Cefic commissions study

With the well-proven adage in mind that "you can't manage what you don't measure", Cefic commissioned Professor Alan McKinnon of the Logistics Research Centre at Heriot-Watt University, Edinburgh, to carry out a study on transport carbon measurement and management for the chemical sector. Cefic is also working with Professor Jan Fransoo of Eindhoven University of Technology who has developed a GHG calculation tool for transport.

The McKinnon report, "Measuring and Managing CO_2 Emissions of European Chemical Transport"*, aims to improve understanding of how to measure and evaluate emissions, and how they can be reduced in chemical transport operations. It draws on existing literature, results of a Cefic survey on transport volumes, interviews with senior logistics managers from chemical companies and a Cefic high-level workshop on the subject. The report also looks at how other industrial sectors are addressing the issue.

As Jos Verlinden, Cefic's Logistics Director notes "This report is an important step towards understanding how chemical and transport companies can assess and improve their transport activities. Defining effective measuring tools will help industry to make progress in this area."

* The report 'Measuring and Managing CO_2 Emissions of European Chemical Transport' is available to download from the Cefic website.

According to Alan McKinnon, there is still a reasonable amount of "low hanging fruit" to be harvested, both on an individual company basis and through cooperation with other companies. And although this will require some initial investment, it will be self-financing in the short to medium term. "Improving logistics efficiency and GHG emissions reduction go hand in hand in many cases," says Verlinden.

Influencing factors

The most important factors influencing transport GHG emissions are weight, volume, distance, loading factor, empty runs and the energy efficiency of the transport mode used. Other factors include the supply chain structure, vehicle capacity and the carbon intensity of the energy source.

Up to 15% of emission reduction could be achieved without increasing costs by modal shift to less energy intensive transport modes, according to the Eindhoven research.

Alternatives to using road transport are, however, often limited. But the energy efficiency of road transport itself can also be improved by using best available engine technology and state-of-the art vehicles, through driver training (eco-driving, Behaviour Based Safety) and by efficient planning to avoid road congestion periods.

Measuring the challenge

The McKinnon study highlights that the basic issue of measurement is far from clear-cut. While efforts have been made to standardise the measurement and reporting of GHG emissions in order to ensure comparability, there is no single agreed standard at present. The European standard organization CEN is expected to complete the development of a standard for the measurement of GHG emissions from transport mid 2012.

Standards developed by the World Business Council on Sustainable Development and the World Resources Institute (the Greenhouse Gas Protocol) and International Standards Organisation (ISO 14064) both offer guidelines for the carbon auditing of individual businesses, and advice on the scoping of the calculation, data collection methods and the allocation of emissions.

But neither provides detailed guidance on how carbon emissions from specific activities should be measured.

Despite the current lack of a uniform methodology for calculating carbon emissions, the McKinnon report provides clear guidance in key areas. It proposes a set of recommended average transport emission factors for the different modes of transport, taking into account the specific characteristics of chemical supply chains. The emission factors recommended by McKinnon have been used by Cefic to prepare initial estimates of the total transport CO_2 emissions of the European chemical industry.

GHG emissions can be measured "tank-to-wheel" (direct engine emissions and emissions from power plants "fueling" rail), "well-to-tank" (indirect emissions from energy exploration, production and distribution), or by combining both: well-to-wheel. In addition, emissions of ancillary services should be included such as storage, material handling, or tank cleaning operations.

Building on experience

A holistic approach is important: tank cleaning, for example, can represent up to 7.5% of transport CO_2 emissions. At this moment most emission factors are however, still based on a tank-to-wheel approach.

The report also examines a range of possible decarbonisation measures for chemical transport operations, focusing on five key parameters: modal split, supply chain structure, vehicle utilisation, energy efficiency and carbon intensity of the energy source. Opportunities and challenges are assessed, and the cost-effectiveness of possible measures is also addressed.

Notes Jack Eggels, Chairman of the Cefic Strategy Implementation Group Logistics: "This report represents the first step to understanding how we can assess and improve our operations. In commissioning this work, the chemical industry is taking a proactive role in improving the measurement and management of transport-related carbon emissions as part of its continuing commitment to safe, efficient and sustainable logistics."