



**America's Future is Looking Up:**  
A Policy Recommendation for  
Making America a 21st Century Solar Power

“The country that harnesses the power of clean, renewable energy will lead the 21st century.”

– President Barack Obama





As the CEO of one of the world's only producers of the silicon-based technology that powers the solar industry, I know firsthand that America's energy transformation is inexorably linked to our nation's economic and manufacturing future.

In order to fully realize the promise of this economic, employment, energy and environmental opportunity, the creation of new green manufacturing jobs and the industries that support them must be a centerpiece of our national efforts to bolster our weakened economy. This will require forging a new path through federal leadership along with the investment and innovation of private industry. Our new path must include integrated policy prescriptions that address each step in the solar energy value chain – from education and workforce development, to raw material and end-product manufacturing, to deployment and market readiness.

America is a nation of innovators, and we have overcome every challenge and seized every opportunity that has come before us. Today is no different. With the right mix of private investment, incentives, support and entrepreneurial spirit, we can revitalize the heart of our nation's economy – our manufacturing sector – and put Americans back to work and move America toward a clean, independent and secure energy future.

Achieving greater energy security will not be an easy task. This is more than just "smart business" for companies like Dow Corning. As a global company, we're committed to doing our part to ensure our nation's competitiveness in the decades to come. Our nation, our economy, our customers, our employees and the citizens in the communities we serve deserve nothing less than our best effort. Working together, we can make America a 21st century solar power.

A handwritten signature in black ink that reads "Stephanie A. Burns". The signature is written in a cursive, flowing style.

Dr. Stephanie A. Burns  
Chairman, Chief Executive Officer and President  
Dow Corning Corporation

Headquartered in Midland, Michigan, Dow Corning is one of the only companies in the world able to provide advanced silicon-based solutions throughout the entire solar photovoltaic (PV) value chain. Through its investments in the Hemlock Semiconductor Group, a majority-owned Dow Corning joint venture, the company is one of the largest producers of polycrystalline silicon, an essential building block for creating solar energy. Other solar-related investments include materials essential in thin-film solar manufacturing and concentrated solar technologies, in addition to innovative materials used for module fabrication and assembly.



Dow Corning is one of Michigan's longest standing technology-based employers. Our investment of up to \$3 billion through Hemlock Semiconductor to expand materials production in Michigan and Tennessee is expected to create hundreds of construction and permanent jobs in the next five to seven years. These investments will add 45,000 metric tons of annual polysilicon production capacity – enough polysilicon, if fully integrated into solar panels, to generate approximately 6,400 Megawatts of electricity annually. As a result, more than 200,000 solar industry-related jobs – in manufacturing, installation and maintenance along the entire value chain – may be created.<sup>1</sup>

Dow Corning has also announced plans to produce monosilane, a specialty gas that liquid crystal display and thin-film solar cell makers use in their manufacturing. This additional investment will create even more solar-related jobs in Michigan and is expected to help the state attract other supply chain investments to the region.

<sup>1</sup> United States Photovoltaic Industry. (2001). *Solar electric power. The U.S. photovoltaic industry roadmap*. Retrieved from [http://photovoltaics.sandia.gov/docs/PDF/PV\\_Road\\_Map.pdf](http://photovoltaics.sandia.gov/docs/PDF/PV_Road_Map.pdf)



## Introduction

America's development of a viable, renewable energy industry is central to its economic renewal. Dow Corning Corporation, one of the world's leading providers of silicon-based materials, supports President Obama's vision for a national commitment to invest in the innovation, manufacturing capability and job creation needed to establish America's global leadership in alternative energy technologies and in speeding their adoption at home.

In keeping with this vision and the public policy imperatives that can make it a reality, Dow Corning has identified four fundamental policy goals for making America a 21st century solar power. Focusing on these four areas, Dow Corning is confident that our nation can expand its energy capacity, create jobs and economic growth, and move toward energy independence from foreign oil.

**Goal #1: Establish a broad federal legislative and regulatory package, designed to encourage the rapid growth of a viable renewable energy industry and encourage consumer adoption.**

Energy security legislation should include:

- Permanent advanced manufacturing tax credit
- Renewable Electricity Standards, with solar set-asides
- Federal interconnection and net metering standards
- Renewable Energy Payments (feed-in tariffs)

In addition, legislation addressing carbon reduction must take care not to inadvertently discourage or penalize growth in the manufacturing and production of renewable energy materials and equipment.

**Goal #2: Increase investments in research and development to support innovation in solar energy technologies.** Legislation

should include:

- Incentives to accelerate the development of solar technologies and manufacturing
- Significant funding increases for applied research and development in the solar industry
- Encouragement for expansion of public-private partnerships to further develop the renewable energy industry as a whole

**Goal #3: Further invest in renewable energy-related education, training and job creation.**

To ensure the long-term sustainability of an economically vibrant renewable energy sector, the United States needs qualified professionals to fill the renewable energy jobs of the future. At present, there are too few solar training opportunities available in the country to rapidly develop the tens of thousands of skilled workers needed to support the growing solar industry.

**Goal #4: The federal government will “lead by example” in the implementation of clean technologies.**

From procurement of onsite generation, including solar energy systems, to retrofitting buildings for improved energy efficiency, to establishing new building standards and power purchase agreements, the federal government can lead the way to a new future for energy, focused on clean, sustainable technologies.

Dow Corning’s four-point plan for making America a 21st century solar power is urgent and achievable. These policy recommendations support the efforts of the Obama administration and Congress as they develop a legislative and regulatory blueprint for a balanced, national energy portfolio.

