



## Obsolescence

Causes, effects, strategies

Fairphone 2 A durable product

Throwing out the throwaway society Guest article by Dr Hugo-Maria Schally

# Piece by piece

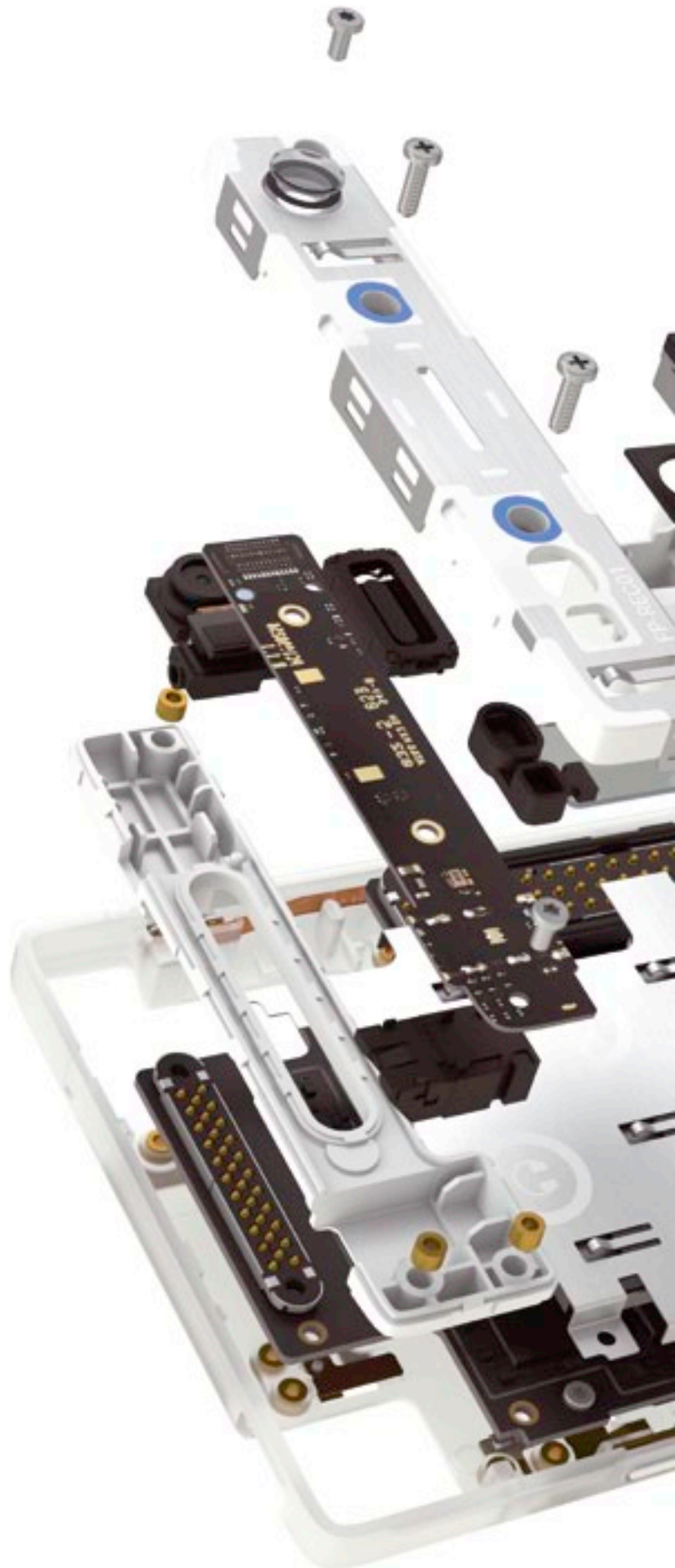
## The Fairphone 2

At a time when mobile phone companies promote themselves by offering annual upgrades to the latest smartphone, the Fairphone 2 seems like a relic of a bygone age. The makers of this smartphone want their customers to feel a stronger connection to their product so that they keep using it for as long as possible. “We decided to create a completely original design,” says Olivier Hébert, Chief Technology Officer (CTO) at Fairphone. “We had a complex set of goals guiding us in this process. For example, we wanted consumers to gain more ownership of the product.”

