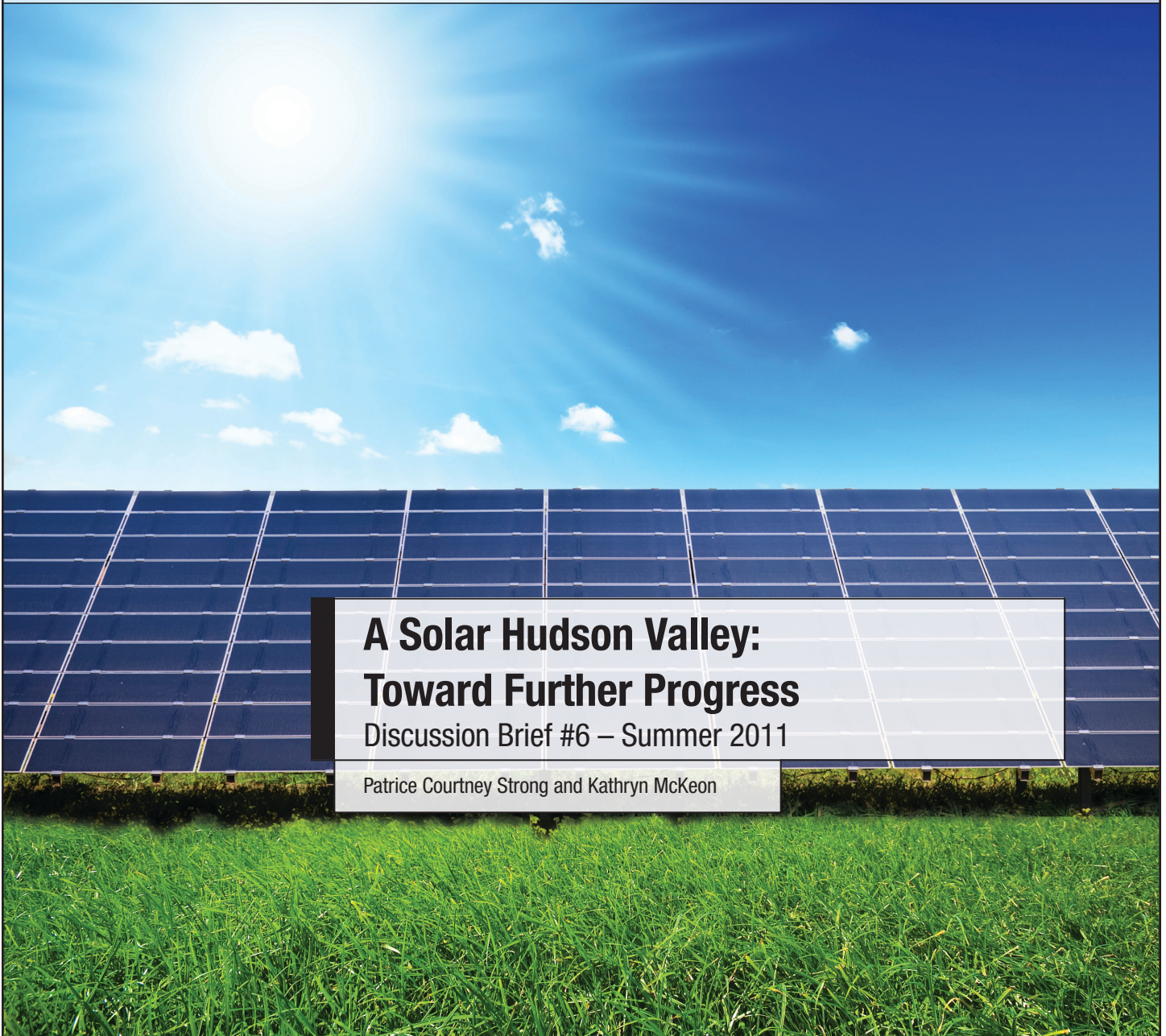


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STATE UNIVERSITY OF NEW YORK AT NEW PALTZ



**A Solar Hudson Valley:
Toward Further Progress**
Discussion Brief #6 – Summer 2011

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The solar technology industry has taken root in the Hudson Valley. Now we must build upon this investment.



At The Solar Energy Consortium, Pat Courtney Strong serves as vice president, Industry Attraction. In this capacity she is charged with attracting businesses to TSEC's renewable energy manufacturing cluster. Pat also provides marketing and education outreach for the New York State Energy Research & Development Authority (NYSERDA) under the Energy Smart Communities program. She is president of the Business Alliance of Kingston (NY). This group of several hundred businesses is working on revitalization through the national Main Street program, energy efficiency and renewable energy projects, and formation of a Business Improvement District.



Renewable Energy Economist Katie McKeon has been with The Solar Energy Consortium for two years. Katie works with her co-workers to promote solar manufacturing business growth and solar technology education and outreach to the community. She is a business advisor to the SUNY New Paltz Solar Car Team and works on various projects to promote the economic development of a solar manufacturing industry in New York. Katie has a bachelor's degree in Economics from Siena College.