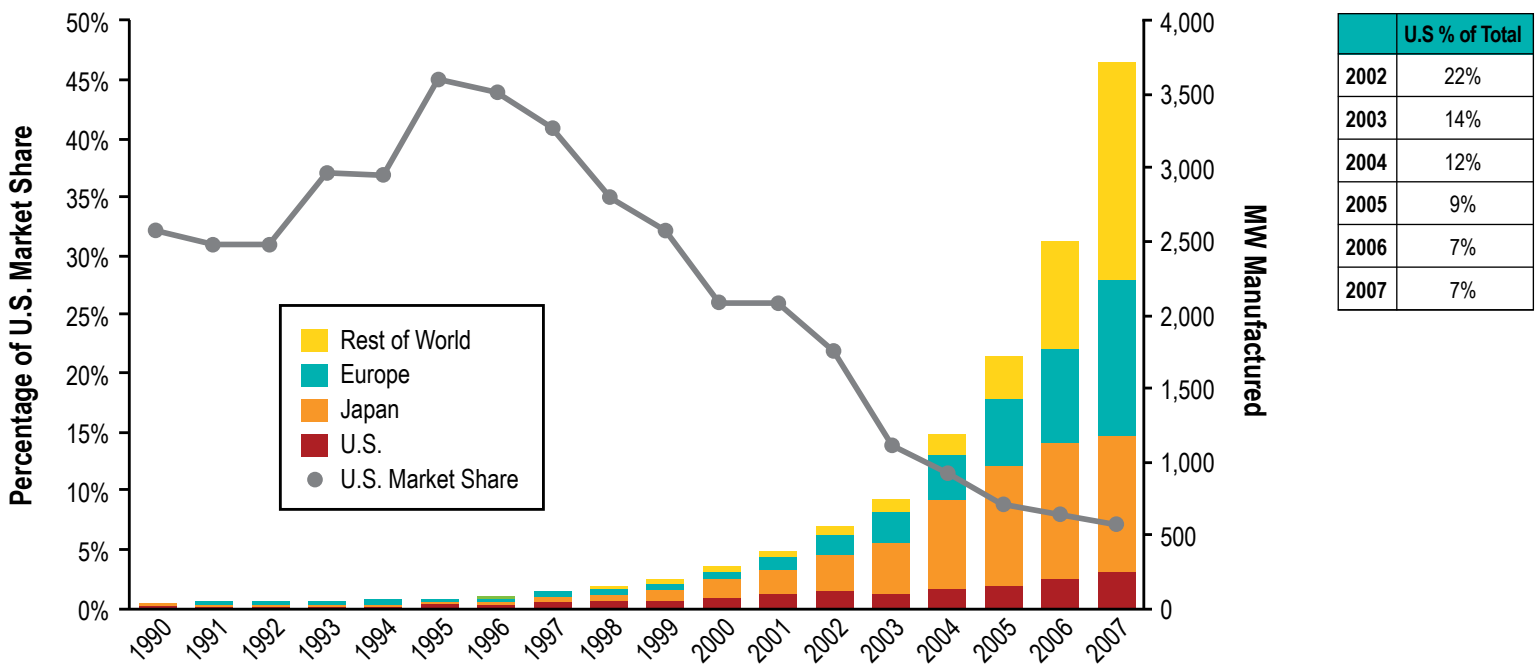
## Broad Federal Legislative and Regulatory Package

One of the primary barriers to expanding the use of solar power is the initial, up-front investment needed to install home- and business-based solar power systems or construct utility-scale solar power plants or component manufacturing facilities.<sup>2</sup> Long-term tax credits are essential to encourage individuals and businesses to invest in solar and other renewable energy systems – and foster large-scale developments by utility providers.

## Permanent Advanced Manufacturing Tax Credits

Solar manufacturing in the United States has fallen behind countries such as Germany and Japan, which have offered solar manufacturers attractive incentives for establishing operations in their countries (Figure 1). For example, the Japanese government instituted a successful program of tax incentives from 1994 to 2003 that resulted in Japan leading the world in solar photovoltaic (PV) capacity by the end of 2004. Unless the United States offers similar incentives, the country's demand for solar energy will most likely be met by solar equipment manufactured outside of the United States.

Figure 1. United States and Global Solar Manufacturing Capacity



Source: U.S. Department of Energy, August 4, 2008.

<sup>2</sup>Pernick, R. & Wilder, C. (2008). *Utility solar assessment (USA) study, reaching 10 percent solar by 2025*. Washington, DC: Cleanedge. Retrieved from [www.cleandedge.com/reports/reports-solarUSA2008.php](http://www.cleandedge.com/reports/reports-solarUSA2008.php). According to the report, the cost of building a PV solar plant currently is on the order of \$5 billion to \$7 billion per billion watt capacity compared with \$1 billion to \$3 billion for a coal plant.

We know that when tax incentives are in place, investment in, and adoption of, renewable energy technologies occur. The 2005 federal Investment Tax Credit (ITC), despite its limitations, is credited for reviving solar power use in the United States. Although solar energy production and use had been steadily growing for several years, the annual growth rate doubled when the federal ITC was increased in 2006. The use of PV, the most widely used type of solar power system, grew by 48 percent from 2006 to 2007.<sup>3</sup>

The ITC helped boost demand for solar power at the consumer end of the solar value chain. However, America's success in competing for additional solar manufacturing facilities and jobs in the global marketplace will depend upon the government's willingness to help compete against the rest of the world for facilities that will focus on the production of advanced clean technologies.

There has been an increase in the amount of solar PV manufactured and installed at the state level due in large part to increased investments in clean-tech development and manufacturing. For example:

- In May 2008, Dow Corning opened a 27,000 foot state-of-the-art Solar Solutions Application Center in Freeland, Michigan.
- In December 2008, Dow Corning announced an investment of up to \$3 billion to increase polycrystalline silicon capacity by approximately 75 percent in four years through Hemlock Semiconductor.
- In October 2008, First Solar, Inc. broke ground on an expansion of its Perrysburg, Ohio, facility that will increase its total capacity to roughly 192 MW per year.<sup>6</sup>

<sup>3</sup> Sherwood, L. (2008). *U.S. solar market trends 2007*. Interstate Renewable Energy Council. Retrieved from [http://www.irecusa.org/fileadmin/user\\_upload/NationalOutreachPubs/IREC%20Solar%20Market%20Trends%20August%202008\\_2.pdf](http://www.irecusa.org/fileadmin/user_upload/NationalOutreachPubs/IREC%20Solar%20Market%20Trends%20August%202008_2.pdf)

<sup>6</sup> First Solar. (2008). Press release. Retrieved from <http://investor.firstsolar.com/phoenix.zhtml?c=201491&p=irol-newsArticle&ID=1206046&highlight=>

The recent passage of the eight year-extension of the ITC greatly aids the solar industry in building new manufacturing capacities, constructing new utility-scale solar power plants and creating jobs. According to the Solar Energy Industry Association, the solar industry is projected to gain 440,000 permanent jobs and \$325 billion in investment by 2016, due to the ITC's extension.

