caribbean, Pacific Islands, and East African countries, including, among others, Tanzania, Burundi, Kenya, Uganda, Rwanda, Jamaica, Haiti, Bahamas and Dominica are enacting legislation on single-use plastics across the region[6,7].
- The first regulatory measures specifically targeting single-use plastic bags were enacted in the early 2000s. As of July 2018, at least one hundred twenty-seven countries had adopted some sort of national legislation regulating plastic bags; the most usual form is the limitation on free retail distribution[2].
- In some countries without national legislation, sub-national governments have enacted state and/or local-level legislation in order to regulate plastic bags use, including several large federal states such as the US, Argentina, Australia, Brazil, India and Mexico. A couple examples are[2]:
  - In Argentina, the Ministry of Environment and Sustainable Development has a *Unit of Sustainable Cities* which, for instance, is in charge of the issues related to plastic bags. This Unit is working with the plastic workers' union, the chamber of plastic recyclers and other civil organizations in order to create strategies to ban and/or reduce the use of conventional plastic bags.
  - In Brazil, the State of Rio de Janeiro enacted Law 5502 of 2009, which provides for the replacement and collection of plastic bags in commercial establishments to support recycling.
- In addition to regulatory frameworks, partnerships between the government and the private sector can assist in developing strategies for dealing with single-use plastics[4]. For example, there are voluntary agreements between government and retailers to encourage bans or reduce single-use plastic bags or arrangements with manufacturers to establish Extended Producer Responsibility (EPR) with deposit-refund schemes[8].

CONSIDERATIONS FOR POLICY DESIGN

The main considerations for imposing bans are[4]:

(i) The single-use products that the ban will target, along with precise definitions of each product.

(ii) The activities that the legislation will target. Legislation can cover any part of a product's lifecycle from production through use, or target one specific behavior, such as selling the product.

(iii) The exemptions that will be established in the legislation. Certain types of plastic or certain uses of single-use plastics may be ex-

empted from the ban for a variety of reasons, such as health and safety concerns or the lack of sustainable alternatives.

(iv) The alternatives to the banned products that should be either exempted from its scope or promoted by the legislation, especially biodegradable plastics and alternative products such as reusable bags.

(v) The effective period of implementation, possibly involving a grace period for implementation of a ban or a phased approach to introducing new requirements.

(vi) The authorities that should be responsible for enforcement, the enforcement mechanisms that are needed, and the penalties that should be imposed for violations of the ban.

ADDITIONAL CONTEXT-SPECIFIC CONSIDERATIONS

EXEMPTIONS:

- Exemptions will take into consideration specific local underlying conditions regarding single-use plastic use in a given country, and should be clearly established beforehand to prevent confusion in enforcement[4].
- The most usual types of exemptions involve garbage or waste storage and disposal, handling of small retail items, use for scientific research or medical use and carrying and transport of perishable and fresh food products[2].
- In 2018, twenty-five countries expressly set up exemptions to their bans on plastic bags. Panama, for instance, exempts from the ban of primary packaging for fresh, perishable or other loose food and pharmaceutical products[2].

AVAILABILITY OF SUBSTITUTES:

- Products to replace banned single-use plastics should be readily available and affordable and should also be environmentally acceptable[4].
- Studies show that, without a proper life cycle impact analysis as a reference, alternative materials to replace plastics may actually be more environmentally ineffective[9,10].

APPLICATIONS

- Plastic bags are the most common target of existing national bans, which generally focus on bags of a certain thickness or material content, and typically used only once or a limited number of times[2].
- Other single-use plastics are banned to a lesser

NOTES

[a] **Single-Use Plastics:** or disposable plastics, are commonly items intended to be used only once (such as plastic packaging, cups, straws, etc.) before they are disposed of or recycled.

Single-Use Plastics include two types of polymers— thermoplastics and thermosets— the main difference is their malleability when heat is applied. Thermoplastics can be melted down and reshaped after setting, in contrast thermoset plastics can only be shaped once. The most common single-use plastic waste items are thermoplastic polymers, such as Polyethylene Terephthalate (PET), Polypropylene (PE), Low Density Polyethylene (LDPE), High Density Polyethylene (HDPE), Polystyrene (PS), Expanded Polystyrene (EPS), Polyvinyl-chloride (PVC), Polycarbonate, Polypropylene (PP), Polylactic acid (PLA), and Polyhydroxyalkanoates (PHA)[2].

Source: April 22, 2015 in Valparaiso, Chile. (photo by U.S. Embassy Santiago Chile)

extent. Particularly products made of polystyrene or expanded polystyrene (Styrofoam), such as those used for packaging, carrying and consumption of food, are most commonly targeted under these bans[2].

- Twenty-seven countries as of 2018 have enacted, through law, some type of ban on single-use plastics either on certain products (such as packaging, straws, cups and plates), materials (like polystyrene) or manufacture restrictions, limiting the quantity or thickness of single-use plastics, or requiring a percentage of recycled material content[2].

- Bans can also target specific activities linked to the plastic product use, in order to help consumers and retailers slowly adapt to them. Some laws focus on banning the sale of goods while others extend beyond this, prohibiting also the advertisement, distribution free of charge, exhibition or use[2].
  - In 2018, a total of eighty-three countries adopted free retail distribution bans, the most common form or regulation on plastic bags, followed by importation and manufacturing bans adopted by sixty-one countries[2].
  - Nearly half of existing bans in 2018 targeted the production, distribution or sale, use, or importation of single-use plastics, while the rest only targeted one or some of these activities[2].

