

Innovation posed questions to industry leader Nokia on the subject of sustainability, here is what they had to say.

Interview with Nokia

INSIGHTS FROM A SUSTAINABILITY

A globally successful company with a Scandinavian twist, Nokia employs more advanced environmental design practices than most companies. In hopes of spreading some of its wisdom, *Innovation* spoke with Anna Valtonen, Nokia's head of design research and foresight, and Markus Terho, the company's director of environmental affairs, to learn how Nokia integrates ecological design into its product development process.

What are some examples of green design at Nokia?

Our packaging design team was challenged to create a new packaging solution for Nokia's devices that would deliver greater environmental benefits without compromising consumer impact at the point of sale or requiring significant reengineering. The design team developed a compact packaging system that uses 54 percent less material and is comprised of 60 percent recycled materials. It was introduced in 2006, and to date Nokia has used it to ship 250 million phones. The smaller packaging has eliminated 5,000 trucks in the distribution of products around the world, which has saved the company 100 million euros.

Nokia 3110 Evolve, a mobile device with bio-covers made from more than 50 percent renewable materials. The device is presented in a small package made of 60 percent recycled content, and it comes with Nokia's most energy efficient charger yet, which uses 94 percent less energy than the Energy Star requirements.



Another example is the Nokia 3110 Evolve, our first mobile device to use enclosures manufactured from bio-polymers. We launched it in 2007 following detailed work with suppliers and designers to ensure that our environmental goals could be met and that the device would conform to Nokia's quality and durability standards. The bio-covers use more than 50 percent renewable materials, reducing the amount of fossil fuels consumed during manufacturing. The device is delivered to consumers in a small package made of 60 percent recycled content. It also comes with Nokia's most energy-efficient charger, which uses 94 percent less energy than Energy Star requirements.



LEADER

Can you outline the background of environmental awareness at Nokia?

More than a decade ago we began looking at how we could do more to save energy and improve the environment. We started by examining such issues as energy efficiency, material use and recycling. Finland is a country where nature has always been high on the agenda. At Nokia we also saw that improving environmental quality offers practical business benefits: improving our risk management, making strong economic and business sense operationally and reinforcing our brand. In addition, employees and external stakeholders can connect with the company's environmental priorities.

What are some of Nokia's more cogent design-for-ecology and social equity guidelines?

We encourage our designers to provide the same standard of quality and reliability regardless of price point. Teams creating entry-market phones apply the same rigor to their products as premium devices.

Social aspects can also be seen in our "design for all" approach where we ensure that all groups, regardless of income or physical impairment, can access the benefits of mobile technology. An example of this is the work we have done on usability to ensure font sizes and keypads can be used by everyone. We also design accessories and solutions to make our phones compatible with hearing aids and other such devices.



Remade is a concept that explores potential new ideas for the future, and is part of Nokia's ongoing work looking at how it can help people make more sustainable choices. The concept consists of two parts: a wearable sensor unit that can sense and analyze your environment, health and local weather conditions, and a mobile device that builds on the "three Rs"—reduce, reuse and recycle—using printed electronics and bio- and reclaimed materials in the phone's construction. The concept includes use of alternative energy sources.

The Nokia design process provides an eco-declaration for all mobile devices and accessories. The main focus during the product planning and design phases is on the product's material substance contents as well as material and energy efficiency. We continuously analyze the materials used in our products with the aim of reducing the amount of hazardous and harmful substances and using better materials, technologies and solutions.

Do you encourage design teams to make cell phones more durable, customizable or reusable?

Mobile devices must be durable and robust. They are intimate objects, used everyday and carried with us everywhere. They have to function and be beautiful to use and hold. This is even more pronounced in some of the developing markets where a single mobile phone is not just used by one person but by a whole family or even an entire village. It can also be used in someone's business, playing a key role in their livelihood. So ensuring that it is robust enough to handle such demands is essential.

Keeping these exigencies in mind, our designers introduced sweat-proof materials so a phone won't slip out of your hand in hot environments, sealed key mats so dust and dirt don't enter the phone in rural areas and shared address books so different people sharing the same phone can still have some degree of personalization.

How are Nokia design teams advised to deal with mandatory environmental regulations (WEEE, RoHS) in European markets? Do you sell any systems that contain lead solder?

The European RoHS Directive banned the use of lead in mobile phones in 2006. Nokia applies this standard to include all of its suppliers and products globally. Our first phone to be compliant with the RoHS legislation—the Nokia 5140i—was on the market a year before the law came into force.

Nokia takes a different approach than many others in the electronics industry. We ensure all materials put into our

products are identified, rather than focusing only on what is not put into them. We carefully study and set guidelines on the use of substances of concern, whether these come from regulatory requirements or our own research. At the moment, we have 28 substances or compounds that we have restricted from use or are monitoring. These guidelines apply to all of our products in all regions.