A study conducted by Navigant Consulting suggests that more than 115,000 jobs and nearly \$19 billion in United States investment could be anticipated in 2009 as a result of Congress recently extending the ITC and wind production tax credits, with the solar industry immediately standing to gain approximately 39,400 of those jobs and \$8 billion in investment.<sup>4</sup> The report also predicts that after eight years the solar industry will have grown to 440,000 permanent jobs stemming from total approximate investments of \$325 billion. This study does not factor in the elimination of the \$2,000 monetary cap on the residential credit, so actual job creation and investment could be even greater.<sup>5</sup>

<sup>4</sup> Navigant Consulting. (2008). *Economic Impacts of Solar Tax Credits*. Retrieved from <http://seia.org/galleries/pdf/Navigant%20Consulting%20Report%209.15.08.pdf>

<sup>5</sup> Solar Energy Industries Association. (2008). Press release. Retrieved from <http://solartoday.wordpress.com/2008/10/03/cnn-bailout-bill-headed-for-passage/>



- In March 2009, Solyndra Inc. announced that, with the backing of a \$535 million loan guarantee from the U.S. Department of Energy, it will expand its solar PV manufacturing capacity to 500 MW per year with construction of a second solar panel fabrication facility in Fremont, California.<sup>7</sup>

To build on the success at the state level, the federal government can – and should – do more to move the nation into an era of sustained renewable energy use, greater global competitiveness and expanded job opportunity.

Congress took a significant first step toward these objectives in the American Recovery and Reinvestment Act of 2009 by creating the Alternative Energy Investment Tax Credit, which supports the manufacture of renewable energy products and equipment. The Solar Energy Industries Association has projected that this two-year, 30 percent manufacturing tax credit could create approximately 315,000 jobs along the entire solar value chain.<sup>8</sup> But the tax credit is temporary and capped at \$2.3 billion, limiting its overall impact on the sector.

With that in mind, and in order to accelerate America's global leadership in renewable energy manufacturing and technology innovation, Dow Corning calls on Congress to make permanent the 30 percent manufacturing tax credit and, at the same time, remove the cap. This would free up and encourage the use of much needed capital for small- and mid-sized manufacturers to quickly establish themselves and increase production and encourage sustainable job creation and economic development.

Taking such actions can provide companies with ample time and means to focus on ramping up production facilities without the concerns of pending end dates or investment limits.

<sup>7</sup> Solyndra Inc. (2009). Press release. Retrieved from <http://www.solyndra.com/News/Press-Release-032009>

<sup>8</sup> Solar Energy Industry Association. (2008). *Solar Manufacturing Tax Credit*. Retrieved from [http://seia.org/galleries/pdf/Solar\\_manufacturing\\_tax\\_credit.pdf](http://seia.org/galleries/pdf/Solar_manufacturing_tax_credit.pdf)



Tax incentives promise to have a broad ripple effect by improving the affordability of solar energy systems while reducing the cost of energy consumption.

- Tax incentives increase affordability of solar energy systems. The average residential solar PV system in the United States costs approximately \$7,900 per installed kilowatt.<sup>9</sup> Without federal tax credits, it can take several years to achieve a return on this initial investment through electricity bill savings.
- Tax incentives lower energy costs. Expanded use and development of solar technologies have dramatically reduced the cost of a single kilowatt hour (kWh) of photovoltaic electricity from 50 cents in 1995 to a market driven price of about 20-30 cents in 2008.<sup>10</sup> Market analysts agree that once solar energy electricity equals the costs of conventional, fossil fuel-based electricity, solar power will no longer need government subsidies, but estimates of when grid parity can be achieved vary greatly.

<sup>9</sup> Barbose, G., Peterman, C., & Wiser, R. (2009). Tracking the sun: The installed cost of photovoltaics in the U.S. from 1998-2007 (LBNL report No. LBNL-1516E). Berkeley, CA: Lawrence Berkeley National Laboratory. Retrieved from <http://eetd.lbl.gov/ea/emp/reports/lbnl-1516e.pdf>

<sup>10</sup> Kebede, R. (2007, June 21). Solar power costs dropping, nearing competition. Reuters. Retrieved from <http://www.reuters.com/article/environmentNews/idUSN2139198820070621>

## Renewable Electricity Standards

As we have seen in Germany and Japan, Renewable Electricity Standards (RESs), also referred to as Renewable Portfolio Standards or Renewable Energy Standards, encourage the use of renewable energy by requiring utilities and other retail electric providers to supply a specified minimum amount of electricity from renewable energy sources to customers.

Currently, the Obama administration is advocating that 25 percent of electricity be generated from renewable sources by 2025. According to the Energy Information Administration (EIA), that percentage would reduce natural gas and electricity bills, saving customers approximately \$2 billion through 2030.<sup>11</sup>

Should the United States pursue the establishment of a federal RES, its guidelines should be universal, predictable and transparent, as well as designed to encourage the growth of all forms of renewable energy. It should include:

- **Credits for electricity derived from distributed generation.** A robust credit multiplier for electricity created by distributed energy systems, such as residential solar panels, will help accelerate the growth of distributed generation capacity. Under a federal RES, many retail electricity providers will not be able to meet the standard through the power they generate, causing them to purchase renewable energy from other sources. By providing a triple credit multiplier for electricity purchased from distributed installations, the implementation of renewable energy systems stands to increase.