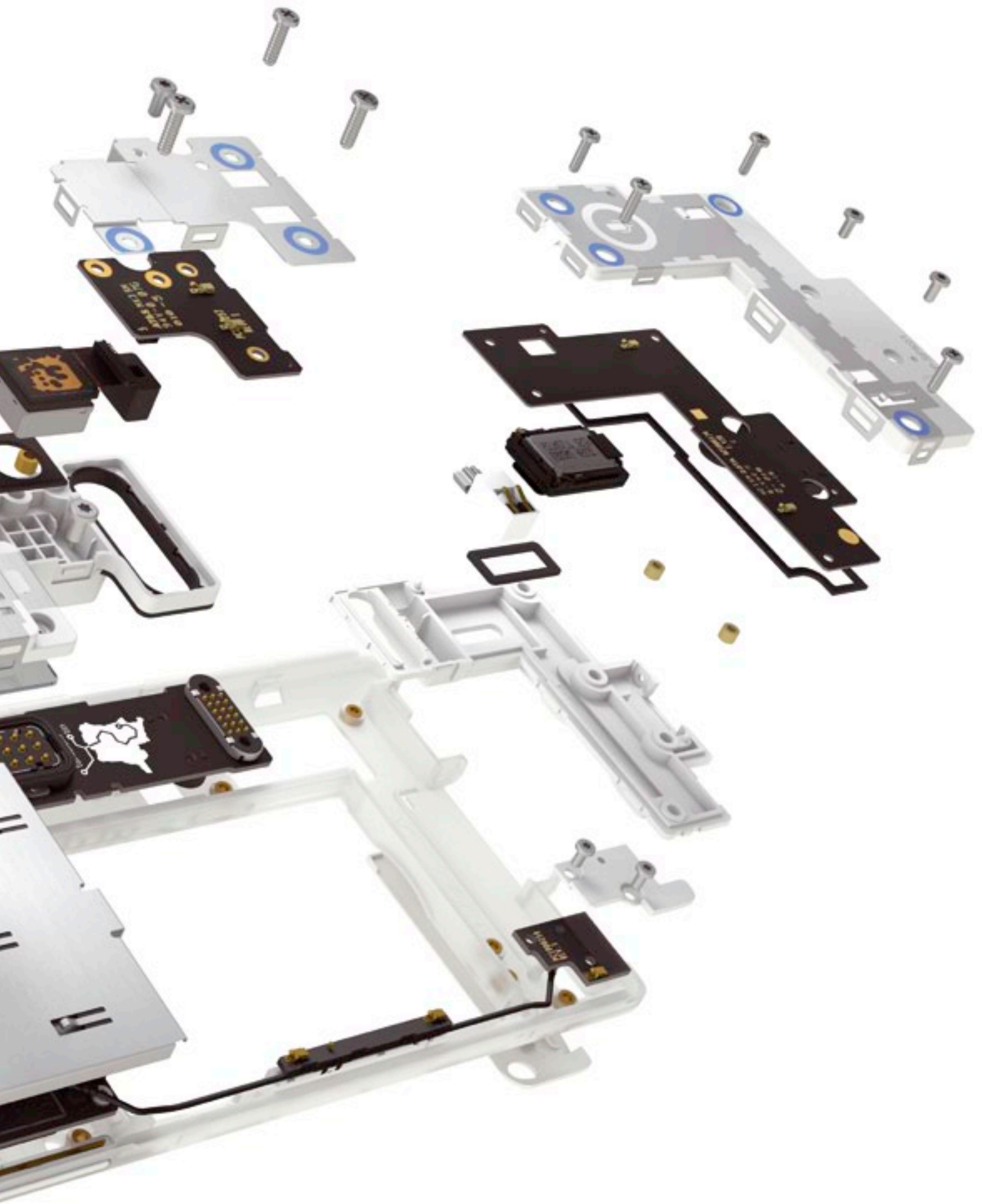
Social and environmental sustainability is key for the second-generation Fairphone 2 as well. The designers’ goal was to create a product that was built to last. “So we looked at the weaknesses affecting other smartphone designs,” Olivier explains. “One of the problems with most other smartphones is that the display can easily crack. So we built a high level of protection into the Fairphone 2 display – and if it does break, it is very easy to replace.” And not only the display: thanks to the modular design, users can easily replace parts such as the camera and flash, battery and speaker units themselves. Instructions are available on the Fairphone website. “The fact that users can do their own repairs is a big plus point for product longevity,” says Olivier. No technical skills are needed: “If you can use a screwdriver, you can repair your Fairphone 2.”