HUDSON VALLEY HOMEOWNERS ARE EXPERTS ON RISING ENERGY PRICES; SO ARE HUDSON VALLEY MOTORISTS. THE AVERAGE COST OF HEATING OIL HAS INCREASED **35%** SINCE 2010. A GALLON OF REGULAR UNLEADED GAS THAT COST **\$2.84** AT THE PUMP A YEAR AGO IN THE SOUTHERN COUNTIES OF THE VALLEY WENT FOR **\$3.93** IN THE SUMMER OF 2011 (UP **38.3%**).

As these costs continue to rise we should count ourselves fortunate that many have been hard at work in our region developing solar energy — a key renewable alternative — not just to meet our energy needs but to build a new supporting element of a vital regional economy. The solar technology industry has taken root in the Hudson Valley. Now we must build upon this investment with smart private sector initiatives and public sector policies to ensure that it continues to pay off for years to come.

The Big Picture

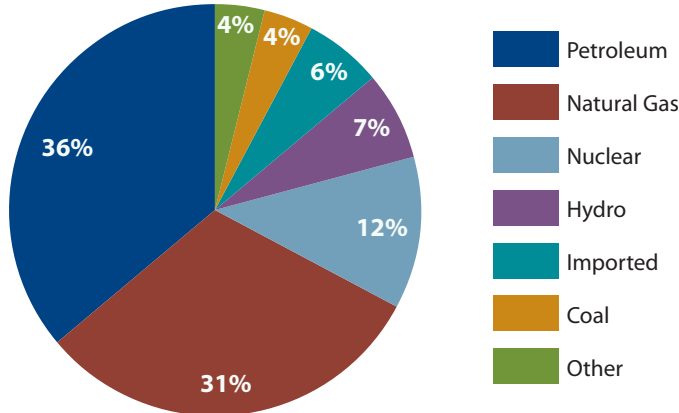
In 2010, total energy consumed in the United States was 97.9 quadrillion British Thermal Units (Btu). (To put this in perspective, burning one barrel of crude oil produces about 6 million Btu's.) The U.S. relies on non-renewable sources to meet the preponderance of its national demand: in 2009, petroleum accounted for 37%,

natural gas 21%, and coal 21% of our total energy consumption. Meanwhile, energy from all renewables together produced only 8% of our nation's needed energy, slightly less than nuclear power (9%).

The primary sources of energy in 2009 in New York State were petroleum (36%) and natural gas (31%), with nuclear providing 12%, hydropower 7%, coal 4% and others (4%) providing the balance. However, for electricity alone in New York, there is little reliance on petroleum (2%). The key sources are natural gas (26%), nuclear (27%) and hydro (18%), with coal providing only 8%.

Reliance on non-renewable sources is a problem precisely because they are non-renewable; sooner or later, they will run out. Long-term thinking suggests that alternatives must be developed now, well before we

New York State Energy Sources — 2009



Source: 2009 New York State Energy. NYSERDA Fast Facts.

are in deep crisis. But there are other, very practical short-term problems associated with non-renewable energy sources.

The cost of crude oil on international markets hovered around \$100/barrel last year, peaking during the winter at \$114/barrel. This was the driver of regional home heating oil and gasoline prices. Growing demand for oil in developing nations, coupled with occasional political turmoil in oil-producing countries, makes supply unpredictable and puts upward pressure on prices. When the cost of oil increases, so does the cost of goods; most items need to be shipped overseas, flown to importing countries or trucked long distances. Rising transportation costs for suppliers are passed along to consumers. And of course, national security is at risk when control of the energy resources upon which we greatly rely is not in our hands.

There is an abundance of natural gas in the United States, a considerable amount of which is in the Marcellus Shale formation in our region. But producing it

in commercial quantities will require hydraulic fracturing (“fracking”), forcing the gas to the surface by pumping millions of gallons of water, sand, and chemicals into horizontal wells a mile or more beneath the ground. This is an enormous regional and statewide issue. Clean water is an abundant, important resource in the Hudson Valley, relied upon not only to meet local needs but also those of New York City. The value of the natural gas we may produce in this way to meet energy needs must be balanced against the potential contamination of ground water from this process. In states that have already approved the process, fracking has been implicated in the contamination of water wells and rivers. In June 2011, the federal Environmental Protection Agency (EPA) began a study of the linkages of fracking to water pollution in Texas, North Dakota, Pennsylvania, Colorado, and Louisiana. In November 2010, New York adopted a moratorium on drilling, but in July 2011 Governor Cuomo lifted the moratorium and the state Department of Environmental Conservation

(DEC) released a draft report which included recommendations for regulating fracking. Under the provisions of the DEC draft, companies must release detailed information on their process, including the chemicals they use. Permits will not be granted on state property or near aquifers, public water supplies, or private wells and in 100-year floodplains. Nor will fracking be permitted in the Syracuse and NYC watersheds. Given recent layoffs at DEC, opponents question the state agency’s ability to adequately monitor and regulate this permitting process and fracking activity. No permits will be granted until after the public comment period on the draft, which is expected to continue throughout the fall and winter of this year.

Coal is also abundant in the U.S., though not in New York. However, air pollution concerns have led to public policy in our state limiting the use of coal for energy production. In July of 2011 the EPA finalized new national standards for the emission of mercury and other toxic pollutants from coal-burning power plants. These dramatically increased protections against sulfur dioxide, nitrogen oxide and other particulates. In her earlier announcement of the proposal, EPA administrator Lisa P. Jackson emphasized that control of these toxic emissions would prevent thousands of deaths and tens of thousands of cases of disease a year.