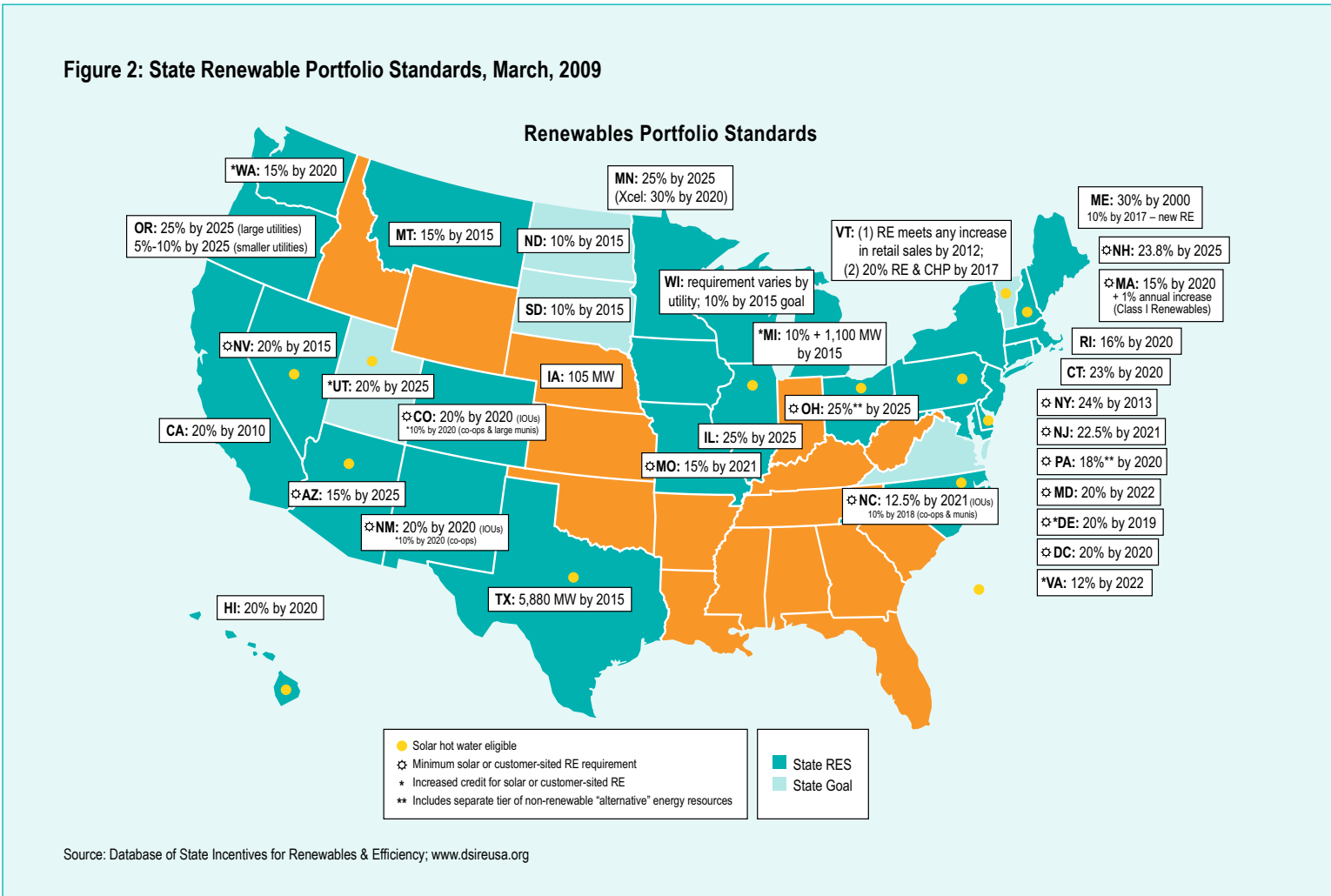
- **A solar energy set-aside.** Specifically setting aside a minimum amount of solar energy to comprise a portion of an RES would create parity between solar energy and other renewable energy technologies that are more easily scalable; accelerate the growth of the solar industry; spur significant private sector investment in solar energy; and create thousands of new solar related jobs, particularly in manufacturing.
- **Extra credits for efficient technology use.** Efforts to create a system that rewards and encourages use of the most effective and efficient technology for a given location, such as solar in Arizona or wind in Texas, have been successful at the state level and can be effective in a federal RES as well.

Renewable Electricity Standards have been widely promoted by environmentalists and proponents of renewable energy as mechanisms for developing the renewable electric industry – reducing costs, creating green collar jobs, speeding economic development and stabilizing electricity prices. They are also credited with providing long-term energy predictability, increasing investment capital, enabling the manufacturing of renewable energy technologies to achieve economies of scale and reducing impact on the environment by reducing carbon emissions.

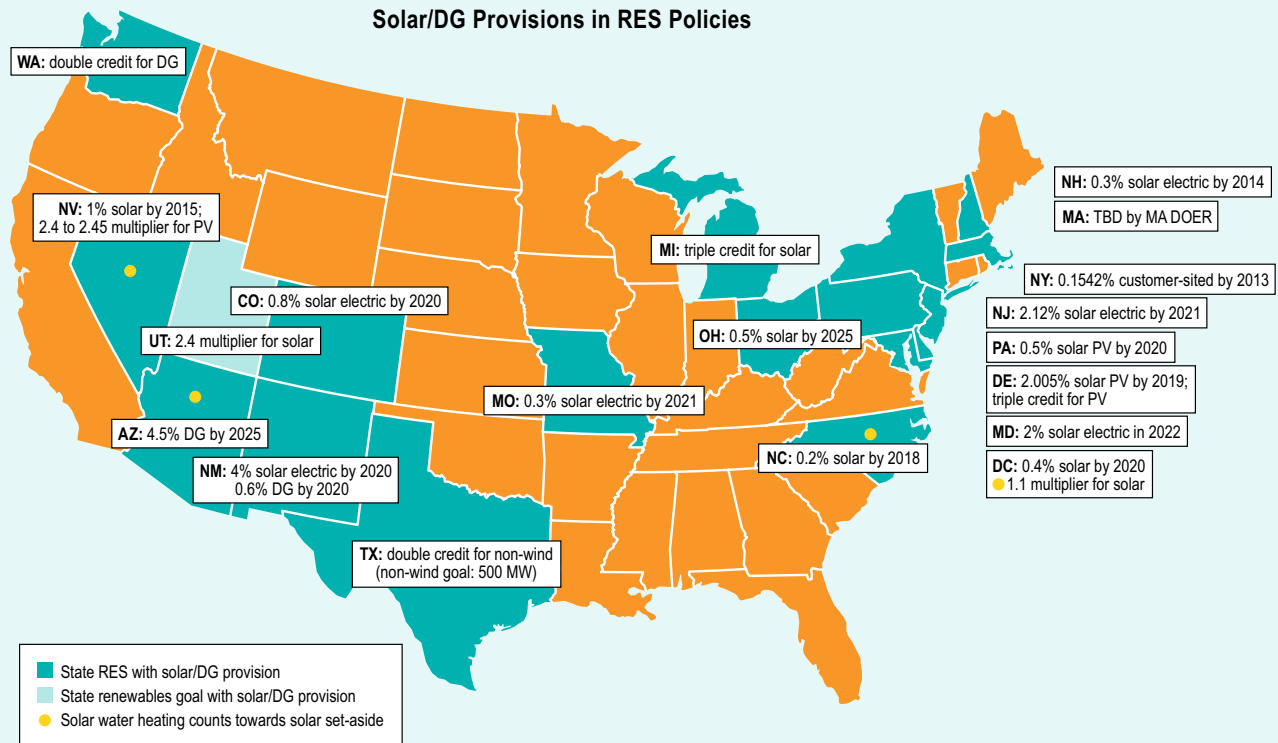
Although some countries have imposed national standards, in the United States they have only been implemented at the state level. To date, 29 states and the District of Columbia have implemented some form of rule or regulation directing use of renewable energy, ranging from two percent in Iowa to 30 percent in Maine. North Dakota, South Dakota, Virginia, Vermont and Utah have established nonbinding renewable energy goals (Figure 2).

