

# Educator's Guide



## Eco 360

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**Activity 9: Policy Action: Circular Economy for Plastics**  
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## Backgrounder: How Can a Circular Economy Solve the Problem of Plastic Waste?

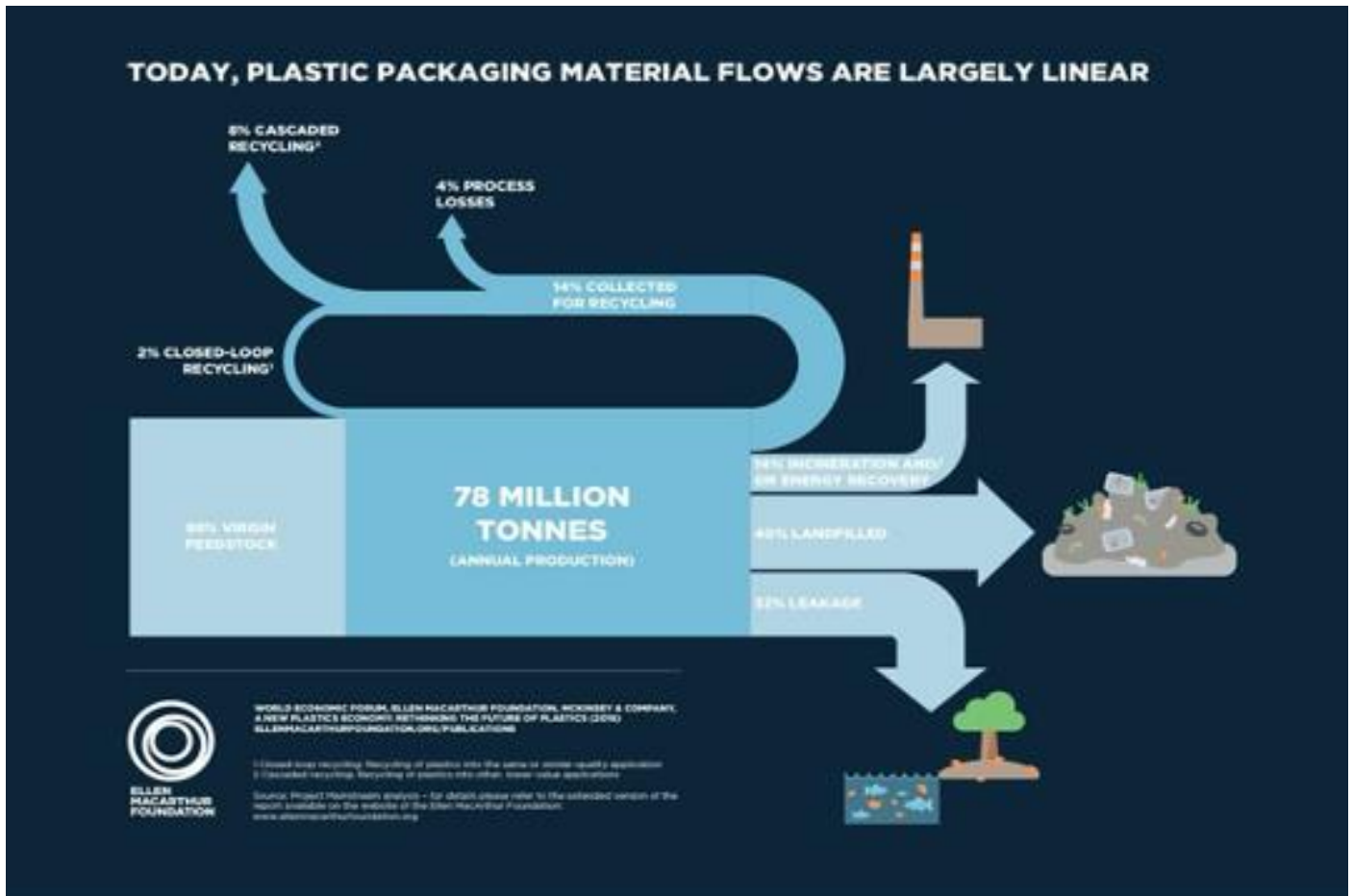
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With our current economy designed linearly focused on a take, make, use and discard model, the world is faced with a huge challenge of plastic waste. Plastic waste is everywhere, polluting our lands, air and especially marine environments.

