# Dow's Energy Plan for America
## Executive Summary

The sharp volatility in U.S. energy prices over the last several months easily illustrates how energy affects America's economy. Ranging from unprecedented high energy costs that led to inflation and demand destruction to falling oil prices caused by the worse economic crisis since the Great Depression, the U.S. economy has suffered on all fronts due to a lack of a comprehensive and sustainable energy policy.

While the U.S. is primarily concerned with oil and gasoline price instability, this is just part of the problem. Our nation's volatile natural gas prices over the past two decades have resulted in a net loss of 120,000 well-paying chemical industry jobs and more than three million jobs in the nation's manufacturing sector. For every $1 increase in the price of natural gas, the U.S. chemical industry loses $3.7 billion. As a result, the chemical industry has gone from a $19 billion trade surplus to becoming a net importer of chemicals in the last 10 years.

It is worth noting that we are spending more than $500 billion *per year* to import oil — roughly on the same scale as the amount authorized one time for the financial rescue package passed by Congress. The flight of dollars overseas for oil and natural gas has undermined our ability to respond to the current global financial crisis and will invariably slow our response.

All of this speaks to the fact that a lack of a comprehensive energy policy threatens the U.S. economy and security, and slows our transition to a low-carbon future.

Our view at The Dow Chemical Company is that we need a comprehensive national energy policy that is bolder and bipartisan. Bolder because we have seen that the half measures Congress has passed in recent years aren't enough, and bipartisan because there is too much at stake to make this a partisan issue designed to appeal to a narrow set of constituencies.
Dow believes any comprehensive energy policy must achieve these eight goals:

- ★ Encourage aggressive energy efficiency and conservation
- ★ Speed more renewable energy to market
- ★ Make commercial-scale alternatives a priority
- ★ Encourage more domestic oil and gas production
- ★ Optimize the carbon efficiency of coal
- ★ Prove the viability of carbon capture and storage
- ★ Accelerate the deployment of nuclear technology
- ★ Recognize from the outset the interrelationship between energy policy and climate solutions

We are confident that policies supporting these goals will lower energy demand and increase supplies while at the same time curbing greenhouse gases. A bolder energy policy will stabilize prices, strengthen our economy, increase our security, create jobs, clean our environment, boost our competitiveness and revitalize U.S. manufacturing.

We also believe we need to act now to develop climate change legislation that is both environmentally effective and economically sustainable in order to slow, stop and reverse the growth of greenhouse gas emissions. We must address climate change consistent with sound energy policy because any emissions cap will have enormous energy consequences.

We believe there are four basic steps to create a new energy policy that increases energy savings, adds domestic supplies, develops alternatives to fossil fuels and reduces greenhouse gas emissions.

## 1. Encourage Aggressive Energy Efficiency and Conservation

Today, few in the U.S. would disagree that we use too much energy, whether we are talking about drivers, homeowners, businesses or manufacturers.

Energy efficiency is the quickest, cheapest and often the easiest way to improve the U.S. energy situation and slash carbon emissions. According to a 2007 report from the National Petroleum Council, available efficiency technology would reduce energy use 15 to 20 percent if applied today.

Dow has been a pioneer in energy efficiency and has been recognized for its leadership. From 1995 to 2005, Dow reduced its energy intensity by 22 percent, saving 900 trillion Btu, which is the equivalent to the energy used by eight million homes for a full year. If the U.S. was to adopt a similar economy-wide goal, this country could save the Btu equivalent of all of its oil imports from the Arabian Gulf.

We call for:

- A goal of improving the energy efficiency of all homes and buildings by 30% over 10 years
- A long-term extension of the tax incentives for energy efficiency and renewable energy
- Voluntary green building programs that establish standards and targets for contractors to build more energy-efficient homes and buildings,
- Policies that provide incentives for power generators and distributors to undertake cost-effective energy efficiency measures.
- A concerted public energy education campaign, which can reduce demand and prices by empowering consumers to use less and adopt smarter habits {California relied on such a program and almost overnight the state was able to slash its power demand by double-digits and keep the lights on in 2000-2001.}
- A pilot program to identify and demonstrate energy-saving best practices in cities, which are responsible for a disproportionate amount of energy demand
- Fully funding and implementing the energy efficiency provisions in the 2005 Energy Policy Act.

Our recommendations highlight tackling the largest energy demand source and one of the biggest climate change contributors: homes and buildings. They account for 40% of U.S. energy demand and 50% of greenhouse gas emissions. A combination of federal financial incentives and energy efficiency building codes could provide large-scale savings and significantly improve this country's energy security. Residential and commercial buildings are difficult to capture under a greenhouse gas emissions cap. However, success in meeting reduction goals depends in large part on the transformation of the energy profile of the building sector.