<sup>11</sup> Energy Information Administration. (2007). *Energy and Economic Impacts of Implementing Both a 25-Percent RES and a 25-Percent RFS by 2025* (EIA report No. SR-OIAF/2007-05). Washington, DC. Retrieved from <http://www.eia.doe.gov/oiaf/servicerpt/eeim/index.html>

Figure 2: State Renewable Portfolio Standards, March, 2009



**Figure 3: Solar/Distributed Generation Provisions in Renewable Electricity Standards, March, 2009**



DG: Distributed Generation  
 Source: Database of State Incentives for Renewables & Efficiency; [www.dsireusa.org](http://www.dsireusa.org)

Many states have moved forward with implementing solar/distributed generation set-asides in addition to their existing RES standard (Figure 3).

Some critics claim that an RES will increase costs to utilities, governments and consumers. Others believe the cost of a well-designed RES policy is marginal, resulting in a less than five percent increase in rates or less than \$5 per month for an average household.<sup>12</sup> According to the Energy Information Administration, “Electricity price impacts vary from region to region, with renewable-resource rich regions like the northern Great Plains states and the northwest states potentially seeing prices decline from reference case levels, while other regions see price increases ranging from one percent to six percent above reference case levels between 2025 and 2030.”<sup>13</sup>

### **Federal Interconnection and Net Metering Standards**

The United States Department of Energy (DOE) has recognized that “grid interconnection has been identified by industry groups as a significant barrier to the installation of distributed generation technologies,” and that, “net metering programs serve as an important incentive for consumer investment in renewable energy generation.”<sup>14</sup> Facilitating the transmission of clean energy and the monitoring of its consumption will require significant innovation created by the establishment of effective interconnection and net metering standards.

In addition to the investments made by the federal government to modernize the electrical grid through the recent passage of the American Recovery and Reinvestment Act of 2009, the federal government should continue to:

- Invest in the development of a national utility grid using smart metering, distributed generation and other advanced technologies to improve electric grid reliability and security, increase renewable energy generation and create greater customer choice and energy affordability
- Take legislative and regulatory actions to encourage all states to improve net metering and interconnection policies to eliminate gaps in the electrical grid
- Work with the industry to promote uniform technical standards and policies as has been done through the Federal Energy Regulatory Commission (FERC) process for standard interconnection agreements

Successful federal interconnection policy should:

- Include all producers of electrical power to avoid any gaps in federal and state jurisdiction
- Promote standard, transparent and specific policies open to the public
- Propose fees that reflect the size of energy projects
- Prioritize interconnection applications by complexity and adopt standard, simple rules for residential systems and quick approvals for other systems

<sup>12</sup> Wisner, R. (2006). *An overview of the results and methods of state RES cost-benefit projections* (Oregon Renewable Energy Working Group). Berkeley, CA: Lawrence Berkeley National Laboratory. Retrieved from [www.oregon.gov/ENERGY/RENEW/docs/Wisner\\_Oregon\\_RES\\_Cost\\_May\\_2006.ppt](http://www.oregon.gov/ENERGY/RENEW/docs/Wisner_Oregon_RES_Cost_May_2006.ppt)

<sup>13</sup> Energy Information Administration. (2009). *Impacts of a 25-percent renewable electricity standard as proposed in the American clean energy and security act discussion draft* (EIA report No. SR/OIAF/2009-04). Washington DC. Retrieved from [http://www.eia.doe.gov/oiaf/servicert/acesa/pdf/sroiaf\(2009\)04.pdf](http://www.eia.doe.gov/oiaf/servicert/acesa/pdf/sroiaf(2009)04.pdf)

<sup>14</sup> U.S. Department of Energy, National Renewable Energy Laboratory. (2008). *Renewable systems interconnection* (NREL report No. NREL/TP-581-42292). Washington, DC. Retrieved from [http://www1.eere.energy.gov/solar/solar\\_america/rsi.html](http://www1.eere.energy.gov/solar/solar_america/rsi.html)

Successful federal net metering policy should:

- Allow up to a two-Megawatt renewable energy system to be net metered
- Allow third-party ownership of renewable energy systems at a customer location to qualify
- Provide an appropriate level of credit for the energy – for example, solar PV systems provide peak energy and therefore should receive a net metering credit commensurate with the value of this energy supply
- Enable monthly rollover of any excess electricity produced
- Include all forms of renewable energy technologies and allow all types of customers to participate
- Ensure net metering standards are applied to all types of utilities in a state
- Eliminate unnecessary or burdensome administrative red tape or additional fees

Adopting a comprehensive package of interconnection and net metering policies would complement and enhance the efforts now occurring in the states. The benefits from adopting a national net metering and interconnection policy would be wide-ranging and significant, such as increasing energy capacity, creating a more efficient energy infrastructure and more reliable supply, creating jobs and expanding the United States economy.

