The Dow Chemical Company

STATEMENT FOR THE RECORD

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

HEARING ON

Moving America toward a Clean Energy Economy and Reducing Global Warming Pollution: Legislative Tools

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Submitted By: Rich Wells Vice President, Energy The Dow Chemical Company appreciates the opportunity to submit these written comments to the Committee on Environment and Public Works.

Dow was founded in Michigan in 1897 and is one of the world's leading manufacturers of chemicals and plastics. We supply products to customers in 160 countries around the world, connecting chemistry and innovation with the principles of sustainability to help provide everything from fresh water, food, and pharmaceuticals to paints, packaging, and personal care products

Dow is an energy-intensive company. We use energy, primarily natural gas and natural gas liquids, as a feedstock material to make a wide array of products. For its global operations, Dow uses the energy equivalent of 850,000 barrels of oil every day. This amount is comparable to the oil consumption of some countries, such as The Netherlands or Australia.

Dow is committed to sustainability. We have reduced our absolute levels of greenhouse gas (GHG) emissions 22% since 1990, and we are committed to do even better in the future. Our ambitious 2015 sustainability goals underscore this commitment.¹

Dow operates at the nexus between energy and all the manufacturing that occurs in the world today. Over 90% of the products made have some level of chemistry in them, so no one has more at stake in the solution - or more of an ability to have an impact on - the overlapping issues of energy supply and climate change than we do.

As a world leader in chemistry, Dow is uniquely positioned to continue to provide innovations that lead to energy alternatives, less carbon intensive raw material sources, and other solutions not yet imagined. In fact, our science and technology has been contributing solutions to the global climate change and energy challenges. Our science has led to the development of alternative energy sources such as biofeedstocks, photovoltaics and wind. Many of our products contribute to reduced energy consumption.

This testimony describes the views of The Dow Chemical Company on global climate change and the need for prompt legislative action by the US Congress as a prelude to a global effort by all major-emitting countries. This testimony explains our preference for an economy-wide US program, the centerpiece of which should be cap and trade, and how such a program should be designed to maintain the competitiveness of energy-intensive US manufacturers. We also compare our recommendations with the recently passed legislation in the House of Representatives, the American Clean Energy and Security Act (ACES).

Dow Perspective on Climate Change

Dow accepts the Intergovernmental Panel on Climate Change (IPCC) conclusion that it is very likely that human activities are causing global warming. Left unchecked, the

¹ To learn more about Dow's commitment to sustainability, go to our website at www.dow.com.

increase in GHGs poses a significant hazard, and the world's response must be comprehensive, far ranging, and expeditious. We recognize the serious nature of the threat and it warrants bold action with clear, long-term performance objectives.

In the long term, innovation in the technologies of renewable and alternative energy will play a significant role in meeting the world's energy needs and will have a positive impact on climate change. However, those that implement alternative and renewable energy sources must be accountable to demonstrate the economic and ecological sustainability of those solutions across their life cycle.

Traditional fossil fuels (oil, natural gas, and coal) will remain critical to meeting energy and feedstock needs until new technologies can substitute into the existing mix. Efficient use of these limited resources with an emphasis on carbon management must be a strong component of any climate change strategy.

The long-range nature of the climate change issue requires different solutions over successive timeframes. The effect of climate change is global and will require immediate action by all major GHG emitting industry sectors and countries. A global climate change strategy calls for sharp, firm, and direct action now to dramatically slow, stop, and then reverse the growth of greenhouse gas levels in the atmosphere. Delivering the world to future generations in a viable state is a moral responsibility for all of us.

Dow supports the concept of multiple solutions to reduce GHG emissions, as outlined by Princeton Professors Socolow and Pacala in their article, "A Plan to Keep Carbon in Check", which appeared in the September 2006 issue of *Scientific American*. Dow will be implementing its solutions in the context of the wedge stabilization model developed by Professors Socolow and Pacala. We will hold ourselves accountable to apply our innovation and expertise in helping to solve the world's GHG and energy challenges.

Need for Prompt Action by Congress

As a member of the U.S. Climate Action Partnership (USCAP), Dow supports prompt enactment of environmentally effective, economically sustainable and fair climate change legislation to reduce U.S. greenhouse gas emissions sharply by mid-century. The centerpiece of legislation should be an economy-wide cap and trade program. This market-based approach is the best way to put a price on carbon and ensure that short- and long-term emissions targets are met. A price on carbon is also the best way to spur the development of new and breakthrough technologies, which are necessary to reduce GHG emissions while growing the economy. It is important to note that the recommendations of USCAP include several complementary policies in addition to cap and trade, such as policies to promote energy efficiency in the building sector. These complementary policies are needed to achieve the economy-wide GHG reduction targets.

