

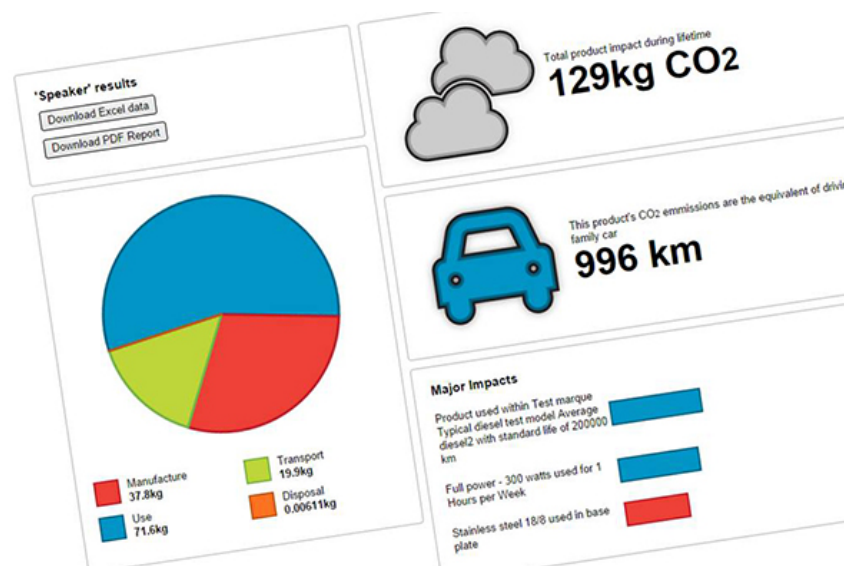
## Sustainable Design: Is the Circular Economy Just More Hot Air?



By Stephen Knowles, Managing Director, IDC

# Sustainable Design: Is the Circular Economy Just More Hot Air?

Published in Engineering, March/April 2019



It's been over a decade since governments, academia and industry started taking sustainability seriously, organising conferences, running courses, setting targets and writing standards. Around this time, at IDC we launched a range of tools and services to assist companies in developing more sustainable products. These included guides, workshops, processes and software tools, such as the LCA Calculator - easy to use lifecycle analysis software which was quickly picked up by many companies and universities as a tool to assess their products and identify areas for improvement.

Roll on ten years and it appears that manufacturers' initial enthusiasm for sustainability has not translated into a flood of truly sustainable products. So why aren't companies working hard to put sustainable design at the top of the list? In our experience it comes down to a number of factors, from cost and misconceptions to quite simply the fact that there is no legislation forcing companies to act, so they are under no pressure to design sustainably.

Over the past 10 years at IDC, we have worked with companies and carried out many strategic sustainability evaluations of products, using our IDC Design Compass tool. In these collaborative strategy sessions, a regular theme keeps coming up. Most companies are professional and responsible, and want to do the right thing. As such they have a good understanding of their supply chain, the materials they use and the manufacturing processes.

On the whole, these companies also have a good understanding of how customers use their products, how often they are used, the energy of use and how long they keep the products. But with only a few notable exceptions, most companies have very little idea and even less control about what happens to the product at the end of its life. Time and again we have carried out these reviews and worked with clients to generate ideas to increase product life, increase reuse, improve recycling, reduce waste, reduce carbon emissions and reduce manufacturing cost. These have been enthusiastically championed by the product team but ultimately get dropped due to the need to adjust the business model and the expense and complexity of setting up the means of recovering products from their customers.

This has been emphasised with the talk of moving to a circular economy, as highlighted recently by the European Union's (EU) Circular Economy Package, which outlines a product development cycle from production and consumption to waste management and the market for secondary raw materials and product re-use. The objectives of a circular economy are great, promising a boost in innovation, sustainable growth and jobs. Also very important is the EU's Monitoring Framework on progress towards a circular economy in order to benchmark the current situation and monitor the effectiveness of new actions at an EU and national level. However, none of the principles of the circular economy are new and none of them are going to change the economic realities for companies manufacturing and selling products. Most of the targets are voluntary and many are laughably unambitious, such as the target to have all single-use plastic recyclable by 2030.

