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# Economy without waste

*What are the challenges – and opportunities – of moving towards a circular economy?*

By **Walter Stahel**, Founder and Director, Product-Life Institute

**S**ustainability is not yet a winning proposition. Since World War Two, waste volumes have been increasing in all our shared spaces: space waste has become a hazard for space exploration, life in the oceans is jeopardised by indigestible plastic particles, the CO<sub>2</sub> level of the atmosphere keeps rising.

These phenomena are the result of a linear and globalised ‘throughput’ economy, which ends at the point of sale with manufacturers passing ownership and

liability to the consumer.

A circular economy enables us to change this. It rests on five pillars:

- **Nature:** the need to conserve nature and the natural environment as the basis for life on Earth, considering nature’s carrying capacity.
- **Toxicity:** the need to conserve the health and safety of people and animals by not releasing toxic agents into the environment.
- **Resource productivity:** the need of industrialised countries to dematerialise their lifestyle; a quantitative issue, measurable in megatonnes, to reduce

resource consumption by 90 per cent through daring, innovative and creative business strategies.

- **Social ecology:** the need to reinforce the fabric of societal structures – including peace and human rights, dignity and democracy, employment and social integration, security and safety – based on sharing and caring.
- **Cultural ecology:** the need to embrace education and knowledge, ethics and culture, attitudes towards risk-taking, and values (of national heritage and other assets) at the individual, corporate and state level.

◀ Plastic chips are dried on the river bank in Dhaka, Bangladesh, in preparation for recycling

The circular economy is based on an intelligent, decentralised use of water, energy, materials and people – “economics as if people mattered” as Fritz Schumacher put it – and a search for holistic solutions.

Today, public policy does not guide individuals to instinctively choose the path of sustainable reuse. Nor does it incite manufacturers to change course towards strict producer liability, as imposed on the tobacco and asbestos industries in industrialised countries.

Social and cultural ecology differ regionally: the idea of a ‘zero’ target has worked to promote zero accidents and zero casualties. But zero waste is only an inspiring objective in Asian cultures. In the West, efficiency is a better incentive, “turning a tonne of resources into a tonne of product” was the motivating challenge given to DuPont managers in the 1990s to achieve zero waste.

**Circularity**

Circularity is the basis of all life on Earth. But we need to distinguish between different kinds of cycles:

- natural cycles are self-regulated and ignore monetary and time pressure: they include the seasons, weather, water and carbon cycles. The populations of plants, animals and humans are also subject to permanent chaotic renewal;
- agro-food cycles are monetised, governed by the shelf life of produce. Food can be produced and consumed sustainably. Waste can be cascaded or composted;
- manufactured-object cycles are monetised, ruled by the service life and use-intensity of product and material stocks. These cycles are managed following the objective of wealth preservation through sustainable production and use (as opposed to consumption).

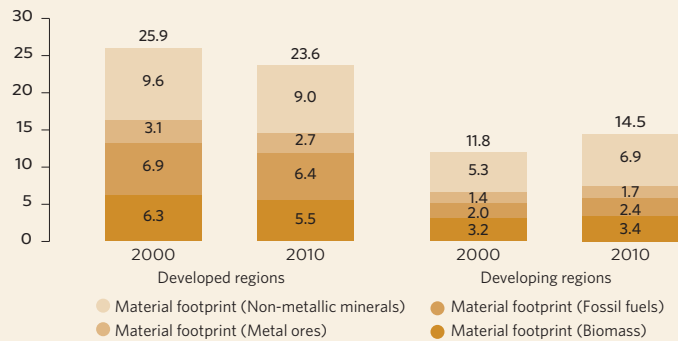
Natural cycles know no waste – all waste is human-made. The common denominator of cycles is that they focus on stocks: be that by preserving biodiversity,