The Fairphone 2 is built to last – but that does not mean that users have no access to new features. “We design different cases and covers so that users can change their phone’s appearance, for example,” says Olivier. “And new technology can be integrated into the phone later on.” A relic of the past? On the contrary – when it comes to user-friendliness and sustainability, the Fairphone 2 is ahead of its time.

*Christiane Weihe*







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# Urban myths and academic analysis

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My first TV was a hand-me-down, acquired when I was a student in the 1970s. It was a 25-year-old black and white set and it could only pick up Channel 1 at first. To access the new programmes when ZDF began broadcasting in 1961, you had to buy a UHF converter. In those days, electrical appliances remained in use for a long time, new technologies and functions were slow to come to market, and repair costs were minimal compared to the price of a new product. Today, the average TV is only used for five or six years (first-use duration) before being downgraded: it becomes the household's third TV or is given away or simply disposed of as e-waste. Any pangs of conscience are assuaged with the thought that it would have stopped working soon anyway. After all, there are plenty of articles telling consumers that "obsolescence" is built in by the manufacturers.

Urban myths – such as planned obsolescence – generally conceal a tiny grain of truth. Once true, perhaps, of certain sectors or eras, they are easy to believe and pass on. That wouldn't matter – after all, there's nothing wrong with fairy tales, they're a good read – if only they didn't mislead and distract us from the real problem. And the problem is not planned obsolescence but our rampant consumerism. Aggressive advertising, a constant array of new functions, discounts, dodgy contracts and all manner of software tricks ... companies stop at nothing to get customers to fall for all kinds of nonsense: oversized, overpowered cars, TVs too big for the living room, new fashions every six months, mobile contracts that offer a new smartphone every year... It seems that consumers have their own built-in switch to turn off their critical faculties if the new product is sufficiently cheap and shiny and the neighbours haven't bought one yet.

At the Oeko-Institut, we continue to investigate and critique the root causes of environmental problems on an independent basis, exploring appropriate solutions and voicing uncomfortable truths. I hope you find this issue of *eco@work* interesting and wish you a pleasant and relaxing summer.

Yours,

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# Throwing out the throwaway society

Guest article by Hugo-Maria Schally

On 2 December 2015, the European Commission adopted an ambitious package of measures to stimulate Europe's transition towards a circular economy. To ensure sustainable growth for the EU, we have to use our resources in a smarter, more sustainable way. It is clear that the linear model of economic growth is no longer suited for the needs of today's modern societies in a globalised world. We cannot build our future on a "take-make-dispose" model. Many natural resources are finite, so we must find an environmentally and economically sustainable way of using them.

The Commission's package aims to maintain the value of products, materials and resources for as long as possible; waste and resource use are minimised, and resources are kept within the economy when a product has reached the end of its life, to be used again and again to create further value. This is intended to stimulate the output of more durable and innovative products, save money and improve quality of life. The Commission is predicting that waste avoidance, ecodesign, reuse and similar measures will bring annual savings of 600 billion euros and reduce EU greenhouse gas emissions by 2 to 4 per cent.

A circular economy starts at the very beginning of a product's life. Better design can help to save precious resources. The Commission will support reparability, durability and recyclability in product requirements under the Ecodesign Directive. Provisions which can have a positive impact by promoting reparability and durability will supplement the existing rules on products' energy efficiency.

A further aim is to help consumers choose environmentally friendly products and services. Through their market power, consumers can stimulate demand for better products and services and support innovative technologies and business solutions. Improving product reuse and repair through ecodesign, better enforcement of the rules in place on product guarantees, and more intensive measures to make green claims more trustworthy will enable the transition to more sustainable modes of consumer behaviour. It is also impor-

tant to improve the supply of reliable and appropriate consumer information about products' environmental impacts and to tackle unfair commercial practices such as planned or built-in obsolescence. This will create economic incentives for companies to design products that can be more easily recycled or reused and to offer services which include shared use, recycling or recovery of raw materials.