## 2. Increase and Diversify Our Domestic Energy Supplies

The U.S. will need to rely on fossil energy to grow our economy while bridging to future alternative and renewable sources of energy. We need additional domestic supplies for security and to grow our economy. Despite this, the U.S. is the only country in the world sitting on known reserves of oil and gas that it has chosen not to develop.

According to the Department of the Interior, there are 86 billion barrels of oil and 420 trillion cubic feet of natural gas offshore on our nation's Outer Continental Shelf — equivalent to 35 years of the oil we import from OPEC and an 18-year supply of natural gas. These are domestic supplies that can be produced with state-of-the-art technologies that assure environmentally friendly production.

Congress has allowed the 26 year moratorium on drilling in parts of the OCS to expire. The next president and Congress must now take affirmative action to encourage additional production, decide the proximity of offshore drilling to U.S. coasts and determine whether and how to share royalties with the states.

By developing the Outer Continental Shelf for oil and natural gas exploration and production, royalty revenues can be shared with coastal states while the federal share could help fund research and development around areas such as energy efficiency, clean coal technology, nuclear waste handling technology and renewable energy deployment.

We call for:

- A new political consensus on offshore oil & gas production that is both environmentally responsible and accesses significant resources {Royalty revenues should be shared with participating states, as was done in the 2005 Gulf of Mexico Energy Security Act, which provides 37.5% to states.}

## 3. Accelerate Development of Alternative and Renewable Energy

The third component of our plan is to accelerate the development of <u>all</u> alternative energy sources, including renewables. We have two main points of emphasis.

For **coal**, we call for a cost-share program providing direct loans and other assistance to demonstrate commercial-scale polygeneration plants. These convert domestic coal and biomass into power, chemicals, plastics and jet fuel for military and commercial aviation. Coupled with carbon capture and sequestration, this will help optimize the carbon efficiency of coal, advance our energy security and provide an alternative source of feedstock to sustain a domestic chemicals and plastics industry.

**For renewables,** we support at least a five-year extension of the renewable energy production tax credits (PTC) and development of new incentives to encourage use of renewable feedstocks, which can replace fossil fuels for producing many chemical and plastic products. The annual expiration of the PTC puts this country's renewable energy industry — along with 100,000 jobs and $20 billion in investments — at repeated risk. Further, the subsidy available to ethanol fuel creates a barrier to use of ethanol as an alternative feedstock for non-fuel materials, such as chemicals and plastics.

We call for:

- Direct loans and other appropriate aid to fund cost-shared demonstration of commercial-scale polygeneration plants
- A long-term extension of the renewable energy production tax credits
- Extend incentives for biofuels to renewable feedstocks, as many chemical and plastic products can be made using ethanol instead of fossil-derived feedstock
- Accelerate deployment of nuclear power by providing certainty in the process by creating a workable plan to address the longstanding spent fuel issue, both in the near- and long-term, and funding R&D on waste recycling technology so that we extract more energy from fuel rods before long-term storage
- A regulatory and liability regime for carbon capture and sequestration to prove CCS' viability and to reduce emissions from fossil fuel plants
- Making the R&D tax credit permanent, to support corporate investments in research into transformative energy technologies.

## 4. Reduce Greenhouse Gas Emissions

As a member of the U.S. Climate Action Partnership, 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 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.

We call for:

- Credit for early action. Efforts to reduce energy use and greenhouse gas in advance of a formal climate policy should be recognized and rewarded.
- Protecting feedstocks. Some manufacturers use fossil energy as a feedstock material. This fossil energy is not combusted and does not result in emissions of greenhouse gases. Cap and trade should not penalize fossil energy used as feedstock material.
- Minimizing anti-competitive impacts on energy-intensive manufacturers. Any climate policy should be designed to prevent “leakage”, that is, the movement of U.S. production overseas to countries that do not have adequate climate policies.
- Establishing a national research program. Lawmakers should accelerate federal research, development and deployment of clean energy technologies and provide incentives for private RD&D. In addition, dedicate any revenue generated from the sale/auctioning of allowances to fund climate friendly projects.
- Ensuring a global approach. Ultimately the problem of climate change must be solved globally. U.S. policy must create incentives and encourage actions by other countries, including large emitting economies in the developing world, to implement GHG emission reduction strategies.

## About Dow and Energy

Dow first expressed alarm about high energy prices in 2002. At that time, our total annual energy and feedstock bill was $8 billion. In 2008, we are on track to spend approximately $30 billion for the year. At this level, our energy expenditures are by far the largest component of our production costs, and equate to over half of our total revenues.

Because of high energy costs, Dow has had to take a number of actions to remain viable as a company. We have focused relentlessly on improving our energy efficiency, shut down dozens of uncompetitive plants, and pursued alternative energy and feedstocks. We have also invested preferentially in parts of the world where energy costs are lower. Our investments in Brazil, China, Kuwait, Libya and Saudi Arabia will create 10,000 direct and 60,000 indirect jobs. Many of these jobs could have been created in the U.S. had it not been for the high cost of natural gas.