Global warming is another compelling environmental concern. The U.S. will require even more energy as our economy continues to recover and grow. Greater consumption of non-renewables

Many in the U.S. are questioning the safety of our current nuclear facilities and are increasingly skeptical of plans to build more.

produces increased carbon emissions — a leading cause of climate change. Renewable power generation offers power with significantly lower emission of carbon dioxide.

The potential of nuclear energy has received renewed attention in recent years. Some nations have made very heavy commitments to nuclear power. In France, for example, almost 75% of energy is provided from this source. However, waste disposal remains an intractable problem. Moreover, with the recent tsunami in Japan and the nuclear disaster at Fukushima which followed, the use of nuclear technology for energy production world-wide is under increased scrutiny. Many in the U.S. are questioning the safety of our current nuclear facilities, and are increasingly skeptical of plans to build more. In New York, Governor Andrew Cuomo has strongly voiced opposition to the continued operation of the Indian Point nuclear facility in Westchester County.

The Commitment to Renewable Energy

The argument for the development of renewable resources to provide us with safe, secure, reliable, and clean energy alternatives is unassailable. President Barack Obama has made it a national goal to reduce the renewable/non-renewable energy source ratio. On March 30, 2011 at Georgetown University he said, “To assure a viable, prosperous, secure future for

the United States, four-fifths of American electricity — twice as much as today — must be generated from clean energy sources by the year 2035.”

The New York State Energy Plan, last published in 2009, is scheduled for updating by 2013. Goals include: improving the reliability of the state’s energy systems; insulating consumers from volatility in market prices; reducing the overall cost of energy; and minimizing public health and environmental impacts, in particular those related to climate change. The plan also identifies policies and programs that, if implemented, are designed to maximize cost-effective energy efficiency and conservation activities to meet projected energy demand growth.

The New York State Legislature in 2011 took important action related to the state’s energy economy and its sustainability. While the failure to pass the NY Solar Industry Development and Jobs Act (Englebright A5713) was a disappointment for the Hudson Valley region, the Power NY legislation did pass (A8510, Chapter Law 388 of 2011). It includes a new power plant siting process, establishes a financing mechanism for a comprehensive energy-efficiency retrofit program, and includes a solar study provision. Additionally, net metering legislation has been signed into law, providing incentives for the deploy-

ment of large-scale solar and wind power plants by municipalities, school systems, public agencies, and energy project developers.

These legislative actions are in accord with pledges made by Governor Andrew Cuomo to invigorate the state’s commitment to developing renewable energy sources as an economic development strategy. He said: “New York spends approximately \$65 billion annually on energy, of which 53% or close to \$35 billion leaves the state to pay for energy imports. The strategy of reducing energy costs and our dependence on out-of-state sources of energy provides many opportunities to create new jobs.”

Renewable Alternatives and the Solar Option

In the U.S., hydropower is the most utilized renewable resource: it is the source of 35% of all renewable energy used. New York State gets 18.1% of its power from hydro. Our leading position among the states in renewable energy use results from our early development of hydropower.

Wind power is a clean, reliable and, when properly sited, efficient renewable energy technology. Wind energy deployment is increasing in New York State and is supported by NYSER-DA’s Renewable Portfolio Standards, which provide financial incentives for turbine installation. This program has already

Consider this: During the 2003 Northeast blackout that caused \$8 billion in economic losses, as little as 500 MW of solar PV deployed in the Midwest and Northeast could have filled the need.

supported the construction and operation of 1,175 MW of wind power and has projects totaling an additional 281 MW in the planning stage.

According to the U.S. Department of Energy, geothermal heat pumps use a quarter to a half less energy than conventional systems. They may reduce heating costs by 50–70% and cooling costs by 20–40%. However, such systems are expensive, carrying a 6–12 year payback period. Moreover, because geothermal production of electricity requires subterranean temperatures of at least 400 degrees, their use is often not practical in the Northeast, where great depth is required to reach these temperatures. Deployment in New York has therefore been slow; incentives remain necessary. NYSERDA reports 63 projects completed since its program began in 1999, with another 46 in the planning stage.

Solar energy for residential use is currently more expensive than these other technologies, with longer payback periods for investment. As solar technology advances, its cost is expected to grow closer to achieving “grid parity”, that is, the cost of creating solar energy will approach equivalence to the cost of energy from non-renewable sources. In fact, the installation costs associated with solar technolo-

gies have been on a significant downward trend, from approximately \$8/watt in 2000 to \$5/watt (for residential systems) today. In some markets, when solar energy is compared to the energy produced by peak power plants, grid parity has already been achieved. The U.S. Department of Energy, which has made lowering the cost of solar technology a national priority, projects a further three-quarters reduction over the next twenty years in the cost of producing a kilowatt hour of solar power.