## Renewable Energy Payments (Feed-in Tariffs)

Renewable Energy Payments (REPs), also known as feed-in tariffs, are widely considered to have been responsible for the success of expanding the use of renewable energy across Europe and are now in place in more than 40 countries.<sup>15</sup>

REPs encourage utilities to acquire and, in turn, stimulate clean energy production by providing renewable energy producers with fixed-rate, long-term contracts. Prices paid by utilities for clean energy are above the current average wholesale prices for conventional energy in their areas with REPs making up the difference in costs. In most cases, REPs are paid from funds created by a charge applied to all electricity consumers as an additional fee on their monthly electric bills. Such fees are typically small, amounting to approximately three to five cents per kilowatt hour.<sup>16</sup>

Rep. Jay Inslee (D-WA) has stated that a national performance-based REP incentive will “open the floodgates to innovation and the growth of these [renewable energy] industries,” and help rebuild the shrinking United States manufacturing base. “We used to hold 40 percent of the world’s photovoltaic manufacturing capacity, and now we’re down to seven percent. That’s in large part because...these feed-in tariffs have spurred the development of their industry. So we want to get back in the game and the way to do that is to tell producers of renewable energy that they will be guaranteed a price [for their energy].”<sup>17</sup>

<sup>15</sup> Gipe, P. (2008, October). IEA: Feed-in tariffs more effective and cheaper than quotas for renewable energy. *Renewable Energy World*. Retrieved from <http://www.renewableenergyworld.com/rea/news/story?id=53837&src=rss>

<sup>16</sup> U.S. Department of Energy, Energy Efficiency and Renewable Energy. (2008). State energy alternatives. Retrieved from [http://apps1.eere.energy.gov/states/alternatives/system\\_benefits.cfm](http://apps1.eere.energy.gov/states/alternatives/system_benefits.cfm)

<sup>17</sup> Lacey, S. (2008, March). Building a FIT renewable energy market in the U.S. *Renewable Energy World*. Retrieved from <http://www.renewableenergyworld.com/rea/news/article/2008/03/building-a-fit-renewable-energy-market-in-the-u-s-51798>

REPs ensure that producers of solar power will be able to sell electricity to utilities at a fixed price for a long-term period, providing a predictable revenue stream, stabilizing the solar energy market and allowing for consistent growth.

In countries such as Denmark, Germany, Italy and Spain, REPs have created strong solar PV and wind markets and added tens of thousands of jobs to their manufacturing bases.<sup>18</sup> According to the German Environment Ministry, 200,000 new jobs have been created since 1999 as a direct consequence of its Feed-in Tariff Law.

To date, in the United States, state governments have largely taken the lead in pressing for the implementation of REPs. Currently, REPs are pending in five state legislatures (Minnesota, Illinois, Michigan, Rhode Island and Hawaii), and eight other states are considering introducing legislation (Florida, Oregon, Wisconsin, New Jersey, New York, Vermont, Massachusetts and Maine). In the early 1980s, California became the first state to introduce a form of REPs – the state’s Public Utility Commission mandated that utilities offer standardized contracts with fixed prices, and, by the middle of the decade, private power producers had installed 1,200 MW of wind capacity in California. For two decades, the wind turbines have delivered approximately one percent of the state’s electricity.<sup>19</sup>

In order to spur growth in the solar industry, Congress should consider establishing renewable energy payments. The REPs should be set at a high enough level to make the investment attractive – and then reduced over time to recognize industry growth, as has been done in other countries.

<sup>18</sup> Ibid.

<sup>19</sup> Ibid.

## **Carbon Reduction**

Finally, but certainly no less important, we ask Congress to ensure that new policies to reduce greenhouse gas emissions, such as a carbon tax or cap-and-trade system, do not inadvertently discourage growth in the manufacturing and production of renewable energy sources.

Producing materials and equipment for a growing renewable energy industry is itself energy intensive, even though over the long term, the end-products will result in significant emissions reductions. Currently there is no reliable, continuous renewable energy source sufficient to meet those needs, meaning that manufacturers must rely on fossil fuel-based electricity to power their facilities. At Dow Corning, we are increasing our use of green power by purchasing wind energy and installing on-site solar PV systems to generate a portion of the electricity we need to operate.

To help facilitate an equitable reduction in carbon emissions, we believe policies should reflect the carbon savings generated by the products made by renewable energy technology manufacturers. This will help ensure that the expansion of domestic renewable manufacturing capacity in the United States continues to take root and grow while the country drives towards a balanced and affordable energy portfolio.





## Increase Investment in Research and Development

To accelerate the development of solar technologies and manufacturing, federal policies should include significant funding increases for applied research and development in the solar industry and public-private partnerships designed to further develop the renewable energy industry.

During the last 20 years, solar energy technology research and development in the United States has been largely driven by the private sector and government laboratories, such as Sandia National Labs and the National Renewable Energy Laboratory, working with individual states or private sector companies, universities, private commercial entities and various public-private partnerships.

The United States must make important policy-related decisions that respond to the increasingly competitive, global renewable energy industry. Implementing policies designed to increase research and development will greatly contribute to the United States regaining leadership in renewable energy technology innovations and applications. To maintain this momentum, the federal government should:

- Increase federal support for renewable energy technologies to level the playing field between renewables and fossil fuels, which receives the largest share of federal support
- Place more emphasis on public-private partnerships by matching private investments with government incentives designed to stimulate greater research and development spending in the private sector

- Encourage states to establish solar energy research and development programs to promote energy efficiency, environmental protection and economic development by funding applied research and the development of new solar technologies

Increasing support of renewable energy research and development strengthens the United States economy, increases energy security by diversifying the nation's energy portfolio, decreases the impact of power outages on cities by creating distributed sources of power and creates thousands of jobs in the public and private sectors.





## Further Investment in Education, Training and Job Creation

President Obama has indicated that his administration will invest \$150 billion over 10 years to accelerate the development of a clean energy-based United States economy that will create five million new green collar jobs.

The United States has the highest-skilled manufacturing workforce in the world, and American manufacturing facilities have long been the primary generator of economic growth in the country.

As the United States increases its focus on further developing renewable energy technologies, so too must we invest in educating and training qualified professionals who will fill the renewable energy jobs of the future. Yet, there are currently too few solar training opportunities

available in the country to rapidly develop the tens of thousands of skilled workers, as noted above, that will be needed to support the growing solar industry.

The federal government has taken initial steps toward laying a foundation for national renewable energy job training programs, such as recently passing the American Recovery and Reinvestment Act of 2009 which provides \$500 million to train workers to fill current and future green collar jobs.