CHALLENGES

- **Enforcement:** Bans, to be effective, require consistent enforcement; otherwise they are generally ignored. At a minimum, enforcement of bans should consider: (i) penalties imposed in case of violations; (ii) how these penalties should be tailored or mitigated according to the nature of the violation of the ban; (iii) identify which authorities have enforcement power; (iv) the scope of investigative and enforcement powers permitted; (v) grace periods before enforcement begins, and (vi) measures to ensure transparency among stakeholders[4].

- **Illegal markets:** Where alternative sustainable products are not available, bans may be ineffective for consumers in practice, creating black markets for illegal bags[4].

- **Industry pushback:** Bans have met with resistance from plastic manufacturers and associations, who cite economic losses, such as, loss of plastic production and manufacturing jobs[4].
- **Policy leakages:** When facing a ban, producers may simply shift from one type of plastic product to another (plastic replacing plastic), on occasions even switching to those that potentially take more energy and water to produce and transport, for example, thicker reusable plastic bags, emitting more greenhouse gases and taking up more landfill space[4,11].
- **Environmental impacts of substitutes:** Plastic bag bans, for instance, may encourage increased consumption of alternatives, like paper or cotton bags, which also have significant environmental impacts in terms of greenhouse gas emissions and the resources required to produce them[1,9].

Figures 1 and 2 | Overview of Countries in LAC with National Bans on the Manufacture, Free Distribution, and Importation of Plastic Bags and Single-Use Plastics[2]

Different types of bans or restrictions on plastic bags in LAC countries

LAC national bans and restrictions on single-use plastics

Table 1 | **Bans and Restrictions on Single-Use Plastics in LAC at a National Level[2]**

COUNTRY	TYPE OF BAN OR RESTRICTION
Costa Rica	Material/product ban: A ban on single-use plastics (including polystyrene) for food service areas of government institutions. **Legislation:** Directive 14, 2018
Dominica	The Prime Minister announced (in July 2018) plans to prepare legislation banning single-use plastics such as straws, plates, cutlery, and Styrofoam cups and food containers by January 2019. This follows an earlier decision to restrict the importation of non-biodegradable containers and plastic products used in food service
Haiti	Material ban: The manufacture, importation, and use of polystyrene products are banned **Legislation:** Presidential Ban in Favor of Environmental Protection, 2012
Guyana	Material ban: The manufacture, use, distribution, and importation of polystyrene containers for food service establishments are banned. **Legislation:** Regulation 8 of 2015 under the Environmental Protection Act
Saint Vincent and the Grenadines	Material and product ban: Ban on manufacture, use, sale, and importation of all expanded polystyrene products in the food service industry. Measure was phased in from 2017-2018 and is fully in force as of January 31, 2018. Fine of up to 5,000 EC$ and up to 12 months jail time, or both for violators. **Legislation:** Environmental Health (Expanded Polystyrene) Regulations 2017

Table 2 | **LAC Countries which have Proposed New Legislation at a National Level on Plastic Bags and Single-Use Plastics as of 2018[2]**

COUNTRY	APPLIES TO	PROPOSED NEW LEGISLATION
Argentina	Plastic bags	The Government announced (in 2018) a prohibition in the use of polyethylene bags and other plastic materials in supermarkets and retail shops that are expected to be replaced gradually with biodegradable ones
Costa Rica	Plastic bags	Plastic bag ban by 2021 to eliminate single-use plastic and plastic bags
	Single-Use Plastics	On June 5, 2017, the President proclaimed a national plan to cut down all types of single-use plastics, to replace them with biodegradable substitutes by 2021. The ban will cover plastic bags, bottles, disposable cutlery, among others

COUNTRY	APPLIES TO	PROPOSED NEW LEGISLATION
Saint Kitts and Nevis	Single-Use Plastics	By early 2018, the country's Premier and the minister of finance announced that the government sought to implement a ban on single-use plastics and Styrofoam containers, and institute an island-wide recycling program
Grenada	Single-Use Plastics	The government has pledged to table legislation banning the importation of Styrofoam and plastic as part of its waste management strategy. The country's health minister announced that a Styrofoam Bill which will ban the importation of this material is only the beginning, after which the government will propose bills to tackle other plastics and promote the recycling of products

Box 1 | The Case of Mexico

In regard to plastics, although there are no federal provisions at the end of 2019, there are 38 proposed bills promoted by various parliamentary groups to ban plastics and to improve waste management (22 initiatives presented by the Senate[12] and 16 initiatives presented by the Chamber of Deputies[13]), they are being discussed by the environmental legislative committees of the Senate and the Congress within the Federal Legislative Branch. Such initiatives are being promoted as a result of the many local and municipal initiatives and bills promoted around the country aiming to harmonize and standardize them at a Federal level[14], besides this, they are being promoted in order to fulfill the international commitments endorsed by Mexico[15] and to create a homogeneous set of provisions for the Mexican Republic to fight and prevent contamination by the excessive use of plastics[16].

Recently, a legislative proposal that aimed to reform/amend the General Law for the Prevention and Integral Management of Solid Waste was presented. It aims at banning the use, consumption, commercialization, distribution or entry of products that generate waste of special handling in protected areas. It also proposes general prohibitions that the States of the Mexican Republic should consider on their local legislation and regulations[15].

