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CleanEnergy
States Alliance

2010 Report

STATE EFFORTS TO
ADVANCE CLEAN ENERGY



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Clean Energy States Alliance (CESA) is a nonprofit coalition of state clean energy funds and programs working together to develop and promote clean energy technologies and markets. CESA provides information sharing, technical assistance services, and a collaborative network for its members by coordinating multi-state efforts, leveraging funding for projects and research, and assisting members with program development and evaluation.

For more information:

Clean Energy States Alliance, www.cleanenergystates.org



Clean Energy Group (CEG) is a leading nonprofit advocacy organization working in the U.S. and internationally on innovative technology, finance and policy programs in the areas of clean energy and climate change. CEG works directly with public clean energy fund managers, private investors, and business academics to use its unique financial and policy expertise to develop effective and transferable models for mobilizing new sources of capital in the clean energy sector. CEG now manages CESA as well as the United Nations Environment Programme's Sustainable Energy Finance Initiative-Public Finance Alliance (SEF Alliance), an international coalition of public clean energy funds.

For more information:

Clean Energy Group, www.cleanegroup.org

Clean Energy States Alliance 2010 Membership List

Alaska Energy Authority

California Energy Commission

Colorado Governor's Energy Office

Connecticut Clean Energy Fund

District Department of the Environment, Energy Administration – D.C.

Energy Trust of Oregon

Illinois Clean Energy Community Foundation

Maryland Energy Administration

Massachusetts Clean Energy Center

New Hampshire PUC – Sustainable Energy Division

New Jersey's Clean Energy Program

New York State Energy Research & Development Authority (NYSERDA)

Ohio's Advanced Energy Fund

Sacramento Municipal Utility District

TRF Sustainable Development Fund – Pennsylvania

Vermont Clean Energy Development Fund

Wisconsin Focus on Energy Program

Xcel Energy's Renewable Development Fund – Minnesota

From the Director

States Lead the Clean Energy Revolution

States today are at the forefront of U.S. efforts to address clean energy and climate change and are showing extraordinary leadership as they design and implement a variety of innovative clean energy and climate programs.

Over the past decade, for example, states have provided critical financial support to spur thousands of new renewable energy projects using a range of financial support tools, from rebates to competitive grants to loans. Complementing these tools is a set of aggressive public policies at the state level—from tax incentives, net metering, and interconnection rules to renewable portfolio standards.

Recently, the American Recovery and Reinvestment Act (ARRA) provided all 50 states with significant new funding resources to accelerate clean energy investments at a time when private investment in these technologies is in a slump.

Clean Energy States Alliance (CESA) and its members are at the center of this state clean energy activity. In fact, CESA is the only national nonprofit organization that works with states to advance clean energy technology development. CESA provides its growing membership with opportunities for multi-state collaboration, information sharing, and technical services. CESA also works directly with states to build and expand clean energy markets throughout the U.S.



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Inside this report, you'll find highlights of these state program offerings and the results achieved by CESA's members as they drive a clean energy revolution.

CESA Supports State Leadership Efforts

CESA believes that states must be key players if our nation is to achieve a cleaner energy future. Today, state clean energy programs are the clean energy experts and serve as laboratories of change and innovation for clean energy technology deployment. State policies and programs are now the main driving force for renewable energy progress in this country, with states viewing clean energy as a foundation of their environmental and economic development strategies. CESA is dedicated to supporting this state leadership, activity, and innovation in the clean energy sector.

Our Strategy

CESA's efforts are designed with one goal in mind: to improve the overall effectiveness of state clean energy programs. How does CESA do this?

- We support a growing peer network of states dedicated to learning from each other and joining forces to expand the markets for clean energy technologies.
- We constantly look to identify effective strategies and best practices to inform state clean energy programs.
- We assist states to work together to tackle major challenges and to achieve their clean energy goals, such as developing new public finance tools to address private financing gaps, harmonizing renewable portfolio standard programs to build more vibrant markets, and identifying effective clean energy marketing strategies.
- We deliver quality data and expertise on clean energy technology advancement and finance to drive state innovation and program effectiveness.
- We work with the National Labs and the Department of Energy to provide low-cost analysis on technology and market information services in the renewable energy sector to the states.
- We jumpstart new strategic partnerships between the states, the federal government, and industry players to accelerate clean energy investment.
- We represent the interests of state clean energy programs in federal forums to ensure states are provided with more resources and flexibility to drive clean energy progress.

Results that Matter

State support for renewable energy has been an essential driver of the recent growth in clean energy installations. Over the next decade, state clean energy programs are expected to spend an estimated \$7.3 billion for wind, solar, biomass, and geothermal projects. The 20 state clean energy programs represented by CESA alone have supported over 50,000 individual projects during the past decade, with 25% of those projects installed just last year and 60% installed in the last three years. These programs have provided direct support for over 2,000 MW of new renewable generation capacity since their inception.

The Future Role of the States: A New Clean Energy Federalism

With this success as proof of concept, CESA today is working hard, on behalf of the states, to create what we call “clean energy federalism”—a fundamentally new relationship between the states and the federal government on climate and clean energy. The economic and climate change challenges facing the U.S. demand a new approach to accelerate public and private investment in clean, low-carbon energy resources. Scaling up this investment can stimulate the nation’s economy and move the country toward a low-carbon future.

Today, the creation of a new national energy strategy appears to many policy-makers, especially in Washington, D.C., as a matter almost exclusively of national policy and federal agency jurisdiction. However, CESA believes that a national approach to carbon regulation and energy policy should *not* be dominated by uniform national rules and a centralized national administration. Instead, it should entail a new, distributed framework that embraces a robust state role.

Such a state and federal energy partnership is important for several reasons.

Foremost, the states today are serving as the real laboratories for deployment and commercialization of new energy technologies. The states already have sophisticated clean energy program initiatives in place. What is lacking are sufficient, long-term resources to tap the full potential of clean energy development. With these working programs in place, the states are capable of quickly using new federal resources to accelerate clean energy development and jobs.

In addition, many states are committed to taking aggressive steps to advance clean energy that will go well beyond a national lowest-common-denominator objective. These state efforts should be

supported and respected if we are to reach our energy independence goals. The states represent a better avenue for policy experimentation and program innovation than the federal government.

Finally, advancing clean energy market development is a very complex undertaking that will require the use of local knowledge, local policies, and the expertise of local players closer to the markets. Economic and resource conditions vary across the country, and policy and program preferences vary across the states. In the development of new federal energy policy, each state must be allowed to retain the flexibility to tailor an approach that makes the most sense given its individual economic, resource, and geographic context. A national energy program will be able to meet national objectives at lower cost and find greater political acceptance *only if* decision-making is distributed across the states.

In CESA’s view, a state/federal partnership on a national energy program is long overdue. The approach has worked well in many other public sectors and is highly flexible and effective. For example, in the transportation sector, in which there is a network of interstate and national highways, federal funding is provided to the states pursuant to federal guidelines to leverage state matching funds, with the vast majority of the work administered by state highway agencies through cooperative arrangements and state transportation plans and priorities. In the federal housing field, federal housing assistance likewise is administered on the ground by state and local housing authorities.

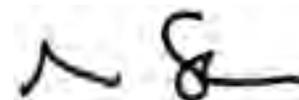
Recognition that a one-size federal solution may not always fit is perhaps the underlying rationale for many federal environmental statutes and programs. The federal Clean Air and Clean Water Acts put state governments in the role of primary implementer under

federal oversight by the U.S. EPA. These comprehensive federal statutes and programs set national minimum standards for action but make states front-line implementers of the programs. These federal programs also allow states to address issues not covered by the federal program, and to enact more stringent state requirements. Why should clean energy policy and programs be implemented differently? States should be granted a similar implementing role in a future federal climate change program and in a national clean energy strategy.

To CESA, it is clear that efforts toward attaining national energy goals will benefit from relying on state leadership and program administration rather than the creation of a top-down federal program administered by a central federal authority. States bring clear understanding of the unique energy circumstances within their boundaries. As on-the-ground implementers of clean energy programs, states have greater knowledge of the regulated entities, easier and more frequent contact with energy developers and utilities, familiarity with local renewable energy resources, and experience with forcing compliance with energy laws.

CESA looks forward to working in the next year to make this clean energy federalism concept a reality.

In closing, we at CESA are extremely proud to work with states in the trenches on clean energy deployment. The CESA states’ programs are shining examples of what is working well at the state level and how states can drive a new national clean energy future.



Mark Sinclair
Executive Director

Clean Energy States Alliance

Providing Value to Members

Clean Energy States Alliance (CESA) is a national nonprofit organization of public clean energy funds and programs that work together to invest in and promote clean energy and low-carbon technologies in their states and, collectively, across the country. CESA seeks to provide the most up-to-date knowledge about clean energy programs, from the U.S. and internationally, to states. CESA enhances its multi-state collaborative network by coordinating state efforts, leveraging funding for projects and research, addressing current clean energy challenges with cutting-edge solutions, and assisting states with program development and evaluation. Services provided to CESA members include the following:

Facilitate Networking Opportunities with State Clean Energy Funds and Programs Coast to Coast

Through monthly conference calls, listserves, and biannual meetings, CESA members—comprised of administrators of state clean energy funds and utility renewable programs as well as state agencies with a direct role in advancing clean energy—meet and communicate regularly to share best practices and information, learn about new ideas and opportunities for driving clean energy markets, and network with fellow leaders in state clean energy programs. The major networking mechanisms include:

- Through update calls, listserves, and meetings, each member has continuous access to an informed network of peers to explore problems and solutions candidly in the clean energy field.
- CESA undertakes longer-term “joint projects” on behalf of our members and based on their input, to address shared clean energy challenges and

opportunities through collaborative action. Joint projects today include: identifying state solar program best practices; informing federal approaches to ensure predictable regulation of wind projects under wildlife laws; assisting states with successful implementation of renewable portfolio standards; identifying how states can foster advanced bio-power conversion technologies; and assisting members with evaluating the economic development effects of their clean energy programs.

Provide Tailored State Program Analytical Information Services

CESA also provides its members with direct access to high-caliber, low-cost analytical information services and technical assistance related to clean energy issues. This analysis is provided in three primary ways:

- The states collectively receive no-cost consulting services involving analysis, strategic advice, and case studies addressing priority issues each year from the Lawrence Berkeley National Laboratory. Recently, the LBNL/CESA team produced several case studies for members examining: innovative finance vehicles for residential PV installation; how to use the federal Production Tax Credit to build durable markets for windpower in the U.S.; design of PV incentive programs to promote performance; and national cost trends for the installed cost of PV in the U.S. from 1998–2007.
- The states receive collectively over 1,200 hours each year of strategic advice and technical analysis and assistance from CESA staff on key, cross-cutting problems that many members face (e.g., guidance on

how to develop smart solar marketing strategies; to address regulatory challenges to wind siting; recommendations on how to create multi-state compatibility among state RPS programs to enhance financing, etc.).