Reuse and recycling will extend products' useful lifetime, save costs for consumers and reduce waste. Consumers will also benefit from improved environmental information and enforcement of the rules on product guarantees. Public authorities will be encouraged to switch to green procurement practices. Purchasing durable, resource-efficient and easily recyclable products lessens the need to replace old appliances and helps consumers save money by reducing electricity, gas or water bills and disposal costs. Stronger demand for products and services which support a circular economy will create new business and growth opportunities for companies offering cost-effective and innovative solutions. New jobs will also be created in product design, reuse and the repair industry – sectors where it is difficult to introduce automated processes.

The package is to be implemented over the next four years. By the end of the Commission's term of office, it will have created a policy environment which supports the transition to a circular economy.



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# Faults, flaws and rampant consumerism

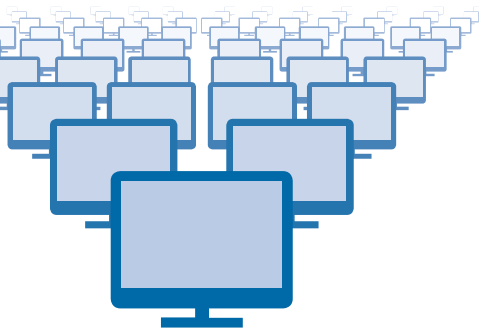
## The obsolescence issue

Ultra-high definition and HDMI, smart TVs and 3D, curved displays and OLED screens ... each new generation of TVs offers an enticing array of features which many consumers plainly find hard to resist. The brand-new flatscreen is barely out of its box when along comes the manufacturer with a newer model that looks even shinier than the last. Bigger, faster, more high-definition ... at knock-down prices which shatter buyers' inhibitions. German households generally replace their modern flatscreen TVs after five or six years. The old-style cathode ray tube TVs were kept for much longer – 10 or 12 years. So what is driving the trend towards obsolescence: in other words, the shorter product lifespan and usage time of electrical and electronic products, which is the subject of much debate and research? Are we right to be suspicious: are manufacturers deliberately building planned obsolescence into their designs? And how does this shorter duration of use impact on people and the environment? These are just some of the questions explored by the Oeko-Institut in a study commissioned by the German Federal Environment Agency (UBA).





"In fact, looking at the high replacement rate for TVs, we see that obsolescence is mainly psychological," says the Oeko-Institut's Senior Researcher Siddharth Prakash, who led the study. "More than 60 per cent of functioning flatscreens were replaced in 2012 simply because consumers wanted to upgrade to a better product." Replacement purchases were driven, he says, by consumers' desire for new and better features and functions and by falling prices. "Of course, advertising feeds this rampant consumerism as well." The result? Seven million new TVs in German living rooms in 2015 alone.



**Seven million**  
new TVs  
were bought in  
Germany in 2015.

Together with the University of Bonn, the Oeko-Institut experts conducting the study – entitled Influence of the useful life of products on their environmental impact: Creating an information base and developing strategies against obsolescence – established a sound data set on the lifespan and usage time of electrical and electronic devices and investigated the causes of the "obsolescence" phenomenon. The researchers looked at four product groups: large household appliances (white goods), small household appliances, information and communication technology, and consumer electronics.

"For most products, first-use duration has decreased in recent years," says Siddharth Prakash. "We found that more and more devices were being replaced even if they were still in good working

order." Technological innovations are often the trigger, as we saw with TVs. "It's the same for white goods such as washing machines and fridges: around one third of the purchases are made to replace an appliance that is still working perfectly. The purchase is motivated purely by the consumer's desire for an upgrade." It's a desire that manufacturers and service providers are only too happy to encourage. "We need only think of telecoms packages, with the offer of a new smartphone every year," says Siddharth. The useful life of mobile phones is far too short, he adds: "According to Stiftung Warentest, 68 per cent of consumers replace their phones within three years, and only 9 per cent of them do so because the battery is weak or faulty." By contrast, 40 per cent were keen to upgrade and 28 per cent acquired a new mobile phone under the terms of their contract.

#### THE CAUSES

The study also found that from 2004 to 2012, average first-use duration of white goods was 13 years – a decrease of around one year. The percentage of appliances being replaced within just five years due to technical defects has increased noticeably: from 3.5 per cent to 8.3 per cent during the period under view. "With white goods, it's clear that technical defects are the main reason for purchasing a replacement," says Siddharth Prakash. However, the average duration of first use has remained fairly long. For washing machines, for example, average first-use duration in 2012/2013 was 11.9 years. "What is worrying is the high incidence of faults occurring during the first few years of use," he says.