**Linear Economy:** Take ▶ Make ▶ Use ▶ Dispose

A linear economy works fine for a small community of consumers. On a global scale with billions of consumers becoming part of our economy, a linear system becomes unsustainable. We are running out of raw materials to create new products for everyone. Landfills are filling up with the massive increase in disposal of waste - products that are no longer in use. This is a challenge that requires changing the way we think of our economy today.

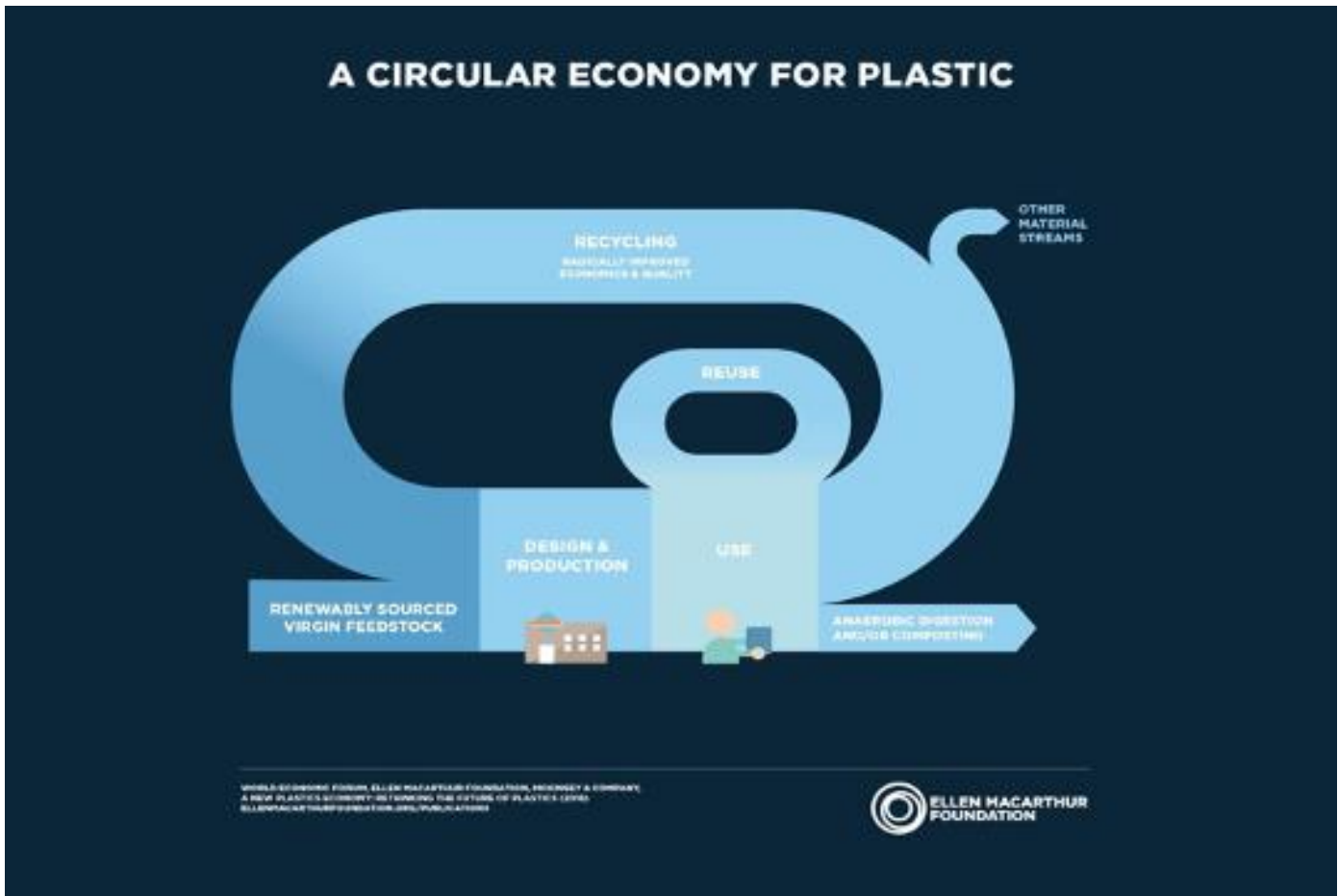
The linear plastic system has created a huge challenge of plastic waste for the global community, see figure below. It is estimated that most of the plastic packaging is used only once, and only 14% is recycled (Ellen McArthur Foundation, 2021).