- CESA provides its members with up-to-date insights and recommendations from public and private financing experts on how to create clean energy program offerings and financial tools that can have greater effect in leveraging private investment from limited public funding. This includes providing technical assistance to members on utilizing DOE’s new loan guarantee program and other federal tax and funding programs directed at clean energy.
- Each CESA member can tap up to 35 hours of “individual client services,” involving analytical research, consulting, and technical assistance in response to state specific program needs and requests. In the past year, CESA staff has helped its members with individual requests for drafting legislation, providing testimony, reviewing new programs and program changes, and acting as external grant reviewers.
- CESA compiles and maintains the only national clean energy database in the country to track, evaluate, and summarize individual, collective, and cumulative project and technology results from the state clean energy programs. The database tracks important market measures to demonstrate the impressive results of state clean energy support, including the number and capacity of projects supported, installed project costs, system size, sector and technology share, etc. This widely publicized report provides state clean energy

programs with a powerful tool to demonstrate the value proposition and real impacts of their programs for use with public officials at the state and federal level. A summary of the database results from 1998–2007 can be found at www.cleanenergy-states.org/Publications/cesa-database_summary_v8.pdf.

Represent State Fund Members to Stakeholders, Policymakers, and Political Leaders

With a membership of over 20 state clean energy programs, CESA's voice and influence continues to grow with external stakeholders. We continually strive to identify and pursue new opportunities for partnership and cooperation with state and federal leaders and policymakers, and with a broad variety of clean energy stakeholders, to work with our members in areas of funding, policy development, and technology deployment to advance a clean energy economy. For example:

- CESA today is working with state regulatory agencies, state pension funds, trade associations, universities, and a host of federal agencies including the Departments of Energy (DOE) and the Interior, and USDA, on clean energy cooperation and investment. CESA recently established an office in Washington, DC, in order for the organization and its members to more effectively to work with key federal officials and agencies and to highlight the important role of states in driving clean energy progress.
- CESA was effective in ensuring that \$3.1 billion of new ARRA SEP funding was provided to states, and with the flexibility and discretion to invest in state-directed renewable energy project deployment, using a host of effective state financing programs and tools. CESA's efforts also helped guarantee that the House and Senate versions of proposed federal RPS legislation clearly allow states to set



higher, different RPS objectives without implied or express federal preemption.

- CESA is informing the drafting of federal climate legislation to provide states with significant new carbon allowance-related funding for clean energy investment, and with plenty of state discretion and flexibility to determine the most effective use of that funding.

The major activities being pursued by CESA today to advance state clean energy program interests and perspectives with key stakeholders include:

- Providing input to the Department of Interior on establishment of its new national offshore energy regulatory/leasing framework.
- Participation in a Department of Interior Federal Advisory Committee to establish an effective, predictable federal approach to applying wildlife laws to wind projects.
- Partnership with DOE's Solar America Initiative (with DOE funding) to expand and advance state-based solar programs across the country.
- Partnership with DOE's Wind Powering America initiative (with DOE funding) to advance outreach and

provide technical assistance to state agencies and officials across the nation in order to accelerate wind project development.

- Partnership with DOE (with DOE funding) and NREL on a first-of-its-kind Marine Energy Technology Advancement Project (METAP), to advance wave energy technology commercialization and to demonstrate a new federal/state cooperative approach to support emerging renewable energy technologies (with a potential state/federal energy storage deployment demonstration project in the works).
- Partnership with DOE and NREL to address state Renewable Portfolio Standard implementation challenges (REC financing, RPS evaluation, etc.).
- Outreach to Congressional leaders to brief federal leaders on CESA member activities and the important state role in clean energy deployment.
- Targeted outreach and technical assistance to non-CESA states on how to establish clean energy funds and policies.
- Annual *State Leadership in Clean Energy* (SLICE) Awards to recognize state program innovation and effectiveness in accelerating adoption of clean energy technologies and advancing clean energy markets.

Through all these activities, CESA provides its members and other clean energy programs with the necessary information and analysis needed to drive clean energy innovation and ensure effective use of public dollars in support of clean energy markets. Beyond that, CESA provides its state members with a critical public voice to champion the important and unique work of state clean energy programs as they continue their leadership in advancing a clean energy economy for the country.

State Clean Energy Fund Support for Renewable Energy Projects

Key Findings and 2008 Annual and 1998–2008 Cumulative Project Deployment Results

The effect of state clean energy funds continues to grow dramatically. Recent years have seen more projects than ever come on line because of support by state funding—projects that have leveraged more than \$10 billion in additional funding from outside sources.

The second annual report summarizes key findings from the Clean Energy States Alliance (CESA) national database of state-fund-supported renewable energy projects. The database reports on more than 52,000 projects that have been installed and commenced operation with state fund support. The findings span state program efforts across the country and cover the full range of renewable energy technologies, including wind, solar, biomass, and hydroelectric.¹

Methodology

CESA and its contractor, Peregrine Energy Group, collected data for over 50,000 clean energy projects from the following 13 states, members of CESA or representing states with the most significant clean energy program investment activity:

- Arizona
- California
- Connecticut
- Illinois
- Massachusetts
- Maryland
- Minnesota
- New Jersey
- New Mexico
- New York
- Ohio
- Oregon
- Pennsylvania
- Vermont
- Wisconsin

FIGURE 1 **Projects and Capacity Installed by Year**

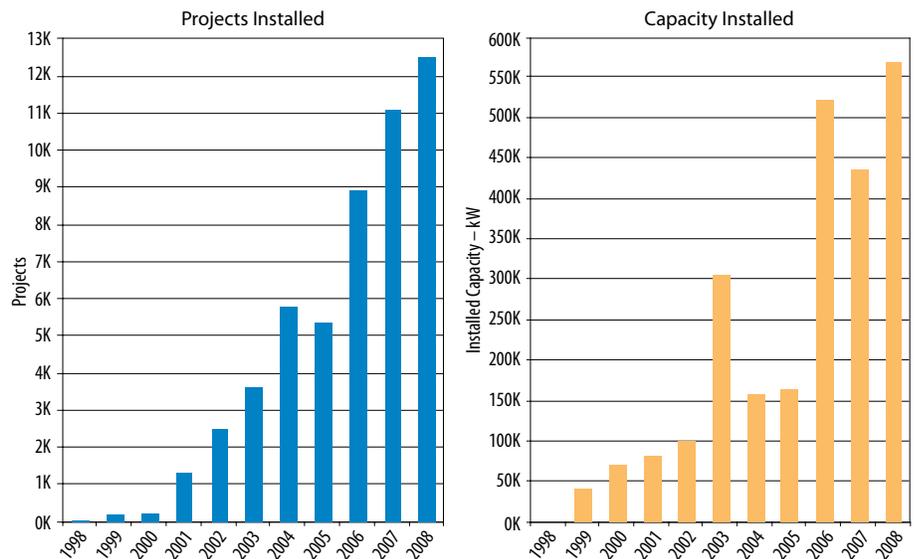


TABLE 1 **Projects, Capacity, and Investments by Technology in 2008**

Technology	Number of Projects	Capacity (kW)	Incentive Amount
Biomass	28	33,629	\$25,096,023
Fuel Cell	8	5,580	\$13,681,298
Hydro	14	11,764	\$5,007,805
Landfill Gas	1	3,000	\$1,005,210
PV	12,368	137,962	\$302,799,065
Wind	135	377,810	\$122,811,752
Grand Total	12,554	569,745	\$470,401,153

The data collected include:

- Technology type
- Installation date
- Capacity
- Annual energy production
- Location
- Incentive amount
- Total cost

Once collected, the data

was standardized and incorporated into a single database to enable analysis and reporting.

¹ While most state-run clean energy funds are funded through a system benefit charge mechanism, the database focuses on new, electricity-generating projects that have been completed and are operational, it does not capture all of the funds' activities. First, it does not include thermal generation projects or projects that are still in development. Those projects will not be added to the database until they come online. Second, it includes only new projects, and thus does not reflect the funds' substantial support for existing renewable energy projects. The support for older projects has been essential to keeping several gigawatts of pre-1998 renewable energy generating capacity operating. Finally, it does not capture the many other activities of the funds, including education, training, clean energy business development, and research and development.

Key Findings

1. 2008 was the most successful year to date for state clean energy funds.

In 2008, state clean energy funds supported the installation of more than 12,500 new renewable generation projects—a 13% increase over the projects installed in 2007 and 24% of the total number of projects installed to date (projects tracked since 1998). As they operate, each year the projects installed in 2008 will generate 1.2 million megawatt-hours of electricity.

This brings the total number of new renewable energy projects supported by CESA member states since 1998 to over 52,000, with a total capacity of 2.5 gigawatts. Figure 1 shows the number and capacity of projects completed from 1998 through 2008.

2. The state funds invested \$1.9 billion in renewable energy projects between 1998 and 2008, and leveraged an additional \$10.1 billion.

State clean energy funds have injected substantial financial resources into renewable energy projects, both with their own funds and through leveraging outside resources. Typically funded through a small surcharge on electric bills, state funds invested \$1.9 billion in renewable energy projects from 1998 to 2008. However, these funds covered only a portion of the total cost of each project. On average, outside sources provided more than \$5 of additional capital for every \$1 provided by a state fund. As a result, the funds' \$1.9 billion investment in clean energy projects leveraged approximately \$10.1 billion, bringing the total investment to \$12 billion. Figure 2 illustrates the proportional investments of program funds and leveraged funds from 1998–2008.

3. The projects supported by the state funds are avoiding CO₂ emissions and creating jobs.

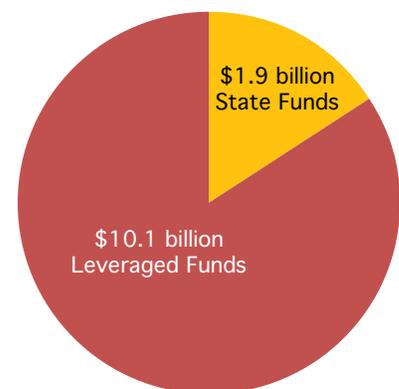
The state funds' efforts are helping both the environment and the economy. As



Colorado Governor's Energy Office: Michael Kostrzewa of Colorado State University instructs students as they raise a tower to measure winds as a part of the anemometer loan program (ALP) from the Department of Energy in Georgetown. The GEO has partnered with CSU's operation of the program since 2007.

they operate going forward, the projects installed in 2008 will avoid over 765 million pounds of CO₂ emissions each year, the equivalent of taking over 66,000 cars off the road. The states' efforts are also creating significant new jobs. Using the Department of Energy's figures for calculating the number of jobs created, the state funds' investments in 2008 created over 5,000 jobs. The funds are helping to build a cleaner and a stronger economy.