USCAP launched its landmark report, titled *A Call for Action*², in January 2007, which lays out a legislative framework for climate protection. Most recently, USCAP released

² A Call for Action and A Blueprint for Legislative Action can be found at www.us-cap.org.

A Blueprint for Legislative Action, which provides consensus recommendations for climate protection legislation. USCAP includes a total of 30 businesses and environmental organizations.³ The coalition recognizes that the United States faces an urgent need to reinvigorate our nation's economy, make the country more energy secure, and take meaningful action to slow, stop, and reverse GHG emissions to address climate change. Thoughtful and comprehensive national energy and climate policy will help secure our economic prosperity and provide American businesses and the nation's workforce with the opportunity to innovate and succeed.

A US climate protection program should create a domestic market that will establish a uniform price for GHG emissions for all sectors and should promote the creation of a global market. A USA commitment to reduce emissions will make it clear to other nations that we are committed to a pathway that will slow, stop, and reverse the growth of our GHG emissions.

It is important to note that a price on carbon does not necessarily mean higher energy costs on business and consumers. A price on carbon will elicit changes in behavior and spur the development of new technologies, both of which will reduce total energy costs. For example, since 1995 Dow has saved more than \$8 billion due to investments in energy efficiency across our manufacturing sites. This cost savings was spurred largely by rising energy prices in the USA, which caused us to change our behavior. Our energy efficiency and conservation program has now become the way we do business. We caution Congress to be very careful in translating a price on carbon into total costs on US consumers or businesses, as it is very difficult to predict or estimate changes in behavior and changes in technological development.

While Congress takes the necessary first step by creating a US program, the Administration should engage in international negotiations with the aim of establishing emission-reduction commitments by all major-emitting countries. The post-2012 global framework should in addition establish further international GHG markets, assist vulnerable populations in adapting to climate impacts, and boost support for climatefriendly technology in developing countries. Dow recognizes, however, that each country should be allowed to establish its own system, with targets fairly set for each sector. Optimum solutions for the US can differ from what works best in China or India, although competitive distortions must be minimized during the transition while country reduction targets converge.

In December, the global community will meet in Copenhagen under the UN process to negotiate a new international post 2012 framework for reducing GHG emissions. Ideally, legislation to reduce GHG emissions needs to pass through both chambers of Congress

³ The current members of USCAP are: AES; Alcoa; Alstom; Boston Scientific Corporation; BP America, Inc.; Caterpillar Inc.; Chrysler LLC; ConocoPhillips; Deere & Co.; Dow; Duke Energy; DuPont; Environmental Defense Fund; Exelon Corporation; Ford Motor Company; FPL Group; General Electric; General Motors Corporation; Johnson & Johnson; Natural Resources Defense Council; NRG Energy; PepsiCo North America; Pew Center on Global Climate Change; PG&E Corporation; PNM Resources; Rio Tinto; Shell Oil Company; Siemens Corporation; The Nature Conservancy; and the World Resources Institute.

for the US negotiating team in Copenhagen to have clarity on what they can reasonably commit to. This is why the Senate should take action this Fall: to provide clarity on US climate change leadership to the world as this will be essential to securing a viable international agreement to reduce global GHG emissions.

It is important to note that the EPA is moving to regulate GHG emissions under the authority of the Clean Air Act (CAA). Dow believes that the CAA does not provide the authority to develop a cost-effective program for reducing GHG emissions in the United States. Consequently, we urge the executive branch to work closely with the legislative branch to (1) avoid spending resources developing ill-advised regulatory programs and (2) develop a new, market-driven program to reduce GHG emissions that is both economically sustainable and environmentally effective.

Maintaining US Competitiveness is Imperative

Manufacturers and industries that deal with certain commodity products that are both energy-intensive and trade-exposed will be particularly challenged by US climate policy if they face competition from countries that have not committed to an internationally recognized GHG-emission-reduction path. In such cases, there is a risk of "carbon leakage", by which we mean the shifting of GHG emissions (and jobs) from the US to these other countries.

It is imperative that any US program to reduce GHG emissions maintain US competitiveness in the short-term. Over the long-term, technological innovation in the USA spurred by a price on carbon will enhance US competitiveness.