Other proposals presented from the parliamentary groups represented in the Senate and Congress range from total bans, partial bans and progressive ones as well as a variety of products at different stages of the life-cycle of single-use plastics (1) Production or Manufacture; (2) Retail Distribution and Use, and (3) Post-Consumer Use and Product End of Life. Eight workshops were organized at the Mexican Senate during 2018 and 2019 conducted by the Environment, Natural Resources and Climate Change Senate Committee, in an attempt to organize and merge all or part of the proposed bills presented by the different legislators and civil society[17].

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FACTSHEET

AVAILABLE POLICY MECHANISMS TO REDUCE SINGLE-USE PLASTIC WASTE IN LATIN AMERICA AND THE CARIBBEAN (LAC) WITH AN APPROACH TO MEXICO: TAXES

Countries around the globe have implemented various policy mechanisms to reduce and manage single-use plastic[a] waste. This factsheet includes findings at a national level on **Taxes** as a policy mechanism, highlighting ongoing initiatives within the LAC region when possible.

OBJECTIVE

Taxes[b] are market-based instruments, in which economic agents are required to pay a compulsory contribution to state revenue, levied by the government or an environmental body, in this case, in order to minimize or 'offset' the potential environmental damage of plastic products[1]. Taxes are put in place to either alter consumer behavior or for collection of tax revenues[2]. They aim at reducing the use of single-use plastics, managing plastic waste, increasing the rate of postconsumer recovery and recycling, or promoting other environmental and circular economy initiatives[1].

CURRENT STATUS

- By 2018, twenty-nine countries have established certain kind of tax on single-use plastics, either in the form of higher excise taxes or as a special environmental tax, fees or charges on waste disposal. Seventeen of them are in Europe, next comes LAC with five[1].
- As of 2018, twenty-seven countries have incorporated taxes on the production, manufacture and importation of plastic bags (only Dominica and Jamaica within LAC), while thirty countries have a levy or fee charged to consumers (only Colombia and Paraguay within LAC)[1].

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CONSIDERATIONS FOR POLICY DESIGN

At the producer stage, the main elements to consider in designing taxes are[3]:

(i) The scope or the product to be targeted.
(ii) The tax base.
(iii) The tax rate, percentage or amount to be paid.

At the retail stage, the key elements to consider when designing a levy or fee are[3]:

(i) What products the levy/fee applies to and corresponding exceptions.
(ii) The point of charge.
(iii) The price/amount of the levy/fee.
(iv) How the levy/fee will be recorded, documented and collected.
(v) How levy/fee funds will be managed and used.

ADDITIONAL CONTEXT-SPECIFIC CONSIDERATIONS

As of 2018, very few countries, such as the Marshall Islands included extensive tax controls, or customer incentives to use plastic bags with more sustainable materials, increase awareness of their importance, or incentives to produce plastic bags with more renewable materials[1]. The most relevant considerations in regards to taxes and levies and fees are illustrated next:

TAXES

Scope: Taxes on single-use plastics must be precisely determined in terms of which products will be taxed and which exempted from the tax. The most commonly applied tax on single-use plastics is on plastic bags[3].

Tax base: There are different approaches to determine the tax base. When taxes are imposed on the consumer, the unit to be taxed is usually the item being sold. Producers are typically taxed on the weight or the volume of the material they provide to the market[3].

Tax rate: Some jurisdictions apply higher or lower tax rates depending on the material used in the product (typically higher to those which use more virgin material or have higher environmental impacts, and lower in the opposite case)[3].

Financial penalties and incentives: Penalties include taxes on producers, distributers, or users of single-use plastic intended to discourage the production and use of single-use plastic. Incentives such as tax credits and subsidies can be granted to persons or entities engaged in behaviors that reduce the production or use of single-use plastic[3].

- Antigua and Barbuda, as part of its plastic bag ban, legislated that specific materials used to produce alternatives shall be free of tax, such as sugar cane, paper, potato starch and bamboo[4].
- St. Vincent and the Grenadines established a ban on imported Styrofoam products used for storage of food or sale and to lower their cost, it was linked with the elimination of the value added tax (VAT) from biodegradable alternatives[4].
- Costa Rica's announced phase-out of single-use plastics and included an offer of incentives to businesses and research institutions for alternatives[5].

LEVIES AND FEES

Scope: There are limited examples of levies being used

to target single-use plastic goods other than plastic bags. One reason for this may be the complexities involved in adding levies to multiple items, and the ability of consumers to keep track of them[3].

- As of 2018, thirty countries charge consumers levies or fees per plastic bag type at a national level with significant prescribed amount ranges, often consisting on the thickness and material content of regulated plastic bags[1].

Exceptions: In some respects, levies offer more flexibility than bans in crafting exceptions, because varying rates can be charged for various products[3].

Point of charge: Where the levy is placed on the retailer, it is charged at the moment when retailers purchase the product, consumer levies are charged when the customer buys a single-use plastic product (consumer levies are currently the most popular option)[4].

- Some countries only require certain businesses or locations to impose a plastic bag levy, thus easing burdens on smaller businesses, allowing the public to adjust to the policy, and limiting the enforcement and oversight burden on authorities[4].

Price: In some approaches, retailers can set the price (offer suggested or optional prices), specify a range of prices, set a minimum price to be charged, require that the price is at least the price paid by the retailer for the item, or set an exact charge (directly or by empowering authorities to do so)[3].