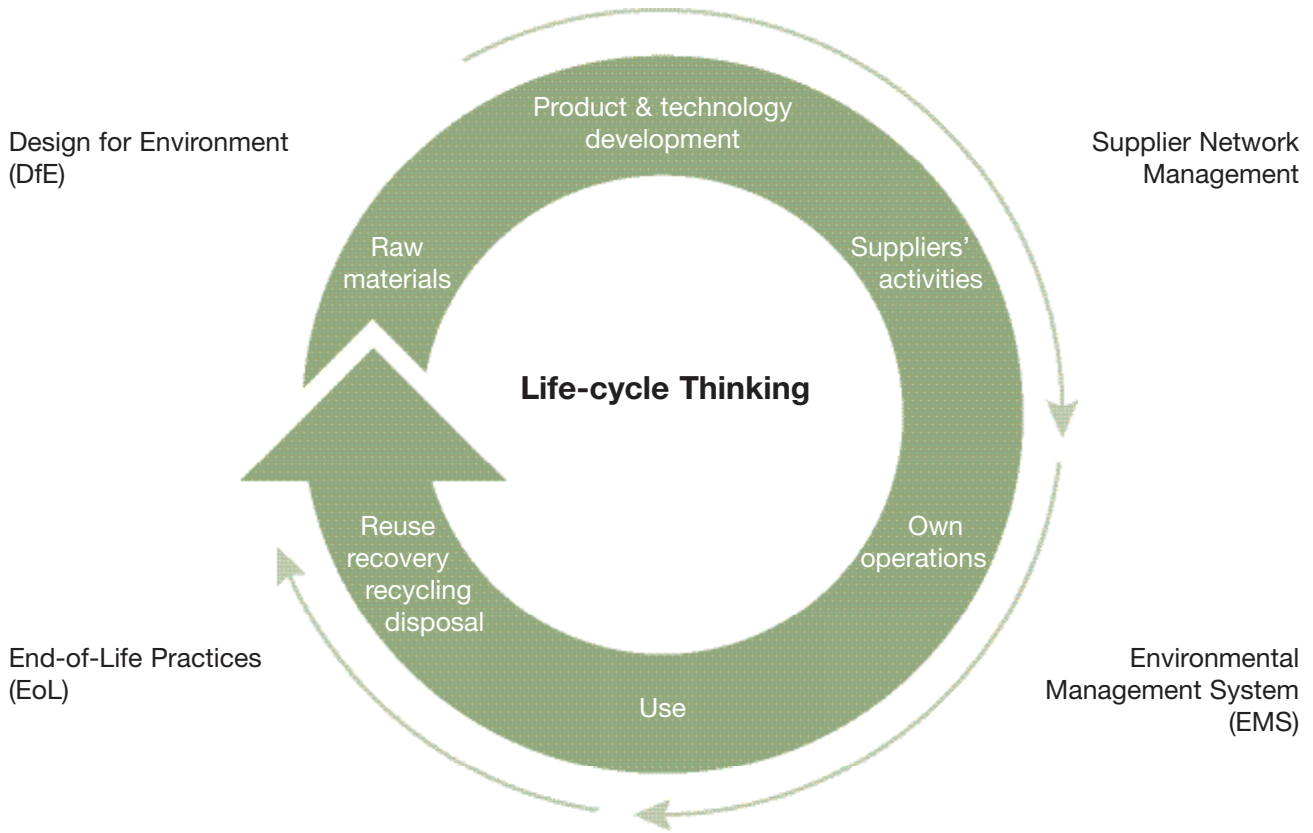
Do you have take-back programs outside of Europe?

We have take-back and collection facilities in 85 countries around the world offering many different ways to recycle your phone, such as bringing it back to a Nokia flagship store or service point. Some phone retailers and municipalities offer this service as well. In the US and UK you can visit Nokia's web site to print a prepaid voucher and return your phone to us directly via the postal service. In the US, we are also placing prepaid, pre-addressed envelopes in the packaging to further ease the return of phones and accessories. And we are collaborating with eBay on its Rethink Initiative to encourage the return of mobile devices.

In China, Nokia set up the Green Box program in 40 major cities and Nokia care points to collect unwanted phones. The program now runs nationwide and accepts any brand mobile phone or accessory. And in Finland in 2006, Nokia and the World Wildlife Fund (WWF) launched a joint campaign to distribute envelopes for the return of used mobile devices. For each returned mobile device and accessory, Nokia donated two euros to the WWF's climate change prevention work in Finland. Throughout the EU, Nokia works with other electronics producers to support countrywide electronics waste collection programs.

Several years ago there was discussion about the social damage caused by the mining of tantalum in Africa. How much tantalum is there in a cell phone?

Tantalum's unique capacitance allows the design of progressively smaller, more powerful and reliable electronic products. In a typical Nokia mobile phone, there is usually one tantalum capacitor. This equates to less than 0.04 gram



Nokia strives to reduce the possible harmful environmental impact of its products, services and operations over the entire product life-cycle.

of tantalum, which is about 0.04 percent of a phone's total weight. Tantalum consumption in the mobile phone industry comprises less than 2 percent of the metal's yearly production. Tantalum is used in all electronics and in the chemical and defense industries. Tantalum capacitors are critical components in cellular telephones, computer motherboards, computer disc drives, video camcorders and many other small devices.

Tantalum ores are found primarily in Australia, Canada, Brazil and central Africa. The Democratic Republic of Congo provides less than 1 percent of the world's supply of tantalum. Due to concerns about illegal smuggling of tantalum and poor working conditions in the Congo, we began requiring our suppliers to confirm in writing that they are not sourcing the metal from there.

What are workable strategies to reduce energy use in cell phones and rechargers?

We look at the environmental impact of our products and operations at each stage, from the materials used and the energy consumed to how products can be safely recycled

at the end of their life. The average power demand for our phones ranges from 1-5 watts—compared to 10-50 watts for a PC. When in standby mode (when the phone is not charging but is still plugged into the outlet), our best-in-class charger uses 30 milliwatts.

Two-thirds of the energy consumed by a mobile phone during its usage phase is lost when it's in no-load mode: when the phone is fully charged and detached from the charger but the charger is left connected to the outlet. We've taken several approaches to reduce this waste. We've reduced the amount of no-load energy used by our best-in-class chargers by 90 percent. By 2010 we aim to achieve an additional 50 percent reduction for our best-in-class chargers and use close to zero energy when in standby mode.

Also, in 2007 we became the first mobile manufacturer to put alerts into phones to encourage people to unplug their chargers. If all Nokia phone users around the world unplugged their chargers when not in use, enough energy could be saved to power 100,000 average-size European homes each year. ■