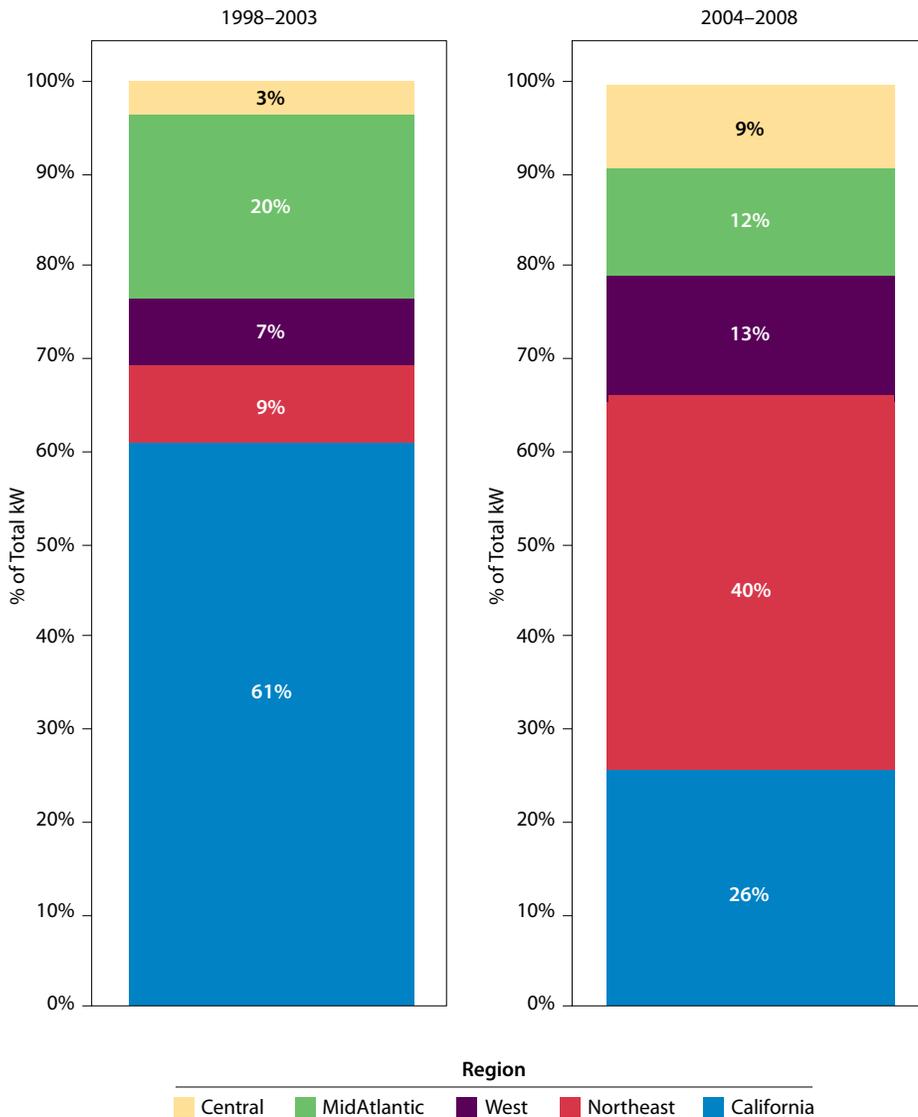
FIGURE 2 Program Funds and Leveraged Funds from 1998–2008



Massachusetts Clean Energy Center: Installed at the wastewater treatment facility in Falmouth, Massachusetts, this 397-foot, 1.65 MW wind turbine was funded in part through a long-term fixed-price Renewable Energy Certificate (REC) contract from the Clean Energy Center. The community-owned wind project will produce approximately 3.1 million to 4.2 million kilowatt-hours per year, providing 30 percent of municipal annual energy use.



FIGURE 3 Generating Capacity of Installed Projects, by Region



4. State fund support for renewable energy is truly a national effort, with states across the country making significant contributions.

While California was the first state to make substantial investments in renewable energy, each year brings an increase in the number of states that are establishing new and expanding existing clean energy programs. Since 2004, other states have scaled up their programs significantly, creating a truly nationwide effort.

Figure 3 shows the percentage, by region, of new generating capacity supported by clean energy funds.

- The left column covers the period 1998-2003
- The right column covers the period 2004-2008.

The data illustrates that California's relative contribution has shrunk dramatically from 61% of the total to 25% as other regions have increased their contributions.

5. State fund support encompasses a broad range of renewable technologies, with a focus on wind and solar.

The state funds have supported the full range of renewable technologies, including wind, solar, landfill gas, fuel

cells, hydro, and biomass. The vast majority of the projects (98%) have been solar; the bulk of the capacity (66%) has come from wind. Figure 4 illustrates the percentage that each technology contributed in 2008 to the total number of projects, the state incentive dollars invested, and the capacity generated.

6. State funding levels vary significantly by technology.

The level of state funding that was provided to clean energy projects in 2008 varied significantly by technology. Some technologies, such as wind and

landfill gas, are near commercial in their ability to generate revenue and so require relatively little support from the state funds. Other technologies, such as PV and fuel cells, are further from being commercial, meaning a significant gap exists between the cost of the projects and the value that will be captured by the system owner. Accordingly, these other technologies require greater levels of support from the state funds. Figure 5 illustrates, for the sum of all state fund activity in 2008, the weighted average state incentive funding levels by technology.

7. Leverage ratios vary significantly by technology.

State clean energy funds have had great success leveraging their program funds with outside capital. As shown previously in Figure 2, the funds have invested a total of \$1.9 billion in new clean energy projects and leveraged an additional \$10.1 billion from external sources.

As with state incentive levels, the ratio of leveraged funds to program funds (leverage ratio) varies significantly by technology. For example, for wind projects, the states leveraged over \$27 for each \$1 of program funds invested. For solar photovoltaic (PV) projects, the states leveraged less than \$3 for each \$1 invested. Figure 6 illustrates the leverage ratio by technology for 2008.

FIGURE 4 Contribution of Each Technology to Number of Projects, State Incentive Dollars Invested, and Capacity Generated in 2008

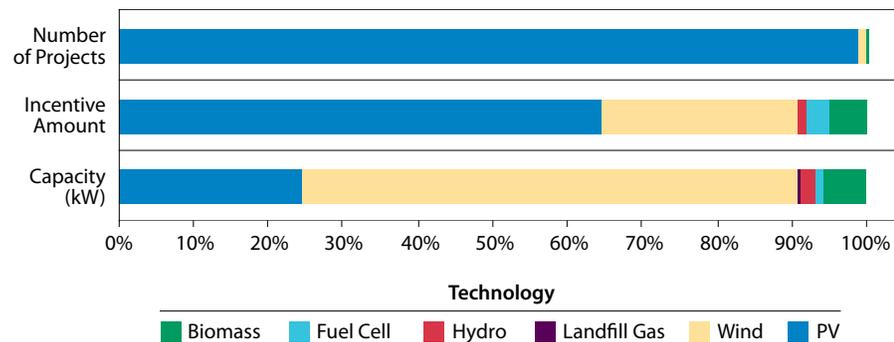


FIGURE 5 Average State Incentive Funding Levels for 2008 (\$ per kWh)

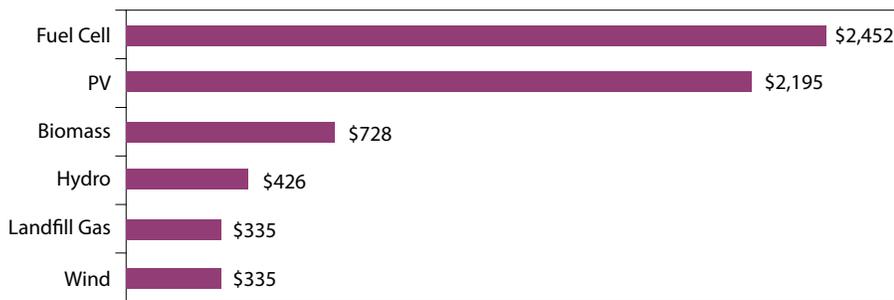
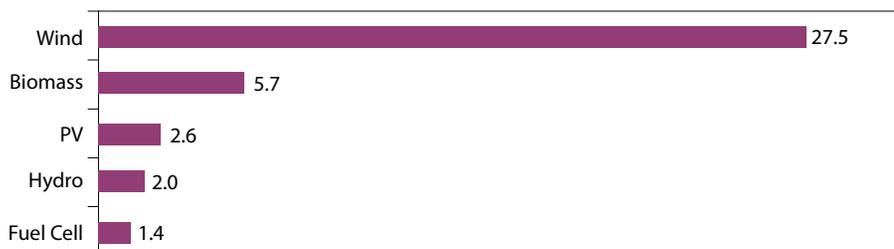


FIGURE 6 Leverage Ratio by Technology for 2008 (\$)



Conclusions

The state clean energy funds have had a remarkable, measurable effect, both cumulatively and individually, on project deployment. Together, the states included in CESA's database have funded more than 52,000 clean energy projects with a total generating capacity of 2.5 gigawatts. They have invested \$1.9 billion and leveraged an additional \$10.1 billion. And as we move forward, each year the projects they have supported will produce clean energy and avoid CO₂ emissions. Continuing to track state efforts to drive the development of renewable energy will hold important lessons at the national and local levels for addressing the complex energy challenges faced by all parts of the country.

This database project was generously supported by the New York Community Trust. CESA is grateful for their support of this work.

CESA's Distributed Renewable Energy Finance and Policy Toolkit

Over the past decade, states have played an increasingly important role in providing financial support to renewable energy projects, with funding primarily derived from state-established public benefit funds. The financial support tools that states have used have ranged from rebates to competitive grants to loans. Although rebates have been the dominant form of support, states are increasingly exploring other options that better incentivize high-performing projects and leverage available funding,

The purpose of Clean Energy State's Alliance's (CESA's) *Distributed Renewable Energy Finance and Policy Toolkit* is to describe the many financing options available to state energy offices, municipal governments, and other energy agencies for utilizing public funds for clean energy project support. The full report, which is available on CESA's website at www.cleanenergystates.org/Publications/cesa-financial_Toolkit_Dec2009.pdf, analyzes each tool's strengths and weaknesses and identifies best practices. One key recommendation of the guide is that the use of these tools as a portfolio of approaches creates the most robust, effective programs.

The tools whose strengths, weaknesses, and best practices are examined in this report (with associated case studies) include:

Direct Financing Tools

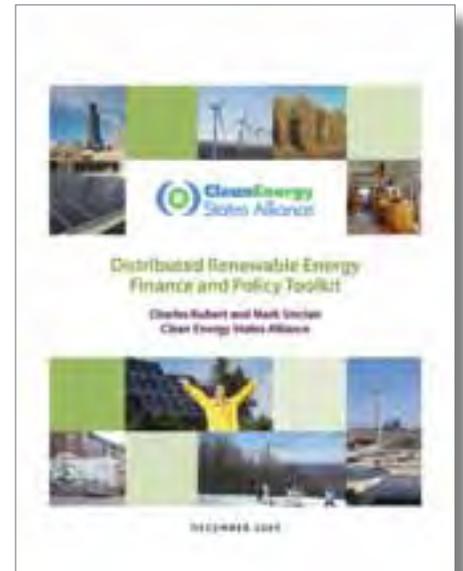
- Rebates
- Performance-based incentives
- Grants
- Loan programs (direct loans, subsidized interest, directed deposits, PAYS)
- Loan guarantees
- Leases
- REC Purchases
- Feed-in Tariffs or Standard Offer Contracts

Tax Incentives

- Investment Tax Credits
- Sales Tax Exemptions
- Property Tax Exemptions

The toolkit evaluates each of the tools using a common set of criteria. Some of the questions asked include:

- **Does it facilitate market transformation?** The financing mechanism should allow the state to gradually diminish support over time, drive technology cost reductions, and enable the building of a mature market.