**12 RESPONSIBLE CONSUMPTION AND PRODUCTION**



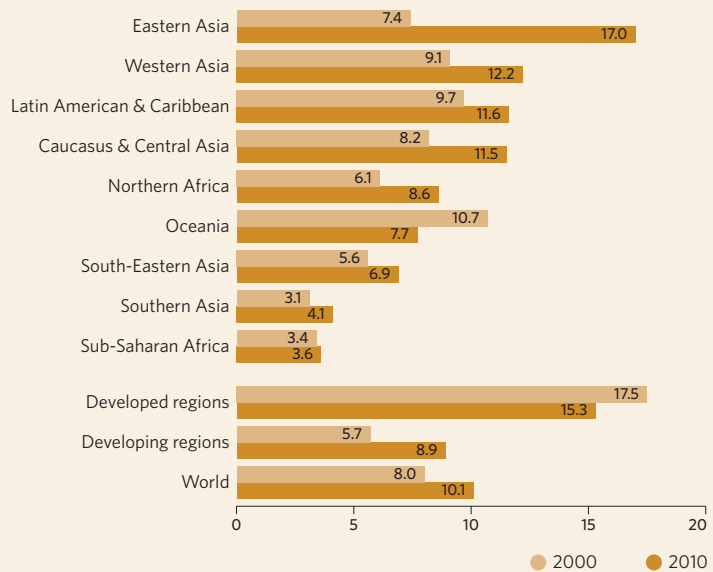
**Ensure sustainable consumption and production patterns**

**Material footprint per GDP by type of raw material, 2000 and 2010, (kilogram per unit of GDP at constant 2005 US dollars)**



The **material footprint** is an accounting of fossil fuels and other raw materials extracted globally and used in a particular country. It reflects the amount of primary materials required to meet a country's needs and can be interpreted as an indicator of the material standard of living or level of capitalisation of an economy.

**Domestic material consumption per capita, 2000 and 2010 (metric tons per capita)**



**Domestic material consumption** measures the amount of natural resources used in economic processes. Despite a slight reduction in developed regions over the period, it remained 72 per cent higher than the value for developing regions.

Source: The Sustainable Development Goals Report 2016, United Nations



educating people, giving away surplus food, managing the built environment or treating cities as urban mines. These are all forms of an intelligent, decentralised stock management. Economic growth is measured as the increase in quality and quantity of stocks, assets and capitals – not higher throughput (in other words, GDP).

Billions of second-hand banknotes and coins are bought and sold daily worldwide, as are millions of used shipping containers, which are rented or leased by logistics companies. These circular economies are omnipresent but not identified as such

## *The circular economy substitutes manpower for energy and material – the opposite of mechanisation*

because they are familiar, local and low key. They need little publicity, packaging or mass transport. By contrast, the linear industrial economy is deafeningly loud and pervasively visible through its publicity and through the movement of goods.

Circular-economy champions are manifold: second-hand markets such as auction houses, eBay and antique dealerships. Repair champions can be found in the innumerable small and medium-sized enterprises (SMEs) maintaining equipment, vehicles, goods, garments, infrastructure and buildings, but also in non-commercial self-help groups, such as the hundreds of repair cafés in the sharing society or websites such as [www.ifixit.com](http://www.ifixit.com).

Caring and good husbandry are the guiding principles of any circular economy of stocks or capitals, be they natural, human, cultural or manufactured. In economically struggling nations, the circular economy was initially a strategy to overcome poverty and scarcity. Then, local services of reuse, repair and remanufacture of objects developed. Used goods such as steel barrels were transformed into kitchenware or small water turbines to produce local electricity.

Meanwhile, the linear industrial economy is necessary to create stocks to overcome shortages of shelter, food

and manufactured objects, until sufficient stocks exist. In markets near saturation, manufacturing no longer increases, but replaces, existing wealth, and the circular economy is more efficient in managing stocks.

The linear industrial economy is complementary to the supply of components of innovative technology when it comes to upgrading existing stock, such as reprogrammable microchips.

In microeconomic terms, the societal advantages of a circular economy of manufactured stocks are:

- ecological, because its activities are low carbon: reuse and service-life extension preserve the water, energy and material resources embodied in goods. Services also tend to be local, near their clients;
- economic, because remanufactured goods are between 40 per cent (for mass-produced goods) and 80 per cent cheaper than equivalent new goods;
- social, because these activities are labour-intensive and involve caring and stewardship.

Scientific, technical and commercial innovation in four domains drive the circular economy:

- the era of 'R': reuse, repair, remanufacturing and repurposing of goods. Doubling the service life of goods halves resource consumption in manufacturing and recycling and waste volumes;
- the era of 'D': to de-polymerise, de-alloy, de-vulcanise and de-laminate goods enables us to reuse pure materials, preserving resources and replacing material recycling;
- innovative materials and components benefit existing stocks as well as production;
- a rapid transfer of the economic and technical knowledge of the circular

economy from SMEs and fleet managers into academic curricula, vocational training and corporate boardrooms.

