INTERNATIONAL COUNCIL OF CHEMICAL ASSOCIATIONS

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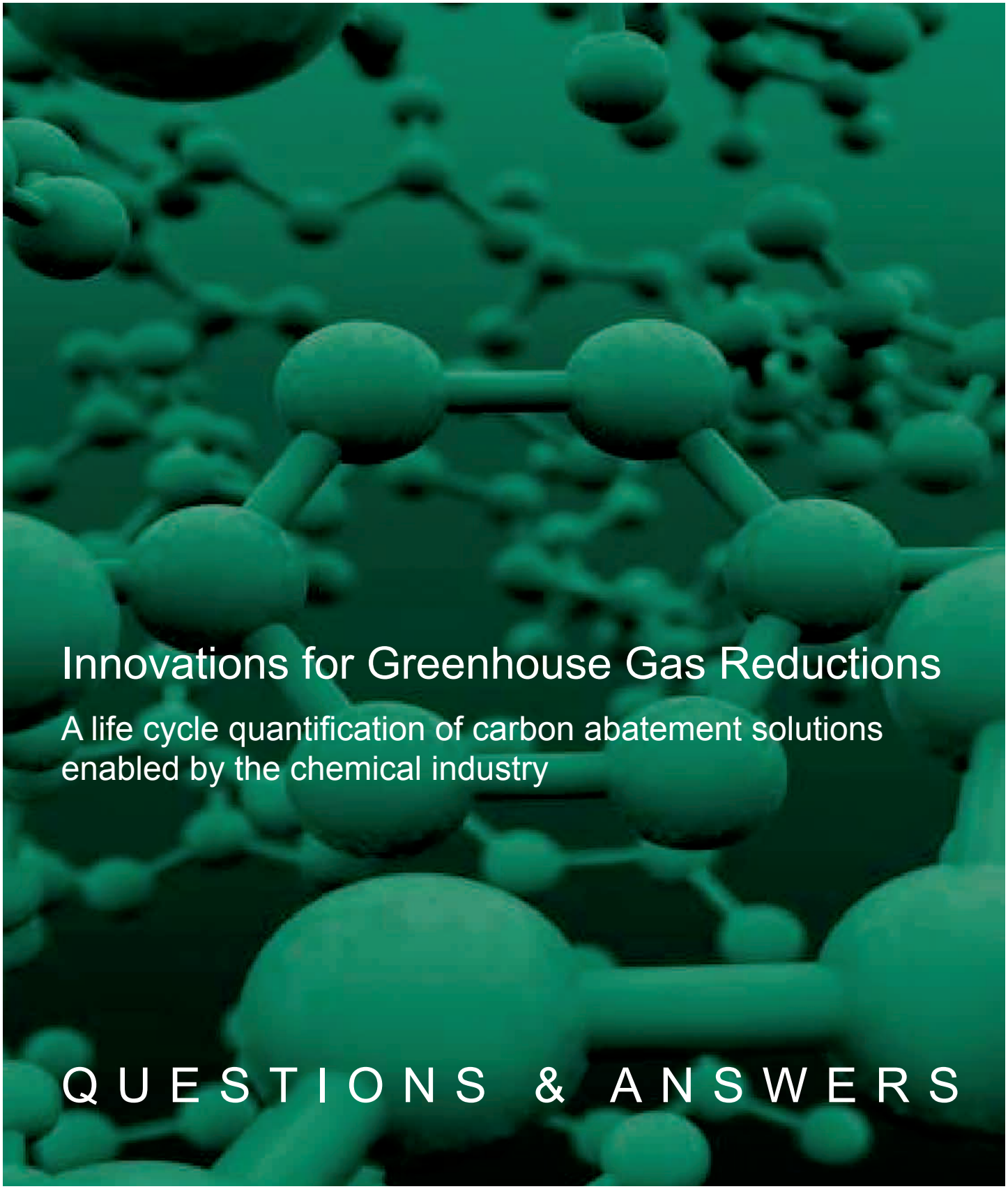

Innovations for Greenhouse Gas Reductions

A life cycle quantification of carbon abatement solutions enabled by the chemical industry

QUESTIONS & ANSWERS

1/ What is the aim of the "Innovations for Greenhouse Gas Reductions" report?

