MANCHESTER 1824
The University of Manchester

Case Study: Carbon Calculator

CCaLC - carbon footprint calculator to support environmental sustainability within industry

The challenge

With increased understanding of the environmental threat posed by climate change, there is growing pressure on organisations of all types and sizes to manage their carbon emissions and evidence sustainability initiatives. The ability to measure the carbon footprint of industrial activity is a crucial step in mitigating climate change effects, however the complexity of industrial supply chains makes this a challenging task.

Previously developed carbon footprinting tools were inadequate for industrial use, being either too simple or too complex and lacking readily available or affordable datasets. Companies required a tool that could be tailored to meet the specific needs of their industry and provide calculations and decision support for reducing carbon footprints along complete supply chains.

> By using CCaLC, Ineos ChlorVinyls and the PVC industry have been able to quantify the implications of sustainability initiatives such as PVC recycling. The tool is being disseminated widely across the sector and is highly valuable for the European PVC industry's commitment towards sustainable development.
>
> *Dr Jason Leadbitter, Sustainability and Compliance Manager, Ineos ChlorVinyls*

The University of Manchester solution

Supported by funding from Natural Environment Research Council (NERC) and Engineering and Physical Sciences Research Council (EPSRC), an internationally leading group in carbon footprinting and sustainability formed a partnership with over 30 companies and organisations across different sectors, to develop a tool to specifically meet industry requirements. By working closely with potential end-users it was possible to build extensive data sets and engage in industry-led concept testing. The resultant product was CCaLC, an award winning carbon footprinting tool that can be tailored for different industrial sectors and applications.

- **Simple:** The tool offers a quick and easy method for identifying carbon 'hot spots' and opportunities for reducing carbon emissions.
- **Comprehensive:** Users can estimate other environmental effects, including the organisation's water footprint. This ensures that the carbon inventory is not reduced at the expense of other environmental impacts.
- **Economic:** The software estimates financial costs and value added to demonstrate the trade-offs between 'carbon added' and 'value added.' The financial cost and benefits of reducing the carbon footprint can also be estimated.

CCaLC is an environmental sustainability project launched by researchers at The University of Manchester. The CCaLC team have developed a number of tools for calculating and reducing the carbon footprint, which are available to download for free. The CCaLC team also offer training courses aimed at understanding the practice of carbon footprinting. **www.ccalc.org.uk**

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The benefits

The collaboration has allowed both The University of Manchester and the industrial partners to improve their awareness and understanding of issues related to carbon footprinting and industrial sustainability. The project has delivered a free carbon footprinting tool that can be downloaded from the internet. Its accessibility has led to significant impact and is being used across the globe in a range of organisations, including commercial companies, government departments, NGOs and universities.

- **ENGAGEMENT** with practitioners in industry and consultancy has advanced understanding of specific industry requirements, resulting in strengthened relationships with external parties and further collaborative working.
- **SUSTAINABLE** income sources for the University have been achieved through the implementation of carbon footprinting and corporate sustainability courses, which have been attended by senior delegates from multiple companies and organisations.
- **CONSULTANCY** activity has increased significantly as a follow-up to the software training courses.
- **AWARD WINNING** software has raised the University's profile within industry. In 2010, CCaLC won the IChemE Award for Outstanding Achievement in Chemical Process Engineering and in 2011 it won the GSK Innovation Prize at the Chemical Industries Association Awards.

CCaLC has offered a strategic framework for managing carbon emissions and integrating carbon management into existing business practice. The application of cutting-edge research to supply chain management has empowered managers to reduce environmental impacts.

"CCaLC has helped Kellogg's to identify business wide hot spots and provide focus in terms of future priorities for carbon reductions along the entire value chain", says Richard Burkinshaw, Kellogg's Senior Sustainability Manager, Europe. "We've also found CCaLC useful to inform how to design more sustainable future products and as a vehicle for engagement with suppliers. One of the other attractions of using CCaLC is that all this can be achieved in house, building know-how and without the need to depend on external consultants."

"The development of CCaLC has been a very rewarding experience for us and has led to new research ideas as well as fruitful new collaborations with industry. As the number of CCaLC users continues to grow, we hope that so will its impact on greening industrial supply chains."

Professor Adisa Azapagic,
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