- One way to set the levy price is to consider what cost will cover the item and its associated waste management at the post-consumption stage[3].
- Another key consideration in setting the price of a levy is the impact that it will have on consumer behavior. An overly steep price may provoke industry or consumer backlash or result in widespread evasion (particularly if alternatives are not readily available). Differently, setting the price too low may mean it does not have the desired deterrent effect on consumer use[3].
- When setting a price, regularly scheduled reviews of the price can provide flexibility. For example, Paraguay's Resolution 353/2017 provides set prices depending on the size of the plastic bag, to be reviewed and revised quarterly, as needed, by an inter-institutional commission[3].

Record-keeping, reporting and collection: When laws permit retailers to keep the levy/fee they collect, reporting obligations should be placed on them to ensure the

NOTES

[a] **Single-Use Plastics:** or disposable plastics, are commonly items intended to be used only once (such as plastic packaging, cups, straws, etc.) before they are disposed of or recycled.

Single-Use Plastics include two types of polymers— thermoplastics and thermosets— the main difference is their malleability when heat is applied. Thermoplastics can be melted down and reshaped after setting, in contrast thermoset plastics can only be shaped once. The most common single-use plastic waste items are thermoplastic polymers, such as Polyethylene Terephthalate (PET), Polypropylene (PE), Low Density Polyethylene (LDPE), High Density Polyethylene (HDPE), Polystyrene (PS), Expanded Polystyrene (EPS), Polyvinyl-chloride (PVC), Polycarbonate, Polypropylene (PP), Polylactic acid (PLA), and Polyhydroxyalkanoates (PHA)[1].

[b] T=Tax, goes entirely or in part to the government; L=Levy and C=Charge, customer is required to pay for a product regardless of where revenue is collected; F=Fee, occasionally referred to as a charge in which money collected goes entirely or in part to the government[5,11].

levy/fee is in fact being imposed. Differently, when the levy/fee is collected by the government, obligations related to record-keeping, reporting, and the means of collecting must be clearly and precisely established[3].

Use and management of funds: For reasons of transparency and accountability, an effective practice is to clearly establish the purposes of any funds collected via levies/fees. Furthermore, where the funds are directed to environmental projects or other public interest outcomes, this can reinforce their role as an environmental tax[3].

APPLICATIONS

Taxes can include both penalties and incentives:

- Penalties can be applied as taxes, levies or fees on those who manufacture, import, sell or buy one or more single-use plastic products[3].
- Incentives can come in the form of tax breaks or an exception for other fees or fines, subsidies or tax credits and may also provide funding to create grants or awards for projects[3], benefitting a more sustainable use of single-use plastic or substitutes[5].

CHALLENGES

Price setting: At the retail and consumer stage, if the charged levy/fee is not set at the appropriate rate, the effect would be smaller than intended, for example consumers may simply absorb the cost and it will not have a deterrent effect[3].

Lack of substitutes: If consumers and retailers are not supported in transitioning to alternatives, and if cheap alternatives are not available, they may continue to use single-use plastics out of necessity, making compliance challenging. This can encourage the development of black markets[3].

Potential social impacts on low-income households and small businesses: Regulating consumer behavior directly via retail taxes or indirectly via producer taxes may increase the cost of certain items burdening those stakeholders who cannot easily absorb the cost of adapting their behavior[3].

Absence of earmarking collected funds for intended purpose (collection and recycling)[6,7].

Figure 1 | **Countries in LAC which use Taxes or Fees at a National Level to Regulate the Manufacture, Distribution/Use or Trade of Plastic Bags[1]**

Table 1 | **LAC Types of Taxation on Single-Use Plastics at a National Level**[1]

COUNTRY	TAX REGULATION
Antigua and Barbuda	Environmental levy on plastic beverage containers for aerated, carbonated and noncarbonated drinks, whether filled or empty, manufactured, imported or used in the country (Environmental Protection Levy Act, 2002)
Jamaica	Environmental protection levy on plastic goods manufactured or imported into the country (Environmental Protection Levy Order)
St. Kitts and Nevis	Deposit levy on all aerated beverages bottled in non-returnable bottles manufactured or imported, subject to refund on re-export or used bottles or other acceptable disposal arrangements (Trade (Bottles and Cans Deposit Levy) Act)
St. Vincent and the Grenadines	Deposit levy on beverages bottled in non-returnable bottles, subject to refund on reexport or used bottles or other acceptable disposal arrangements (Environmental Levy Act)
Uruguay	Tax on containers for bottling beverages (VAT on PET Manufacturers and Importers)

Table 2 | **LAC Country Examples of the Regulation at a National Level of Plastic Bags Through Taxes, Levies or Fees**[1]

COUNTRY	REGULATION BY PAYMENT OF LEVIES OR FEES
Colombia	Consumption tax on plastic bags, when delivering any plastic bag, whose purpose is to load or carry products sold by the commercial establishment that delivers it. Sustainable alternatives of plastic bags will have differential rates of 0%, 25%, 50% or 75% of the whole amount of the tariff, when the following guidelines are met: 1. Biodegradability: equal to or greater than 30%. The composition of the plastic bag must not contain substances of interest. 2. The recycled material percentage in the bag composition. 3. Reuse: Plastic bag that, demonstrates that it is reusable, by dynamic load test, with the maximum load specified (in compliance with the norms)

COUNTRY	REGULATION BY PAYMENT OF LEVIES OR FEES
Paraguay	Consumer fee: Based on size and thickness of the bag, the law establishes (as of April 1, 2017) that each cash register of supermarkets, self-service stores and stores in general, can deliver up to 3 polyethylene bags of only one use for the transport of merchandise for free but must charge from the 4 unit a minimum price based on the size of the bag. The objective is to deliver polyethylene bags to the consumer, which can be reused often, and charge for the additional bags to allocate resources to awareness campaigns

Box 1 | The Case of Mexico

An initiative was presented at the Mexican Chamber of Deputies to establish a fee of $0.10 Mexican pesos for sold or imported plastic straws (per straw)[8]. There is an additional initiative to reform the *General Law for the Prevention and Integral Management of Solid Waste* (LGPGIR, Spanish acronym), so that it incorporates circular economy principles and concepts, including incentives to the use of recycled materials. A further initiative in Congress proposes the creation of the "Law of the Federal Tax for Single-Use Plastic Bags"[9].