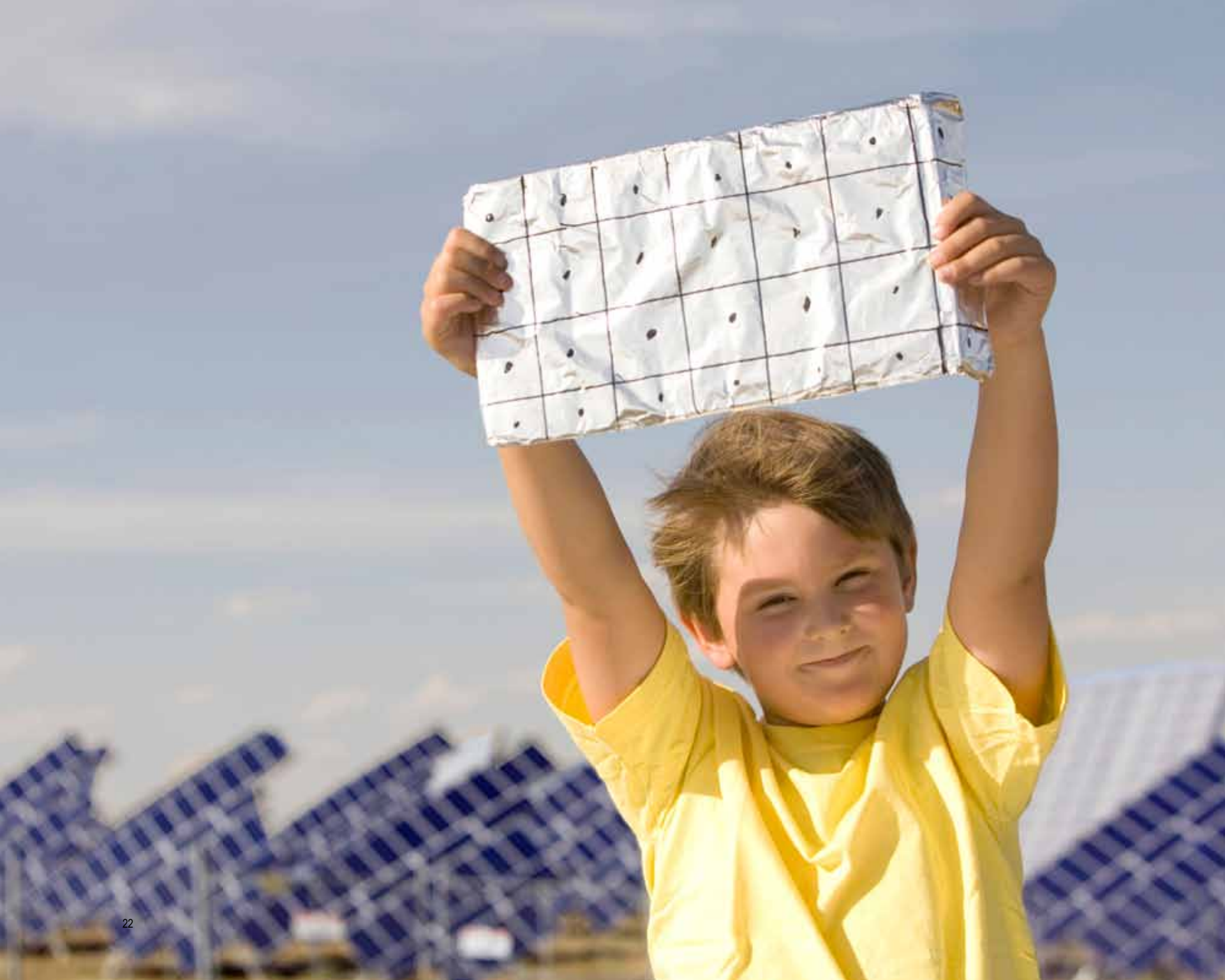
According to the Interstate Renewable Energy Council (IREC), five main types of solar energy-specific training efforts are currently offered in the United States by community colleges, specialized training centers and community-based centers:

- Consumer/general public: workshops and seminars related to solar energy knowledge
- Career interest: non-accredited educational courses offering a basic knowledge
- Building codes: workshops designed for building industry professionals
- Solar energy installation: single courses, continuing education, credit and non-credit courses, certificate programs and associate degree programs
- Apprenticeships: training opportunities offered through apprenticeships, such as through the National Joint Apprenticeship and Training Committee

As an example, Dow Corning collaborates with Delta College in mid-Michigan on curriculum review and program development. Since the basis of solar production is an understanding of chemistry, Delta College offers one- and two-year Chemical Process Technology programs for those without a degree or experience in the field, as well as a new “Fast Start” track which helps individuals with an associate’s degree in a related technical field get the content of the chemical operator degree in a compressed time period.

Additional federal funding and future investments will benefit such training and education programs, as well as meet the growing workforce needs of the renewable energy industry. To further meet the needs of the industry, federal support should be continued for:

- The creation of solar research “Centers of Excellence” at academic research institutions nationwide
- Increased funding for the Department of Energy Technology Pathway Partnership Program, designed to achieve solar cost competitiveness by 2015
- The National Energy Training Partnership Grants, designed to award grants to non-profit partnerships that train renewable energy industry workers
- The State Energy Training Partnership Program, which awards grants to states enabling them to administer renewable energy workforce development programs
- The Pathways Out of Poverty Demonstration Program, which awards grants to training programs that serve those who fall below the federal poverty line



## Federal Government Leading by Example

As a candidate, President Obama repeatedly stated that the federal government is the world's largest consumer of energy. As such, the United States government has a unique opportunity to lead the country in the adoption and implementation of renewable energy technologies in its daily operations, signaling to the private sector and general public that top priority should be given to establishing sound energy practices and crafting public policies that stimulate market growth.

Many have argued that we can reduce our reliance on fossil fuel energy by making the United States a leader in the green building market: investing in building retrofits to achieve increases in energy efficiency, overhauling national efficiency standards and improving government procurement policies, providing for a federal 30-year power purchase agreement (PPA) authority and requiring the use of clean sources of power such as solar PV systems to provide a standard minimum amount of green power consumed by its agencies.