As the premier chemical producer and one of the largest industrial energy users, 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. Dow is uniquely positioned to continue to innovate concepts that lead to energy alternatives, less carbon-intensive raw material sources, and other products and solutions not yet imagined.

The current state of our economy requires bold action on many fronts. Most of the recessions occurring since World War II have been preceded by a spike in energy prices. We must take comprehensive action to strengthen and diversify our energy portfolio. There is no single silver bullet. Concerted bipartisan action will be necessary to achieve an energy policy that is up to the challenges of the 21st Century.

# Addendum

The following policy papers explain, in more detail, the individual points of the Dow Energy Plan for America.

## I. Energy Efficiency

## Improving Energy Efficiency of All Homes and Buildings

### The Need

Currently in the U.S., annual greenhouse gas (GHG) emissions are projected to rise from 7.2 gigatons CO2e in 2005 to 9.7 gigatons CO2e in 2030, an increase of 35%. Buildings are consuming approximately 48% of the energy in this country compared to industry at 25% and transportation at 27%. As the U.S. economy moves toward a carbon market, it is vital that the nation's biggest energy consuming sector takes strong measures to complement emission reduction programs aimed at the industrial and transportation sectors. One of the cheapest and fastest ways to reduce our nation's energy demand and GHG emissions is through increased energy efficiency across all sectors. This is especially true for buildings where programs need to address both new construction and the retrofit of existing buildings.

A building constructed without optimum energy efficiency means decades of high cost and lost opportunity.

### Solutions

- Congress should establish a national goal of increased energy efficiency of 30% for model energy codes by 2012 and 50% by 2020 based on the 2006 International Energy Conservation Code (IECC).

- Congress should provide incentives to states that adopt these model energy efficiency codes in a prescribed timeline upon a determination by the Department of Energy.

- Increase federal tax credits for existing homes to motivate homeowners to take advantage of more comprehensive energy efficient improvements.

- Increase federal tax incentives for new and existing buildings to improve energy efficiency performance.

- Congress should establish grants to regional sponsors of programs, like Home Improvement with Energy Star, aimed at improving the energy efficiency performance of existing homes in the U.S.

# Long Term Tax Incentives for Energy Conservation and Efficiency

## The Need

Only when the federal energy tax incentives are extended long term (e.g., 8-10 years), are the private markets for these technologies truly allowed to develop. Our nation's goal should be to provide incentives sufficient to allow this development to occur and then allow the incentives to expire. A long term extension gives the public time to modify its behavior to adopt and purchase energy-efficient products. Further, long-term tax incentives buy time for the private sector to develop technologies that eventually will make these programs cost effective on their own. For example, after a modest start three years ago, the energy efficient new homes credit is finally starting to show its value. Nationally, the credit experienced an almost three-fold increase in usage in 2007 over 2006 levels, as more home builders develop strategies to integrate energy efficiency components into their building processes.

## Solutions

The following incentives, which encourage taxpayers to purchase products designed to conserve energy, should be retained and modified to extend their effective dates through 2016:

- Credit for home owners to retrofit existing homes with energy-efficiency improvements. Expires 2010 (no credit in 2008).
- Credit for home builders to build new energy efficient homes. Expires 2010.
- Deduction for purchases of energy efficient property installed in commercial buildings. Expires in 2014
- Credit for purchases of energy efficient appliances. Expires 2011.
- Faster depreciation for the cost of smart electric meters and grid equipment for 10 years (instead of regular 20 years). No expiration date.
- Exemption from excise taxes for purchases of anti-idling devices and advanced insulation in heavy trucks. No expiration date.
- A comprehensive 10 percent investment tax credit for combined heat and power and waste energy recovery technologies, to motivate plant owners to save 20 to 40 percent more energy by utilizing waste heat from their processes.

# Promote Voluntary Green Building Programs

## The Need

Buildings emit 39% of the $CO_2$ and consume 71% of the electricity in the U.S. Voluntary green building programs guide builders and designers toward the construction of sustainable, energy efficient buildings. Currently, the National Association of Home Builders estimates that by 2011, 10% of the new homes constructed in the U.S. will meet green building guidelines. Further, LEED estimates that 186 million square feet of commercial construction will be LEED-certified in 2008. While this is an excellent initial step, we can and must do more with voluntary programs to transform the building environment in the U.S. We believe a phased approach to an ultimate goal of carbon neutral buildings must be part of an overall energy plan.

## Solutions

- Fully support and expand the Department of Energy's Builders Challenge, which challenges our nation's homebuilders to deliver 220,000 new homes built to advanced energy efficiency levels by 2012.

- Congress should require DOE's Building Technologies Program to develop a road map aimed at delivering on its strategic goal to create technologies and design approaches that lead to marketable zero-energy[1] homes by 2020, and zero-energy commercial buildings by 2025.

