



CIRCULAR ECONOMY

The Japanese concept of **mottainai** expresses that it is a shame for something to go to waste without having made use of its potential in full — something that happens with regularity in a linear economy.

Something old, something new



The circular economy is a new way of creating value, and ultimately prosperity. It works by extending product lifespan through improved design and servicing, and relocating waste from the end of the supply chain to the beginning—in effect, using resources more efficiently by using them over and over, not only once. By and large, today's manufacturing takes raw materials from the environment and turns them into new products, which are then disposed into the environment after use. It's a linear process with a beginning and an end. In this system, limited raw materials eventually run out. Waste accumulates, either incurring expenses related to disposal or else polluting—indeed, a 2012 World Bank report estimates that municipal waste generation will double over the next 20 years in low-income countries. On top of that, manufacturing processes are often themselves inefficient, leading to further waste of natural resources.

In a circular economy, however, products are designed for durability, reuse and recyclability, and materials for new products come from old products. As much as possible, everything is reused, remanufactured, recycled back into a raw material, used as a source of energy, or as a last resort, disposed of.

For 50 years, UNIDO has worked towards a truly sustainable industry. In doing so, we have moved towards a circular economy. The building blocks of a circular economy do not need to be invented. They already exist.



Governments are encouraging-and, in some cases, requiring-the adoption of circular economy principles and practices that would lead to more resource efficiency and less waste. At the global level, the Sustainable Development Goals, adopted by the United Nations Member States in 2015, include many related ambitions.

At the country and regional level, in 2008 China was among the first to adopt a circular economy law promoting the recovery of resources from waste. In that same year, the G8 environment ministers agreed on an action plan for the 3Rs: reduce, reuse and recycle. Following on that, the 2015 G7 Summit Leaders' Declaration underscored the need for "sustainable supply chains" that protect workers and the environment

Then, in late 2015, the European Union adopted an ambitious Circular Economy Package, including goals for food, water and plastics reuse. "The message is that while you are protecting the environment you can boost your economic development and provide new growth and new jobs," said the then European Commissioner for Environment Janez Potočnik in support of the EU Circular Economy Package in 2014.

Indeed, there is a strong business case to be made for a circular economy. Nike, Google, and H&M are already implementing aspects of the circular economy in their global business. Dutch technology company Philips refurbishes medical

Inclusive and Sustainable Industrial Development



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All 'round the world:

Embracing the circular economy

equipment such as MRI systems. Chilean pump technology company Neptuno Pumps remanufactures energy-efficient pumps from reused and recycled pump material, and its common practice for automotive manufacturers is to use recycled plastics in components under the hood and for vehicles' internal parts. Mexican brewer Cuauhtémoc Moctezuma Heineken México and American computer company Dell, as well as smaller companies such as Serbian rolling-element bearing manufacturer FKL Temerin are also leaders in adopting circular economy principles. By designing products with resource recovery in mind, they can protect themselves from price changes in the raw-materials market by creating a more reliable source of raw materials, as well as maintain longer-lasting relationships with consumers by ensuring contact throughout a product's life cycle.

There are also **efficiency gains**: According to the Ellen MacArthur Foundation, by 2025 about \$1 trillion per year of materials cost savings could be generated from circular business models. National economies, entrepreneurs and employees will benefit, as they form new businesses and create new jobs to fill niches created by the circular economy, through resource recovery and remanufacturing.



INCLUSIVE The winners' circle

We find this vision of the future compelling, but we also see reason for concern. While the circular economy takes into account two pillars of sustainability—environmental and economic performance—it risks leaving out an essential third pillar: **inclusiveness**. Simply put, the circular economy could cut poorer countries out of the global supply chains they've worked so hard to enter. How? First, as wealthy countries learn to extend their resource use, they will reduce their dependency on imported raw materials as well as other products manufactured abroad. For example, the Netherlands recently announced that it aims to cut in half its use of primary raw materials from minerals, fossil fuels and metals by 2030, with the ambitious goal of a fully circular economy by 2050.

Second, developing countries—especially least developed countries—may struggle to access the knowledge and new technologies that make the circular economy possible. They will be less able to fill the demand for products that meet increasingly stringent circular economy standards in their export markets, as well as for circular economy services such as reclamation and remanufacturing.

Yet, developing countries stand to also profit immensely from a circular economy. There is a growing need for material, water and energy because of both population growth and increased demand by infrastructure, industry and consumers in developing countries. Circular economy activities have the potential to address a significant share of this need—dampening or, possibly, reversing the rise in resource use by developing countries, and in turn reducing resource depletion, climate change and the pollution of natural areas. In fact, a report from the McKinsey Global Institute estimates that up to 85 per cent of opportunities to improve resource productivity lie in developing countries.

As we think back on 50 years of environmental work at UNIDO, our conviction grows that we can help advance circular economy models, in particular in developing economies. Many of our projects already address various building blocks of a circular economy. Some support cleaner manufacture of products, others help develop safe, easy-to-recycle products with longer lifetimes and still others deal with the recovery or safe disposal of resources at the end of a product's life.



A key part of the circular economy is **improving** resource efficiency during production. A major way we do this in UNIDO's Department of Environment is through programmes related to Resource Efficient and Cleaner Production (RECP). RECP means applying preventive environmental strategies to processes, products and services to increase efficiency as well as reduce risks to humans and the environment. Thanks to these programmes, individual companies and entire industrial sectors have profited.

One example is our Chemical Leasing programme, where chemicals are leased rather than purchased in a cooperation between chemical producers, suppliers and users. The total use of chemicals is reduced, leading to economic and environmental benefits.



Since 2014, when UNIDO's Resource Efficient and Cleaner Production (RECP) pilot project was launched in the Republic of **Belarus**, more than 30 companies learned how they can cut production-related costs and at the same time reduce adverse environmental impacts. In one example, UNIDO helped a confectioner to use safe and sweetwater to make marmalade for chocolate fillings.





In **Serbia**, the National Cleaner Production Centre (NCPC) is a particularly strong player in implementing sustainable chemical solutions, including new business models such as Chemical Leasing.







Industries in the Southern Mediterranean region face high energy costs, scarcity of water and increasing pressure for environmental certifications from international markets. In 2009, UNIDO launched the MED TEST initiative to help industrial enterprises meet these challenges through the transfer of cleaner technology. Pictured here is the leather industry in **Tunisia**, where previously discarded animal products are turned into resources for manufacturing soap and other products.

Unfortunately, many countries lack expertise in resource efficiency strategies. To remedy that, since the mid-1990s UNIDO and the United Nations Environment Programme (UNEP) have been working together to support the development of national service providers. Today, these have grown into a global network, called **RECPnet**, with over 70 members specialized in providing RECP services to industry in developing and transition economies.



Since 1994, UNIDO and UNEP have been working together to build local capacity in Resource Efficient and Cleaner Production



MED TEST II, a component of the UNIDO-led SwitchMed programme, facilitates the shift towards sustainable consumption and production in the Southern Mediterranean region. To date, UNIDO has trained nearly 160

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