One way (but not necessarily the only way) to maintain competitiveness is to design the US program in accordance with the recommendations in the USCAP *Blueprint for Legislative Action*.

We wish to make three policy recommendations to Congress that are imperative for Dow as an energy-intensive, US chemical manufacturer under any US climate program: (1) do not penalize the use of fossil energy used as a feedstock material, (2) provide free allowances to the most vulnerable US businesses at risk of carbon leakage, and (3) take steps to minimize fuel switching from coal to natural gas in the power sector.

Do Not Penalize Fossil Energy Used as a Feedstock Material

Many cap and trade bills that have been introduced in Congress in recent years impose a point of regulation not just on those who emit GHGs, but also on those who produce fossil energy (i.e., petroleum products). This means that there will be a price signal imposed not just on fossil energy that is combusted (with the release of carbon dioxide, a greenhouse gas), but also on fossil energy that is used as a feedstock material to make carbon-based products that are not designed to be combusted (and do not release carbon dioxide to the atmosphere). The House-passed bill would provide compensatory allowances to those who use fossil energy in non-emissive ways, such as a feedstock

material. We believe the bill that recently passed the House of Representatives meets our criterion: it would not punish companies for using fossil energy in a non-emissive manner.

Provide Free Allowances to Prevent Carbon Leakage

Recent legislative proposals have included provisions to provide rebates to energyintensive, trade-exposed sectors that are at risk of carbon leakage. Senator Sherrod Brown has long championed this approach, which Dow believes is the best way to address the competitiveness issue prior to an international agreement among major emitting countries or a global sectoral agreement.

The House-passed bill adopts this approach, which proceeds in two steps. In the first step, EPA would identify the most energy-intensive, trade-exposed sectors that are at risk of leakage based on clear and objective criteria. In the second step, EPA would award rebates to eligible facilities to compensate them for some portion of their direct and indirect GHG emissions. This approach, developed by Representatives Jay Inslee and Mike Doyle, is generally consistent with the recommended approach outlined in the USCAP *Blueprint for Legislative Action*.

Dow believes that it is critical that the rebate not be reduced or eliminated until the competitive disadvantage is reduced or eliminated. Targeted assistance to energy-intensive industries should be terminated only when the carbon leakage problem is solved through an international agreement. And, it should be phased down only in proportion to progress made in reducing the cost differentials between trading partners in a fashion that demonstrably reduces the disadvantage to domestic producers.

We note that there are a few challenging implementation issues with this section of the House-passed bill. For example, determining the average GHG intensity by sector is particularly challenging for any sector that doesn't make a homogeneous product using similar production technology. Sectors utilizing combined heat and power seek clarification as to how self-generated electricity and steam will be handled under this provision. Integrated facilities may be disadvantaged versus non-integrated facilities. We plan to work closely to ensure this provision is fair and workable.

The House-passed bill also includes a border adjustment. Dow is concerned about a border adjustment in that it may impede the President's ability to conduct international negotiations and may lead to retaliatory trade measures by our trading partners against US goods. We recommend that any legislation to address competitiveness be consistent with WTO rules.

Take Steps to Minimize Fuel Switching

One of the easiest, and most likely, ways to meet aggressive, short-term emission reduction targets, such as those in the draft bill, is through fuel switching from coal to natural gas in the power sector. Too strong a price signal on carbon would exacerbate such a movement, which is already underway even in the absence of a US program to reduce GHG emissions. If fuel switching is excessive, demand for US natural gas will rise, and US manufacturers that depend on natural gas will suffer.

The fuel-switching solution could be economically ruinous for those industrial businesses and consumers dependent on affordable natural gas, if natural gas supply does not keep pace with rising demand, or if natural gas supply lags significantly behind demand. Recent US history suggests this is a very plausible scenario.

Congress has been enticed into over-reliance on natural gas before. The Clean Air Act Amendments of 1990 were enacted with the belief that natural gas would be the clean fuel of the future and would be cheap and plentiful. Unfortunately, Congress did not anticipate the run-up in natural gas prices and the resulting demand destruction in the industrial sector.

In designing a cap and trade program, several different elements (targets and timetables, cost containment, the allocation of allowance value, and complementary policies for coal and energy efficiency) will impact the degree of fuel switching, and Congress should keep all of these in mind as it develops a climate policy. For example, fuel switching is exacerbated by more stringent short-term (2020) targets, reduced incentives for CCS, fewer allowances for coal-fired power producers, and fewer offsets. Dow recommends that any US climate policy be designed in ways to minimize fuel switching. We believe the House-passed bill could be improved by favoring short-term targets at the lower end of the USCAP recommended range (i.e., a 14%-20% reduction from 2005 levels by 2020) and by including incentives to spur the growth of nuclear power generation and domestic supplies of natural gas.