- Congress should allocate sufficient funding for R&D programs directed toward building envelope technology innovation to meet the challenge of net-zero energy homes and buildings.

- The nation should be strongly encouraged to set national goals to increase the use of voluntary green building programs to increase beyond 10% the number of covered housing starts. Ten percent is a start, but more can and must be done.

- Congress should endorse the Architecture 2030 challenge, which is now supported by the U.S. Conference of Mayors Resolution #50. Congress and the next administration should make this initiative a national energy policy goal and challenge industry to deliver cost effective innovation.

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[1]A net-zero energy building is a residential or commercial building with greatly reduced needs for energy through efficiency gains (60% to 70% less than conventional practice), with the balance of energy needs supplied by renewable technologies.

# Public Education on Energy Efficiency

## The Need

At relatively little cost, we have the ability to directly reduce energy demand, combat global warming and reduce the need for power plants and other infrastructure. A national energy education campaign aimed at consumers can deliver these benefits swiftly yet will have a lasting effect. The political benefit for leading such a campaign will be great; Americans understand they use too much energy and most want to protect the planet, but don't know how.

A national media campaign of not less than $100 million would educate consumers on the needs and benefits associated with reducing personal energy consumption.

California launched such a campaign ("Flex Your Power") during its energy crisis in 2000 and it succeeded wildly. Power demand fell by 14%, consumers saved $600 million in six months in avoided utility costs, and there was a triple-digit increase in the sale of energy-efficient Energy Star appliances and compact fluorescent light bulbs. It all proved good for the state's economy.

Congress has endorsed a public education campaign in its last two major energy bills. The Energy Policy Act of 2005 (EPACT ’05) authorized a $90 million campaign (Sec. 134). The Energy Independence and Security Act of 2007 (EISA) also called for a media campaign (Sec. 801) that would increase the energy efficiency of the U.S. economy, decrease oil consumption and promote the national security benefits of using energy wisely. However, to date, lawmakers have not funded any program akin to what it envisioned, nor has the Administration requested appropriations for such an effort.

The American people are anxious to be called together for a great national purpose. Energy conservation is an excellent way for Americans to invest in their own energy and national security, while saving money and improving the economy

## Solutions

- The next president should use his “bully pulpit” to enlist the American people in a national campaign to reduce energy use. It is something that can bring the nation together for a common purpose.

- In support of this effort, Congress should extend and appropriate the authorized amount to fund the public education campaign enacted in EPACT ’05, and adequately fund the energy efficiency provisions of EISA.

## Funding & Implementing EPACT

### The Need

The Energy Policy Act of 2005 contains nearly 70 provisions that require federal agencies to undertake research, development and demonstration of new technologies, to engage in public-private partnerships, or to make available financial incentives to the private sector for the development of new energy technologies, which range from hydrogen and fuel cells to clean coal to greenhouse gas emissions reduction.

Many of these measures remain unfunded or have missed their statutory implementation deadlines, nullifying the effect of good legislation enacted by Congress and signed by the President.

### Solution

Congress should fully fund and the administration must fully implement these provisions without delay.

## Urban Energy Efficiency Pilot Program

### The Need

Energy demand and carbon emissions are disproportionately higher in cities, and urban and suburban populations are growing. Given that urbanization is expected to continue for the foreseeable future, the U.S. should create and fund a pilot project that will identify and demonstrate energy-saving best practices used in urban areas, so that they can be replicated for wide effect. The pilot should be conducted in cities in multiple regions to account for differences in regional climates.

In the U.K., a utility and a think tank ran a pilot in 8 cities. They found that with the right practices and technologies households could cut their CO2 emissions by 20% and their energy usage by 30%. Some managed to cut their natural gas consumption by 50%. It was estimated if the program was replicated nationally in the U.K. — which has an urban population one-fifth the size of the U.S.'s — it could save almost £5 billion.

### Solution

Congress should create and fund an Urban Energy Efficiency Program, for several cities of varying sized and in different climatic regions.

# Energy Efficiency Policies for the Power Sector

## The Need

Many electric and natural gas utilities currently have a disincentive to aggressively pursue and promote energy efficiency, demand response programs and other measures as a result of existing regulatory and ratemaking structures. In order to truly prioritize energy efficiency as a resource, removing these regulatory barriers is critical.

Aside from changing the regulatory structure, portfolio standards have been adopted by many states as one way to promote energy efficiency in the power sector. Under a federal Energy Efficiency Resource Standard (EERS), retail distributors would be required to obtain energy savings from customer facilities, distributed generation installations, or their own distribution systems in amounts equal to a specified percentage of base year sales of electricity (energy) or natural gas. The requirements apply to retail distributors, including unbundled distribution utilities or fully integrated generation and distribution utilities that have annual sales over a set level of megawatt hours of electricity or cubic feet of natural gas.