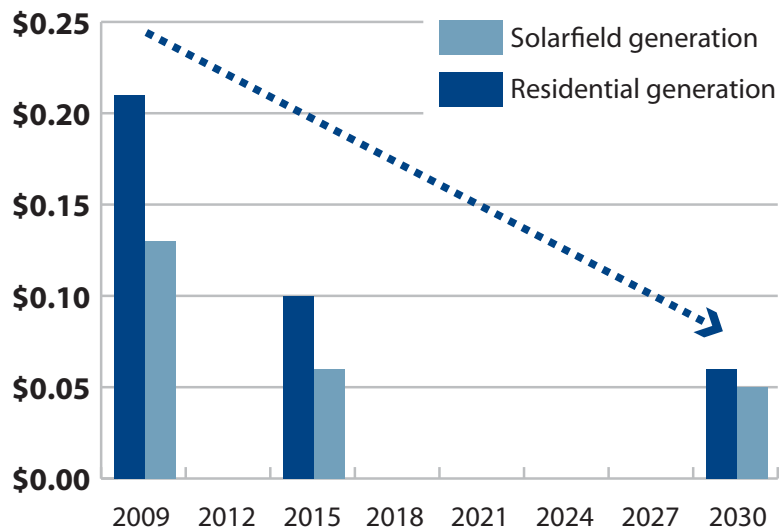
Solar power has significant benefits. One of utility companies’ largest concerns is black- and brown-outs caused by high demand on the system. Drawing upon experience in California, solar power peak generation

coincides with peak energy demanded by utility customers, allowing solar energy to directly reduce a key strain on the grid.

As Joe Romm has pointed out, the beauty of solar photovoltaics (PV) is that its availability matches up perfectly with demand on the sunniest summer days of the year. Richard Perez, an energy expert from the University of Albany, put it succinctly: “We should be using the source of the problem to create the solution.”

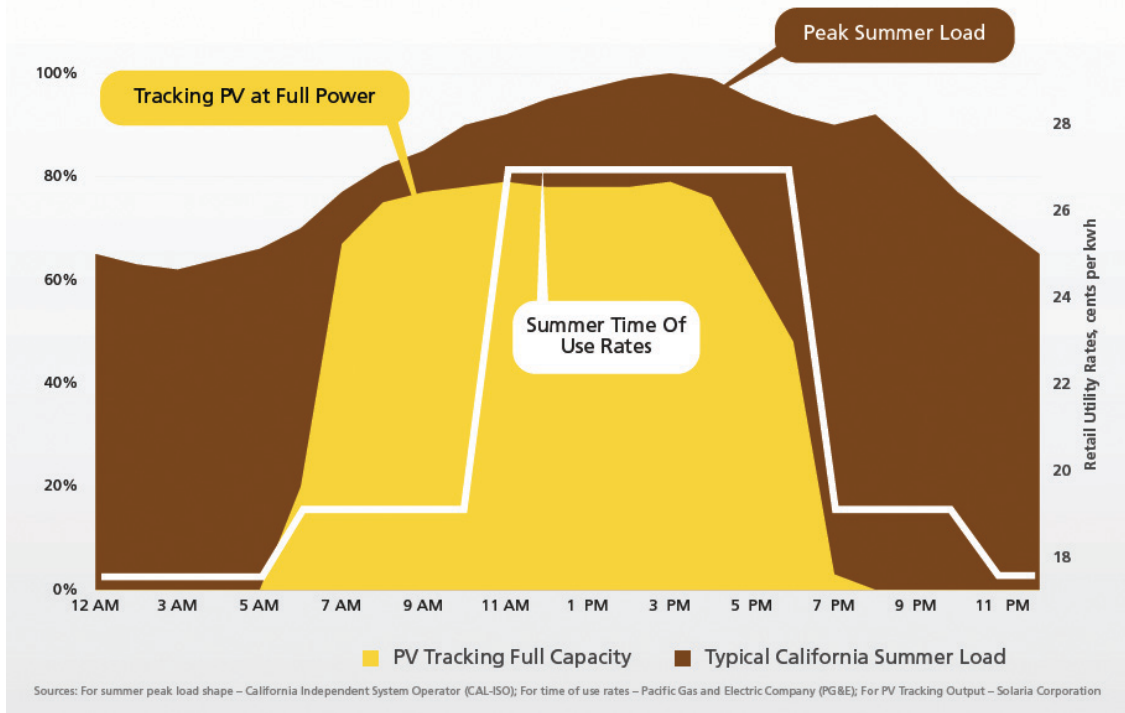
Consider this: during the 2003 Northeast blackout that caused \$8 billion in economic losses, as little as 500 MW of solar PV deployed in the Midwest and Northeast could have filled the need.

Projected Cost of Solar Power (in cents per kWh)



Source: White House. Blue Print for a Secure Energy Future, March 2011.

Solar Meets Critical Peak Power Demand



Solar energy can be produced anywhere in the U.S. where sunlight is unobstructed. As solar cells become more efficient, residential system size will decrease. When coupled with efficient energy storage technologies (still in development), solar systems will become an even more useful asset to the power grid. As solar deployment increases, domestic manufacturing of solar technology will also increase, helping to revitalize our economy and provide jobs for our citizens.

Solar technologies are suitable for both rural and urban environments. A recent study by a City University of New York research team shows that under typical weather conditions, panels placed on the roofs

of buildings in the city “could meet 49.7% of the current estimated daytime peak demand and about 14% of the city’s total annual electricity use.” While all renewable technologies will play a necessary role in the transition away from fossil fuels, it is clear that solar holds great promise for making a major contribution.