In February 2019, the National Supreme Court of Justice determined that the States of Mexico have legal authority to establish ecological taxes[10].

In April 2019, a comprehensive bill was proposed by 8 legislators from each of the parliamentary groups represented in the Mexican Senate that aimed to reform/amend the LGPGIR in which, among others, establishes the creation of the "National Institute for Innovation and Research for Waste and Plastic" to be composed of a board and stakeholder committees. Some of the responsibilities of this new Institute would be the research on taxes, levies, fees and incentives and proposing taxes and incentives for a transition from plastics to compostable and recyclable materials[12].

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FACTSHEET

AVAILABLE POLICY MECHANISMS TO REDUCE SINGLE-USE PLASTIC WASTE IN LATIN AMERICA AND THE CARIBBEAN (LAC) WITH AN APPROACH TO MEXICO: DEPOSIT-REFUND SCHEMES

Countries around the globe have implemented various policy mechanisms to reduce and manage single-use plastic[a] waste. This factsheet includes findings at a national level on **Deposit-Refund Schemes** as a policy mechanism, highlighting ongoing initiatives within the LAC region when possible.

OBJECTIVE

Deposit-refund schemes are intended as broad instruments that combine a tax or disposal fee (deposit) when purchasing a (plastic) product with a recycling subsidy (refund) when the product is collected and/or recycled[1]. Deposit-refund schemes are generally designed to collect funds to cover the waste management costs, they can introduce a market for products, have the potential for some reduction of plastic waste and improve collection and/or recycling rates[2].

CURRENT STATUS

As of 2018, twenty-three countries had requirements for taking back single-use plastic products through deposit-refund schemes. Europe led the way with fifteen countries, whereas the Asia-Pacific region had five countries, followed by Latin America and the Caribbean with three countries[3].

CONSIDERATIONS FOR POLICY DESIGN

Scope: Deposit-refund systems support segregated recycling as they can be used to collect materials of particular color or thickness and facilitate separation. The scope of the scheme can cover only country manufactured products or include imports[3].

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Voluntary vs. mandatory: A deposit-refund scheme can be required by law or it can be voluntary[1].

- Germany established in 2003, a mandatory deposit-refund system by law for single-use beverage packaging composed of plastics, metals, glass or mixed materials. This deposit-refund system was developed from 2003 to 2006 on a direct relationship between retailers and consumers. After 2006, it was changed to a nationwide deposit-refund system with clearing mechanisms[b,4].
- The Netherlands introduced in 2005, a deposit-refund system with clearing mechanism for PET bottles. Despite the fact that the system has been implemented countrywide, just two supermarket chains are taking part in it[4].

Centralized vs. decentralized: The system can be designed as a centralized model that requires a company to set and collect the deposit fee and a payment of "take-back compensation" to the retailers and for the handling of all the packaging[5]. While a decentralized model, can even have subsystems for each retailer reporting separately to each producer, commonly retailers can retain the unredeemed deposit fee and the collected product[6].

Recycling infrastructure complementarity: To consider if the deposit-refund system will also include regulation of recycling infrastructure, to increase recycling targets[5].

Regulation of product or specific activities: It is important to make it clear which products attract refunds whether based on container size, materials or product content (legislative provisions can also include requirements for exemptions)[3,5].

Roles and responsibilities: Clear definition of who is responsible for enforcement, compliance and information sharing that is required to meet compliance needs. Legislation could cover information requirements that allow tracking, record keeping and auditing. Key indicators could include: return rates, payments (refunds, fees), and placement of containers access points[5].

NOTES

[a] **Single-Use Plastics:** or disposable plastics, are commonly items intended to be used only once (such as plastic packaging, cups, straws, etc.) before they are disposed of or recycled.

Single-Use Plastics include two types of polymers— thermoplastics and thermosets— the main difference is their malleability when heat is applied. Thermoplastics can be melted down and reshaped after setting, in contrast thermoset plastics can only be shaped once. The most common single-use plastic waste items are thermoplastic polymers, such as Polyethylene Terephthalate (PET), Polypropylene (PE), Low Density Polyethylene (LDPE), High Density Polyethylene (HDPE), Polystyrene (PS), Expanded Polystyrene (EPS), Polyvinyl-chloride (PVC), Polycarbonate, Polypropylene (PP), Polylactic acid (PLA), and Polyhydroxyalkanoates (PHA)[3].

[b] **Clearing mechanism:** It is carried out by a company (clearing company) that is in charge of managing the deposit financial flows and for organizational and administrative aspects between the manufacturers, importers, retailers and consumers. Consumers can give back the packaging at different participating retailers to receive the deposit amount. Various retailers are involved, and they pay the deposits to consumer goods companies (fillers, importers) who pay these deposits to a clearing entity. The clearing entity refunds the retailers according to their accounting history of the collected empty containers[4].