The single best way to promote energy efficiency in the power sector is to set a price on carbon dioxide emissions. As energy efficiency is the most cost-effective option for reducing emissions, the price signal will drive energy efficiency. A cap-and-trade program provides maximum flexibility to power companies to reduce emissions through energy efficiency. Because of the flexibility it provides, a cap-and-trade approach would be a much better driver of energy efficiency in the power sector than a portfolio standard.

## Solutions

- The federal government should clarify that energy efficiency is a priority resource and encourage the alignment of state regulations and ratemaking with the delivery of cost-effective energy efficiency and demand management programs.

- The federal government should establish a mandatory cap and trade program to put a price on carbon, reduce emissions of greenhouse gases, and drive energy efficiency. If, in order to garner sufficient political support for a meaningful cap and trade proposal, Congress decides to include a national portfolio standard, such a portfolio standard should be a low-carbon standard, allowing for a wide variety of responses, including energy efficiency.

# II. Domestic Energy Supplies

## A New Political Consensus on Offshore Oil and Gas Production

### The Need

In its seminal report, "Facing the Hard Truths about Energy," the National Petroleum Council called for a variety of measures to address the world's growing demand for energy and the limitations on supply. All sources of energy — from efficiency and conservation, renewables, nuclear and clean coal, to additional domestic oil and gas production — were recommended. Global oil demand and supply have been alarmingly tight, with less than 1 million barrels per day of cushion. Under these conditions, an additional 1 million barrels per day of domestic production would make a difference in gasoline prices. Natural gas has been similarly high and volatile. While oil is a globally traded commodity, natural gas is regional.

It must be remembered that oil and natural gas are more than a fuel. These hydrocarbons are the basic building blocks for the chemicals and plastics that are used in 96 percent of all manufactured goods.

U.S. manufacturers are competing with producers in parts of the world that have access to cheaper natural gas. One clear example is the Middle East, where natural gas is available at the wellhead for under $1.00 Mcf. This means that certain manufactured goods using natural gas as a raw material can be landed in the U.S. from the Middle East at a natural gas equivalent price of $4-$4.50/Mcf. U.S. natural gas (Henry Hub spot price) averaged $7.17/Mcf in 2007 and is expected to average about $9.70 in 2008. Demand for natural gas by power generators, an industry sheltered from global competition, increased at a rate of 5.4 percent per year over the past decade. Due to increased prices and the inability to "pass along" higher energy costs due to global competition, industrial consumers were forced to decrease consumption by a similar amount.

This competitive disadvantage for American manufacturers is insurmountable under current supply conditions. Further, the eventual enactment of climate change legislation will result in the increased demand for natural gas, perhaps dramatically so if clean coal with carbon capture and storage and sufficient additional nuclear power can't be deployed quickly enough. Some producers are seeking to legislate new uses for natural gas in power production and motor vehicles. This could create another relatively inelastic source of demand, further positioning manufacturers as the shock absorbers for the inevitable demand destruction that will occur with sustained high prices.

### Solutions

While efficiency, alternatives and renewables are essential to our energy security, so too is the need to produce oil and gas from American sources. We are on a path to export up to $500 billion per year to foreign oil producers. This figure dwarfs the amount authorized to rescue the U.S. financial system. Something must be done to capture a larger portion of this value to sustain American jobs, reduce inflation and improve the local economy. This nation can no longer afford the zero-sum debate between energy producers and environmentalists. It is time

for a new consensus on domestic energy production. This new consensus should be based on the following principles:

- Congress should not re-impose the moratoria on offshore drilling, but create a statutory construct under which drilling can go forward in a safe and effective manner.

- The next president should not reinstate the presidential moratoria.

- Any offshore energy access policy should be flexible enough to assure that coastal views are protected and that access is provided in areas reasonably expected to offer the greatest prospect for productive oil and gas wells. It makes no sense to establish a 50-mile ban and learn that closes off a huge natural gas field 35 miles from shore.

- States should share in the revenue from offshore energy production. Given the current fiscal strain on state budgets, offshore oil and gas revenue sharing can be of enormous benefit to state economies if used prudently.

- The granting of states the right to opt-in to offshore drilling should be explored. This must be balanced against the national energy security imperative and the fact that the energy off our shores is federal land and the resource belongs to all of the American people.

- The federal share of royalty and bonus bid revenues should be dedicated to helping to promote energy efficiency, renewable energy and other low-carbon technology development and deployment.

# III. Alternative & Renewable Energy

## Funding Cost-Shared Demonstration of Commercial-Scale Polygeneration Plants

### The Need

One way to optimize the carbon footprint of coal is to engage in polygeneration — that is, use coal and biomass to generate electricity, fuels and the building blocks for chemicals and plastics. The construction and operation of multiple world-scale polygeneration facilities in the United States could offer a critical bridge to alternatives and renewables through the next two or three decades and lead us to important answers on carbon efficiency and sequestration along the way. Each polygeneration facility constructed — producing approximately 60,000 to 100,000 bbl/day of fuels (largely for aviation use), 1 million tons/ year of naphtha (for the chemical industry) and 250 MW of electricity — would use a variable range of feedstock from coal, to biomass to waste blended to increase efficiencies and minimize the carbon footprint. The ability to produce plastics from the naphtha would convert carbon to commonly used products. Remaining CO2 would be used in enhanced oil recovery and otherwise sequestered, as part of a national (and worldwide) effort to minimize the carbon output and impact of fuel production and power generation.