As highlighted by our experience working with companies, the circular economy will not become a reality until there is a suitable infrastructure to facilitate proper take back, reuse and high value recycling, together with suitable incentives/penalties to encourage this transition. Currently there is little coordinated government action to either support or compel companies to make this transition. Until there is a proper legal requirement for products to be designed for a circular economy, this issue will remain a low priority or too big a hurdle for individual companies to manage alone. In the UK, the first small steps have shown the way in which government action can quickly have a big impact with the introduction of the 5p carrier bag charge in England leading to a reduction of 85%<sup>[1]</sup> in the number of single use carrier bags given out.

### **What's the Opportunity?**

If the Government wants to promote a circular economy, we need far greater awareness of the benefits to motivate companies to act as well as incentives to make the high impact disposable culture less profitable. Here's where we need to see some action:

### **It's about more than recycling**

The circular economy is about developing products that use minimal resources and keeping these in use as long as possible by rebuilding or updating, right through to the end of a product's life when the value of the resources could be recovered, with components reused or materials recycled. Already, most types of plastics are recyclable but in reality only a few are commonly collected and only a small portion of what is collected actually is used to make equivalent products. According to a recent Greenpeace study<sup>[2]</sup>, the average recycled content of PET drinks bottles is just 6.6%. With the soft drinks industry decreasing their use of refillable bottles over the past 10 years, it is time for government to force the change to reusable bottles and other types of single use packaging.

## **Incentivise take back**

It's this end of life process that presents most challenges to organisations. Usually once a product leaves a distribution centre, the company loses engagement with the product and there isn't a process to get the product back again. A whole new business model is needed to get the product back, whether for an upgrade or dismantling.

Many companies see this as an impossible hurdle requiring great investment. This need not be the case; in fact product returns, service or maintenance could be made into a profitable venture, with customers offered service packages for repairs and upgrades, driving loyalty with customers and creating new jobs at the same time. This process offers an exciting opportunity for novel thinking turning goods into services, with different approaches to ownership like leasing and maintenance contracts. Here again, government might help set up some of this infrastructure and consider how it can incentivise companies to extend the product life, for example by reducing VAT rates for products which offer longer guarantees or refurbishments. Incentives such as these also encourage more localised manufacturing, as returning products to factories on the other side of the world adds unnecessary delays and costs.

## **Encourage remanufacturing**

Remanufacturing doesn't require dependency on raw materials; relieving the stress of constant price fluctuations of new materials. One of our clients, Jaguar Land Rover, was an early adopter of the LCA Calculator and now includes circularity in its design and assembly process, using 50% recycled aluminium in some of its car models. In doing this, it not only saves money, but takes away some of the dependency on aluminium, which is a high value material. Walter Stahel, who introduced the concept of the circular economy, believes companies can make five times as much income from remanufacturing as manufacturing.

Reuse also creates opportunities. Dell is a good example of this. The company launched an initiative to reuse product components and materials by setting up both a new retail venture and a partnership to support it. Customers can return used products to Dell or their partner Goodwill Industries, and the company will refurbish 90% of them and resell through the Dell Outlet at a slightly lower price.

## **Ensuring products are designed sustainably**

Design is at the very heart of the circular economy. Making an investment in a properly designed sustainable product is an essential starting point. By reducing components and minimising materials, in combination with clever design for upgrades using modular approaches and standardised parts, as well as design for deconstruction and reuse, the product itself is already set-up for a circular lifecycle. When manufacturers consider the whole lifecycle of their products, they can frequently identify numerous easily implemented areas to reduce impact. The whole sustainable design approach is a wise investment

and stripping down the design to these essentials often brings cost savings that surprise many manufacturers. Building in a requirement for this analysis to be carried out and documented for all new products would benefit manufacturers and the environment.

### **So what's the Solution?**

While there are a few innovative companies who are demonstrating great success with circular products, unfortunately the truth is that when it comes to sustainability, companies are only just scraping the surface. Rates of consumption are set to rise dramatically at the same time as natural resources are in decline. We need to take action now, but the rate of progress is incredibly slow and will remain so until there is a proper reason to act.