Other Issues

Other issues are also of concern to Dow, and we wish to raise them to the Committee's attention as it considers legislation to reduce GHG emissions.

Offsets

Dow favors the creation of high-quality offsets for compliance with any US cap and trade program. Offsets—and, in particular, legitimate, high-quality (additional, permanent, verifiable, enforceable) offsets—help to reduce the total cost of cap and trade; indeed, EPA analysis shows that offsets are one of the biggest determinants of the cost of compliance. The more high-quality offsets, the lower the total cost of the program International and domestic offset projects will reduce emissions, while enabling regulated sectors the freedom to select the most economically sustainable option for compliance. This is good for the economy and the environment.

Dow is developing offset projects around the world, but only if such projects have a direct positive impact on the company, either through promotion of a Dow product, advancement of a Dow technology, or in reducing emissions at a Dow facility. For these

reasons, it is puzzling to hear Members of Congress complain that international offset projects send US money abroad and don't benefit the country. Our international offset projects benefit Dow directly, and policies that inhibit the development of high-quality offsets are detrimental, not beneficial, to Dow and to any US company that seeks a range of cost-effective options for compliance under a US cap and trade program.

Dow is concerned that the House-passed bill imposes certain procedural hurdles that will prevent legitimate, high quality, domestic and international offsets from being developed and utilized. These hurdles will delay the implementation of offset projects that would reduce GHG emissions. Specifically, we are concerned about the requirement for EPA to regulate small sources of GHG emissions, which could eliminate a large source of domestic offsets in the early years of the program. We are also concerned that the House-passed bill requires international offsets to only come from developing countries that have a bilateral agreement with the USA and only if such offsets conform to as-yet-unwritten regulations for sectoral offsets. In addition, we are concerned about the requirement for a 1.25:1 ratio of international offsets to allowances. We recommend modification or elimination of such procedural hurdles to better encourage the development of legitimate, high-quality offset projects both domestically and internationally.

<u>HFCs</u>

HFCs are potent greenhouse gases and are also used in specialized applications. For example, HFCs are used to make energy efficient insulation. Dow uses an HFC as a blowing agent to make extruded polystyrene building insulation as well as spray-applied polyurethane foam, both of which improve the energy efficiency of commercial and residential buildings. Indeed, the HFC blowing agent provides the insulation with a very high energy efficiency rating, saving 40 times the GHG emissions during its use than are released to the atmosphere during its manufacturing. Should Congress impose a price on carbon, the price of HFCs will rise, and HFC products will become more expensive to produce. It is likely that many insulation products will become less attractive to consumers, leading to the use of less energy efficient insulation products and potentially eliminating valuable products from the marketplace.

Dow is concerned that the net impact of a carbon price on HFCs will be to increase GHG emissions if consumers choose less energy efficient insulation products. For our building insulation, there are currently no substitutes that allow us to make these same products with the same level of energy efficiency performance, and it will be several years—at best—before substitutes are available.

Ironically, Dow spent the last several years, and tens of millions of dollars, switching our blowing agent from HCFCs to HFCs as a consequence of EPA implementation of the Montreal Protocol to eliminate ozone-depleting substances. This switch reduced GHG emissions as our HCFC had twice the global warming potential as the HFC we currently use. Now, Congress may be forcing us to switch blowing agents again, before adequate substitutes are commercially available.

We recommend that the Senate consider very carefully the impact of any climate legislation on building insulation made from HFCs and design a program such that the most energy efficient insulation products remain available to consumers. Unfortunately, the House-passed bill does not have any special provisions for HFC-containing insulation, and so it is imperative that any Senate bill address this problem.

Combined Heat and Power

CHP is the sequential or simultaneous generation of multiple forms of useful energy in a single integrated system. Most commonly, CHP involves the generation of useful mechanical and thermal energy. Mechanical energy is used for electricity generation and thermal energy is used to produce steam or hot air for drying for use at a host facility. Electricity can be used in part or in whole on-site and any excess exported to the grid for distribution to consumers. CHP increases fuel efficiency, reduces electricity demand and reduces transmission and distribution inefficiencies. CHP efficiencies reach over 80%, while stand-alone power plants average only in the lower 40% range. The vast majority of Dow's US energy requirements are supplied through CHP technology.