Source: <https://www.ellenmacarthurfoundation.org/explore/plastics-and-the-circular-economy>

### So, how can we design a better economic model that reduces waste going into landfills?

The answer is redesigning the entire system to a circular economy. Much like the natural world where there is no waste generated that requires disposal to a landfill, a **circular economy** works similarly. Raw materials and products are used and reused as many times as possible to reduce the extraction of new raw materials. This also reduces the amount of waste going to landfills. We need to move to a plastic system that creates no plastic waste or pollution. “From the outset, [plastic] products and the systems they sit within should be designed to ensure no materials are lost, no toxins leaked, and the maximum use is achieved from every process, material and component” (Ellen McArthur Foundation, 2021).



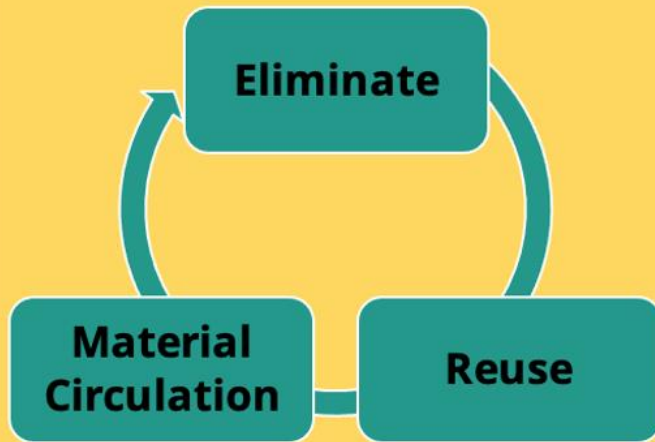
Source: <https://www.ellenmacarthurfoundation.org/explore/plastics-and-the-circular-economy>

We can achieve a circular economy for plastics by adopting the following vision presented by the Ellen McArthur Foundation, see figure below:

# What is the vision for a circular economy for plastic?

The vision for a circular economy for plastic has six key points:

- 1** Elimination of problematic or unnecessary plastic packaging through redesign, innovation, and new delivery models is a priority
- 2** Reuse models are applied where relevant, reducing the need for single-use packaging
- 3** All plastic packaging is 100% reusable, recyclable, or compostable
- 4** All plastic packaging is reused, recycled, or composted in practice
- 5** The use of plastic is fully decoupled from the consumption of finite resources
- 6** All plastic packaging is free of hazardous chemicals, and the health, safety, and rights of all people involved are respected



**Eliminate** all plastic items that are harmful to the environment and unnecessary.

Adopt **reuse models** by ensuring the plastics created are designed to be reusable, recyclable or compostable.

**Circulate** all plastic items, especially packaging materials to keep them in the economy, and out of the environment.

Source for information: (Ellen McArthur Foundation, 2021).

