



July 31, 2012

Technology Executive Committee
United Nations Framework Convention
on Climate Change
P.O. Box 260124
D-53153 Bonn
Germany
Via Email to tec@unfccc.int

RE: Technology Executive Committee call for inputs on technology road maps; experiences and lessons learned from road map development

Dear UNFCCC TEC Members:

CEFIC, the European Chemical Industry Council¹, and the International Council of Chemical Associations (ICCA)², are pleased to provide this input in response to the Technology Executive Committee's (TEC) request for input on the development of technology road maps. Our organizations have a significant interest in the development and use of technology road maps as a means of assessing the energy efficiency and greenhouse gas reductions that can be achieved by improving the use of existing technologies that rely on chemistry, as well as identifying emerging chemical technologies and products that can enhance those savings.

Background

CEFIC and the ICCA member associations are committed to reducing greenhouse gas emissions. We are working to meet this commitment in two ways: First, by reducing emissions in the industry's manufacturing facilities; and, second, by innovating new products that reduce emissions when used by other industries and consumers.

In our own facilities, chemical companies have significantly improved energy efficiency and reducing greenhouse gas intensity. The European chemical industry reports that overall greenhouse gas emissions have been curbed by 49% between 1990 and 2009, while production increased 60%. Between 1990 and 2010, the Japanese chemical industry improved energy efficiency by 17%, and reduced absolute greenhouse gas emissions (including HFCs, PFCs and SF6) by 29%. In the United States, the industry's absolute greenhouse gas emissions fell nearly 25% between 1990 and 2011, while industry output was up 28% (output declined between 2008 and 2011, reflecting the economic downturn).

¹ CEFIC is an accredited UNFCCC observer organization.

² ICCA has applied for accreditation as a recognized UNFCCC observer, but to date has not been informed of a decision on our application.

The products of the chemical industry are already enabling greenhouse gas emissions savings by industries and consumers; savings that are more than twice the emissions from manufacturing. The ICCA study “Innovations for Greenhouse Gas Emission Reductions” (July 2009) shows these savings across a range of more than 100 chemical products.³

ICCA’s Technology Road Maps

ICCA’s work on technology road maps supports the dual objectives of improving our production efficiency and contributing to reductions in energy use and GHG emissions. The work builds on our 2009 study by providing a bottom up assessment of future technology improvement options.

ICCA has focused its efforts in three areas: **Bio-fuels and Bio-energy, Efficiency/Catalysis and Building Energy Efficiency**. Industry experts from our global regions have been collaborating with the International Energy Agency (IEA) to identify and evaluate current and future contributions of chemicals and new materials to energy efficiency and greenhouse gas emissions improvements with a time horizon towards 2030/2050. Our work is being supported through international workshops led by ICCA and IEA. A summary of our work in each area is attached for your further information.

ICCA’s contribution to the IEA’s bio-fuels and bio-energy roadmap was completed in May, 2012, with the IEA’s publication of its bioenergy for heat and power technology roadmap. Our work on the catalysis roadmap is nearing completion. We received input from technical experts and policy makers and conducted outreach on the topic during a working in China, held in May, 2012.

ICCA’s building energy efficiency roadmap is continuing, and is expected to be completed by October, 2012. Using 2000 as a baseline year, the roadmap addresses the energy efficiency and greenhouse gas emissions savings from the use of chemically-derived products in the areas of insulation, house wrap, windows, roofing, and piping. The report specifically analyzes the achievable improvements in the residential and commercial building sectors of the United States, Europe, and Japan. The ultimate objective is to outline a strategic plan identifying options and prioritizing actions for how the plastics and chemicals industry can further contribute to achieving zero or low-emission buildings, and to address barriers to creating an enabling environment that facilitates technology development that result in low or zero emissions buildings. We anticipate that the energy savings and greenhouse gas emissions reductions attributable to the use of the products of chemistry in residential and commercial buildings will be significant.

Over the last two years, ICCA member companies and associations have gained some important insights into the development and possible use of technology road maps. For example, it is clear that developing and obtaining the data on which to base the roadmaps was the single largest challenge for our sector. Understanding the limitations of the available data, and articulating the assumptions on which the analysis could be conducted, were also among the important lessons we have drawn from the process.

³ ICCA, “Innovations for Greenhouse Gas Reductions,” (2009), available at http://www.icca-chem.org/ICCADocs/ICCA_A4_LR.pdf. Note that this is a large document. An Executive Summary of the report is also available at http://www.icca-chem.org/ICCADocs/QA_v6.pdf.

Technology Executive Committee

July 31, 2012

Page 3

We understand that the TEC will consider the inputs at its fourth meeting, scheduled to take place from 6-8 September, 2012, in Bangkok. We would appreciate your positive recognition of this initial input, and look forward to the opportunity to follow up with more detailed information. In the meantime, please let us know if you require any further information.

Best regards,



Shigenoir Otsuka
Executive Consultant
Mitsubishi Chemical Holdings Corporation
Chairman, ICCA Energy & Climate Leadership Group



Peter Botschek
Director, Energy
CEFIC

Attachments



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Biofuels Technology Roadmap: “Cleaner Transport: Powering Transportation with Cleaner Fuels”

- Biofuels enable considerable GHG reduction in the transportation sector and contribute sustainably to energy security and socioeconomic development.
- The chemical industry can play a role in realizing a sustainable future that is targeted toward biofuels and bioenergy production.

ICCA efforts to Develop Biofuels Technology Roadmap

- ⇒ ICCA helped develop a “Biofuels for Transport” roadmap with IEA to set up a potential scenario to meet CO₂ emission reduction goals.
- ⇒ The Roadmap clearly acknowledges the importance of the chemical sector both in terms of R&D investments and core technology components, such as tar-free syngas production and bioethanol from the conversion of cellulose to sugar.

