

**H**OW different is the future from the present? The answer lies partly in the pattern of consumption and its impact on natural ecosystems. Manufacturing, usage and disposal of various products generate huge amounts of pollutants and waste. Greenhouse gases (GHGs) are particularly important due to their impact on the environment. The environmental impact assessment of a product involves converting all GHGs involved in its life cycle into carbon dioxide equivalent, called CO<sub>2</sub>-eq. It is also known as carbon footprinting of a product.

By understanding the carbon footprint of a product, companies can focus on specific activities throughout the product life cycle that have disproportionate impact on the environment. For example, according to Apple, 81 per cent of the estimated GHG emissions (110kg CO<sub>2</sub> equivalent) for an Apple iPhone 6 over its life cycle is attributable to production, compared to 14 per cent for use, 4 per cent for transportation, and 1 per cent for recycling. To reduce the environmental impact of an iPhone, one should therefore investigate cleaner methods of production.

Through product footprinting, companies are better able to inform stakeholders that it is serious about sustainability, and has a rigorous approach for improving the environmental performance of its products.

In recent years, many companies in diverse sectors, ranging from farming to transportation, are paying at-



# For a cleaner environment

Industries, governments paying close attention to cutting down greenhouse emissions

tention to the environmental performance of their products and services. There are government-supported environmental labelling schemes, called eco-label schemes, that aim to communicate and help consumers choose products from companies that are committed to addressing the environmental impact of their products and services.

Overall, the environmental impact assessment of products and services is a relatively new trend. In recent years, several indicators have been proposed to systematically evaluate the environmental impact. There are a growing number of databases which have been developed and are regularly updated to support these assessments. PAS2050 was developed to estimate GHGs for diverse products and services. PAS2050:2011 provides guidance on how to carbon footprint products, identify hot spots, and reduce emissions in the supply chain.

The environmental assessment of the life cycle of products has also led to increased attention on a company's supply chain. Eco-friendly or green innovation helps businesses to stay at the cutting edge, retain existing jobs and create new ones.

In the construction sector, the world's largest industry, measures include designing green buildings as well as retrofitting existing buildings by improving the efficiency of individual components like electronic appliances, heating, ventilation, air conditioning and lighting systems. The demand for people with specific knowledge and skills to conduct environmental assessment of products is growing as companies compete for market share and look to differentiating themselves on the basis of eco-friendly products.

In other words, job scopes are changing. Engineers are expected to interact with suppliers and customers in diverse countries while contributing to the environmental sustainabili-

ty of products and services. In other words, the new jobs are without borders.

Recognising the need to equip students with new skills and knowledge, I educate mechanical engineering students at the National University of Singapore with life cycle assessment and carbon footprinting methods. The other two contributors to this article, Dr Daniela La Rosa from Catania, Italy conducts research on life cycle assessment of various products in Europe and Mr John Hsu is an expert in carbon footprinting and lifecycle assessment at the Carbon Trust, an organisation that helps companies and organisations reduce the environmental impacts of their goods and services.

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