Any bill to reduce GHG emissions should not penalize, and preferably should reward, CHP as a source of energy. Existing cap and trade programs have done just that, but in a variety of ways. The House-passed bill does not adequately reward CHP and concerns have been expressed that certain provisions of the bill may actually penalize manufacturers that use CHP over those that do not. We urge the Committee to consider carefully the impact of climate legislation on industrial CHP so as not to penalize, and preferably reward, those who use this most efficient source of energy.

Early Action

Under a cap and trade approach, Congress may choose to provide free allowances based on historical GHG emissions. Such an approach penalizes companies that took early action to reduce GHG emissions and rewards their competitors who did not take such action. For example, Dow's voluntary, company-wide energy efficiency program is a major reason for the company's significant reduction in GHG emissions since 1994. Congress should ensure that such early action is not penalized. The House-passed bill sets aside 1% of allowances for early action, but it is not clear if this amount is adequate, nor is it clear how EPA will determine who receives such early action credits.

Conclusions

Dow supports the need for a commitment by all major-emitting countries to reduce GHG emissions. This is a global problem that requires a global solution.

The US can help secure such a global commitment by first taking action to reduce its own GHG emissions.

Congress should enact legislation establishing an economy-wide program to reduce GHG emissions, the centerpiece of which should be cap and trade. Complementary policies will also be important.

The US should not regulate GHG emissions through the existing Clean Air Act because it would not provide flexibility to business to reduce GHG emissions in the most cost-effective way.

Any cap and trade program needs to be designed in the right way to ensure the competitiveness of US manufacturing. This means Congress should not penalize fossil energy used as a feedstock material; should provide free allowances to energy-intensive, trade-exposed manufacturers; and should minimize fuel switching by coal-fired power producers.

Dow commends the House of Representatives for passage of the American Energy and Security Act (ACES), which reflects many of the recommendations of the US Climate Action Partnership (USCAP). In our opinion, the bill could be further improved, and we look to the Senate to develop and approve a cap and trade bill that reflects the recommendations raised in this testimony.

Appendix—Dow's Progress and Commitment To Reduce Its Climate "Footprint"

Dow accepts the Intergovernmental Panel on Climate Change (IPCC) conclusion that it is very likely that human activities are causing global warming. We recognize the serious nature of the threat and that it warrants bold action.

We understand that it is not enough to agree with consensus scientific opinion. Our commitment to sustainability requires that we act upon such information responsibly. To that end, Dow has made considerable progress in reducing its climate "footprint":

- From 1994 through 2008, in keeping with its publicly announced sustainability goals, Dow reduced its energy intensity (BTU per pound of product) by 38%, resulting in energy saving of 1,600 trillion BTUs, which is equivalent to all the electrical energy consumed by California residents for one year.
- Since 1990, Dow reduced its absolute greenhouse gas (GHG) emissions since to a level that exceeds Kyoto targets. Overall, emissions of Kyoto GHGs were reduced by more than 20% during this time period.
- GHG emission reductions achieved through the use of Dow products more than offset the GHGs produced during the manufacture of those products.

Although this record is positive, we are committed to continued improvement and reduction of our environmental footprint. In order for Dow to contribute even more to climate change solutions, we have developed a clear vision and key milestones for the years 2015 and 2025. Our vision will guide our decisions today and into the future, and based on this vision, we pledge to reach a number of far-reaching objectives:

- Our vision is to have contributed to the achievement of a world in carbon equilibrium, a target described by Princeton University professors Robert Socolow and Stephen Pacala in the September 2006 edition of *Scientific American*. We will have set the industry benchmark through our own performance. We will apply our innovation and expertise to help solve the world's GHG and energy challenges.
- Our key milestones:
 - By 2015, Dow will reduce its energy intensity by another 25% compared to base year 2005.
 - By 2015, Dow will reduce its GHG emissions intensity (tons of CO₂ per pounds of production) 2.5% per year.
 - By 2025, Dow will stop the growth of absolute emissions of GHG within the company. Our absolute emissions will remain below the 1990 baseline, and we will begin on a journey of year-over-year reduction in GHG emissions.
 - By 2025, Dow aims to have non greenhouse gas emissive energy provide at least 400 MW equivalents, or 10% of Dow's global electrical demand.
 - By 2050, at least 50% of the energy consumed by Dow globally will be non-carbon emitting.