- **Is it adaptable to changing market conditions?** The financing mechanism should be flexible in response to changing market conditions, such as a breakthrough in technology or price.
- **Is it economically efficient?** For public funding to be used efficiently, the program design should provide only the incentive level required to make a project economically viable.
- **Is it sustainable?** The program should be maintained and funded for a sufficient duration to build markets and investor confidence.
- **Does it have low administrative costs?** The financing program should require fairly low administrative costs and be simple to apply for and participate in without excessive administrative burden.
- **Is it open to wide participation?** An effective financing program will offer an appropriate type and level of incentive to address the specific needs of a wide variety of technologies, sectors, and participants, including low-income customers.
- **Does it leverage private capital?** The financing tool must fill financing gaps that private capital markets cannot meet.



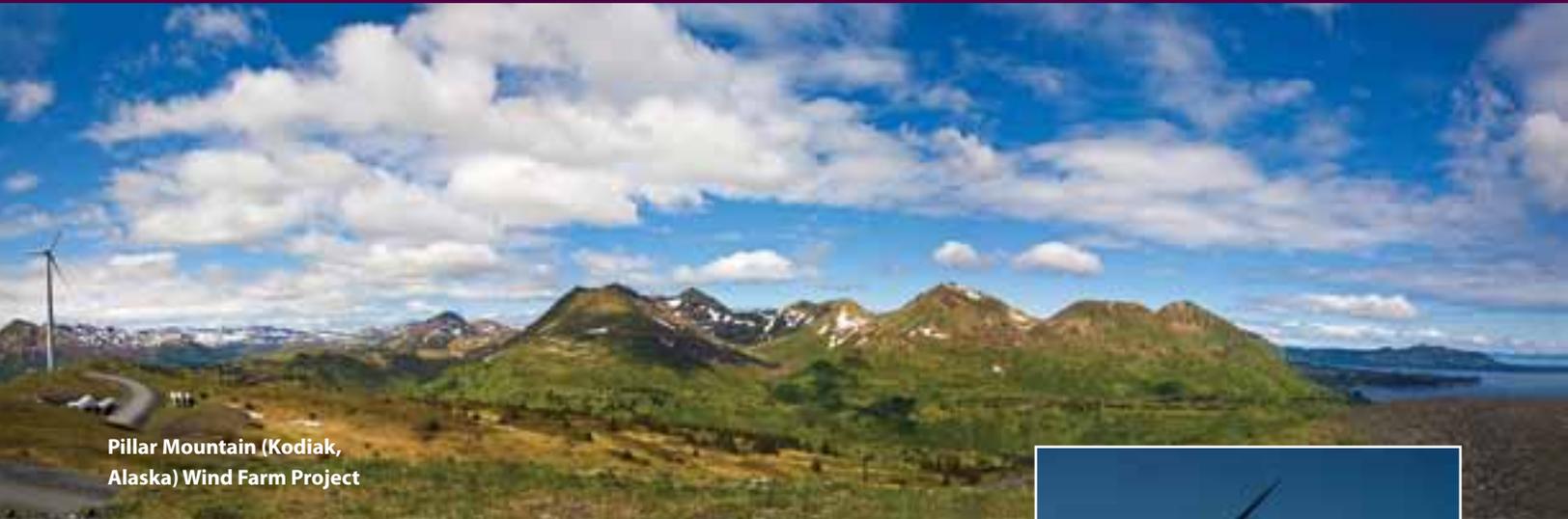
Each tool has merit, depending on the specific financial and administrative resources available, the targeted technologies and project sizes, the underlying energy markets and regulations in a state, the objectives of a clean energy program, and the market price and maturity of specific technologies. States should adopt a portfolio of tools to support a variety of technologies and projects. At the same time, states should avoid a “shotgun” approach in offering too many programs that are insufficiently targeted, inadequately funded, and/or cannot be administratively supported or marketed. Finally, programs need to have staying power. While programs can and should be modified to reflect changing market conditions, programs require several years to mature and build market awareness. Just as in a stock portfolio, program managers should avoid “churning” program offerings.

It is critical to emphasize that all of these programs are dependent on the establishment of robust, predictable, and long-term funding sources. Today, most state renewable energy programs are funded through systems benefit charges on utility bills, a funding mechanism that should be independent of state budget appropriations. Other potential funding sources include negotiated settlements with utilities and possible federal grants to states for clean energy project deployment.

The tens of thousands of renewable energy projects that have been supported by state clean energy funds over the past decade are an indication of the success of these incentives in driving renewable energy markets. Furthermore, the recent grants to all states through the American Recovery and Reinvestment Act (ARRA) has given states the seed capital needed to begin to develop sustainable clean energy financing programs. By using the tools described in this report to address financing, market, and regulatory gaps, states and their constituents can build a long-term market transformation for renewable energy.



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Pillar Mountain (Kodiak, Alaska) Wind Farm Project

Photo by Carol Scott Photography

Alaska Energy Authority (AEA) is a public corporation of the state. The Authority was created by the Alaska Legislature in 1976 in order to reduce the cost of energy in Alaska. AEA's major programs include:

Renewable Energy Fund

The Alaska State Legislature created the \$250 million Renewable Energy Fund (REF) in 2008. This legislation placed Alaska at or near the forefront of the 50 states in funding for renewable energy. The Legislature authorized AEA to manage the REF project application process, project evaluations, recommendations, completion of grant agreements, and disbursement of funds to grantees. Following AEA's recommendations, the 26th Legislature in the 2009 session approved 107 renewable energy projects totaling \$125 million. In February 2010, AEA completed its REF

“We are in the beginning stages of a journey that requires focus, determination, innovation, and balanced risk-taking. We are striving to reduce our reliance on fossil fuels by looking at local resources as a way to stabilize energy costs.”

Steve Haagenson, Executive Director

Round III evaluations and provided the Legislature its recommendation for funding up to 90 projects totaling \$65.8 million.

Alternative Energy and Energy Efficiency Program

AEA's Alternative Energy and Energy Efficiency (AEEE) program currently manages and funds projects and initiatives totaling \$157 million in state and federal funding (activity substantially



Northern Power Systems

100 kW Northwind 100 Wind Turbine Installation, Toksook Bay

increased after REF implementation). This program promotes the use of renewable resources as alternatives to fossil fuel-based power and heat. It also promotes measures to improve energy production and end-use efficiency. In rural areas, the program may support developing local sources of coal and natural gas as diesel alternatives. The



Steve Haagenson
Executive Director

Alaska Energy Authority
813 West Northern Lights Blvd.
Anchorage, Alaska 99503-2495

PHONE 907-771-3000
EMAIL energycoordinator@aidea.org
WEB www.akenergyauthority.org



HIGHLIGHTS

AEER program is divided into eight separate program areas: Alaska Energy Inventory; Biomass Energy; Diesel Generation Efficiency; End Use Efficiency (Conservation); Geothermal; Hydroelectric; Ocean and River Energy; and Wind.

Bulk Fuel Upgrades Program

Presently, Alaska's remote communities rely on diesel fuel for heating and power generation. Many rural bulk fuel tank farms were constructed more than 20 years ago and are in poor condition. With substantial contributions from the Denali Commission, AEA's Bulk Fuel Upgrades Program undertakes the design and construction of modern, code-compliant bulk fuel facilities in rural Alaska. As of February 2010, bulk fuel upgrades had been completed in 89 communities. Approximately 29 communities await upgrades.

Rural Power Systems Upgrade Program

Electricity provides for lighting, communications, heat, and power necessary to operate infrastructure that supports all other elements needed in any community to permit safe and healthy living conditions. In rural communities throughout Alaska, electricity is generated by a small, local system using diesel fuel at a cost often three to five times higher than in Alaska's urban areas. AEA's Rural Power Systems Upgrade Program (RPSU) concentrates on powerhouse and electrical distribution upgrades. Energy efficiency, reliability, safety, and sustainability are primary drivers during the conceptual design, final design, and construction process. Identification of available renewable energy and interoperability is high priority. As of February 2010, 44 communities had received upgrades; 47 communities remain.

Loan Programs

- **Power Project Fund:** This program provides loans to local utilities, local governments, or independent power producers for the development or upgrade of electric power facilities, including conservation, bulk fuel storage, and waste energy conservation.
- **Bulk Fuel Revolving Loan Fund:** This program assists communities, utilities, or fuel retailers in rural communities with purchasing emergency, semi-annual, or annual bulk fuel supplies.

Power Cost Equalization Program

AEA's Power Cost Equalization (PCE) Program provides economic assistance to customers in rural areas of Alaska where the kilowatt-hour charge for electricity can be three to five times higher than the charge in more urban areas of the state. PCE

Published **ALASKA ENERGY—A FIRST STEP TOWARD ENERGY INDEPENDENCE**. Continuing development of the Alaska Energy Plan Pathway. (www.akenergyauthority.org)

Launched **RENEWABLE ENERGY FUND GRANTS PROGRAM**. Administering Rounds I and II Project development. Submitted REF Round III recommendations to Alaska Legislature. (www.akenergyauthority.org/RE_Fund-III.html)

Teamed with Alaska Department of Natural Resources (DNR) to launch **ALASKA ENERGY DATA INVENTORY**. (www.akenergyinventory.org/)

In response to a directive from the Alaska Legislature, AEA led the effort to prepare a **REGIONAL INTEGRATED RESOURCE PLAN** for Alaska's Railbelt Region. (www.akenergyauthority.org/regionalintegratedresourceplan.html)

Managing **ALASKA SMALL CITIES ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANTS**. (www.akenergyauthority.org/eecbg.html)

only pays a portion of approximately 30% of all kilowatt-hours (kWh) sold by the participating utilities.

PCE fundamentally improves Alaska's standard of living by helping rural areas maintain the availability of communications and the operation of basic infrastructure and systems, including water and sewer, incinerators, heat, and light. PCE is a core element underlying the financial viability of centralized power generation in rural communities.

Technical Assistance Program

This program provides training, consultation, and on-site technical assistance to rural utilities for the operation and maintenance of their electrical generation and distribution systems. Through this program, AEA helps communities improve the efficiency, safety, and reliability of their power systems and reduce the risk and severity of emergency conditions. The ability a community has and the methods it uses to maintain and operate its powerhouse have a significant impact on efficiency. Operator training, parts availability, automatic system monitoring, data trending, and data analysis along with proper maintenance are key factors in keeping reliability, efficiency, and performance high.

Training Program

AEA and the Denali Commission Training Fund provide training to rural Alaskans to ensure that local residents have the best skills with which to sustain their energy infrastructure in a business-like manner.

California Energy Commission, Renewable Energy Program



Peter Dempster, California Biomass Collaborative

Covanta Mount Lassen Power in Westwood, California

The Mount Lassen Power biomass facility manages more than 270 tons of sawmill waste and forest residues each day. Incentive funding provided by the Existing Renewable Facilities Program supports the 11.5 megawatt (MW) project as it converts these materials into enough electricity to meet the needs of 11,500 homes.



