Horizon
The EU Research & Innovation Magazine

European Commission

Tech trends undermine move to zero-waste economy

Each year a new wave of computers, smartphones and accessories swarm the market with smaller components made from increasingly complex materials. While this technological evolution may be exciting for consumers, the trend towards obsolescence is impeding our progress towards a zero-waste society, according to researchers working in the area.

11 August 2016 - By STEVE GILLMAN

The idea of a zero-waste society, also known as a circular economy, is to cut resource use, reduce waste and boost recycling.

At the moment, we live in a so-called linear economy where we dispose of our resources once we've finished with them. Adopting a circular economy model would close this wasteful loop and keep materials in use for as long as possible, extracting the maximum value throughout their life and then transforming them into new goods.

This has clear upsides for our environmental footprint, but researchers say progress is being undermined by a disposable culture in the tech industry.

'When you look at the design of products, you see several trends that are not helping enable the circular economy,' said Dr Tjerk Wardenaar, an energy and environment consultant at PNO Consultants in the Netherlands. He coordinates the EU-funded NEW_InnoNet project, which is helping to re-examine value chains.

The Issue

In December 2015, the EU set out a circular economy action plan to help consumers and businesses get maximum value and use from all raw materials.

It estimates that moving to a zero-waste economy could save businesses EUR 600 million a year, and reduce annual greenhouse gas emissions by 2 to 4 %.

More than EUR 650 million has been set aside to fund research projects related to the circular economy under Horizon 2020.

'You see a trend of miniaturisation, everything has to be smaller and smarter, and this makes it more difficult at the end of the value chain to recover materials,' he said. 'Second, you see increasingly complex materials that are more difficult to take apart at the end of the lifecycle. Then, there is an increasing and rapid update of products.'

Recycling

With new designs released each year, waste companies are struggling to adapt their sorting technology to this ever-changing world.

A smartphone, for instance, can include up to 50 different types of metal. Similarly, plastics can contain over 25 different compounds, and this makes recycling tougher.

'It is difficult for plastic packaging recyclers to come up with good quality plastic that also can compete with the currently low costs of virgin (new) plastics,' said Dr Wardenaar.

Combined, these factors remove economic incentives to adapt to a circular economy.

In response, NEW_InnoNet has brought together experts from different industries who specialise in electronic, automotive and plastic production to identify bottlenecks for the near-zero-waste economy. The aim is to come up with a new European strategic agenda which highlights key research and innovation priorities.

'There is not enough communication between specialists and practitioners at different parts of the value chain,' said Dr Wardenaar. 'NEW_InnoNet is there to organise a collaboration among them, to let them talk among each other and share information.'

Although modern design trends are proving to be a difficult hurdle to overcome, Dr Wardenaar sees enough support at both private and public levels to keep momentum for the circular economy going.

'We can't talk about the circular economy, or a zero-waste economy, as a silver bullet solution. The concept is, the implementation isn't. But there are a lot of actors in the field who want to develop solutions.'

It's good business to turn waste into a resource, it cuts costs, creates new revenue streams, and makes enterprises more competitive. The problem is knowing where and how to act.

Cities

'Almost 80 % of the population of Europe lives and works in urban areas, so we have to focus on waste in cities,' said Claudia De Luca, assistant project manager of the EU-funded project UrBAN-WASTE which is developing strategies to support the reuse, recycling, collection and disposal of waste.

The project is focusing on tourist cities where they have to deal with extreme levels of typical waste streams. In the Canary Islands alone, tourists generate more waste than the actual residents.

Electric waste, for instance, is a big part of the hotel industry. Each room often has its own fridge which may be replaced every four to five years, while they also have individual kettles, hair dryers, irons, TVs and sometimes even an espresso machine.

In response to this growing problem, UrBAN-WASTE is bringing together 11 different cities where circular economy strategies will be implemented. Best waste-reducing practices will be shared among different groups such as hotels, restaurants and municipalities.

‘In Tenerife, we have involved a confederation of hotels. One hotel, and supermarket, have already introduced a best practice that created a link with a local farmer,’ said De Luca. ‘They give the farmer all their food waste who uses it for compost, this is all without using the waste management of the island.’

Avoiding conventional waste management is of particular value to islands. ‘In the Canary Islands, they don’t have a lot of space and don’t know where to put their waste anymore. For several different kinds of waste they have to send it to Spain, which is very expensive,’ said De Luca.

UrBAN-WASTE will work with these cities to help identify opportunities where they can implement a circular approach. The project will also develop a mobile phone app to teach tourists how to manage their waste and reward good behaviour with discounts at restaurants or hotels.

‘All the pilot cities’ energy and resource flows will be considered, analysed, then everything that is waste will be considered output. In a parallel process we involve stakeholders, such as tourists, associations of hotels and restaurants, to implement how to best manage urban waste,’ said De Luca.

More info

NEW_InnoNet

UrBAN-WASTE