Polygeneration itself is more efficient and will have less net carbon impact than existing independent power and fuel generation regimes – refineries focused on just oil, gas, etc; CTL, focused on just liquid fuels or power generating plants, focused on just electricity. By blending the input of the facility and maximizing the use of the output, the carbon efficiency can be superior to that of a conventional oil refinery.

### Solution

The good news is that the technology already exists to build these world scale facilities, and Dow has pledged to lead a consortium of interests to make investments in polygeneration in the United States. The most difficult barrier to the successful construction and operation of a world scale project is financing. Initial estimates of the cost of a single project is approximately $10 billion. The shear scale of project and cost would require a unique federal financing mechanism that would be able to take an equity position in each project of as much as 50% ($5 billion/ each). Initial review indicates that the return on this large scale capital investment is medium to high, with the price per bbl of oil at $60 or higher. Dow proposes that a minimum of three of these projects be built in the United States, and as each is completed and operational new understandings and technologies developed from the research and operations can be applied to drive down the cost and reduce further any impact from CO2.

Congress should establish a direct loan program, along with other incentives, to build three polygeneration plants. The government share of capital costs should not exceed 50% and should cover the added costs of carbon reductions and management.

# Renewable and Alternative Energy and Fuel Incentives

## The Need

Similar to the rationale for extensions of energy efficiency tax incentives, the incentives for renewable and alternative energy and fuel sources must also be long term (e.g. 8-10 years). According to a recent study by Navigant Consulting, the renewable energy tax incentives have resulted in the creation of 116,000 jobs in the wind and solar industries and more than $19 billion in clean energy investment. Eventually, these nascent industries will be sufficiently grounded, both in technology and public acceptance, to manage on their own without the tax incentives. However, this will never be tested without the long term extensions, which will provide the assurances that these risky endeavors still require.

## Solutions

The following renewable and alternative energy and fuel incentives are among those that should be retained and modified to extend their effective dates through 2016:

- Credit for production of electricity from renewable energy sources, including wind, closed-loop biomass, open-loop biomass, refined coal, geothermal energy, solar energy, small irrigation power, wave and tidal energy, municipal solid waste and qualified hydropower production. Expires on various dates, including 2010 for wind and coal and 2011 for other sources.

- Credit for purchases of renewable energy business property, including solar and geothermal sources.

- Credit for purchases of residential property that produces power from alternative sources, including geothermal power, solar electric, small wind investments.

- Credit for purchases of plug-in electric passenger vehicles and light trucks, ranging between $2,500 and $7,500. Terminates when total vehicle count in the U.S surpasses 250,000.

- Bonus depreciation of 50 percent for cellulosic biomass ethanol, and other cellulosic biofuels, production facilities. Expires for property placed in service after 2012.

- Credit of $1 per gallon for biodiesel production, credit of $1 per gallon for diesel produced from biomass, credit of 10 cents per gallon for small producers, credit of 50 cents per gallon for diesel produced through a mixture of biomass and petroleum. Expires 2010.

- Credit for the production of fuels from alternative sources; qualifying coal must achieve at least 50 percent carbon dioxide sequestration; includes biomass-produced gas fuels. Expires 2010, except hydrogen expires in 2014.

- Credit for carbon capture and sequestration demonstration projects, including coal gasification and advanced coal electricity projects. Limited by total cost of $1.424 billion that can be allocated.

- Credit for capturing CO2, on a per ton basis; requires a facility to capture at last 500,000 metric tons of CO2 per year. No expiration date.

# Extend Incentives for Biofuels to Renewable Feedstocks

## The Need

Renewable raw materials are typically thought of as a source of replacement for fossil energy used as fuel. However, there is great potential to use biomass as a raw material to make many chemicals and plastics, further disconnecting our manufacturing economy from oil and natural gas. While oil and natural gas will continue to be used as feedstock for the petrochemical industry, most organic chemistry practiced today can be achieved using ethanol, seed oils and other biological sources. Take for example Dow's joint venture in Brazil to build a world-scale polyethylene plant using ethanol derived from sugar cane instead of petroleum. Consider that it will result in, say, a plastic milk jug that is chemically identical to a petroleum-derived jug, but which is born from an annually renewable and energy-rich crop.