Collection and administration of refunds: Designate responsibilities for collection of fees and the level of consumer refund by means of ensuring: (i) how the deposit is added to specific products; (ii) whether the fee collection is handled by government or private industry; (iii) whether the refund is collected as an upfront cost or subject to separate rules in which the refunds and containers are administered by private operator(s)according to established regulations[3,5].

ADDITIONAL CONTEXT-SPECIFIC CONSIDERATIONS

Cost covering: In some cases, the system's operating costs can be funded by the unredeemed deposits from containers not returned and from the sale of the recovered materials returned[5,9]. Revenues generated may become another source of general revenue or may create a windfall for a particular target group[7].

System accreditation: Legislation often includes industry being responsible to have their collection system accredited by government to allow functioning[5].

Recycling benefits: Supporting segregated recycling by providing a monetary value to the targeted product can also be used to collect materials of particular color or thickness to enable separation[6].

- Deposit-refund schemes offer some level of collection and recycling rates for single-use beverage packaging, operating separately from and sometimes in parallel with comprehensive Extended Producer Responsibility (EPR) programs[8,9].

Enabling environment for a deposit-refund scheme (especially for island countries that have a limited area for waste management facilities and own fragile natural environments) comprises[10]:

(i) Effective financial incentives.
(ii) Strict supervision by the national government.
(iii) High participation of the public sector.
(iv) Cooperation among authorities with clear description of roles and responsibilities.

APPLICATIONS

- Deposit-refund approaches combine incentives and disincentives, by imposing an initial financial penalty but then reimbursing that cost after some compensatory behavior occurs[5].

- Deposit-refund systems are based on one to one relations between a retailer and a consumer, in which, the take-back station can just be the point of sale where the consumer returns empty packaging or items, presents the sales receipt and the retailer pays back the deposit[4].

- More centralized approaches require retailers to pay the deposit fee to producers/importers, who then pay the deposits to a clearing entity. Subsequently, based on the retailers' deposit-refund records, the clearing entity reimburses the retailers in accordance with their accounting history of the empty containers collected[4].

CHALLENGES

Complementary measures: Container deposit laws may thrive in combination with other actions (legisla-

tive and non-legislative) to manage and decrease waste, from increasing infrastructure for solid waste management to consumer awareness and education, environmental levies, development of local businesses, product design and management of sustainable materials[5].

Fees and refunds: Administration of the fees, refunds and charges can create complexity in the systems especially when they apply over a number of different types of products[5].

Failure to earmark for intended purpose: Absence of earmarking collected funds for intended purpose (collection and recycling)[11,12,13].

Cross border considerations: Where plastic is regulated at the regional level, there has been concern that mandatory deposit-refund schemes can create barriers to trade, given that they make it difficult to sell the same product in the same packaging in more than one country without requiring changes to labelling and takeback systems[5].

Consumer knowledge: Initiatives to provide guidance for consumers to identify products that are covered by the deposit-refund system[5].

Roll-out of systems: Container deposit laws could require wide consultation, understanding by the public, infrastructure roll-out (such as collection points) and design of the scheme, not adding industry resistance[5].

Inter-institutional coordination: Effective cooperation between different levels of government and stakeholders[10].

Figure 1 | **LAC Countries with Mandated Deposit-Refund Schemes at a National Level[3]**

Table 1 | **LAC Countries with Mandated Deposit-Refund Schemes at a National Level[3]**

COUNTRY	DEPOSIT-REFUND SCHEME
Belize	Dealers and distributors must collect a deposit on beverage containers at the time of distribution or sale, and upon evidence of procurement, accept any empty beverage containers from a redeemer at the place of the transaction and refund its value. (Returnable Containers Act)
Uruguay	Merchants, retail shops, and other intermediaries in the chain of distribution and marketing of packaged products are obliged to receive and accept the return of the packaging of products they have placed on the market. (Law for Packaging Recycling)
Venezuela	Manufacturers, distributors and importers of goods or consumer products that generate solid waste must have return programs for the recovery of their waste, including the mechanisms of return or deposit-refund. (Law of Integral Management of Garbage)

Box 1 | **The Case of Mexico**

As of March 2018, reforms were proposed to the *Special Tax on Production and Services Law* and the *Fiscal Coordination Law*, in order to significantly reduce the final waste disposal and open-air dumping of plastic containers, recognized to cause severe damage to the environment. However, these reforms were rejected in October 2018 by the Chamber of Deputies[14].

These modifications propose an environmental tax on the supply and use of containers made from Polyethylene Terephthalate (PET), with three types of differentiated fees according to the volume of the containers. It is established, nevertheless, that whomever places their products on the market in returnable PET containers would not be obliged to pay the differentiated fees[15].

As of September 2019, another legislative proposal was presented to promote that the government, in collaboration with the chambers of commerce: adopt appropriate policies and programs that discourage the use of disposable plastic bags, through exchangeable economic incentives for merchandise and/or promotional items[16].

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WRI MÉXICO

FACTSHEET

AVAILABLE POLICY MECHANISMS TO REDUCE SINGLE-USE PLASTIC WASTE IN LATIN AMERICA AND THE CARIBBEAN (LAC) WITH AN APPROACH TO MEXICO: EXTENDED PRODUCER RESPONSIBILITY (EPR)

Countries around the globe have implemented various policy mechanisms to reduce and manage single-use plastic[a] waste. This factsheet includes findings at a national level on **Extended Producer Responsibility (EPR)** as a policy mechanism, highlighting ongoing initiatives within the LAC region when possible.

