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to by Reginald Bassey



Entry points for thinking about the circular city economy 2021

The circular economy

The economy can be seen as a set of metabolic processes – processes by which societies 'exchange' energy and matter with their biophysical environment, extracting natural resources while dumping waste into the air, waters and land.

A historic abundance of cheap natural resources has encouraged extraction and use of the planet's resource wealth – to the extent that we are now beginning to come up against the depletion of key, finite materials and minerals.

Meanwhile, waste is increasingly difficult to dispose of safely. One of the consequences of mineral extraction, waste disposal is traditionally the last step in a linear, 'take-make-use-dispose' process. As a consequence, plastic waste is contaminating the oceans while domestic and industrial waste requires more and more landfill to manage. Toxic chemicals are leaching into aquifers and rivers, reducing freshwater sources. Ever-larger quantities of waste require a step change in management and safe handling. New thinking and approaches concerning waste treatment are urgently required.

The circular economy closes off these linear processes to maintain or create value that is otherwise lost. In a circular economy, elements of a system are designed and arranged in a manner that ensures that waste from one system is an input to a complementary system – and the wider system as a whole produces no waste. This helps to:

- ensure there is an appropriate flow of required resources in the future;
- reduce inefficiencies in material and resource extraction and usage;
- reduce energy inputs and, where required, ensure that they come from renewable sources;
- reduce waste and toxicity;
- · reduce damage to ecosystems; and
- repair and restore damaged ecosystems.

This series of city related policy and information briefs draws on lessons learned from cities and infrastructure work carried out by Triple Line over the past five years. It is intended to contribute to more sustainable, inclusive and climate-resilient cities that generate equitable economic growth opportunities for all by identifying marketdriven solutions to urbanisation challenges and strengthening democracy and decentralisation processes through capacity building of government agencies at national, regional and city levels. Entry points for thinking about the circular city economy 2021

How do we create circular economies?

The first step is to establish the level at which we are intervening, and understand the systems at each level. Is it the household or factory level? Is it the neighbourhood or industrial area level? Is it the city level or the country level? Each level is connected to other systems and levels, which also have to be understood – in a context in which human systems are becoming more complex, needing new approaches and insight. Each level will therefore require a different type of intervention.

Circular economy intervention levels (1 to 4)

- Level 1 Household and factory. Basic human needs are met at the household level. Inputs include shelter, energy, food, water and other services. Waste leaves the home in the form of packaging, wastewater, heat and greenhouse gas and other emissions. At a factory, materials or components enter the system alongside energy and other services. Waste leaves the factory as chemical residues, waste materials, offcuts and emissions depending on the products being manufactured.
- Level 2 & 3 Neighbourhood, industrial and city levels. Homes form neighbourhoods and factories make up industrial areas. Together with service networks, transportation and other cultural and social infrastructure, they form cities. Resources flow into cities, through to neighbourhoods and industrial areas and then to individual homes and factories. And waste flows either back into another process, or into the environment as pollution of the air or waterways or as landfill. Cities are surrounded by the natural world. They metabolise water, fresh produce, marine life, timber, minerals, sand, stone and fossil fuelled energy. The resources absorbed by cities are either mined or grown. Mined resources tend to depletion and are difficult to replace. Grown resources are the building blocks of sustainability.
 - Level 4 National level. At the national level, resources are metabolised either in cities or in rural areas whilst waste is recycled, integrated back into a circular system or is released into the environment.



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What should cities do?

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In building support for circular economies, it is helpful to think about different spheres of engagement. Engagement will be context specific, but there are three broad spheres of engagement for possible action. These are:

- Policy and institutions. Policy is led by the authorities responsible for the level of the intervention. This must be grounded in local conditions. For instance, cities all have different climatic conditions, different social, economic and political structures and have different resource and skills bases.
- Technology and skills. Future resource constraints suggest that responsible building and infrastructure design must take a long-term and resource-efficient view. Attention needs to be paid to choice of materials; and the potential for flexible use of structures over their lifetimes. The demand for new technologies needs to be reflected in local skills and skills development programmes.
- Economic and social impact. Local supply chains need to be designed and adapted into more circular systems. The aim is to shorten supply chains as much as possible and to reduce waste and waste disposal as much as possible. Resource flows and waste streams first need to be mapped in order to identify ways in which supply chains can be shortened and circular systems introduced by local stakeholders.

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