This report helps industry, stakeholders and policymakers understand the role that chemical products play as enablers of climate solutions through the supply chain. McKinsey & Company, the global management consulting firm, conducted independent analyses and overall project management for the study, which examined the global chemical industry's impact on greenhouse gas emissions through the life cycle of chemical products and the difference they make in the applications they enable. In commissioning this report, the International Council of Chemical Association's goal (ICCA) is to further reduce the greenhouse gas (GHG) emissions of the chemical industry by improving its processes while encouraging the use of products that save energy and create a net emission reduction along the value chain.
The Öko Institut, a German scientific NGO reviewed the scientific basis of the report. As such, this report does not attempt to verify the findings of the IPCC reports.

2/ What are the main findings of this report?

The report found that for every unit of greenhouse gases emitted directly and indirectly by the chemical industry, this industry enabled 2-3 units of emission savings via the products and technologies provided to other industries and consumers. In other words, products of the chemical industry enabled greenhouse gas savings 2-3 times greater than their emissions, depending on the scope and assumptions used. The most significant emissions savings by volume came from insulating foams in buildings, agrochemicals, lighting, plastic packaging, marine antifouling coatings, synthetic textiles, automotive plastics, low-temperature detergents, engine efficiency, and plastics used in piping.
Under 2030 scenarios, the report found that the ratio of emissions savings to emissions could increase to more than 4:1, based on stronger emission improvements in the production and use phases.

3/ Why is this report being published now?

The decision to commission this report was taken by ICCA members more than a year ago to provide solid, independently validated data based on their practical experiences to prepare for pragmatic solutions. Producing such a complex report took many months.
Even apart from the United Nations Framework Convention on Climate Change, this report can contribute sound data and perspective to climate policy decisions at the national, regional and international levels, such as the COP-15 process or the individualized carbon frameworks.

4/ What's new in this report?

The chemical industry is the first global industry to do such a comprehensive global carbon study on a lifecycle basis (cLCA). The report confirms that the chemical industry's efforts to reduce greenhouse gas emissions are yielding results – its own performance and in its contributions to GHG reductions by others. The chemical industry in many different parts of the world has improved its energy savings at manufacturing sites and in this regard reduced its GHG emissions over the last decades significantly. And the study highlights the vital role of this industry in reducing GHG emissions by making products that save energy and create a net emission reduction along the value chain. Moreover, the two scenarios to 2030 show that the chemical industry has substantial potential to help the world further reduce emissions.
The report suggests the importance of broadening the climate discussion to consider the chemical industry's current emissions abatement contribution and future potential when constructing policies and approaches.

5/ Is this a report on environmental commitments?

The chemical industry is committed to reducing further greenhouse gas emissions in its own operations by improving processes. This report only deals with climate issues, providing an analysis of the global chemical industry's current GHG emissions and current and future potential abatement performance. ICCA communicates on other environmental issues like water or product safety via other initiatives like Responsible Care®.
Significantly, the scenario suggesting the potential for a 4-5:1 ratio of emissions savings to emissions will require improvements beyond the chemical industry. Reaching this potential will also require more extensive use of chemical products for energy-saving applications as well as careful design and implementation of governmental policies.

6/ How credible and transparent is this report?

The report was supported by McKinsey & Co and its cLCAs were reviewed by the Öko Institut, an independent scientific NGO in Germany. Data, analysis and methodology used are available in the report. It relies on extensive use of surveys and scientific external advice or bodies. The study calculated the chemical industry's impact on emissions in 2005, the most recent year for which complete data is available. The ICCA and its members have contributed product information for the report.

7/ How was the analysis performed?

The cLCA report used a life cycle carbon dioxide-equivalent (CO_2e) emissions analysis to assess the impact of the use of chemical products in enabling greater carbon efficiency in the global economy. This is not a new methodology but a simplified LCA, taking only greenhouse gases into account. Carbon Life cycle analyses were performed for over 100 individual chemical product applications, comparing the emissions of a chemical product in a given application with those of the next best non-chemical alternative.

8/ Why did this report make some extrapolations in its calculations?

In this ICCA report, each carbon life cycle analysis (cLCA) compares the CO_2e emissions of a chemical industry product in a specific application with the next best non-chemical industry alternative that preserves current life style. What was used is not a new methodology, but rather a simplified LCA, measuring greenhouse gases only. For simplicity, the term "chemical product" is used to define a product that is produced by the chemical industry.

For those chemicals not covered in the analysis, the results of the cLCAs therefore were extrapolated in a careful and conservative manner so that conclusions could be drawn for the chemical industry as a whole.

