Statement by the American Chemistry Council

U.S. House of Representatives Energy and Commerce Committee

Subcommittee on Energy and Power

"American Energy Security and Innovation: An Assessment of Private-Sector Successes and Opportunities in Energy Efficient Technologies"

February 26, 2013

The American Chemistry Council* welcomes the opportunity to comment on private-sector successes and opportunities in energy efficient technologies. The chemical industry plays a critical role in providing solutions that increase energy efficiency in buildings and pave the way towards the near-zero energy buildings of the future. Many effective chemical industry products – including a range of energy efficient plastics – are already available and in wide use today and new and better technologies are constantly being developed.

According to the International Energy Agency's Energy Technology Perspectives 2012 report, the building sector is directly or indirectly responsible for about 32% of global energy consumption and for 26% of global total end-use energy-related carbon dioxide (CO2) emissions. Huge amounts of energy – over 970 million tonnes of oil equivalent in 2009 - are required for space heating and space cooling in the global building stock due to heat gains and losses from building envelopes. The energy requirements and associated greenhouse gas (GHG) emissions are substantial in cold and hot climates alike. Overarching climate goals can only be reached with major contributions from the building sector.

The amount of residential and commercial building stock in Europe, Japan, and the U. S. is projected to increase from 59 billion square meters in 2000 to 93 billion square meters in 2050. With this growth in building stock, energy use for building heating, cooling, and water heating would increase by almost 60% and GHG emissions would rise from 3,400 million metric tonne

carbon dioxide equivalent (MtCO2e) in 2000 to 5,200 MtCO2e in 2050 if no improvements were made to the energy efficiency of new and existing buildings.

Improvements in new stock and gradual removal of older, less efficient stock are not enough to offset the growth in stock. Although tightened standards for new construction would hold the increase in GHG to 300 MtCO2e from 2000 to 2050, this is still a net increase of nearly 10% in building sector GHG emissions. In order to achieve net reductions in building energy use and associated GHG emissions while building stock increases, the energy efficiency of the large existing stock of residential and commercial buildings must also be improved. Combining better energy efficiency standards for new buildings with a moderate rate of renovation of 2000 building stock would result in a 12% decrease in energy and GHG by 2050, while tighter new building standards combined with a more ambitious renovation rate could result in a 23% reduction in energy use and GHG compared to 2000.

To better understand how the products of chemistry contribute to energy and GHG savings in residential and commercial construction, the International Council of Chemical Associations (ICCA) commissioned a Building Technology Roadmap (http://www.icca-chem.org). The report, released last November, focused on the potential savings from five chemically derived building technologies that are commercially available today: insulation, pipe and pipe insulation, air sealing, reflective roof coatings and pigments, and windows.

According to the ICCA report, energy-saving products installed in homes in the United States prevented nearly 283 million tons of CO2 emissions in 2010—equivalent to the greenhouse gas emissions of 50 million passenger vehicles. Studies show that if this trend continues, more than seven billion tons of emissions can be avoided by 2050 in the United States alone—equivalent to the CO2 emissions of more than 1.2 billion passenger vehicles.

Averaging at least 75 percent of the heat loss in households, single-family homes provide most of the potential for energy savings within the residential sector. In 2010, the cumulative energy savings from chemically derived building products in U.S. residential buildings was 46 times greater than the energy required to produce the products.

In 2050, the amount of GHG savings attributed to the value chain for chemically-derived building products (insulation, piping, air barriers and sealing materials, cool roof coatings and pigments) is based on their expected market shares by decade. By 2050, the GHG savings attributed to these products is 970 (MtCO2e) for the moderate renovation rate and over 1,100 MtCO2e for the ambitious renovation rate. Use of energy efficient plastic-frame windows adds another 300 to 370 MtCO2e of GHG savings, where the chemically derived content of the window assembly plays a major role for to the overall performance of the window.

Over time, the emission savings realized by the users of chemically derived building products are many times greater than the energy and GHG impacts for their production. The products continue to accrue use phase savings throughout their life in the building. By 2050, the cumulative net GHG savings (use phase savings minus production impacts) for the chemically-derived building products installed in the buildings from 2000 and 2050 could be 30,000 MtCO2e for Europe, Japan, and the U.S.2

The chemical industry has already made great strides in providing energy efficient solutions to the building sector, and continues to advance acceptance and use of energy efficient building products through efforts such as:

□ Participating in projects that demonstrate how low energy houses, passive houses and zero emission buildings are realistically achievable and cost effective over time for society and the individual investor alike;

□ Sponsoring life cycle assessment studies to provide credible, science-based data quantifying the net energy and GHG benefits over the full life cycle of chemically derived building technologies;

□ Continuing to invest in research and development of new and improved products that achieve higher levels of energy efficiency over longer lifetimes, leading to greater GHG savings;

□ Cooperating with the value chain □ from architects to craftsmen □ with the objective of ensuring proper use and installation of energy efficient building products.

In addition to the chemical industry's own activities, it is critically important that other stakeholders such as governments, policymakers, institutions, associations and buildings energy

efficiency value chain also take actions needed to ensure that the full potential of energy saving building technologies are realized. These actions include:

- Ensuring that the regulatory environment and building codes support inclusion and enhanced deployment of energy-efficient chemically-derived technologies;

- Providing incentives needed to increase renovation rates and foster new technologies;

- Utilizing international forums as a platform to harmonize building standards, exchange key information resources, and facilitate dialogue between policy makers, industry experts, and other stakeholders regarding energy efficient buildings;

- Creating greater awareness of the economic and social benefits of high energy efficiency in buildings through collaborative efforts of governments, industry, institutions, and associations.

In conclusion, The ICCA Buildings Technology Roadmap report focuses on the chemical industry's contributions to energy and GHG savings in the buildings sector, including the benefits of high performance plastic foam insulation, plastic pipe and pipe insulation, reflective roofing, products and materials used to reduce energy loss due to air infiltration and heat loss, and chemically-derived components of energy-efficient windows. The objective of this report is to provide thorough, credible, scientifically based analyses that quantify the net benefits of the production and deployment of chemically derived building products. Industry and regulators can use this information to guide decisions and actions needed to achieve the substantial reductions in global warming impacts that are possible through greater use of chemically-based building products.

The Chemical Industry has an important, if not crucial, role to play in increasing energy efficiency in buildings and in helping to pave the way towards the near-zero energy buildings of the future, with many technical solutions that are already available or are in development.

*The American Chemistry Council (ACC) represents the leading companies engaged in the business of chemistry. ACC members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. ACC is committed to

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