The Market Barriers to Change

While there is a push towards renewable energy consumption and away from fossil fuel reliance, large-scale realignment still faces substantial obstacles. A lack of consistency in public commitment to change is driven by the volatility of prices for non-renewables. President Obama put it best when he

noted the national tendency of “going from shock to trance on the issue of energy security, rushing to propose action when gas prices rise, and then hitting the snooze button when they fall again.”

There is an important economic development side to this equation as well. Governor Cuomo has encouraged and supported a regional approach to renewing the state’s economy and has identified multiple facets of the solar industry in the Hudson Valley for particular focus. While still governor-elect, he wrote of his intention to: “take advantage of a budding solar energy industry in the state — from small companies like Solartech Renewables in the Town of Ulster that plans

In an environment of intense foreign competition, TSEC works with local and state agencies to help foster companies' growth in the Hudson Valley solar industry cluster, promoting business sustainability.

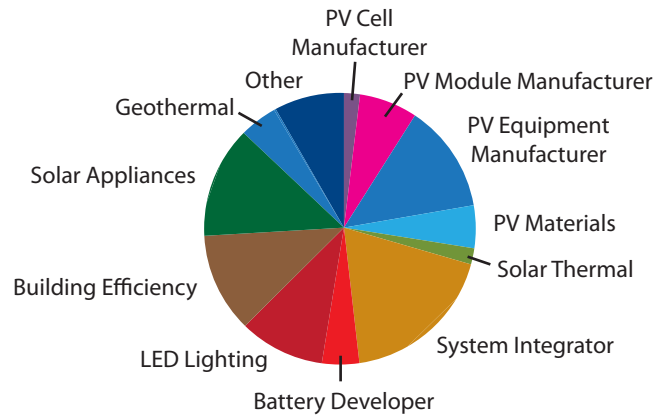
to create 100 new jobs there within the year and as many as 300 more over the next five years — to solar energy research backed by some of the state's most prominent research universities.”

TSEC and the Hudson Valley Solar Cluster

The work of The Solar Energy Consortium (TSEC) has been critical to the creation of the solar manufacturing cluster in our region. With the support of Congressman Maurice Hinchey, TSEC began as an all-volunteer staff of technology executives in the summer of 2007. It has become a state and federally funded non-profit recognized by the National Renewable Energy Laboratory as an industry-led consortium working towards the advancement of solar manufacturing, one of only eighteen such consortia in the world. The consortium's objectives include: advancing solar innovations, creating solar solutions, attracting solar-related manufacturing to New York, supporting the dissemination and adoption of advances in solar technology, and delivering solar outreach and education to the community.

Industry clusters provide a number of benefits to local and

Industry Partners (proportion of total)



Source: TSEC

regional economies that begin to accrue comparatively early in their development. The synergies such clusters engender increase the pace of innovation and productivity, while boosting employment. They can create new industrial sectors while strengthening older ones, and focus economic policies on critical business interactions.

TSEC works closely with 95+ industry partners in areas from raw materials to system aggregation and installation, establishing a supply chain within the state. TSEC estimates that these efforts helped create nearly 600 manufacturing jobs since its inception. In an environment of intense foreign

competition, TSEC works with local and state agencies to help foster companies' growth in the Hudson Valley solar industry cluster, promoting business sustainability. TSEC provides all of its partners with technical, operating, and business support to counter the temptation for companies to move outside the region.

The Hudson Valley has a history of involvement in semiconductor research and manufacturing. The consequent availability of infrastructure and technical talent, combined with TSEC's industry support and focused federal and local economic development efforts, has resulted in the establishment

Solar Supply Chain



Source: Lux Research

It is important to the success of the industry that solar energy technology purchased in the United States is manufactured here, as well.

of a vital and growing photovoltaic manufacturing industry cluster in our region.

Current Policy: National and State

National Policies

Over the past decade, the U.S. Department of Energy (DOE) has invested more than \$1 billion to pursue an integrated set of research and development investments to advance solar energy technologies and bring down the cost of solar energy systems. Innovations in both science and technology have helped reduce solar energy costs by more than 60% since 1995. The DOE has worked closely with industry in a wide variety of public-private partnerships to capitalize on these federal investments.

Commercialization and Development Incentives

The DOE has awarded \$50 million to support the Photovoltaic Incubator Project, aimed at accelerating the commercialization timeline for promising technologies. This funding leveraged \$1.3 billion in private investments, delivering a 24 to 1 private to public investment ratio for American taxpayers. The Photovoltaic Manufacturing Initiative (PVMI), launched in 2011, supports accelerated development for the U.S. PV industry by means of \$125 million over five years of DOE investment in winning

project teams. Sematech and the College of Nanoscale Science and Engineering (CNSE) in Albany, along with their university and industrial partners, received PVMI grants. Recently, the DOE also created the SunShot Initiative, a \$27 million program aimed at making solar technologies more cost-competitive. The initiative's goal is to lower the cost of solar energy systems 75% by 2020.

The 2009 American Recovery and Reinvestment Act (ARRA) included a competitive tax credit for advanced energy manufacturing projects. New York recipients included Brookhaven Science Associates, General Electric Company, City University of New York (CUNY), and Columbia University. The program proved immediately successful and its cap of \$2.3 billion was rapidly reached, leaving more than \$5 billion in eligible applications unfunded. These unfunded applications represent manufacturers ready to break ground once funding is received. A request for an additional \$5 billion was included in President Obama's Fiscal Year 2012 budget proposal.