Additional resources on the circular economy of plastics:

- Plastics and the Circular Economy: <https://www.ellenmacarthurfoundation.org/explore/plastics-and-the-circular-economy>
- The Circular Economy Handbook: [https://www.accenture.com/ca-en/about/events/the-circular-economy-handbook?c=acn\\_glb\\_greenbehindthecgoogle\\_11633510&n=psgs\\_1020&gclid=Cj0KCQiAgomBBhDXARIsAFNyUqP-L\\_RKswWw-P\\_BO9Di\\_igbjdvuasFLso0Rv8xC97H-fBjOSW-0OdlAqgjEALw\\_wcB&gclsrc=aw.ds](https://www.accenture.com/ca-en/about/events/the-circular-economy-handbook?c=acn_glb_greenbehindthecgoogle_11633510&n=psgs_1020&gclid=Cj0KCQiAgomBBhDXARIsAFNyUqP-L_RKswWw-P_BO9Di_igbjdvuasFLso0Rv8xC97H-fBjOSW-0OdlAqgjEALw_wcB&gclsrc=aw.ds)
- A Vision for a Circular Economy: <https://www.greengrowthknowledge.org/research/vision-circular-economy-plastics-canada-benefits-plastics-without-waste-and-how-we-get-it>

## Bibliography

Ellen McArthur Foundation. (2021). *Plastics and circular economy*. Retrieved from Ellen McArthur Foundation: [ellenmacarthurfoundation](https://www.ellenmacarthurfoundation.org)

# Curriculum Connections

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## Activity 9: Policy Action: Circular Economy for Plastics

### Alberta

- ❖ Social 10-1
  - 3.7 explore multiple perspectives regarding the relationship among people, the land and globalization (spirituality, stewardship, sustainability, resource development)

### Ontario

- ❖ Grade 9 Geography
  - C1. The Sustainability of Resources: analyze impacts of resource policy, resource management, and consumer choices on resource sustainability in Canada
- ❖ Grade 9 Chem (C1.2)
- ❖ Grade 9 Bio (B1.2)
- ❖ Grade 10 Bio (B1.3)



## Activity 9: Policy Action: Circular Economy for Plastics

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### Overall Objective

Learners will learn how policy can help transition to a circular economy. Learners will look at various circular economy policies around the world.

### Materials

- Internet-enabled device
- Topic backgrounder
- Eco 360 notebook (we recommend asking learners to maintain a notebook for this program to write down reflections as they go through the program)
- Case study: A European Strategy for Plastics in a Circular Economy

### Time Required

60 minutes - 90 minutes

### Learning Outcomes

By the end of this activity, learners will:

- understand how plastic waste can be eliminated in a circular economy
- identify circular economy policies around the world addressing plastic waste
- analyze the effectiveness of circular economy policies around the world
- improve reading comprehension skills and solving case studies

### Grade Level

Suitable for Grades 9 to 12

## Activity Outline

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### Step One

Begin by introducing how a circular economy can work for the plastics industry by watching this video: <https://www.youtube.com/watch?v=xmTQA-RNygQ> (8:11 minutes)

- a. After watching the video, discuss the six vision points mentioned in the video that are needed to transition to a circular economy for plastics.
- b. Learners can also reference the vision presented in the video as a web-page: <https://ellenmacarthurfoundation.org/plastics-vision>

### Step Two

Now that learners have an overview of what is required to transition to a circular economy for plastics, continue to explore circular economy policies around the world that aim towards accomplishing this transition. In this second part of the activity, learners will read a case study of EU's circular economy policy proposal and answer questions given in learner assessment.

### Learner Assessment

Consolidation: After reading the case study, divide your class in groups to work on answering the following questions using information from the case study. Learners can record their answers in their Eco 360 notebooks:

- a. Did you identify any or all of the six vision points discussed earlier in the case study?
- b. How does the proposal aim to accomplish the transition to a circular economy for plastics?
- c. What challenges do you foresee in implementing this strategy?
- d. Can we adopt a similar strategy to transition to a circular economy for plastics in Canada? Why or why not? What challenges do you foresee and how can we overcome them?