In addition to surveying manufacturers, repair centres and consumers, the experts analysed product lifetime studies from Stiftung Warentest and research from The Wrap Institute in the UK in order to pinpoint the causes of obsolescence. The analysis showed that almost every component or part installed in a device or appliance can develop a fault – but some components and parts are more likely to do so and therefore to limit products' useful life.

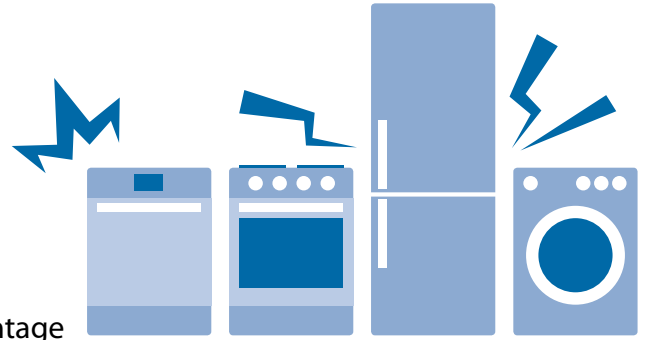
Repairs are also a challenging issue, according to the researchers. "Having a defective product repaired is generally a good option for the environment and has many positive social impacts in terms of jobs, for example, but financially, it doesn't always pay off for the consumer," says Siddharth Prakash. "This is partly because repair costs tend to be high and the costs of a new appliance are low." In their analysis, the experts calculated the life cycle costs of TVs, washing machines and notebooks. The cost breakdown highlights the critical aspects of repairs. "From the consumer's perspective, repairs really only make financial sense for high-end goods which rarely or never develop a fault," says Siddharth Prakash. "Cheap goods are simply not worth repairing." Time will tell whether and how the independent repair sector will rise to the challenges posed by current market trends and product development.

#### THE EFFECTS

What is certain is that the useful life of electrical and electronic devices is decreasing – and that is bad for the environment and resources. "We see less environmental impact from durable products," says Siddharth Prakash. "For example, greenhouse gas emissions from a more durable washing machine are 700 kg to a tonne lower than from a product with a shorter lifespan. The figure is 600 kg for TVs and 300 kg for notebooks. These emissions could be reduced by switching to a more durable product." What's more, electrical and electronic appliances contain a number of raw materials which generally go to waste if the product has poor longevity. "This applies to precious metals such as gold and silver, the rare earths, and other critical raw materials like cobalt, palladium and indium," the Oeko-Institut expert explains. Extracting and processing these resources often has a negative impact on human health and the environment. Take cobalt: most of the global supply is sourced from the Democratic Republic of the Congo, where mining conditions put lives at risk and violate human rights. Cobalt mining claims around 100 lives a year and child labour is not uncommon.