Use of ethanol and other renewable feedstocks to make value-added products enhances the sustainability of renewables and can help to sustain domestic manufacturing by using alternative raw materials. While the conversion technology is relatively simple, there are a number of barriers to producing chemical and plastic products from biomass at scale. The most significant is the distortion caused by the ethanol fuel subsidy, which causes ethanol feedstock to compete unfavorably with ethanol as a fuel. There are several solutions to this problem.

## Solution

- Promote incentive parity with ethanol as a fuel.
- Support transitional imports of ethanol from Brazil when used as a non-fuel feedstock. Assure that the $0.54/gallon import tariff will not apply.
- Recognize the value of ethanol as a chemical feedstock substitute for oil and natural gas.
- Provide government R&D support to help improve yield and energy density of crops.
- Provide capital risk reduction for early adopters.

# Accelerate Deployment of Nuclear Power

## The Need

The federal government has an important role to play in reducing the impact of rising electricity prices. Electricity prices will rise in the future as the U.S. builds the carbon-free and low-carbon technologies necessary to meet energy needs and environmental imperatives. Simply maintaining nuclear energy at 20 percent of U.S. electricity supply will require construction of 20 to 25 new nuclear power plants by 2030. Under all credible climate change policy scenarios, modeling shows failure to deploy sufficient nuclear power generation capacity will result in an over-reliance on natural gas, of which there has so far been insufficient willingness to produce.

By providing targeted financing support and working cooperatively with state governments, the federal government can lessen the impact of rising prices on electricity consumers (residential, commercial and industrial). Many of the states where new nuclear plants are planned — including Florida, Virginia, Texas, Louisiana, Mississippi, North Carolina and South Carolina — have passed legislation or implemented new regulations to encourage construction of new nuclear power plants by providing financing support and assurance of investment recovery. By itself, this state support is not sufficient. The federal government must also provide financing support for deployment of clean energy technologies to address growing U.S. electricity needs and reduce carbon emissions.

The nuclear energy industry manages its used nuclear fuel safely at plant sites but the public, state government officials and others must have confidence that the federal government has a credible long-term program for used fuel management and disposal. The federal government's program to manage used fuel must be restructured and placed on a path to long-term success.

## Solutions

- Federal and state governments must ensure stable policies relating to nuclear energy. Like other advanced energy technologies, new nuclear power projects will not enter service until the 2016-2017 timeframe and need assurances of sustained policy and political support to be commercially successful.

- The federal government must provide financing capability commensurate with the scale of the baseload power projects being developed. The loan guarantee program authorized by the 2005 Energy Policy Act allows for $18.5 billion in loan volume for nuclear projects, which is inadequate given the $6 to $8 billion estimated cost of a new nuclear power facility.

- The federal government program to manage used fuel must be restructured and placed on a path to long-term success. The federal program must include the development of interim storage facilities to meet its obligation under the Nuclear Waste Policy Act; an R&D program to demonstrate advanced fuel cycle technologies; a commercial deployment of advanced fuel cycle technologies; and the construction and operation of a permanent disposal facility.

- The federal government should continue efforts to develop the Next Generation Nuclear Power Plant.

# Carbon Capture and Sequestration Viability

## The Need

Carbon Capture and Sequestration (CCS) technology is a critical component in the battle to slow, stop and reverse the growth of CO2 emissions. Deployment of cost-effective CCS is necessary to promote energy independence and to minimize price pressures on domestic natural gas.

The next President should promote a "holistic" approach to CCS, including coal to chemicals and CO2 to chemicals processes.

As with any energy and climate change innovation, there are hurdles to overcome for CCS to be commercially and technically successful. These hurdles include capital costs, efficiency penalties, thermodynamics and liability issues.

For CCS to be part of the climate change solution, the U.S. needs to implement a "putting carbon and CO2 to work" strategy that includes enhanced oil recovery, and coal bed methane recovery. Additionally, the utilization of hydrogen produced from nuclear and renewable energy sources, should be explored as a means avoid production of CO2 in the conversion of coal and biomass into fuels and useful chemical feedstocks.

## Solutions

The federal government can help expedite the implementation of CCS in the U.S. through the following initiatives:

- Assume management of liability issues
- Provide sufficient incentives to encourage rapid deployment of cost-effective CCS.
- Provide financial incentives and support for R&D efforts for CCS and CO2 utilization.
- Promote and support the value of world-scale polygeneration projects
- Conduct RD&D on the use of hydrogen to convert CO2 derived from coal to a useful chemical feedstock.

# Making the R&D Tax Credit Permanent

## The Need

The federal tax code currently provides taxpayers a credit to offset the costs incurred in the U.S. for qualified research and development activities. The credit was first enacted in 1981, but only on a temporary basis. Since then, Congress has extended the credit 13 times, often retroactively. The credit is once again scheduled to expire after 2009.

The energy crisis our nation faces will be solved only if we commit to intensive R&D activities. For example, only with new research will we be able to discover more energy-efficient materials and better ways to power our factories, homes and automobiles. The credit has fostered such activities by companies of all sizes in America. Additionally, during this particularly volatile time for U.S. workers, more than 70% of the value of the credit goes to wages for high-skilled, high-paying jobs in the United States. Dow alone spends more than $1 billion annually in research worldwide.