Efficiency

- Membrane technologies reduce the energy required to recover ethanol from fermentation broth and makes the process more efficient.
- The chemical industry’s ability to achieve and integrate heat transfer in processing plants reduces the cost of materials and operations.
- Incorporating such integration for combined heat, power and fuel production can improve the efficiency of biofuels manufacture and support energy crops from agriculture and aquaculture.

Technology

- The chemical industry developed and uses catalytic processes critical to biofuels production.
- As greater emphasis is placed on advanced fuels, increasingly production of biofuels will rely on technologies practiced by the chemical industry.

Economics

- The cost of feedstock is an impediment to expanded use of biofuels.
- Chemical pretreatment processes that simplify hydrolysis on cellulose markedly improve the economics of fuel production.

Technology roadmaps

ICCA is working closely with the International Energy Agency (IEA) as it is preparing technology roadmaps on climate issues.

ICCA

The International Council of Chemical Associations (ICCA) is the world-wide voice of the chemical industry, representing chemical manufacturers and producers all over the world. It accounts for more than 75 % of chemical manufacturing operations with a production exceeding USD 1,6 trillion annually. ICCA promotes and co-ordinates Responsible Care® and other voluntary chemical industry initiatives.

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Catalysis Technology Roadmap:

- The chemical industry contributes to reductions in energy usage and GHG emissions by continuing to invent and deploy new catalyst technology.
- More than 85% of chemical products are produced via catalytic processes.
- Newly developed catalysts allow processes to proceed via a lower energy pathway, which can allow process steps to be eliminated and streamline downstream processing, saving large quantities of energy and reducing GHGs.

ICCA efforts to Develop Catalyst Technology Roadmap

- ⇒ ICCA is working with IEA to show how catalysts can help meet CO₂ emission reduction goals.
- ⇒ The roadmap will show where catalysts can play a key role in chemical industry efforts to reduce energy consumption, enable adaptation to a changing feedstock mix, and allow production of unique advanced materials that help save energy for consumers.

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Changing Hydrocarbons into Useful Products

- Catalysts play a key role in the efficient transformation of hydrocarbon precursors, such as methane, ethane and propane, into fuels and chemical products.
- The trends toward production of lower quality fuels, more stringent environmental regulations on fuels, and the advent of new fuel sources demand step changes in the development and application of new catalyst technology.

Alternative & Renewable Feedstocks

- The ability to change alternative or renewable feedstocks into useful precursors for chemical production is already a reality and will be vital to future production capabilities, and catalysis has a role to play in this area.
- Fuel cells, hydrogen production, and reuse applications of CO₂ are active areas of catalyst research.

Materials Development

- Catalyst innovations allow development of new materials used to make lighter-weight vehicles and aircraft, adhesives for advanced materials, and renewable energy structures such as wind turbines and solar panels.
- Advances in catalyst technology will be crucial to addressing the challenge of producing these materials from new monomers.



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Building Energy Efficiency Technology Roadmap:

- The chemical industry contributes to a reduction in GHG emissions and improved energy efficiency in buildings through advanced component technologies.
- Significant improvements in GHG emission and energy efficiency, both for new construction and retrofits for existing buildings, can be achieved in the following areas: insulation, plastic house wrap, windows, roofing and piping.

ICCA efforts to Develop Buildings Energy Efficiency Technology Roadmap:

- ⇒ ICCA is working with IEA to develop a “Low Emission Buildings” roadmap with IEA to help meet CO₂ emission reduction goals.
- ⇒ The roadmap clarifies the importance of the chemical sector both in terms of R&D investments and core technology components.

Building Technologies

Insulation

- Whether spray polyurethane foam (SPF) in the attic or rigid foam polyiso board on the roof, polyurethane-based systems offer durability, energy savings and moisture control. When used in retrofit situations, they also help reduce building waste sent to landfills.
- In walls, behind walls and under floors, polystyrene foams provide significant energy efficiency. Savings vary by material and products: rigid extruded polystyrene (XPS) is a builder favorite because it can be installed easily and effectively; structural insulated panels made with expanded polystyrene (EPS) can help homeowners save hundreds of dollars annually on heating and cooling bills.

Plastic House Wrap

- The advent of plastic house wrap technology has reduced infiltration of outside air into the average home by 10% to 50%, helping to drastically reduce the energy required to heat or cool the home. These plastic films have helped reduce GHG emissions in the United States by 120 million to 600 million tons of CO₂ since 1980 (assuming that all homes built in the U.S. since 1980 have some form of plastic barrier).

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Windows

- Plastics rival traditional materials for window glazing. These clear, lightweight, shatter-resistant plastic products, such as polycarbonate used in windowpanes, have low thermal conductivity, which can help to reduce heating and cooling costs.
- Vinyl window frames are inherently energy efficient and save the U.S. nearly 2 trillion thermal units of energy per year, helping reduce GHG emissions associated with energy generation—all the while cutting maintenance time, materials and costs.

Roofing

- Reflective light-colored roofing membranes made of vinyl or thermoplastic olefin blends are key energy saving applications, especially for commercial buildings in warm climates.

Piping

- Plastic pipe and fittings are durable, easy to install and do not rust or corrode over time. Several types of plastics are used for piping, depending on the properties and performance required. Products like polyethylene, polypropylene, polyvinyl chloride (PVC), or acrylonitrile butadiene styrene (ABS) offer fusion integrity when joined properly, eliminating potential leak points where water could be wasted.
- In home building, flexible blue and red cross-linked polyethylene piping (PEX) is becoming a builders' favorite for hot and cold water delivery due to its flexibility, lightness, and ease of installation—enabling multiple feed lines throughout a house, to allow hot water to arrive more quickly to a sink or shower, with significant water savings.