

## Designing A Waste-Free City: An Overview

Imagine a city 100 years in the future that generates no waste and no pollution. Is this even possible? If we look to the natural world, the answer is yes! In nature, one organism's waste is another organism's food. Nutrients and energy flow in a cycle of growth, decay, and reuse. This is called a circular system.

Today's built world works as a linear system (think of it as a straight line, rather than nature's circle). This linear system follows a path of taking natural resources, making products, using them, and then throwing away anything that is left over after we are done with it – from empty water bottles to old cars. While some things in this linear system are recycled, today's approach does not have a way to capture all the resources and materials that make up the items we throw away or the waste that's created in the original production process. This results in a lot of trash and pollution and is using up the world's natural resources.

But what if cities followed nature's circular system? What if everything was reused or taken apart and remade into something else—from the house you live in, to the food you eat, the bus or car you ride in, the roads you travel on, the battery that powers your phone, and the clothes you wear? A city run on such a system would be truly waste free.

All around the world, engineers, city planners, innovators, entrepreneurs, and government leaders are using the principles of a circular economy to create waste-free cities. They are designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.

**Your challenge:** Design a waste-free city that uses the principles of a circular economy.

### What is a Circular Economy?

A circular economy is a way to design, make, and use things. It requires shifting our systems and will involve everyone and everything: businesses, governments, and individuals; our cities, our products, and our jobs.

A circular economy is based on three principles:

1. **Design Out Waste and Pollution**  
Waste and pollution are not accidents, but the consequences of decisions made at the design stage. What if we looked at waste as a design flaw? How can we use new materials and technologies to ensure that waste and pollution are not created in the first place?
2. **Keep Products and Materials in Use**  
We can design some products and components so they can be reused, repaired, and remanufactured. Making things last forever is not the only solution, we should be able repurpose items or recycle materials so they don't end up in landfills.
3. **Regenerate Natural Systems**  
In nature, there is no concept of waste. Everything is food for something else – a leaf that falls from a tree feeds the forest. By returning valuable nutrients to the soil and other ecosystems, we can enhance our natural resources.

Learn more about circular economies at [www.ellenmacarthurfoundation.org](http://www.ellenmacarthurfoundation.org)  
Register for the 2021-2022 Future City Competition at <https://register.futurecity.org>