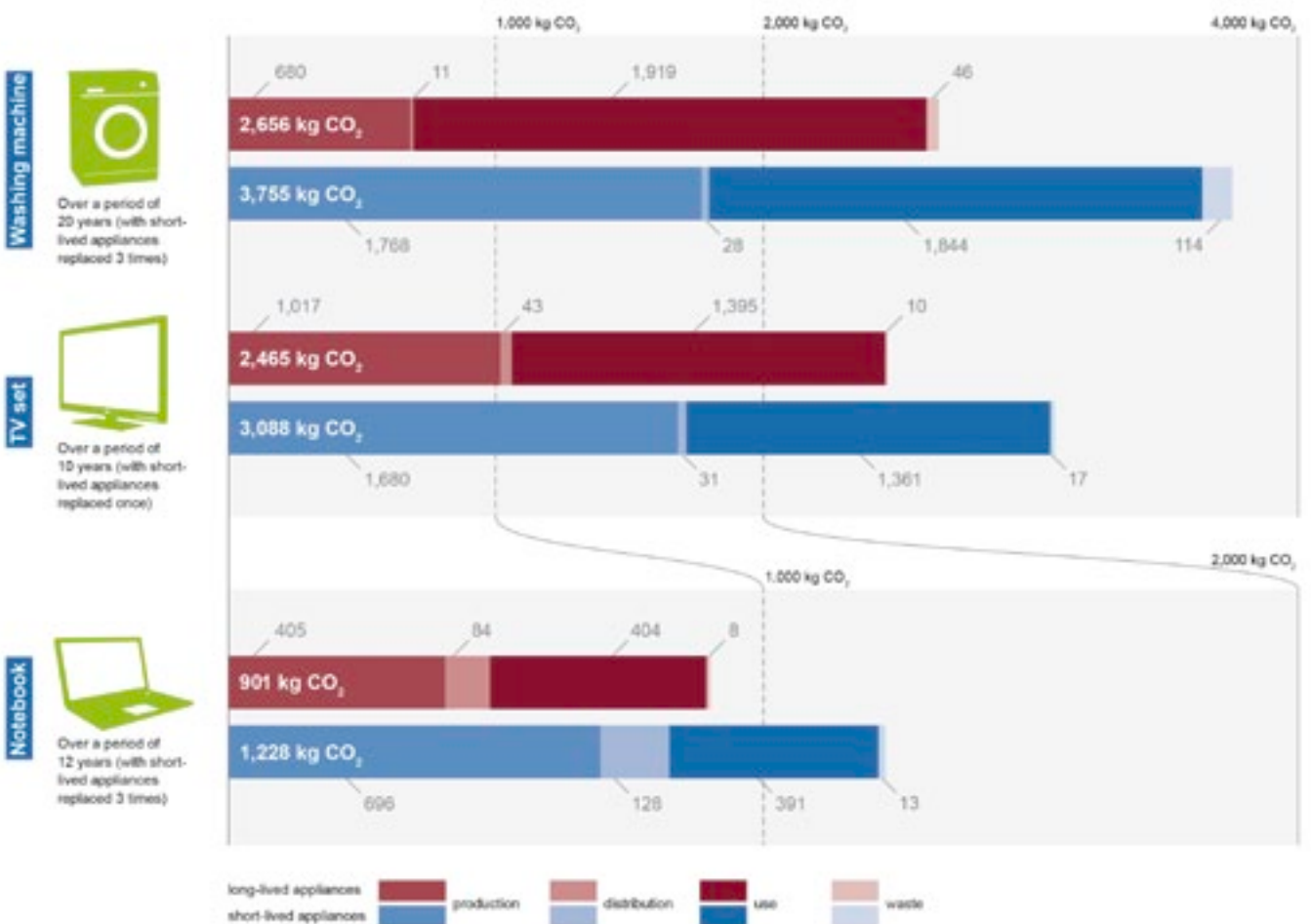
But isn't it often said that a new, energy-efficient appliance saves energy and costs? The Oeko-Institut has explored this issue in various studies as well. "There's no clear answer –whether it is worth extending longevity and useful life for the sake of the environment very much depends on the individual product," says Siddharth Prakash. "One factor which has a bearing is consumer behaviour; another is the level of the efficiency gains obtained from the new product; a third is the manufacturing process." If buying a new product is the only option, the consumer should of course choose one which is as energy-efficient as possible. "But if the existing electrical or electronic device is still in good working order and was only purchased a few years ago, the durable product is generally better for the environment," Siddharth Prakash explains. In other words, using the product for as long as possible benefits the environ-



The percentage of domestic appliances being replaced within just five years due to technical defects has increased from 3.5 per cent to **8.3 per cent.**

ment. And let's be honest: the natural world has much more attractive features than even a top-of-the-range flat-screen TV.

*Christiane Weihe*



Comparison of the environmental impacts of short- and long-lived products: Greenhouse gas potentials of washing machines, TV sets and notebooks

# A task for the whole of society

## Anti-obsolescence strategies

The useful life of electrical and electronic devices is shortening, according to the Oeko-Institut's latest obsolescence study, which also draws attention to the negative impacts on people and the environment. But whose task is it to take action? Is it down to policy-makers to set minimum product standards? Should manufacturers step up and offer high-quality durable products? Or should consumers refuse to buy cheap appliances that develop faults very quickly? The answer, as the study shows, is: all of the above. On behalf of the German Federal Environment Agency, the Oeko-Institut and the University of Bonn have developed strategies for extending products' useful life and duration of use.

For Siddharth Prakash, who led the obsolescence study, strategies to extend product lifespan and duration of use should adopt a multi-level approach. "Of course, policy-makers must put the right conditions in place and create incentives for longer product use," he says. In his view, minimum quality and durability standards are essential, not only for the appliances themselves but also for their critical components and parts. "In essence, we have to separate off the lower end of the market, thus stopping the poor-quality goods from being put on sale in the first place," he says. "Quality and durability standards would ensure that consumers could rely on a minimum lifespan for products and components, including a period in which products never, or only very rarely, need to be repaired." In practice, this means developing standards and norms for measuring and testing product and component durability and longevity. "Of course, there are already various standards and norms in place to verify components' safety and fitness for purpose, but there are no tests for product longevity."