To further encourage the use of clean energy, the U.S. government should:

- Further increase the amount of solar energy equipment used to meet the energy and thermal heating needs of all new and renovated federal buildings, as recently passed in the American Recovery and Reinvestment Act of 2009
- Enact a federal 30-year PPA authority

- Amend the Energy Policy Act to double the existing renewable energy goals for federal agencies to 10 percent from 2010-2012; 15 percent in 2013; and 20 percent by 2020

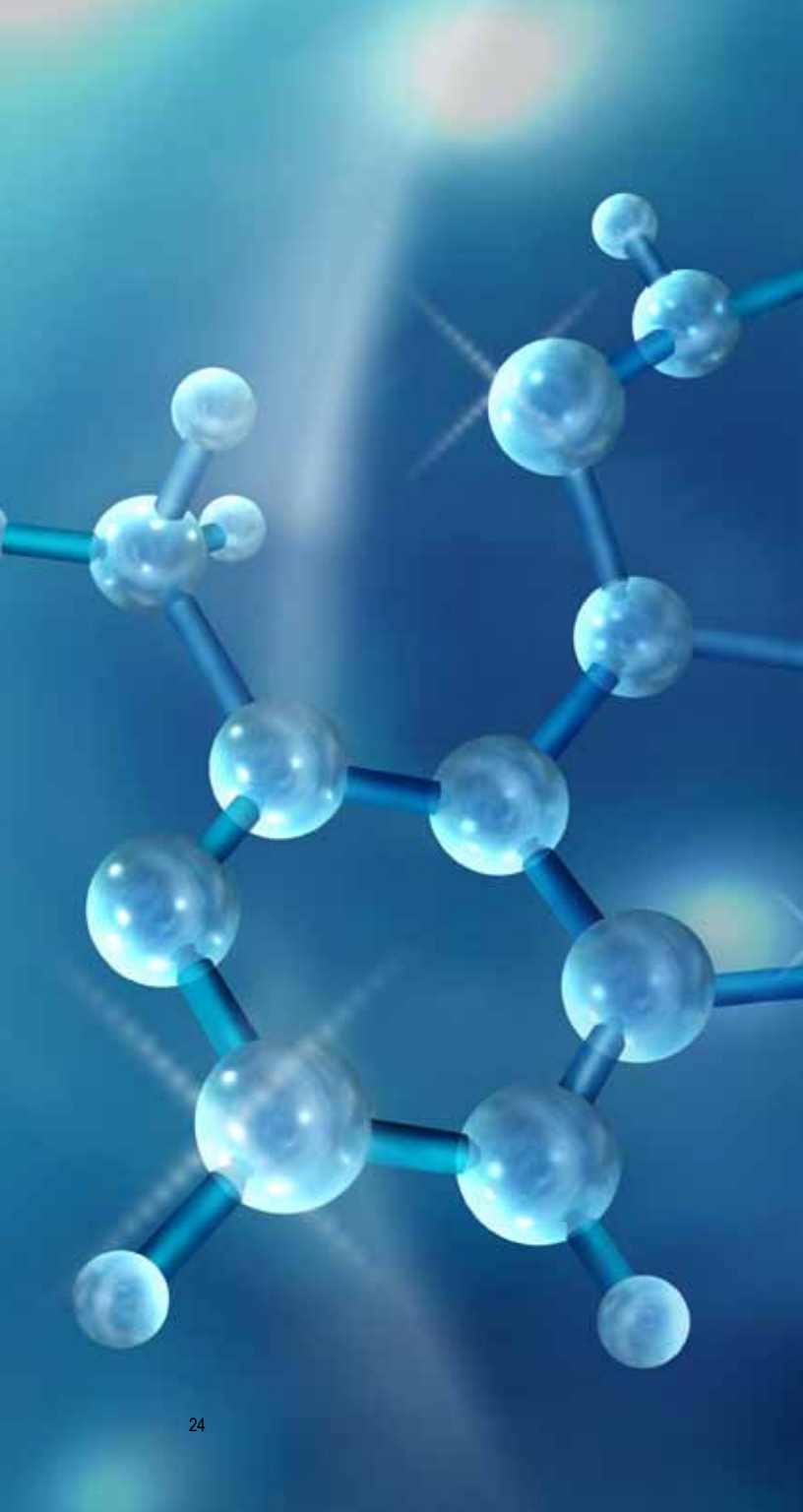
Many states have enacted policies to establish energy and building standards for state and local government buildings. These policies, which include environmental and energy use standards, energy conservation, building materials and renewable energy use, have primarily been applied to government and school buildings. This approach should be taken at the federal level.

PPAs enable property owners to contract with a solar energy provider to install solar technology on a specified property without the associated costs of implementation. The owner agrees to purchase the electricity generated by solar power for an extended period of time, typically 20-30 years, and the cost of the solar electricity is often less than the cost of existing electricity, because of the duration of the PPA.

This model is currently used in the private sector and at some military installations that do not have PPA restrictions. For example, Nellis Air Force Base has a 20-year PPA in place and is saving approximately \$1 million per year.<sup>20</sup>

Providing the entire federal government with 30-year PPA authority could both increase the use of solar power and save the federal government money. However, current law limits the length of federal PPAs to 10 years. A massive investment in solar energy technologies to power the federal government, for example, would lower federal

<sup>20</sup> Nevada Renewable Energy and Energy Conservation Task Force is a site that provides information related to Nevada's state energy plan (<http://www.nevadarenewables.org/?section=featured&id=80>).



electricity bills, reduce carbon and other polluting emissions, and help ensure energy security for the country.

Governments of every size may enjoy the benefits of adopting self-regulatory renewable energy policies. While the results of such policies may not be as wide ranging as the private sector markets, governments are able to address several issues through adopting green policies, such as:

- Increasing energy capacity
- Promoting energy conservation
- Lowering environmental pollution and carbon emissions
- Saving money through reduced energy costs

Perhaps the greatest benefit, however, is the ability to demonstrate leadership in the promotion and use of clean, renewable energy, as government initiatives can sometimes serve as frameworks that the public and private sectors can adopt.

## Conclusion

Investing in solar and other renewable energy technologies will help the United States reestablish itself as the global leader of the renewable energy industry and reinvigorate its economy by creating the thousands of jobs needed today to meet America's future energy needs.

Dow Corning Corporation supports a multifaceted public policy approach in developing a national, diverse energy portfolio and believes that American solar power sits at the center of a comprehensive national strategy for securing America's energy independence.

Achieving greater energy security for America will take federal leadership, smart, integrated policy prescriptions and the energy, investment and innovation of private industry. Dow Corning is committed to doing its part to encourage a climate of collaboration, creativity and commitment to realize this important goal.







## CONTACT DOW CORNING

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