Peter Dempster, California Biomass Collaborative

Tracy Biomass, Tracy, California

Tracy Biomass is a 20 MW biomass plant that generates enough electricity to power 19,000 homes. Each year, on average, the facility processes 170,000 dry tons of biomass waste, diverting urban wood waste from local landfills and avoiding open-burning of orchard waste. To date, the Existing Renewable Facilities Program has incentivized their electricity production with nearly \$5.3 million.

Renewable Energy Program

Since 1998, the California Energy Commission's (Energy Commission's) Renewable Energy Program has supported policies and programs that provide Californians with cleaner sources of energy for their homes, businesses, and schools. The Renewable Energy Program has encouraged investments in renewable energy by providing various rebates and renewable electricity production incentives for new and existing renewable facilities and emerging technologies. Meeting California's energy needs while reducing greenhouse gas emissions with renewable resources are the centerpieces of the program's efforts and are key to achieving the state's ambitious Renewables Portfolio Standard (RPS), California

"Over the years, California's commitment to clean energy has been enhanced by its relationship with CESA. The organization has proven to be a valuable tool in coordinating and supporting the efforts of states who share the common vision of a clean energy future for the nation."

Tony Gonçalves, Manager

Solar Initiative, and greenhouse gas reduction goals.

Renewables Portfolio Standard

California's RPS requires retail energy sellers to increase renewable energy as a percentage of their retail sales to

20 percent by 2010. Governor Arnold Schwarzenegger's signing of two Executive Orders set into motion higher RPS goals challenging California to get one-third of its electricity from renewables by 2020. The Energy Commission and the California Public Utilities Commission jointly implement the state's RPS, and the Energy Commission is tasked with certifying renewable facilities as eligible for the RPS and designing and implementing an accounting system to track and verify RPS compliance.

Western Renewable Energy Generation Information System (WREGIS)

The Energy Commission, together with APX, Inc., and the Western Electricity Coordinating Council, implemented and put into operation the WREGIS, a regional



Tony Gonçalves
Manager

California Energy Commission, Renewable Energy Program

1516 Ninth Street, MS-45
Sacramento, CA 95814-5512

PHONE 1-800-555-7794 (toll free in California)
(916) 651-2917 (outside California)

EMAIL tgoncalv@energy.state.ca.us

WEB www.energy.ca.gov



renewable energy certificate tracking and registry system. Launched in 2007, WREGIS issues and tracks WREGIS Certificates to support verification of compliance with California's RPS and with regulatory and voluntary renewable energy programs in the Western Interconnect.

Existing Renewable Facilities Program

The Existing Renewable Facilities Program offers production incentives to biomass, solar thermal electric, and wind facilities. Incentive payments are tied to market prices, with no payments made if the market price is above a predetermined target price.

Emerging Renewables Program

The Emerging Renewables Program provides rebates and production incentives to end-use consumers who purchase and install eligible renewable energy systems for on-site generation. Through 2006, eligible technologies were solar photovoltaic, small wind, fuel cells using renewable fuels, and solar thermal electric. Effective in 2007, only small wind systems and fuel cells (using a renewable fuel) are eligible. The Energy Commission's New Solar Homes Partnership (NSHP) and the California Public Utilities Commission's California Solar Initiative have replaced the solar component of the Emerging Renewables Program.

New Solar Homes Partnership

The Energy Commission's NSHP intends to create a sustainable market for solar homes and to gain builder commitment to install solar energy systems. The program offers incentives to encourage solar installations, with high levels of energy efficiency, in the residential new construction market. The goal of the NSHP is to install 400 MW of capacity by 2016.

Senate Bill 1

Senate Bill 1 (Murray, Chapter 132, Statutes of 2006), an extensive and multi-faceted legislation, enacts Governor Schwarzenegger's Million Solar Roofs Initiative and is built upon the California Public Utilities Commission's California Solar Initiative, the Energy Commission's NSHP, and the publicly owned utilities' existing solar energy incentive programs. With an emphasis on energy efficiency and high performance installations, this \$3.35 billion comprehensive statewide solar effort aims to install 3,000 MW of capacity by 2016.

Consumer Education

The Consumer Education Program funds grants and contracts to increase public awareness of renewable energy and its benefits and helps develop a consumer market for renewable energy and small-scale emerging renewable energy technologies.

Californians embraced the power of the sun in the Energy Commission's second annual **GO SOLAR CALIFORNIA SWEEPSTAKES**, which educated consumers about solar and energy efficiency. Nearly 31,000 online entries were received in the contest and more than 22% requested more information about solar energy. The sweepstakes, which ended October 31, 2009, challenged entrants to test their solar knowledge for a chance to win "green" prizes, including a Green Home Makeover. Visitors took a quiz and watched an educational video about the Energy Commission's New Solar Homes Partnership on the GoSolarCalifornia.org website.

Final payments have been issued and the results are in for the **EMERGING RENEWABLES PROGRAM**'s enormously successful solar PV rebate program offered from 1998 through 2006. The program was responsible for 122.6 MW of generating capacity and issued total rebates of \$398 million for more than 28,000 on-site PV system installations.

In addition to the 20% by 2010 renewable energy goal established under California's RPS statute, Governor Schwarzenegger has called for a **20% BIOMASS TARGET** within this goal to be met with electricity from biomass. Currently, generation from biopower resources provides about 20% of California's renewable energy. Of this 20%, more than 70% of California's biopower generation comes from solid-fuel biomass facilities receiving funding from the Existing Renewable Facilities Program.

Since its beginning in 1998, the **NEW RENEWABLE RESOURCES ACCOUNT** conducted three auctions resulting in 47 projects being brought online—principally wind, geothermal, and landfill gas—for 488 MW of new renewable electricity. Although the account was discontinued in July 2008, its production incentives provided more than \$76 million in payments and supported about 8,730 GWh of generation.



Ironwood at Wolf Creek Solar Home, Temecula, California

Taking advantage of Southern California's sunshine, 92 homes in the Ironwood at Wolf Creek subdivision have installed solar systems and applied for rebates under the New Solar Homes Partnership (NSHP). These "Solar Advantage" homes feature a subtle solar tile product and meet the NSHP's Tier II energy efficiency levels, meaning they are 35% more energy efficient than California's current Title 24 Building Standards.

Colorado Governor's Energy Office

The mission of the Governor's Energy Office (GEO) is to lead Colorado to a New Energy Economy by advancing energy efficiency and renewable, clean energy resources. The GEO works in partnership with communities, local governments, nonprofits, state agencies, and residents. Since 2007, the GEO was funded with state dollars, but it is currently funded almost entirely with federal dollars, including money issued through the American Recovery and Reinvestment Act.

The **Commercial Buildings Program** provides a host of programs and services to private and public entities to assist with their energy reduction efforts in new and existing buildings.

The **Colorado Carbon Fund** marks the first state-based program in the country designed to help people and businesses offset their greenhouse gas emissions by directing money raised from carbon offset purchases to develop clean energy projects here in Colorado.

Our **Residential Program** works on several fronts to reduce residential energy consumption in Colorado homes. Initiatives include educating builders, realtors, and building code officials on energy code standards, promoting the construction of efficient ENERGY STAR qualified New Homes, and providing insulation rebates for homeowners.

The **Weatherization Program** provides free weatherization services statewide to families with incomes



Colorado Gov. Bill Ritter, left, tours Confluence Energy in Kremmling, CO, with owner Mark Mathis, center. Confluence Energy turns beetle kill wood into pellets and wood chips, which fuel many of the biomass boilers in Colorado that have been made possible by the GEO's feasibility study and funding.

"CESA offers a rare opportunity to brainstorm and share ideas with colleagues facing similar challenges throughout the country in an effort to deliver effective renewable and energy efficiency programs to the public."

Tom Plant, Director

up to 200% of the federal poverty level. Services include conducting energy audits, insulating walls and attics, weatherstripping, and installing energy efficient appliances. There are over one million

households eligible for this service in Colorado.

The **Renewable Energy Program** is a policy and consumer rebate program designed for small wind, solar, small hydro, geothermal, and biomass investment and development. The Renewable Energy team is integrally involved in designing successful legislation and incentives to strengthen renewable energy markets and encourage investment.

The **Greening Government Program** was established in order to meet Governor Bill Ritter's specific goals to green state government by reducing energy, water, paper, and petroleum use by



Tom Plant
Director

Governor's Energy Office

1580 Logan St., Suite 100
Denver, CO 80203

PHONE 303-866-2100

EMAIL geo@state.co.us

WEB www.colorado.gov/energy



Governor's
Energy Office

HIGHLIGHTS

mid-2012. Many quality programs are in place and significant accomplishments have been made that will save taxpayer dollars by reducing utility bills and hedging against future price spikes in fuel and electricity.

Our **Financial Program** identifies opportunities within the New Energy Economy where finance gaps exist, or where there is a lack of access to capital. Such gaps can exist for homeowners interested in financing “green” home improvements, or developers who need a bridge loan to access the capital market, or a manufacturing plant that could benefit from a lower borrowing rate. The GEO financial program seeks creative ways to fill these gaps with certain financial resources and with partnerships throughout the state that are focused on economic development.

The **Electric Utilities and Transmission Programs** work closely with electric utilities to encourage an ever-increasing fraction of demand-side management, conservation, demand-response, distributed generation, smart grid, utility-scale renewable power, and high-voltage transmission to connect the power to the markets.

The **Public Outreach Program** understands consumers in Colorado lack a clear and direct source of information about what they can do to save energy, what incentives are available, and who can do the work for them in their area. The GEO Public Outreach Program will provide access to such information with an innovative one-stop-shopping website and a telephone hotline, as well as a comprehensive consumer outreach effort.



Chris Roma (left) and Danny Smith (right) of Shaw Environmental construct a piping system to extract methane gas from the Larimer County Landfill. The methane gas will be converted to electricity and represents the first clean energy project partially funded by the Colorado Carbon Fund.