### MORE TRANSPARENCY

Developing these standards and norms is a highly complex and time-consuming task, however. "So to begin with, it would be sensible to develop them for

the components and parts which are most prone to wear and tear," says Siddharth Prakash. But it is also important to ensure that product design matches the real-world parameters of use. Otherwise, the product can easily become overloaded, causing defects to occur prematurely. "What's more, we should keep in mind that it is not always possible to measure and test longevity reliably within a meaningful timeframe for each product group," says Siddharth Prakash. "For example, if you wanted to simulate seven-year usage for a TV, you would have to keep it running in the lab for around eighteen months, according to Stiftung Warentest. But by the time the test ended, products with short innovation cycles would no longer be on the market." Existing safety standards for components and parts therefore offer possible starting points. "First, it is essential to test how these standards can be expanded to include longevity and durability testing," says Siddharth Prakash. "The minimum standards of quality and durability for critical components can then be implemented via the EU's Ecodesign Directive."

The authors also recommend introducing more stringent obligations for manufacturers to provide product information. "Consumers should be aware, for example, of which shutdown functions have been built in as safety features and which parts are prone to wear and tear, under which conditions they

are likely to develop a fault, and how often the device should be serviced," says Siddharth Prakash. Manufacturers should also clearly state the limits to use: hand-held electric mixers, for example, should only be kept running for short periods of time.

The obsolescence study also looked at software-related decreases in the lifespan of appliances such as notebooks and printers. "It is unacceptable that a device in perfect working order goes to waste or has to be replaced simply because it cannot operate using the latest software," says the Oeko-Institut's expert. "Binding minimum software standards are required, such as sufficiently long availability of basic software drivers and mandatory hardware and software updates." Promoting free software and hardware initiatives such as open source operating systems may be another option. The Oeko-Institut's experts are now looking at sustainable software in a current study for the Federal Environment Agency.

### A QUICK FIX!

Another of the experts' key recommendations concerns better reparability of electrical and electronic devices – although they should of course work perfectly for a specified minimum period. The obsolescence study emphasises





**24 million**

smartphones were sold in Germany in 2014.

that independent repair centres which are not tied to specific manufacturers should have access to detailed repair manuals and to replacement parts, tools and diagnostics in order to ensure fair competition in the repair sector. "Clear minimum standards on the provision of spare parts and tools and on the replacement or reparability of parts subject to wear and tear, such as batteries, are essential," says Siddharth Prakash.

In addition, new service arrangements offered by producers may be useful. "Here, there are many possible approaches, such as leasing schemes, after-care or even buy-back agreements where the appliance is collected by the dealer or manufacturer for processing prior to reuse," says Siddharth Prakash. "The viability of these approaches should be explored in more detail and discussed with producers and sales outlets." An enabling environment is needed so that appliances remain in use for as long as possible. "One option is to promote reuse and the used appliance market by introducing a quality label to increase the appeal of second-hand electrical and electronic devices."

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**WHAT ABOUT CONSUMERS?**  
 .....

Besides policy-makers and manufacturers, consumers also have a role to play, note the experts. "The obsolescence study shows that many consumers buy new devices for lifestyle reasons," says Siddharth Prakash. "But they should be asking themselves: do I really need a new smartphone every two years, or indeed every year, which is what some mobile phone companies are offering?" Here, a new consumer mindset is needed to encourage more sustainable behaviour and a willingness to use electrical and electronic devices for as long as possible – for social and environmental reasons.

But strategies to combat obsolescence take time and cannot be introduced overnight. "This is a task for the whole of society and solutions are only possible if policy-makers, manufacturers

and consumers work together," says Siddharth. And pausing briefly, he adds: "We need a constructive dialogue, not conspiracy theories."

*Christiane Weihe*



*Siddharth Prakash's research focuses on sustainable consumption and production. He led the comprehensive study on obsolescence conducted by the Oeko-Institut and the University of Bonn from 2013 to 2016 on behalf of the German Federal Environment Agency.  
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