Startup Funding The DOE also has a loan guarantee program, geared towards larger-scale projects (not small businesses) that assists solar start-ups in acquiring funding. Another effort, the 1603 Treasury Grant Program (TGP),

allows the owner of commercial solar property to receive a 30% grant in lieu of taking the solar Investment Tax Credit (ITC). The ITC functions as a 30% uncapped tax credit for residential solar systems under Section 25D and commercial solar systems under Section 48 of the Internal Revenue Code. The ITC is in effect through December 31, 2016. Since its inception as part of the ARRA, the program has funded the deployment of approximately 1100 projects in 42 states (both solar electric and solar thermal) and supported the creation of thousands of jobs and billions in investment, it facilitated the near-doubling of the solar industry in 2010. More than 200 New York State companies have participated in this program, including companies in Newburgh, Fishkill, Hyde Park and Saugerties. The TGP has been extended until 2012.

Creating Demand

It is important to the success of the industry that solar energy technology purchased in the United States is manufactured here, as well. Using a national security rationale, President Obama recently signed into law a provision that requires solar energy panels purchased by the Department of Defense to be made in America.

New York State Policies

NYSERDA The primary agency that oversees programs that further the development

While there are policies in place to help propel the solar industry forward, American solar businesses are still facing challenges.

of energy-efficient and renewable energy technologies is NYSERDA. Through competitive solicitations, NYSERDA seeks to develop markets for energy efficiency; demand management; outreach and education services; research, development, and demonstration; low-income services; incentives for renewable manufacturers; and renewable power generation system installations.

Encouraging Renewable Installation and Production

In 2004, the New York State Public Service Commission (PSC) adopted renewable portfolio standards (RPS). Currently a total of 29 states and the District of Columbia have mandatory RPS. An additional seven states and two territories have adopted volunteer renewable energy goals. An RPS is a policy that seeks to increase the proportion of renewable electricity used by retail customers, employing a central procurement model. New York State mandates that 30% of the state's electricity must come from renewable sources by 2015. PV installations are eligible under the RPS but there is currently no stipulation requiring a specific percentage, or "carve-out" of the RPS to be renewable energy generated by solar PV. Additionally, the Long Island Power Authority and the New York Power Authority have both issued requests for proposals for the installation

of PV totaling 150 MW; all chosen projects are or will be supported with Power Purchase Agreements.

New York also supports net-metering, a practice that allows electric customers with solar-PV, wind, or anaerobic digester systems to receive credit for the electricity sent back to the grid. There are limits, however, to how much electricity customers are allowed to sell back to the utility. For residential net metering, the cap on system size is 25 kW; for commercial properties the cap is set at 2 MW. Recent legislation facilitating remote net metering (Chapter 35, Laws of 2011) will allow municipalities, school systems and developers to aggregate power produced on non-contiguous properties for sale to the utility. This legislation is expected to stimulate solar technology deployment significantly.

Lastly, residential PV installations of up to 10kw are eligible for personal income tax credits equal to 25% of the cost of the solar energy system, with a maximum credit of \$5,000. (For condos or coops the PV installation size limit is 50kw.)

Public Policy: Next Steps

While there are policies in place to help propel the solar industry forward, American solar businesses are still facing challenges. In an effort to discover what Hudson Valley companies see as the greatest obstacles to achieving a thriving U.S. solar

industry here, a focus group was convened during TSEC's Solar CEO conference held at SUNY New Paltz in January 2011. CEO's from the Hudson Valley solar cluster expressed concerns in three areas: accessible capital funding, building market demand through institutionalizing non-traditional procurement practices, and indirect subsidization through additional tax relief.

Access to Capital

The Great Recession of 2007–2010 made it difficult for start-up companies to acquire private investors; new start-ups in the solar industry were no exception. Capital investments are needed in all phases of business development:

- Short-term: solar companies face high upfront capital costs associated with setting up a factory (machinery acquisition, for example)
- Middle term: CEO's of companies that produce balance of system products (e.g. inverters) mentioned that there is little manufacturing assistance for their part of the solar supply chain
- Long-term: since a business can take years before it is capable of producing a profit, financing options in addition to the DOE loan guarantees are sought for large upfront investments

To meet these challenges, CEO's suggested more working capital loans, state- and federal-sponsored loans/grants, more local financing and more long term financing of solar projects.

To meet these challenges, CEO's suggested more working capital loans, state- and federal-sponsored loans/grants, more local financing and more long-term financing of solar projects. They suggested that long-term financing might include 20-year project installation financing and more power purchase agreements. Under such agreements, installers own a system on the customer site and the customer buys renewable power from them.

Building Demand

Market demand is at the heart of the American solar market; without strong demand, the industry will not flourish. There are many policy options that will assist in the creation of market demand, putting the United States and New York on a more even playing field with other places creating solar sectors in their economies.