To arrive at this extrapolation, the study segmented the emissions linked to the chemical industry into three groupings:

1) chemicals in applications for which cLCAs were calculated (explicit numbers for gross and net savings were available, e.g. light-weight plastics in vehicles);

2) chemicals in applications for which cLCAs were not calculated, but non-chemical industry solutions exist (e.g. low-volume applications of polymers and many specialty and fine chemicals, e.g. food preservatives or catalysts in oil refining. The assumption here was that emissions and gross savings are equal);

3) chemicals in applications for which realistic alternatives from other industries are not available without destroying performance or severely compromising living standards.
For this category, the study took an even more conservative approach and assumed gross savings of zero (hence negative net savings, thereby negatively impacting the industry's savings ratio)..

9/ Why can this report be the basis for policy action?

The study creates the basis to assess the need for better policymaking. Effective policies are essential to ensure that the net emissions savings potential identified in this study materialize. Some guiding principles for policy action are:

- Develop a global carbon framework which covers all regions and sectors.
- Focus on the largest, most effective and lowest cost abatement opportunities.
- Push for energy efficiency and support the development and implementation of new technologies.

Enabling a more appropriate global framework to avoid market distortions, supporting the development and implementation of new technologies, focusing on the most effective abatement, incentivizing the use of energy savings materials and pushing for more energy efficiency, rewarding early movers that proactively reduce their CO_2e footprint, this report provides a basis for global actions.

10/ Why is carbon leakage addressed by this report?

Carbon leakage is the migration of industrial production, GHG emissions and jobs into non-regulated regions with higher carbon intensity. It is addressed by this report because it can hurt regions and companies by causing distorted competition and inhibit their capacity to produce innovative solutions essential to carbon reduction. Carbon leakage also reduces the effectiveness of policies intended to reduce greenhouse gas emissions because net global emissions increase rather than decrease.

Carbon leakage is, then, a significant concern for the chemical industry. The chemicals sector is a carbon-intensive industry with strong exposure to international competition. It is a very complex and integrated network of interdependent products, where price changes for one product may have a "domino effect" on an entire value chain, affecting even consumer goods. It must be emphasized not only that basic chemicals are exposed to fierce international competition, but also that downstream chemical products are highly trade exposed, especially in recent years.

11/ How can this report help to avoid carbon leakage?

This report suggests taking a global approach to meet concerns about possible market distortions and to avoid carbon leakage. The benefits of the described products as shown in the cLCAs can only be fully exploited by an industry that retains competitiveness and innovation capacity. Harmonized global policies for global markets – or one global policy – are an essential element that authorities must strive for to avoid market distortions and minimize carbon leakage. In the interim, as the chemical industry is carbon-intensive and trade-exposed, it may need local transitional provisions to avoid market distortions.

12/ Why does the report have two future scenarios?

Use of two scenarios helps to illustrate the potential impact of different approaches taken by industry, policymakers and other stakeholders to realize greenhouse gas mitigation measures. One scenario is the Business As Usual (BAU) approach that is characterized mainly by volume growth, assumptions for regular energy efficiency gains and regional production shifts to areas of the world that are more dependent on coal for energy. No additional regulatory push for low-carbon development is assumed in this case. The other scenario, called the Abatement scenario, assumes aggressive implementation of measures leading to a low-carbon economy.

13/ Which chemical products have the most savings?

The report shows the areas in which chemical products can have the greatest impact on emissions reductions: insulating foams in buildings, agrochemicals, lighting, plastic packaging, automotive plastics, low-temperature detergents, engine efficiency, marine antifouling coatings, and synthetic textiles. In some cases, benefits per unit of product are small, but contribute to significant savings due to their widespread use. Governments should continue

funding research and development. The important role of the chemical industry should be reflected in these programs. Policies at the international, regional and national levels should include steps to fully capture the abatement potential.

14/ What is the International Council of Chemical Associations (ICCA)?

The ICCA is the worldwide voice of the chemical industry, a sector with 2007 turnover of more than US$ 3 trillion for 70 000 products. ICCA members come from countries that account for more than 70 per cent of global chemical manufacturing operations. Chemicals management, international climate negotiations, government and business partnerships, regulatory affairs, stakeholder outreach, advocacy and communications are key areas of focus for ICCA, which also promotes and co-ordinates Responsible Care® and other voluntary initiatives, advancing best practices within the industry.
For additional information, see http://www.icca-chem.org.

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ICCA website
Further information about the Council and its activities, including various materials for downloading, can be found on the ICCA website www.icca-chem.org

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