OBJECTIVE

Extended Producer Responsibility principle, is an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle. This form of regulation shifts the responsibility, partially or fully; physically and/or economically, away from the municipalities and toward the manufacturer, offers incentives to the manufacturers to integrate environmental aspects in their product design[1] (waste prevention and reduction), reduces the volume of waste going for final disposal and increases rates of recycling[2].

CURRENT STATUS

- As of 2018, forty-three countries had included elements or characteristics of EPR for plastic bags within legislation[3].
- By 2018, sixty-three countries had EPR regulations for single-use plastics, considering product take-back, deposit-refunds, and recycling objectives. Europe had thirty-eight countries, followed by LAC with nine[3].

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CONSIDERATIONS FOR POLICY DESIGN

Scope: EPR can be applied to cover a single product (e.g. PET beverage bottles, plastic coffee pods), all types of single-use plastic and/or packaging or to cover only commercial or industrial packaging[4].

Voluntary vs. mandatory recycling or collection targets for products[4].

- Voluntary producer programs (ranging from voluntary agreements between government and industry to voluntary industry initiatives), may be operated by individual consumer products companies; by packaging manufacturers (e.g. glass, aluminum); by industry sectors (e.g. beverage producers); or by coalitions of industry (e.g. ECOCE in Mexico). However, EPR programs operating at a national scale and with high recovery and recycling targets are almost always underpinned by legislation[5].

Collective vs. individual producer responsibility: Individual responsibility is when a producer takes financial and physical responsibility for its own products. Collective responsibility is when producers pay a fee to participate in a Producer Responsibility Organization (PRO) which is in charge of the management of the product such as recovery and recycling[4,2].

Obligations: The allocation of responsibilities of different stakeholders (waste generators, producers and retailers) in handling and collection throughout the life cycle of the product[4].

Liability: All the effects caused by a product through its life cycle (including environmental damage) remain with the producers[4].

Costs: Clear regulation of the cost coverage (collection, treatment, source segregation, program operation and enforcement) of the EPR related to the products management[4,6].

Externalities: EPR measures could improve the implementation of the legislation, integrating EPR into circular economy and environmental targets could contribute to the reduction of environmental externalities of packaging waste[4].

Fees: EPR schemes in concept would charge different fees to producers (fee modulation) based on a range of product design criteria, however in practical terms a basic fee structure on a product is based on cost for collection and recycling. Other costs to support collection and/or treatment could include labelling, public awareness and communication initiatives[4].

NOTES

[a] **Single-Use Plastics:** or disposable plastics, are commonly items intended to be used only once (such as plastic packaging, cups, straws, etc.) before they are disposed of or recycled.

Single-Use Plastics include two types of polymers— thermoplastics and thermosets— the main difference is their malleability when heat is applied. Thermoplastics can be melted down and reshaped after setting, in contrast thermoset plastics can only be shaped once. The most common single-use plastic waste items are thermoplastic polymers, such as Polyethylene Terephthalate (PET), Polypropylene (PE), Low Density Polyethylene (LDPE), High Density Polyethylene (HDPE), Polystyrene (PS), Expanded Polystyrene (EPS), Polyvinyl-chloride (PVC), Polycarbonate, Polypropylene (PP), Polylactic acid (PLA), and Polyhydroxyalkanoates (PHA)[3].

Competition: EPR systems must be designed to allow fair competition in order to improve efficiency and to reduce monopolies. For example, an EPR system with free competition between PROs needs an independent organization to validate compliance, consolidate and gather reports of performance, and guarantee fair competition for all the participants[4,6].

Enforcement: Creation of systems and rules that ensure effective enforcement of the EPR scheme obligations[4].

ADDITIONAL CONTEXT-SPECIFIC CONSIDERATIONS

Exceptions: Clear EPR legislation, combined with solid state legal institutions and adequate funding for enforcement can increase producer participation, although: (i) provisions are usually made to exempt the smallest, (ii) some companies, especially those which market online or by catalogues, may avoid participation (characterized as *free riders*)[5].

Product design and material content: In theory, EPR would foster product innovation aiming to include sustainability, performance, cost-competitiveness, wide availability, and consumer perception that the product is more sustainable[7]. However, in implementation the fees have basically been implemented to provide for cost collection and recycling[6].

Multifactorial: The most cost-intensive schemes are not necessarily the best ones. Based on the European Union experience, factors that could affect EPR performance include public awareness, population density, legal frameworks and local regulations[6].

Costs: An EPR program will commonly consider the cost to manage each packaging material type and charge the producer accordingly, applying a fee, to cover the producers' share of the costs of managing packaging recycling systems operated by other actors, or to finance packaging waste management systems directly operated by producers, usually through a PRO[5].

PRO role: (i) Register all obligated producers and collect data on all packaging supplied into the market; (ii) develop an implementation plan and mechanisms to achieve the recovery and recycling targets; (iii) define a fee-setting methodology, collect fees from all obligated producers and directly manage program funds; (iv) create contracts with municipalities, recycling organizations and commercial entities to implement and manage recycling services; (v) provide overall program administration, promotion and education programs; (vi) report to producers, government and other stakeholders, and (vii) develop a funding program to facilitate the transition of informal recyclers into emerging formal recycling systems and into other economic enterprises where possible[5,8].