# Case Study: A European Strategy for Plastics in a Circular Economy



This document summarizes the information presented in the full report found here:

<https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy.pdf>

## PLASTICS TODAY: KEY CHALLENGES

Over the past 50 years, the role and importance of plastics in our economy has consistently grown. Global production of plastics has increased twentyfold since the 1960s, reaching 322 million tonnes in 2015. It is expected to double again over the next 20 years. In the EU, the plastics sector employs 1.5 million people<sup>4</sup> and generated a turnover of EUR 340 billion in 2015. Although plastics production in the EU has been stable in recent years, the EU's share of the global market is falling as production grows in other parts of the world.

In the EU, the potential for recycling plastic waste remains largely unexploited. Reuse and recycling of end-of-life plastics is very low, particularly in comparison with other materials such as paper, glass or metals. Around 25.8 million tonnes of plastic waste are generated in Europe every year.<sup>5</sup> Less than 30% of such waste is collected for recycling. Of this amount, a significant share leaves the EU<sup>6</sup> to be treated in third countries, where different environmental standards may apply. At the same time, landfilling and incineration rates of plastic waste remain high 31 % and 39 %, respectively and while landfill has decreased over the past decade, incineration has grown. According to estimates, 95 % of the value of plastic packaging material, i.e. between EUR 70 and 105 billion annually, is lost to the economy after a very short first-use cycle.<sup>7</sup> Demand for recycled plastics today accounts for only around 6 % of plastics demand in Europe. In recent years, the EU plastic recycling sector has suffered from low commodity prices and uncertainties about market outlets. Investments in new plastic recycling capacity have been held back by the sector's prospects of low profitability.

Very large quantities of plastic waste leak into the environment from sources both on land and at sea, generating significant economic and environmental damage. Globally, 5 to 13 million tonnes of plastics — 1.5 to 4 % of global plastics production — end up in the oceans every year.<sup>11</sup> It is estimated that plastic accounts for over 80 % of marine litter. Plastic debris is then transported by marine currents, sometimes over very long distances. It can be washed up on land,<sup>12</sup> degrade into microplastics or form dense areas of marine litter trapped in ocean gyres. UNEP estimates that damage to marine environments is at least USD 8 billion per year globally.

## **TURNING CHALLENGES INTO OPPORTUNITIES: A VISION FOR A CIRCULAR PLASTICS ECONOMY**

A smart, innovative and sustainable plastics industry, where design and production fully respects the needs of reuse, repair, and recycling, brings growth and jobs to Europe and helps cut EU's greenhouse gas emissions and dependence on imported fossil fuels.

- Plastics and products containing plastics are designed to allow for greater durability, reuse and high-quality recycling. By 2030, all plastics packaging placed on the EU market is either reusable or can be recycled in a cost-effective manner.
- Changes in production and design enable higher plastics recycling rates for all key applications. By 2030, more than half of plastics waste generated in Europe is recycled. Separate collection of plastics waste reaches very high levels. Recycling of plastics packaging waste achieves levels comparable with those of other packaging materials.
- EU plastics recycling capacity is significantly extended and modernised. By 2030, sorting and recycling capacity has increased fourfold since 2015, leading to the creation of 200 000 new jobs, spread all across Europe.
- Thanks to improved separate collection and investment in innovation, skills and capacity upscaling, export of poorly sorted plastics waste has been phased out. Recycled plastics have become an increasingly valuable feedstock for industries, both at home and abroad.
- The plastics value chain is far more integrated, and the chemical industry works closely with plastics recyclers to help them find wider and higher value applications for their output. Substances hampering recycling processes have been replaced or phased out.
- The market for recycled and innovative plastics is successfully established, with clear growth perspectives as more products incorporate some recycled content. Demand for recycled plastics in Europe has grown four-fold, providing a stable flow of revenues for the recycling sector and job security for its growing workforce.
- More plastic recycling helps reduce Europe's dependence on imported fossil fuel and cut CO<sub>2</sub> emissions, in line with commitments under the Paris Agreement.
- Innovative materials and alternative feedstocks for plastic production are developed and used where evidence clearly shows that they are more sustainable compared to the nonrenewable alternatives. This supports efforts on decarbonisation and creating additional opportunities for growth.
- Europe confirms its leadership in sorting and recycling equipment and technologies. Exports rise in lockstep with global demand for more sustainable ways of processing end-of-life plastics.