When the R&D tax credit was first created, the U.S. had the distinction of providing the most generous tax treatment for research among all OECD nations. Today, that is not the case because the credit has been whittled away over the years due to our global competitors such as Canada, China, India, Japan and others that offer more aggressive R&D incentives. In fact, the U.S. has fallen out of the top 10 globally when measuring government incentives for private sector R&D. America risks a "brain drain" to these other countries, as top scientists chose to work in countries that place a higher value on their work.

## Solution

- The R&D credit should be permanent. Unlike other temporary tax credits, the R&D credit is not designed to, and should not be allowed to, expire. Instead, only when made permanent will the true purpose of the credit — to encourage a greater level of R&D activities in the U.S. — be realized. When Congress makes the credit permanent, activities will expand in the U.S. to resolve our dual energy and climate crises, as well as other critical problems facing our country.

# IV. Reduce Greenhouse Gas Emissions

## Reducing Greenhouse Gas Emissions

### The Need

The design of a cap and trade system is very difficult because of the need to avoid disproportional impacts to important sectors of the economy. As one of the world's largest industrial energy consumers, Dow understands how fossil energy impacts global competitiveness. And yet, because Dow products save much more energy than is used in the manufacturing of those products, we recognize the transformational power of policies that place a price on carbon.

Certain design elements are critical to minimize the costs and maximize the benefits of cap and trade:

Credit for early action: A cap and trade system that provides a significant share of free allowances to regulated entities should also provide a significant share of free allowances to those who have already reduced greenhouse gas emissions. Otherwise, the program will reward the largest emitters.

Feedstocks: Some manufacturers use fossil energy as a feedstock material. This fossil energy is not combusted and does not result in emissions of greenhouse gases. A cap and trade system that imposes a cap on those who produce (rather than emit) fossil energy has the potential to raise feedstock prices, which will hurt domestic manufacturing without addressing greenhouse gas emissions.

Leakage: U.S. manufacturers who produce energy-intensive, commodity-like products that are globally traded are particularly vulnerable to higher energy prices from a cap and trade scheme or a carbon tax. Such industries (iron and steel, basic chemicals, cement, pulp and paper, glass and ceramics, non-ferrous metals) have lost three million jobs in the past eight years. If not designed carefully, U.S. climate policy will result in the outsourcing of jobs to countries that do not have rigorous GHG controls.

Offsets: Legislative proposals that would impose a cap and trade program often contain limits on the amount of offsets that can be used to meet a firm's compliance obligation. Such a limit on legitimate, high-quality offsets—both domestic and international—increases the cost of cap and trade and reduces the flexibility of firms that have to comply. Care must be taken to ensure that international offsets are not a substitute for action by countries having significant GHG emissions.

Energy Efficiency: The UN Foundation reports that doubling the rate of energy efficiency improvement by the G-8 countries can, with current technology, come close to achieving the high end of the stabilization range for atmospheric concentrations of greenhouse gases.

Technology: The only way the world economy can slow, stop, and reverse its growth of greenhouse gas emissions to reach the low end of the stabilization range of 450-550 ppm is with new technology.

A global approach: The challenge of climate change must be solved globally because the contributions of GHG emissions come from several countries, and these emissions change over time.

## Solutions

- Credit for early action. Companies that can demonstrate company-wide reductions in greenhouse gases through energy efficiency should be eligible to receive credit if their reductions are considered to be better than a set performance standard.
- Protect feedstocks. If cap and trade imposes an "upstream cap on fossil fuel, manufacturers that use this "fuel" as feedstock should be reimbursed for their higher costs through the issuance of free allowances equal to the CO2 content of their feedstock material.
- Do not impose a quantitative limit on the amount of high-quality offsets that can be used to meet a firm's compliance obligation.
- Promote energy efficiency. The new administration should seek agreement among the G-8 plus 5 countries to double their rate of energy efficiency improvement.
- Avoid "leakage" of U.S. manufacturing jobs. The best way to accomplish this is by keeping allowance prices as low as possible, and by the awarding of free allowances to energy-intensive manufacturers to compensate them for their increased costs from a cap and trade program. These free allowances can be discontinued once there is an internationally level playing field. A global sectoral agreement would be ideal for these sectors.
- Establishing a national research program. Lawmakers should accelerate federal research, development and deployment of clean energy technologies and provide incentives for private R&D. In addition, any revenue generated from the sale/auctioning of allowances should be dedicated to fund climate friendly projects.
- Ensuring a global approach. U.S. policy must create incentives and encourage actions by other countries, including large carbon emitting economies in the developing world, to implement GHG emission reduction strategies. Seeking consensus on global sectoral agreements should be a high priority for the U.S.