Until its cost can compete with that of fossil fuels, there needs to be focused support for generating demand for power from solar sources. Many countries and states have put in place demand-inducing policies in support of domestic solar technology manufacturing. "Buy-American" provisions are advocated as the best way to compete with foreign suppliers. Currently, the Defense Department is required to buy American-made panels and the

ARRA put source restrictions on projects it funds, but focus group participants reported that this was not sufficient. They argue that policies need to cover a broader scope of federal and state procurement agencies. Examples include:

REMI: In New Jersey, a thriving market for solar technology, "Buy New Jersey" provisions are part of the State's Renewable Energy Manufacturing Incentive (REMI). REMI makes New Jersey-manufactured solar products eligible for a rebate. To be classified as a New Jersey-manufactured product, 50% of its cost must be attributable to components, overhead, raw materials, and labor from New Jersey. There are also customer incentives available under this program. A policy similar to this in New York would reward New York manufacturers, making the NYS solar market more attractive to investors and consumers.

SRECs: Solar Renewable Energy Credits (SRECs) are an alternative approach that may provide a solar customer with a consistent income. These are used in Delaware, Maryland, Massachusetts, New Jersey, Ohio, and Pennsylvania. North Carolina also sells into the SREC market. A country or a state may require electricity

suppliers to meet a solar energy compliance level, either by generating solar energy or by purchasing credits from others who do so. One SREC is earned every time a solar system generates 1,000 kWh of electricity; the SREC may then be sold to someone looking to purchase it. SRECs can become a lucrative source of income that will offset or exceed the cost of a solar system. However, prices are set through auctions, and are subject to market conditions. Currently, New Jersey has a flourishing SREC market; while the prices fluctuate, a New Jersey SREC is sold for around \$600.

FiT: A Feed-in-Tariff (FiT) also fosters solar system demand. The most common solar incentive policy in the world, FiTs are currently in place in 63 jurisdictions across the globe, including a dozen U.S. states that are building renewable sectors. A FiT encourages the adoption of renewable energy sources and helps accelerate the move toward grid parity by paying a premium price to renewable electricity generators (including homeowners and businesses) for any renewable electricity they produce. Typically, regional or national electric grid utilities are obligated to purchase the electricity produced this way. Different tariff rates are set for different

Streamlining the permitting process for installing solar systems makes the process more affordable.

renewable energy technologies, linked to the cost of resource development in each case. These cost-based prices enable a diversity of projects (wind, solar, etc.) to be developed while investors obtain a reasonable return on renewable energy investments.

Streamlined Permitting: Streamlining the permitting process for installing solar systems makes the process more affordable. Generally a building and/or electrical permit are required before installing a photovoltaic (PV) system and a plumbing and/or mechanical permit before installing a solar water heating (SWH) system. The permitting procedure ensures that a solar installation meets engineering and safety standards. Following installation, an inspector will verify that the installation complies with code. When the final inspection is completed and approved, the system can begin operation, so long as it is also approved for interconnection by the serving utility.

These processes exist to assure public safety and allow local governments to track installations in their communities. At the same time, the process of obtaining permits can substantially increase the time and cost of installing a solar system, often becoming a major obstacle to solar market development. Several cities have streamlined the solar permitting process

with clearly defined requirements, expedited processing for standard installations, and offered the option to submit paperwork online. Some local governments are going a step further and working with other jurisdictions in their regions to make the permitting requirements and process consistent across jurisdictions and throughout the state. The DOE's recently-issued Rooftop Solar Challenge initiative supports these efforts.

Permit fees are often the focus of concern, but a broader view of costs includes those to the contractor, jurisdiction, and system owner. Waiving or discounting fees for local building permits, plan-checking or design review can support local solar market growth. Even more important, however, are online document submittals and predictable review schedules, for these can yield greater savings to a project than waiving fees. The key is to develop a process that reduces costs to all stakeholders while maintaining or improving public safety.

Non-traditional Procurement Practices

Non-traditional procurement methods are another way to attract more consumers to solar generation systems. Under traditional solar resource procurement, a request for proposal (RFP) is issued and a power purchase agreement (PPA) is negotiated with the winning proposal. Non-traditional

methods include: joint procurement with other utilities, PPA or utility-owned; electronic auctions; standard offers; franchise bidding; combined purchasing; reverse auctions; and forward pricing with volume guarantees.

Joint Procurement

A successful strategy for the development of large-scale utility resources for both generation and transmission is joint procurement. These efforts have been most successful where a legal framework exists through which the process may be managed. In contrast, new consortia of utilities that have tried to aggregate their efforts have encountered problems from participant attrition, changed expectations over time, and faced the difficulties of properly allocating risks and rewards among participants.

Electronic Auctions

E-procurement such as electronic and web-based systems may reduce costs for buyers and sellers by increasing transparency, efficiency, competition and access to all potential participants. Electronic procurement may serve, too, to automate aspects of supply chain management, lower business-to-business transaction costs and improve buyer and seller communication through a shared web-based infrastructure. However, they have not been tested for large capacity acquisitions or long-term contractual commitments.

Solar Energy CEO's argue that state and regional tax incentives should be increased and tax benefits should equal or surpass offshore offers for support.

Standard Offers

The Public Utilities Regulatory Policies Act (PURPA), passed by the U.S. Congress in 1979, is commonly known as Standard Offers. Lawmakers sought to develop smaller-scale technologies from renewable resources and those that could improve the generating efficiency of aging utility facilities, particularly through cogeneration of both electricity and thermal energy. To do this, Congress imposed an economic restraint on the development of these new generation resources; it required that they be able to produce electricity at an "avoided cost," calculated at or below the price a utility would otherwise pay to build its own resources or purchase power from another source. The new class of non-utility generation thus needed to meet a stringent cost hurdle, particularly in regions and territories where the system average cost of generation was perceived as low.