ENERGY STAR NEW HOMES (ESNH) 2008 PARTNER OF THE YEAR award. The GEO worked with dozens of partners to support construction of more than 2,100 ESNH. Since the program began in 2007, Colorado saw an increase of 7% to 28% of new homes that were constructed with ENERGY STAR standards. The annual benefits of these efficient homes in Colorado include eliminating pollution equal to the emissions from more than 700 vehicles and carbon dioxide emission reductions of 8.8 million pounds, and saving the energy equivalent of more than 4.4 million pounds of coal. (www.colorado.gov/energy/index.php?/residential/energy-star-new-homes/)

Partnering with 8 agencies, in 2009, our **WEATHERIZATION** program assisted 3,477 low-income households, resulting in total energy cost savings of \$549,366 each year. This year, increased funds from the American Recovery and Reinvestment Act have expanded the program goals to weatherize 7,000 homes, doubling last year's impressive efforts. (www.colorado.gov/energy/index.php?/residential/category/energy-saving-partners-program/)

THE COLORADO CARBON FUND invested \$230,000 in its first project, a 1.4 MW methane-electricity plant in Larimer County. The project's annual CO₂ reductions are equivalent to taking about 7,500 cars off the road for a year. Poudre Valley Rural Electric Association will buy back enough power generated by the plant to supply 900 homes. (www.colorado.carbonfund.org/index.php/projects/)

Across Colorado, 18 community partners have received **ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANTS (EECBG)** totaling \$2.2 million to develop local strategies for saving energy and creating jobs in the state's rural, agricultural, and mountainous regions. Each partner is assisted by a community energy coordinator who ensures our programs are being discussed and promoted, as well as providing a local point of contact for regions all around the state. (www.colorado.gov/energy/index.php?/policy/energy-efficiency-and-conservation-block-grants-eecbg/)

The last two years of **NEW ENERGY ECONOMY** legislation have included the doubling of the state's renewable energy standard to 20% by 2020 as well as the adoption of **SENATE BILL 51**, making solar energy systems more affordable for homeowners and improving market conditions for solar energy companies doing business in Colorado. **SENATE BILL 91** produced a highly referenced report that maps out Colorado's renewable generation development areas; this led to the complimentary Renewable Energy Development Infrastructure report, which analyzes the barriers and necessary steps to realizing the 20% renewable energy standard, concluding with the need for strengthening Colorado's transmission line infrastructure. (www.colorado.gov/energy/index.php?/utilities/category/renewable-energy-development-infrastructure)

Connecticut Clean Energy Fund

The Connecticut Clean Energy Fund (CCEF), which began operations in 2000, was created by the state legislature and is charged with developing, investing in, and promoting clean, sustainable energy sources. The CCEF invests in enterprises and projects through initiatives aimed at:

- Creating a diverse and growing supply of clean energy in Connecticut;
- Accelerating the development of clean energy technologies in Connecticut;
- Educating Connecticut consumers about the benefits and availability of clean energy.

The fund is administered by Connecticut Innovations, a quasi-public organization, and is funded by a surcharge on electric utility bills. As of December 31, 2009, CCEF's funded projects and commitments were in excess of \$180 million.

CCEF programs are available to businesses, municipalities, nonprofits, other institutions, and residents.

CCEF programs that create a diverse supply of installed clean energy resources:

- Affordable Housing Initiative (NEW)
- CT Solar Lease Program (NEW)
- Geothermal Heat Pump Incentive Program (NEW)
- On-Site Renewable Distributed Generation Program
- Pre-Development Loan Program



Kroon Hall, Yale School of Forestry & Environmental Studies, New Haven

A 107.9 kilowatt (kW) solar photovoltaic (PV) array was installed on the rooftop of this new, ultra-green building with financial assistance from CCEF. Yale's most sustainable building to date, Kroon Hall has recently received LEED platinum rating and will serve as an instructional model of sustainable design.

"CESA and its members provide valuable information regarding the clean energy industry. That information has enabled CCEF to craft an effective and expanding set of initiatives, based on national best practices, to move the industry forward in Connecticut."

Lise Dondy, President

- Project 150
- Residential and Small System Program
- Solar Thermal Incentive Program (NEW)

CCEF programs that foster the growth, development and commercialization of early stage clean energy technologies:

- Fuel Cell Monitoring Program (NEW)
- Operational Demonstration Program
- Small Wind Demonstration Program (NEW)



Lise Dondy

President, CCEF
Vice President,
Connecticut Innovations

Connecticut Clean Energy Fund

200 Corporate Place, 3rd Floor
Rocky Hill, CT 06067

PHONE 860-563-0015

EMAIL info@ctcleanenergy.com

WEB www.ctcleanenergy.com



HIGHLIGHTS

CCEF programs that stimulate demand for clean renewable energy by increasing consumer awareness:

- 20% by 2010 Campaign
- Community Innovations Grants Program
- Connecticut Clean Energy Communities Program
- CTCleanEnergyOptionsSM Program
- High Performance Schools Program (NEW)
- Learning for Clean Energy Innovation (NEW)



Connecticut Science Center, Hartford

Installed in 2009 with financial assistance from CCEF, this 200 kW fuel cell at the new Connecticut Science Center generates almost 100% of the electricity used at the science center and, with its educational graphics and data links, is itself a working exhibit.



A.I. Prince Technical High School, Hartford

A teacher at A. I. Prince Technical High School (far left) works with two students on a solar energy education module provided through CCEF's Learning for Clean Energy Innovation program.

As of December 2009, **CCEF HAD SUPPORTED OVER 1,550 CLEAN ENERGY INSTALLATIONS AND DEMONSTRATIONS** statewide, including 1,528 solar PV systems, 16 fuel cells, 4 biomass systems, and an assortment of other clean energy systems.

CCEF GENERATED SUBSTANTIAL MARKET INTEREST IN THE INNOVATIVE CT SOLAR LEASE PROGRAM with approximately 450 solar leases signed for low- and moderate-income households. The program was launched in 3Q 2008 to address the barrier of high initial capital costs associated with solar photovoltaic installations. CCEF expects to have fully committed the program's resources by 1Q 2010. This is the first program in the nation to have a ratepayer-funded organization (CCEF) partner with financial institutions to leverage federal tax credits in order to make renewable energy more affordable.

CCEF COMPLETED THE SECOND AND THIRD ROUNDS OF PROJECT 150 recommending 136.5 MW of large renewable projects to the utilities for long-term power purchase agreements. With these competitive rounds of project reviews, CCEF achieved its goal of recommending 150 MW of projects to the utilities; a total of 151 MW of projects were recommended in rounds 1–3.

CCEF'S COMMUNITIES PROGRAM CONTINUED TO GROW IN POPULARITY with an additional 60 Connecticut cities and towns committing to purchase 20 percent clean energy by the year 2010. As of December 2009, a total of 94 Connecticut municipalities, representing over half of Connecticut's 169 municipalities, had made this commitment. Additionally, CCEF successfully integrated an energy efficiency requirement into its Connecticut Clean Energy Communities Program, inspiring 41 Connecticut municipalities to sign up for the EPA Community Energy Challenge.

CCEF LAUNCHED A STATEWIDE TEACHER/WORKFORCE TRAINING INITIATIVE. CCEF's Learning for Clean Energy Innovation program provides teachers with professional development sessions, curricula, and classroom tool kits on solar and wind energy technologies—to help them educate Connecticut's emerging workforce about clean energy. As of 4Q 2009, CCEF had provided teacher training for 180 teachers and supplied 75 schools with clean energy tool kits.

CCEF RECEIVED CESA'S 2009 STATE LEADERSHIP IN CLEAN ENERGY AWARD. This national award from the Clean Energy States Alliance recognized the success of CCEF's Connecticut Clean Energy Communities Program in encouraging communities and individuals to purchase clean energy.

Energy Trust of Oregon is an independent nonprofit organization dedicated to helping utility customers benefit from saving energy and tapping renewable resources. Our work helps keep energy costs as low as possible, creates jobs, and builds a sustainable energy future. Energy Trust operates three renewable power programs:

The **Solar Electric and Thermal Programs** are a long-term market transformation initiative to make solar photovoltaic (PV) and direct-use (thermal) solar more accessible and affordable in Oregon. By providing cash incentives, marketing, standards, education, training, project screening, and quality assurance, the program's goal is to create a long-term sustainable market.

The **Biopower Program's** goal is to acquire significant amounts of renewable energy from wood-fired and other biomass generation and develop markets for less mature energy resources such as dairy manure and forest biomass. The program offers financial incentives, cost-sharing for feasibility studies, and other assistance.

The **Other Renewables Program** supports small and community-scale wind, geothermal electric, and hydro-power. In addition to cash incentives for projects, the program provides cost-share funding for feasibility studies and technical assistance. The wind initiative also provides support for a network of wind installers, resource monitoring, and marketing.



Energy Trust's board president John Reynolds attended the ribbon-cutting for the city of Albany's 500 kW hydro project. The turbine and generator are part of the city's drinking water system.



Peter West
Director of
Energy Programs

Energy Trust of Oregon

851 SW Sixth Avenue, Suite #1200
Portland, OR 97204

PHONE 503-445-7609
FAX 503-546-6862
EMAIL peter.west@energytrust.org
WEB www.energytrust.org



HIGHLIGHTS



Energy Trust provided an incentive to help Mike and Chris Bernards install a 10 kW Abundant Renewable Energy turbine at their farm in Yamhill County. The turbine is mounted on a 120 foot tower.



Photo courtesy of Mark Olson, Dynalectric. No duplication without owner's permission.

This 859 kW PV system powers Portland Habilitation Center's (PHC) industrial facility, where people with developmental, physical, and mental disabilities receive education, training, and union jobs. PHC's president was instrumental in getting Oregon to increase its size limit for net-metered systems. The PV system was financed with a flip model in one of the first uses of that third-party financing vehicle in the state.

"The energy field is changing rapidly. Working with other organizations doing work similar to ours helps Energy Trust of Oregon track changes in the market and provide the most effective programs possible for customers."

Peter West, Director of Energy Programs

During 2008 and 2009, Energy Trust of Oregon:

Provided **INCENTIVES** for 740 PV systems that total 10 MW of capacity, along with 374 solar water heating systems, saving 664 MWh and 28,000 therms annually.

Collaborated with a neighborhood association on an **INNOVATIVE BULK SOLAR PURCHASE** effort. More than 100 homes are planning to install PV systems through the program.

Launched the **SMALL WIND INITIATIVE** to support the growth of a small wind industry in Oregon. Eleven projects, ranging in size from 2.4 kW to 20 kW, have been installed. The number of wind installers working in Oregon has grown from a small handful to nearly 20.

Provided incentives for three **HYDROPOWER** projects with combined capacity of 620 kW. Three more projects are under construction.

Published a set of **HYDRO PERMITTING GUIDEBOOKS** designed to assist communities in successfully navigating the state and federal permitting and exemption process.

Assisted more than 50 rural small businesses in applying for **USDA RURAL ENERGY FOR AMERICA** grants.



Stahlbush Island Farms in Corvallis, a national leader in sustainable agriculture and food production, has begun full operations of the first-of-its-kind biogas plant in North America by producing electricity from fruits and vegetable by-product. The project capacity is 1.6 MW and is expected to generate 12,500 MWh annually.

Illinois Clean Energy Community Foundation



Chicago Botanic Garden

The new LEED Gold Daniel F. and Ada L. Rice Plant Conservation Science Center at the Chicago Botanic Garden features a green roof with a 57 kW photovoltaic system.

The Illinois Clean Energy Community Foundation (ICECF) invests in clean energy efforts, working with communities and residents to improve environmental quality in Illinois. In carrying out this mission over the past decade, ICECF has steadily ramped up its support of clean energy investments in Illinois through a widening array of program initiatives. Steady and ongoing support has spurred visible and measur-

“Drawing on the experience of fellow CESA members has provided very valuable programmatic insights that have helped us to improve our programs.”

Dennis O’Brien, Executive Director

able progress in helping 501(c)3 non-profit organizations and local and state governmental bodies in Illinois capture

the benefits coming from the use of energy efficiency technologies and the installation of renewable energy generation.

In the last three years, ICECF has awarded over \$41.5 million for more than 860 grants to support clean energy projects throughout Illinois. Over its 10-year life, the Foundation has awarded nearly 3,000 clean energy grants, totaling over \$122 million.