Fee modulation: Commonly, EPR programs are based on a single fee rate or fees designed by categories of materials. However, fees charged to producers could in theory be modulated or adjusted in order to encourage participation in EPR schemes, to reward sustainable product design, penalize poor product design, or relative success in recovery of materials, thereby providing an economic signal to the producer. Fees can, in theory differ according to potential costs or environmental impacts on the end-of-life product phase, for instance through the use of fees that can be variable (such as based on weight) instead of fixed (for example, unit-based) or according

to specific product design features such as toxicity, durability, reusability, reparability, recyclability, and compostability[2,4,5].

Performance: Examples where EPR legislation has been rescinded if the costs incurred outweigh the benefits derived have not been identified. Nor were there cases cited of a producer or a product failing in the marketplace directly as a result of the implementation of an EPR program where a level playing field has been established for all producers[5].

APPLICATIONS

- There is no single harmonized approach to creating EPR systems across the globe and there are differences between countries, at state and city levels[2].
  - EPR policies have focused primarily on: (i) relieving municipalities and taxpayers of the costs of packaging and managing products at the end of their useful life, (ii) decreasing the quantity of waste designated for final disposal, (iii) increasing recycling rates of specified packaging and products[5].

CHALLENGES

Transparency: EPR systems rely on setting targets and being able to monitor the progress against them, whether they are collection targets or reduction of use of materials compliance[9].

Adaptation: By the time new products are designed to provide high rates of recycling, minimum costs, and a robust transition to a circular economy, the EPR systems should adapt[6].

Information availability: Where data on packaging types, quantities and current recycling rates is incomplete (for example, Brazil, Ecuador, Chile) a cumulative recycling target for all packaging can be initially established moving forward to specific targets once data availability and performance indicators are improved[5].

Informal sector: Research has shown that EPR schemes that exclude the informal waste disposal sector may suffer from reduced performance. Informal sector workers can prevent producers from achieving their targets by recovering materials that are then no longer available to be captured by the scheme. An option is to establish a provision in the scheme that gives incentives to the informal recyclers to participate and sell to the formal recyclers or to formalize themselves[2].

Policy leakages and free-riding: EPR schemes need rules for packaging that cannot be recycled, and to prevent leakage (products that do not get recycled). Free-riding should be addressed through organizational or established solutions or regulations, for the reason that the aforementioned policy is adequately enforceable to guarantee compliance[2,9,10].

Registration and compliance: EPR rules can require new registration and enforcement of new standards. EPR procedures that require companies to register, establishing new administrative or licensing requirements and require enforcement of targets need to be regulated by an institution like a PRO[9].

Fee modulation: A fee modulation that rewards producers who consider eco-design approaches, in an effort to facilitate recycling and reuse actions and promote resource efficiency, contributes to a fair competition and a properly enforced EPR[11].

Market power risk: In respect of taking benefit of economies of scale and lowering the need to examine individual organizations, collective PROs may be appealing but caution should be taken that market power does not result in monopolistic practices[10].

Industry support: Changes of standards for packaging and design across multiple products in the implementation of upstream EPR requirements need to consider the industry concerns[9].

Cost effectiveness: Nonetheless, there is indication that EPR approaches can accomplish their environmental targets, theoretically it is after all, an open question which particular EPR schemes will accomplish those targets at the minimum cost. Academic economic literature on EPR provides insights that, compared to single instrument policies, the policies within the EPR framework appear to be more efficient[10].

Self-organization: An overarching goal of an EPR system, in which producers can be allowed to self-organize (individually or collectively); can design an approach to improve packaging recycling rates; can be supported by an appropriate financing mechanism; and can maintain direct control over the EPR program funds raised[5].

Figures 1 and 2 | Countries in LAC with EPR

Countries in LAC which Include EPR at a National Level to Regulate Plastic Bags[3]

Countries in LAC with EPR at a National Level on Disposable or Single-Use Plastics[3]

Table 1 | Examples of EPR Rules at a National Level from Different Countries in LAC[3]

COUNTRY	EPR RULES
Belize	Obligation to institute deposit-refund or take-back scheme for empty beverage containers
Bolivia	Establish environmental management plans and mechanisms for prevention management of the waste generated by activities; assist in the implementation of public programs for the use of waste, including the conditioning, separation, storage, delivery and collection of waste
Brazil	Responsibility to collect end-of-life packaging; implement sectoral agreement to reduce 22% of packaging waste being sent to landfills
Uruguay	Producers obligated to introduce an environmental variable in the design of the packaging of its products and create detailed packaging waste management plans

Box 1 | The Case of Mexico

Mexico's Constitution establishes that environmental damage and degradation will generate responsibility for those who cause them[12].

Although EPR is not explicitly mentioned in current legislation, it may be associated to the "principle of shared responsibility" between the government, society and industry, which is defined in the General Law for the Prevention and Integral Management of Solid Waste[13].

The Senate is working on various reforms to the *General Law for the Prevention and Integral Management of Waste* considering plastics and solid waste, as well as on amendments to the *General Law of Ecological Balance and Protection of the Environment* and to different relevant laws, such as the ones related to environmental protection, environmental responsibility, energy, climate change and water, among others, in order to include legislation around the concept of circular economy and establish mechanisms that would allow policies such as EPR to be implemented. EPR has been mentioned and included in some proposed bills or initiatives presented in 2019 by several legislators of different parliamentary groups[14].

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ABOUT WRI

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Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

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CHANGE IT
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We don't think small. Once tested, we work with partners to adopt and expand our efforts regionally and globally. We engage with decision-makers to carry out our ideas and elevate our impact. We measure success through government and business actions that improve people's lives and sustain a healthy environment.

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WRI RESOURCES

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