In Europe, citizens, government and industry support more sustainable and safer consumption and production patterns for plastics. This provides a fertile ground for social innovation and entrepreneurship, creating a wealth of opportunities for all Europeans.

- Plastic waste generation is decoupled from growth. Citizens are aware of the need to avoid waste, and make choices accordingly. Consumers, as key players, are incentivised, made aware of key benefits and thus enabled to contribute actively to the transition. Better design, new business models and innovative products emerge that offer more sustainable consumption patterns.
- Many entrepreneurs see the need for more resolute action on plastics waste prevention as a business opportunity. Increasingly, new companies emerge that provide circular solutions, such as reverse logistics for packaging or alternatives to disposable plastics, and they benefit from the development of digitisation.
- The leakage of plastics into the environment decreases drastically. Effective waste collection systems, combined with a drop in waste generation and with increased consumer awareness, avoid litter and ensure that waste is handled appropriately. Marine litter from sea-based sources such as ships, fishing and aquaculture are significantly reduced. Cleaner beaches and seas foster activities such as tourism and fisheries, and preserve fragile ecosystems. All major European cities are much cleaner.
- Innovative solutions are developed to prevent microplastics from reaching the seas. Their origin, routes of travel, and effects on human health are better understood, and industry and public authorities are working together to prevent them from ending up in our oceans and our air, drinking water or on our plates.
- The EU is taking a leading role in a global dynamic, with countries engaging and cooperating to halt the flow of plastics into the oceans and taking remedial action against plastics waste already accumulated. Best practices are disseminated widely, scientific knowledge improves, citizens mobilise, and innovators and scientists develop solutions that can be applied worldwide.

## **THE WAY FORWARD: TURNING VISION INTO REALITY**

1. Improving the economics and quality of plastics recycling
  - a. improve design and support innovation to make plastics and plastic products easier to recycle;
  - b. expand and improve the separate collection of plastic waste, to ensure quality inputs to the recycling industry;
  - c. expand and modernise the EU's sorting and recycling capacity;
  - d. create viable markets for recycled and renewable plastics.
2. Curbing plastic waste and littering
  - a. Preventing plastic waste in our environment;

- b. Establishing a clear regulatory framework for plastics with biodegradable properties;
  - c. Addressing the rising problem of microplastics.
3. Driving innovation and investment towards circular solutions
- a. Innovation is a key enabler for the transformation of the plastics value chain: it can help reduce the costs of existing solutions, provide new ones and amplify potential benefits beyond Europe's borders.
  - b. Innovative solutions for advanced sorting, chemical recycling and improved polymer design can have a powerful effect.
  - c. Research and innovation can also make a difference in preventing plastic waste and microplastics pollution. The Commission is particularly attentive to innovation on materials that fully biodegrade in seawater and freshwater and are harmless for the environment and ecosystems.
  - d. New approaches developing innovative business models, reverse logistics or designing for sustainability, for instance can do much to help minimise plastic waste at source, while achieving further economic, environmental and social benefits. Finally, further scientific research is needed to gauge the potential health impacts of microplastics and develop better monitoring tools.
4. Harnessing global action
- a. The EU will continue to support international action, promote best practices worldwide, and use its external funding instruments to support improved waste prevention and management around the world.
  - b. Adequate plastic waste prevention, collection and recycling systems are needed in many parts of the world. Marine litter from one country can end up on the beaches of another, and fragments of plastic from all over the globe accumulate over time in the oceans and seas, carried by marine currents.
  - c. Going forward, there are also significant prospects for developing an innovative circular plastics industry worldwide. The EU already has the world's highest rate of plastic recycling. With its objectives on improved recyclability of packaging and increased recycling rates, it is well placed to lead new developments by supporting, in particular, investment in modern recycling technologies, new materials better suited to recycling, and solutions to curb marine litter.