Through its energy efficiency grant



Gabriela Martin
Program Officer for
Renewable Energy

**Illinois Clean Energy
Community Foundation**
2 N. LaSalle, Suite 1140
Chicago, IL 60602

PHONE 312-372-5191
EMAIL info@illinoiscleanenergy.org
WEB www.illinoiscleanenergy.org



Illinois Clean Energy
community foundation

HIGHLIGHTS



City of Geneseo

The City of Geneseo recently installed two Vensys 77 1.5 MW gearless turbines that will provide roughly 12% of the electricity consumed in Geneseo.

portfolio, ICECF is promoting high-return efficiency upgrades in existing public buildings, green design for new and rehabilitated buildings and adoption of energy efficient building codes. In support of LEED-rated green buildings, ICECF has awarded grants to gain recognition and acceptance of the feasibility and benefits of using leading-edge energy efficiency building products and technologies not widely in use in Illinois, from large-scale geothermal HVAC to advanced day-lighting, in order to establish them as cost-effective best practices in the Illinois marketplace.

ICECF is helping to bring renewable power generation to Illinois. The Foundation's renewable energy grants cluster according to the type of renewable resource.

A "Solarbration" at St. Philips the Apostle school caps off the successful completion of a 1 kW educational PV system installation as part of the Illinois Clean Energy Community Foundation's Solar Schools Program.

WIND PROJECTS. ICECF is focusing its grant support on helping to make possible the installation of small-, mid-, and commercial-sized turbines to generate power for local use, bringing the reality of renewable power to rural communities. The Foundation provides grants for both wind feasibility studies and turbine installations. With the growth of wind development throughout the state, the Foundation is also funding an increasing number of small-scale educational turbine installations at schools and has provided hardware to colleges and universities to provide hands-on training in wind technology.

SOLAR ENERGY PROJECTS. ICECF is continuing to support the installation of solar energy systems in Illinois. These installations are intended to establish the high potential of solar for meeting future energy needs. The Foundation has taken two approaches to advance its goal:

- ICECF grants are supporting the installation of PV systems in conjunction with the Foundation's emphasis on seeing green buildings become the norm. ICECF also provides grant support for the installation of solar thermal systems. These systems provide hot water, heating, and cooling for affordable housing, supportive housing, schools, and municipal buildings.
- ICECF has steadily expanded its initiative to educate today's school-aged generation to be ready to capture the potential of solar power as they grow up. This program focuses specifically on schools and has already made over 140 grants for 1 kW photovoltaic system installations. Augmenting the installations to extend the impact of this program to more schools and the public at large, ICECF sponsors the Illinois Solar Schools website (www.IllinoisSolarSchools.org) as well as teacher-training workshops. The website allows users to view real-time data of the schools that have installed PV systems, is a resource for teachers, and provides teachers and students with an opportunity to post stories about their projects.



Dawn O'Brien

Maryland Energy Administration

The Maryland Strategic Energy Investment Fund (SEIF), created by the General Assembly in 2008 and managed by the Maryland Energy Administration (MEA), promotes affordable, reliable, and clean energy. The SEIF provides incentives to decrease energy bills, increase the supply of renewable energy, reduce Maryland's carbon footprint, and create new, green-collar jobs. The program also provides residential rate relief and assists low-income families with energy assistance funds. The SEIF is a special fund consisting of the proceeds from the auction of carbon emission allowances to power plants under the Regional Greenhouse Gas Initiative.

Seventy-three percent (73%) of the SEIF has been returned directly to Marylanders in the form of credits on household electric bills and bill payments to keep the lights on for thousands of low-income Marylanders. The remaining

“CESA is an enormous resource to Maryland and should be used by all state energy agencies. The organization follows developments in policies, finance, and technologies and provides a valuable conduit for informational exchange, fostering best practices and avoidance of potential pitfalls.”

Ross Tyler, Director of Clean Energy



Salvo Auto Parts uses a Maryland Energy Administration mid-size American Recovery and Reinvestment Act-funded grant to help offset cost of a 50 kW array on its corporate facility.



Malcolm Woolf
Director, Maryland Energy Administration

Maryland Energy Administration

60 West St., Suite 300
Annapolis, MD 21401

PHONE 410-260-7655

EMAIL MEAinfo@energy.state.md.us

WEB <http://energy.maryland.gov>



HIGHLIGHTS

27% has been invested to help homeowners, renters, and businesses to save money through energy makeovers and renewable energy systems, creating hundreds of green collar jobs and reducing greenhouse gases in the process.

As shown in the below chart, the SEIF investments during FY10 and FY11 are anticipated to achieve the following benefits for Marylanders:

	FY 10	FY 11
SEIF funds invested by MEA into energy efficiency and renewable energy (RE) programs	\$11.8 million	\$6.5 million
Energy savings over life of investments	\$47 million	\$31 million
New green collar jobs created	134	95
CO ₂ emissions reduced	14,500 tons	9,600 tons
Cars off the road (in CO ₂ equivalent)	2,500	1,700
# of Maryland low- to moderate-income families benefitting from energy retrofits	730	630
RE systems installed on homes	540	262
Annual MWh equivalents saved	25,000	16,800
Number of Marylanders receiving rate relief	2.1 million	2.1 million

EMPOWERING LOW- AND MODERATE-INCOME FAMILIES. Programs include the **Electric Universal Service Program**, which assists low-income customers who have difficulty paying their electric bills. In FY 2010, MEA has set aside over \$40 million in SEIF funds for the Department of Human Resources, helping thousands of low-income Maryland households keep the lights on; the **Multi-Family Housing Retrofits for Low- and Moderate-Income Families** program, which provides energy efficiency retrofits to low- and moderate-income apartment units to help renters reduce their home energy bills. Over the next two years, the program will reduce energy consumption by 11,400 MWh, saving those families nearly \$9 million over the next 15 years; and the **Energy Retrofit Program**, which provides, at low or no cost, home improvements for families to reduce their home energy bills. The program provides additional and expanded funding and operations for the state's Weatherization Assistance Program for energy upgrades, building improvements, HVAC replacement, and weatherization.

EMPOWERING HOUSEHOLDS. Programs include the **Residential Rate Relief Program**, which provides direct rate relief for customers, and the **Residential Renewable Energy Grants** program, which provides financial incentives for the installation of small renewable energy systems. Grants to install solar, wind, or geothermal systems can alleviate congestion on the grid and help move more Marylanders toward renewable energy sources. The nearly \$2 million in SEIF funds allocated to this program in FY 2010 will help over 500 families receive grants this year, and the \$800,000 in SEIF funds allocated to this program in FY 2011 will help another 300 families receive grants in FY 2011. Also the **State Energy Efficient Appliance Rebate Program**, which offers consumers rebates for the purchase of energy efficient clothes washers, refrigerators, and heat pump water heaters, and the **Public Outreach Campaign**, which includes transit, outdoor, print, radio, and internet ads to educate Marylanders about opportunities to reduce energy bills and energy consumption, and also to educate the public on renewable energy.

EMPOWERING CLEAN ENERGY BUSINESSES AND JOBS. Programs include the **Commercial and Industrial Programs**, including a 2010 FY allocation of \$500,000 in SEIF funds for loans to help the industrial/commercial sector—which accounts for approximately 30% of electricity consumption in Maryland—implement energy efficiency upgrades; the **Farm Energy Technical Assistance & Incentives** program, which is designed to assist the over 12,000 Maryland farms reduce the over \$26 million spent on electricity annually by providing technical assistance, energy assessments, and cash rebates for farms that install energy efficiency measures; and **Energy Workforce Training**, through which MEA has been working closely with DHCD and the community colleges to develop and promote a home energy retrofit training program. Classes began in July 2009, and approximately 700 Marylanders have been trained to date.

EMPOWERING CLEAN ENERGY COMMUNITIES. Programs include the **Energy Efficiency Low to Moderate Income Grants** program, which awards grants to local governments and nonprofit organizations for energy efficiency improvement programs that benefit low- to moderate-income Marylanders; the **Jane E. Lawton Conservation Loan Program**, which attempts to address the financing barrier that precludes individuals from participating in energy efficiency programs by making loans to local governments, nonprofits, and businesses for projects that can be paid back out of the energy savings over time. In FY 2010, \$1.75 million in Lawton loans are available; the **EmPOWERing State Government to Lead by Example** program; the **Maryland Department of the Environment's Climate Change Program**; the **Department of General Services** program, which helps pay the salaries of Department of General Services energy staff to pursue clean energy programs and projects; and the **State Energy Performance Fund Swap**, which makes project repayments to the State's Master Lease for those agencies participating in energy performance contracting, freeing up general fund dollars in those agencies that will be used to reduce the State budget. In FY 2010, MEA allocated \$4.4 million of SEIF funding for this program and will allocate another nearly \$6 million in FY 2011.

Massachusetts Clean Energy Center

The Massachusetts Clean Energy Center (MassCEC) was established in 2008 to advance the state's clean energy economy.

The quasi-public agency, chaired by Massachusetts Executive Office of Energy and Environmental Affairs (EEA) Secretary Ian Bowles, serves as a clearinghouse and support center for the clean energy sector, making direct investments in new and existing companies, helping companies access capital and other vital resources for growth, and developing training programs to build a strong clean energy workforce that capitalizes on the job opportunities created by this vital industry.

In November 2009, Governor Deval Patrick signed legislation that transferred the Massachusetts Renewable Energy Trust to MassCEC, creating a single agency responsible for fostering the development and installation of clean energy technologies and the green jobs that go with them. MassCEC's initiatives include promoting renewable energy generation, investing in job creation, and developing the clean energy cluster and a strong clean energy workforce.

Commonwealth Solar

In January 2010, MassCEC launched Commonwealth Solar II. Building on the success of the Patrick-Murray administration's inaugural solar PV program, which supported 1,200 installations for more than 23 MW, Commonwealth



Biomufacturing and life science research firm Millipore Corp. unveiled its 350 kW solar panel installation in October 2009. The project, which was funded from the Clean Energy Center's Renewable Energy Trust and the Renewable Energy Grant Program, will help Millipore achieve its goal to cut greenhouse gas emissions by 20 percent. In less than two years, the Commonwealth Solar rebate program funded more than 1,200 solar PV projects such as this in more than 200 cities and towns across the state.

"States are at the forefront of the effort to drive innovation and growth in renewable energy. As the federal government increases its support for clean energy, it's vital that individual states continue to support the development and deployment of clean energy innovations."

Ian Bowles, Secretary of Energy and Environmental Affairs

Solar II complements the introduction of a new Solar Renewable Energy Certificate (SREC) program launched in January 2010 by the state's Department of Energy Resources. Residential and small commercial-scale solar systems are eligible for rebates under Commonwealth Solar II. In addition, residential, small commercial, and larger systems will receive incentives through the SREC program, which features an innovative price support mechanism. Under a separate initiative, MassCEC administered \$8 million to support large-scale (10 kW



Pat Cloney
Executive Director

Massachusetts Clean Energy Center

55 Summer Street, 9th Floor
Boston, MA 02110

PHONE 617-315-9355
EMAIL info@masscec.com
WEB www.MassCEC.com



to 200 kW) solar PV projects with funding from the American Recovery and Reinvestment Act-funded State Energy Program.