Economic actors need to change their business models to include the factor of time, if they are to profit from the longer service lives of goods.

The circular economy substitutes manpower for energy and material – the opposite of mechanisation. Macroeconomic studies by the Club of Rome think tank in seven EU countries found that a shift to a circular economy would reduce national greenhouse gas emissions by 70 per cent and grow the workforce by four per cent.

### **Taxing resources**

Human capital is a resource that has a qualitative component. Governments can increase its quality through education and vocational training, but they often ignore inconvenient facts such as:

- human skills rapidly deteriorate if unused, whereas the quality of a tonne of coal does not change if it stays another 10 years in the ground;
- acquired human capital – such as knowledge, skills and wisdom, capabilities, and experience, together with science and technology – are key for any economic development.

Do governments therefore have a moral obligation to promote the use of human capital before any other resource?

Policymakers can promote the circular economy by adapting the framework conditions accordingly. Sweden is the first country to do this – the Swedish Parliament decided at the end of 2016 to make the labour expenses for repairs tax-deductible, and to reduce VAT on repairs by 50 per cent from 25 per cent to 12 per cent.

Governments should not tax renewable resources including human labour, but instead tax loss of stocks, waste and emissions. This is taxation as if human labour mattered. Policymakers should also levy value-added tax only on value-added activities. The value-preserving activities of the circular economy should be exempt.

Not taxing work (human labour) will foster, and reduce the costs of, all activities based on caring, be it looking after human, natural, cultural or manufactured capital. Many of these caring activities are the responsibility of, and paid for by, nation states. This could lower non-taxed wages – also reducing administrative burdens. Users also have a role to play in job creation – more than half of all money spent on a 30-year-old car is the cost of local labour.

### The performance economy

The most sustainable business model of the circular economy is the performance economy. It retains the ownership of

goods and embodied resources, and turns consumers into users.

Economic actors in a performance economy have to internalise the liability and costs of risk and waste, but gain future resource security ('the goods of today are the resources of tomorrow at yesterday's price'). They increase their profitability by developing system-based solutions and exploiting sufficiency and efficiency, decoupling economic success from resource consumption and increasing competitiveness.

Lighthouses are a good example of system-based solutions: they have contributed more to the safety of shipping and sailors than any

technical improvement to ships. They are durable, reliable and upgradeable in response to technological progress.

The performance economy is the preferred business model of service industries, digital businesses and the internet of things. Manufacturers of durable goods and pharmaceuticals, the United Nations Industrial Development Organization for chemical leasing, and public authorities for infrastructure have started adopting it.

The performance economy is competitive because it introduces a new notion of time and quality. In the words of Aristotle: "Real wealth is based on use, not ownership". ●

## FISE ASSOAMBIENTE

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### Waste management in an era of economic crisis



By **Elisabetta Perrotta**,  
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In an economic landscape still largely defined by the global crisis of 2008, waste management is now a key element in the country's economic output. Thanks to recent advances in technology, the industry provides materials and energy from recycling and recovery activities to the manufacturing sector. This allows manufacturers to use more waste as inputs instead of raw materials.

In this way, the waste sector represents an essential component in revitalising the economy, while also creating new opportunities for environmentally

responsible consumption. However, the sector needs clear and consistent rules if it is to play its full part in this economy transformation. There needs to be a clear long-term strategy, solid legislation, and more consistent implementation and reading of the rules if the waste sector is to grow without adding to environmental pollution.

Currently, the sector suffers because of concerns related to NIMBY (not in my back yard) and NIMTOO (not in my term of office). Private waste management operators also face particular difficulties in Italy in gaining access to local public-sector markets. This is caused by various barriers to entry, such as late payments by municipalities.

FISE Assoambiente is the Italian association representing companies involved in municipal hygiene services,

waste management and soil remediation at both national and European level. Since its inception, the association has been concerned with enhancing both regulation and the technical aspects of the industry. Our aim is to develop the necessary conditions that foster fair competition in, as well as the industrialisation of, the waste sector.

The industry now offers the chance to promote both economic growth and new opportunities for qualified, professional employment. But only by treating the waste sector objectively will it be possible to allow operators to grow while also complying with the requirements of best available techniques.



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