If governments are serious about developing the circular economy, they have to be the ones driving change to adjust the mindset from one of disposable products to products focused on longevity and circularity. Legislation is undoubtedly the only way to really enforce the circular economy and transform the mindset. We have seen how successful EU energy rating regulations have been for the domestic appliance market in creating a new generation of energy efficient devices – with a similar legislative approach, the circular economy could become a realistic achievement.

If businesses are ready to adapt and encourage these changes there will be some great opportunities. Manufacturers may need to reassess their business models and look at opportunities for moving to more of a service-based offering. When sustainable design approaches are combined with new business models and government action and incentives, then we will really start to see the power of innovative businesses addressing the urgent environmental problems facing every country.



## **7 Actions for Government to Reduce Waste and Encourage the Circular Economy**

### **1 - Compulsory charge for disposable coffee cups**

A mandatory charge for disposable cups in coffee shops would have a big impact. This could be 50p for cups containing plastics and 20p for all paper cups. Currently, many UK coffee chains offer 50p off your drink if you bring your own reusable cup so financially this will not be a big change. However, the psychology of switching the default to reusable cups should see a dramatic reduction in waste.

### **2 - A Return system for drinks bottles and cans**

Current UK glass recycling involves collecting glass, colour separating and then smashing to create cullet and using that to make new bottles. Although better than create new bottles from Silica, it still uses substantial amounts of energy. Reusing bottles dramatically reduces energy and environmental impacts, as well as decreasing wastes. Germany has this approach with its Pfandsystem which regulates the sales and return of plastic and glass bottles and cans. Glass bottles can be reused up to 50 times with a dramatic effect on the waste.

### **3 - Install public drinking water fountains**

Many people already carry a reusable water bottle which they fill up at home or at work, however most city centres have very few public places where people can easily fill a bottle or have a drink of water. This lack of free available tap water forces people to buy bottled water or soft drinks, generating unnecessary waste. Easily accessible drinking water fountains in cities, towns and villages used to be quite normal and if installed would have a huge effect on reducing plastic waste.

### **4 - Impose VAT on food with excessive single-use plastic packaging**

Most basic food is exempt from value added sales taxes, however if the weight of the packaging is greater than a defined % of the product weight then this exemption would be lost. These targets might be adjusted for different classes of food and could become stricter over time. A similar approach could be taken with toiletries and cosmetics etc.

### **5 - Tax breaks for longer product life**

Money motivates and one effective way would be to encourage different tax concessions for companies who can create products in circulation for 5, 8 or even 10 years. This could be through lower VAT rates on products with long guarantees and commitments to repair, or through corporation tax credits (similar to those used to encourage R&D) for product repair or reuse. Another option would be to reward manufacturers by the amount of materials they are able to reclaim and reuse.

### **6 - Develop a standardised reusable food packaging system**

This is a longer term opportunity, to apply the approach used in reusable bottle systems to more a general food and grocery packaging system. With the increase in internet, home-delivered grocery shopping, there is a simple low cost way to return the packaging to the food producers back through the delivery chain. A set of standardised food containers, such as air-sealed, tamper evident jars and containers could be used for bulk breakfast cereals, rice, pasta, flour, condiments and sauces and even ready meals. The empty containers used during the week would be collected by the company delivering the following week's shopping. Brands could differentiate their products though the design of the paper labels.

### **7 - Make environmental design considerations a legal requirement and enforce the rules**

All products sold in the EU have to have a CE mark. This requires that they have a technical file showing that the product meets all the relevant standards, for safety, materials etc., together with all relevant manufacturing data. For Medical Electronic Equipment, there is already a standard (IEC 60601-1-9, 'Requirements for environmentally conscious design') which requires manufacturers to identify the environmental impacts of new products and identify actions to manage and reduce the major impacts over time. If such a requirement existed and was enforced for all products, the greater focus on reducing impact would undoubtedly yield positive results.



Written by Stephen Knowles, MD at IDC

**[www.idc.uk.com](http://www.idc.uk.com)**

#### References

[1] Drop in plastic bags littering British seas linked to introduction of 5p charge, The Guardian, Thu 5 Apr 2018 06.30 BST.

[2] Greenpeace report reveals plastic footprint of world's largest soft drinks companies, March 2017, <https://www.greenpeace.org.uk/press-releases/greenpeacereport-reveals-plastic-footprint-worlds-largest-soft-drinks-companies-20170314/>.