Reverse Auction

Flipping the role of the buyer and seller, reverse auctions have the buyer driving the auction. Online auctions can provide price transparency and control that the paper-based RPF process may not always provide. Quoting performed in real-time via a web-based platform results in dynamic bidding, helping to achieve rapid downward price pressure that is not normally created

using more conventional and static paper-based bidding and procurement.

Forward Commitment Procurement Model

Providing the market with advance information of future needs, early engagement with potential suppliers, and the incentive of a "forward commitment" to purchase a product or service that currently does not exist, at a specified future date, can be delivered to agreed performance levels and costs. The model is perceived as a way to manage risk in the marketplace by making the market aware of genuine needs and requirements and offering to buy products that meet these needs once they are available at prices commensurate with their benefits. This model is being tested by some public sector agencies, but seems better suited for obtaining components or services rather than large-scale utility-grade generation resources.

Taxation

Hudson Valley Solar energy CEO's feel high state and local taxes divert money from companies' R&D efforts. State and regional tax incentives should be increased, they have argued, and tax benefits should equal or surpass offshore offers for support. Taxation of commercial PV systems is nonproductive when the state is trying, with other tax policies, to encourage them. The combined 8%+ state and local sales tax in New York

is, in fact, many times more than the manufacturers' margin. Recruitment of foreign companies to the nation and state that are in competition with New York companies through the use of NY and federal incentives (ESD, section 48C, etc.) is a cause of great concern to domestic manufacturers.

State Legislative Objectives

To continue to cultivate and sustain the growing solar industry in the state of New York, a broad coalition, including the New York State Solar Energy Industry Association (NY-SEIA), was working closely with Ulster County Assembly member and Energy Committee Chair Kevin Cahill and the Office of Governor Andrew Cuomo as the 2011 legislative session drew to a close. The goals:

- Creating a fully-funded program to install 5,000 MW of solar PV capacity by 2025
- Building support for generating 2,000 MW of solar/thermal in the state as a replacement for oil and natural gas by the year 2020
- Ensuring the success of New York's first solar/thermal incentive program that will provide \$25 million over five years through the Renewable Portfolio Standard program to encourage the installation of systems to heat water using solar energy

Additionally, advocates were championing Assembly Bill 5713, also known as the Solar Jobs Bill. The legislation creates a SREC Program like the one described above, designed to stimulate the installation and generation of solar energy in New York State. A Renewable Energy Credit model will provide investment stability through long-term contracts and competitive bidding in open auctions. This program remains on the legislative agenda (A5713, now in the Ways and Means Committee). If adopted, it would enable New York State to help fulfill the goal set by the Governor’s Renewable Energy Task Force to facilitate the installation of 100 MW of solar, with the possible creation in New York of 20,000 clean energy jobs and generation of more than \$20 billion for the state economy.

Aside from the proposed legislation, it is important to look for guidance to the states that have the highest numbers of solar installations. In 2009, these were: California, New Jersey, and Florida. In 2010, the Empire State fell out of the top 10, going from seventh to eleventh place (Texas was 10th).

New Jersey is the sixth-largest solar market in the world. If solar capacity were to be calculated on a per-square-mile basis, New Jersey would lead the nation. This leadership is not just because of exceptional solar resources. It reflects political will and an informed renewable energy policy. As detailed by Shayle Kann, Managing Director of GTM Solar Research in his recent U.S. Utility PV Report, “New Jersey

has long been the country’s second-largest state market behind California, but has only recently begun to develop a utility market. With a large RPS solar requirement that ramps up increasingly in later years, the state is poised to lead the East Coast utility market.”

CONCLUSION

The 2011 Power New York Bill was a major step forward in energy policy in New York. Importantly, at the initiative of Energy Committee chair Kevin Cahill, it included MW targets in the study it mandated for the further development of PV energy in the state. The Solar Energy Consortium, along with other solar advocates like NYSEIA, continues to work on growing the Hudson Valley

solar cluster. Moving forward, it is important that the four issue areas identified by the CEO focus group be addressed to retain solar businesses and jobs already established here, and grow new ones. Greater access to capital, increased market demand, better procurement policies, and additional tax relief are the needs that must be met to entrench the nascent regional solar industry. With the right policies in place, the New York solar sector will surely flourish; positive effects on the environment and on our economy will follow. If positive steps are not taken now, however, competitive policies in other states and other countries will cause New York to lose the gains it has made in nurturing a strong solar industry in our state and region.

<i>2010 Installations, Top 10 States</i>	<i>Photovoltaics (MWdc)</i>	<i>Concentrating Solar Power (Mwac)</i>
California	258.9	-
New Jersey	137.1	-
Nevada	61.4	-
Arizona	54.0	1.5
Colorado	53.6	1.0
Pennsylvania	46.8	-
New Mexico	42.8	-
Florida	35.2	75.0
North Carolina	30.7	-
Texas	22.6	-
Rest of U.S.	135.2	-
Total	878.3	77.5

Source: The Top 10 Solar States of 2010, Calfinder 2010

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Comment

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