Commonwealth Wind

This program consists of three main components:

- **Micro Wind** is a performance-based incentive program offering support to wind installations below 100 kW.
- **The Community-Scale Wind** program provides feasibility and design and construction support to projects ranging from 100 kW to 2 MW in conjunction with the state's new net-metering regulations.
- **The Commercial-Scale Wind** program grants non-recourse loans to early stage projects that will sell to the regional wholesale power market.

In addition, MassCEC supports the development of national offshore wind policy by funding of the U.S. Offshore Wind Collaborative.

Commonwealth Hydro

The state's new Renewable Portfolio Standard (RPS) regulations require that eligible facilities become certified by the Low Impact Hydro Institute. MassCEC's hydroelectric support helps small dam owners explore certification and provides substantial grant support to improvements that create incremental increases in renewable power generation.

Workforce and Development Training

MassCEC's Workforce Development and Training program has devoted nearly \$4 million to workforce training and education initiatives by awarding grants for training in weatherization, solar photovoltaic and thermal, wind energy, clean energy construction, apprenticeship development, and entrepreneurship. Massachusetts implemented the state-funded Pathways Out of Poverty green jobs training initiatives. MassCEC established a statewide network for energy efficiency and building science training and continuously sponsors workforce training and education events.

Job Creation

Through its new investment program, MassCEC makes seed-stage and expansion-stage capital investments in clean energy companies, and it partners with its portfolio companies, new companies, and clean energy investors to help companies develop proofs of concept and prototypes.

In the past two years, Massachusetts' legislative leaders have passed landmark pieces of legislation that have spurred development in the clean energy industry:

The **GREEN COMMUNITIES ACT** is a comprehensive reform of the state's electricity marketplace that promotes a dramatic expansion in energy efficiency, supports the development of renewable energy resources, creates a new, greener state building code, removes barriers to renewable energy installations, stimulates technology innovation, and helps consumers reduce electric bills. In addition, the state's existing RPS was enhanced under the law, doubling its rate of increase, and a commission on wind energy siting reform created by the Act produced draft legislation, which is now being considered by the Legislature.

The **OCEAN MANAGEMENT PLAN** is the first-in-the-nation comprehensive plan to manage development in state waters, providing new protections for critical environmental resources in nearly two-thirds of the state's coastal waters and setting standards for the development of community-scale and commercial-scale offshore wind energy, as well as other infrastructure.

The **CLEAN ENERGY BIOFUELS ACT** is the first tax incentive in the nation for next generation, non-food-based gasoline alternatives. It exempts cellulosic biofuels from the state's gasoline tax, sets minimum advanced biofuel content for diesel and home heating fuel, and commits the state to developing a Low Carbon Fuel Standard on a regional basis.

Since 2008, the **COMMONWEALTH SOLAR I** program has leveraged installation of more than 23 MW of solar PV through targeted investment of \$68 million from the Renewable Energy Trust Fund. This and other initiatives will bring the state up to more than 60 MW from 3.5 MW in four years, from when Governor Patrick took office.

Since 2006, the amount of **WIND ENERGY** installed has increased five-fold in the Commonwealth from 3 MW in 2006 to more than 15 MW as of February 2010.

In June 2007, Massachusetts won a \$2 million competitive grant from the U.S. Department of Energy, and in May 2009 it received \$25 million in federal stimulus dollars for the construction of the new **WIND TECHNOLOGY TESTING CENTER** (WTTC) in Charlestown, which will offer certification tests for state-of-the-art turbine blades up to 90m in length, and the latest wind turbine blade testing and prototype development methodologies. The WTTC will attract new wind technology and other renewable energy technology companies to the region.

In July 2009, MassCEC awarded \$1.875 million for the Massachusetts Energy Efficiency and Building Science Training Initiative to Springfield Technical Community College to establish **REGIONAL TRAINING CENTERS** for new and incumbent workers seeking energy efficiency skills training.

New Jersey's Clean Energy Program

New Jersey's **Clean Energy Program™** is a signature initiative of the New Jersey Board of Public Utilities (BPU).

It promotes increased energy efficiency and the use of clean, renewable sources of energy including solar, wind, and sustainable biomass. The result for New Jersey is a stronger economy, less pollution, lower costs, and reduced demand for electricity.

The program offers financial incentives, programs, and services for residential, commercial, and municipal customers. It provides education, information, and financial incentives for energy efficiency measures and renewable energy systems.

New Jersey has instituted a number of successful initiatives that help to reduce the state's peak energy demand, conserve finite resources, and transform the marketplace for the next generation of electricity and natural gas supply technologies. Incentives are available to offset the initial cost of energy efficient and renewable energy technologies for all ratepayers in New Jersey. Programs are comprehensive and complementary and focus on providing technical and financial assistance to homeowners, businesses, schools, and government organizations. The programs are also designed to offer full project development assistance, from information on best practices to rebate payments and financing tools.



From the roof of the Atlantic City Convention Center, you can see both the Atlantic City Convention and Visitors Authority's 2.37 MW solar energy installation, the largest roof-mounted solar PV system in the U.S., and the Atlantic County Utilities Authority's five 1.5 MW wind turbines, the first utility-scale coastal wind installation in the eastern U.S.

"The New Jersey Clean Energy Program's association with CESA enhances New Jersey's programs by providing a forum for states to share best practices and potential pitfalls. Our work together fosters the expansion of clean energy while contributing to reduction of greenhouse gas emissions, which are responsible for climate change."

Michael Winka, Director



The 2009 New Jersey Clean Energy Annual Conference and Leadership Awards were held in Atlantic City during October 2009. Themed *Clean Energy Now*, the two-day conference drew nearly 1,100 attendees and over 80 exhibitors presenting best practices in energy efficiency and renewable technologies. U.S. Department of Energy Secretary Stephen Chu, co-winner of the 1997 Nobel Prize for Physics, opened the conference.



Michael Winka

Director, Office of Clean Energy—New Jersey
Board of Public Utilities

New Jersey Board of Public Utilities

Office of Clean Energy
44 South Clinton Avenue, P.O. Box 350
Trenton, NJ 08625-0350

PHONE 877-786-5278 (toll free) • 609-777-3300

EMAIL info@njcep.com

WEB www.njcleanenergy.com
www.njcep.com



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EXECUTIVE ORDER CALLS FOR 20% BY 2020. In January of 2007, an executive order was signed to adopt proactive and ambitious goals for the reduction of greenhouse gas emissions in New Jersey. The order specifically called for reducing greenhouse gas emissions to 1990 levels by 2020, approximately a 20% reduction, followed by a further reduction of emissions to 80% below 2006 levels by 2050. New Jersey was one of the first states in the nation to adopt such aggressive goals.

SREC REGISTRATION PROGRAM. In September of 2007, the BPU unanimously approved the transition of New Jersey's solar PV incentive program to a fiscally responsible market that will foster the continued growth of solar energy use in the state. Under this program, PV system owners earn solar renewable energy credits (SRECs) for solar electricity production, which are registered and traded among electricity suppliers and other buyers within an established infrastructure. Electricity suppliers are required to either buy the SRECs or pay a Solar Alternative Compliance Payment (SACP). The BPU set an eight-year schedule for the SACP. To meet these RPS goals, the BPU established a solar market that focuses on the sale of SRECs, which resulted in the launch of the SREC-Only Pilot Program. Since the pilot program successfully proved the concept by delivering over 40 MW of PV capacity without the use of rebates, the process is now referred to as the SREC Registration Program.

RGGI. In early 2008, the Regional Greenhouse Gas Initiative (RGGI) Act was signed into law, allowing electric public utilities and gas public utilities to offer energy efficiency and conservation programs, to invest in Class I renewable energy resources, and to offer Class I renewable energy programs in their respective service territories on a regulated basis.

NJ ENERGY MASTER PLAN. In October 2008, the State issued New Jersey's Energy Master Plan (EMP). The Energy Master Plan proposes a road map to guide the state toward a responsible energy future with adequate, reliable energy supplies that are both environmentally responsible and competitively priced. The Energy Master Plan sets the following goals to be achieved by the year 2020:

1. Reduce projected energy consumption by at least 20%
2. Reduce peak demand by 5,700 MW
3. Generate 30% of the State's electricity from renewable resources

MILLIONS IN INCENTIVES. In 2008, the program provided \$112 million in direct financial incentives to residential customers, businesses, schools and municipalities to install energy efficient and renewable energy technologies, including solar photovoltaic systems. The result for New Jersey is a stronger economy, climate benefits, energy savings, and reduced demand for electricity.

\$5 BILLION IN SAVINGS. The energy savings plus the electricity generated from renewable energy and distributed generation systems installed from 2001 through 2008 will save 2,440,485 MWh of electricity and 4,152,721 Dtherms of natural gas per year, saving New Jersey residents and businesses a total of \$5,013,620,105.

MULTIPLE AWARDS. For the past 3 years the Clean Energy Program has received several awards, including: EPA's 2009 ENERGY STAR Partner of the Year for Energy Efficiency Program Delivery for New Jersey ENERGY STAR® Homes; the 2009 ENERGY STAR Sustained Excellence Award as part of the Northeast ENERGY STAR Lighting and Appliance Initiative; the 2008 Excellence in ENERGY STAR Promotion for Home Performance with ENERGY STAR and Excellence in Energy Efficient Affordable Housing for Comfort Partners; and for the past four years, the New Jersey ENERGY STAR Products Program has received an ENERGY STAR Partner of the Year award from the EPA. Additionally, in 2009, New Jersey, along with four other states, was recognized by Clean Energy States Alliance and awarded a *State Leadership in Clean Energy* award for the Solar Renewable Energy Certificate (SREC) Program and its efficient, market-based approach to providing solar developers and building owners with financial incentives without reliance on rebates.

CLEAN ENERGY CONFERENCE AND LEADERSHIP AWARDS. In 2009, New Jersey held its fifth annual Clean Energy Conference and Leadership Awards, which opened with U.S. Department of Energy Secretary Steven Chu, who offered the keynote address. "New Jersey's innovators and entrepreneurs are leading the way, and I look forward to building on the work of this important conference," said Dr. Chu. The conference achieved record levels in terms of attendance and support from sponsors and exhibitors, including 1,089 attendees, a 37% increase over 2008; 82 exhibitors, a 74% increase; and 21 sponsors, a 62% increase. Over 90% of attendees and exhibitors indicated that they plan to attend in 2010.

5,000TH SOLAR PROJECT REACHED. As of December 31, 2009, New Jersey's Clean Energy Program has provided over 164 MW of sustainable energy including solar, wind, biomass, and fuel cell projects. In January of 2010, the Clean Energy Program reached its 5,000th solar project across the state.



In April 2008, the BPU authorized PSE&G to launch a program that will provide about \$100 million in loans to install solar systems on homes, businesses, and municipal buildings in New Jersey. The loans will be repaid with revenue provided by the sale of SRECs from the financed projects. M&M Mars's 2 MW solar installation was one of the first projects to take part in this program.

New York State Energy Research and Development Authority

With an annual budget of approximately \$650 million, the New York State Energy Research and Development Authority (NYSERDA) supports the development and manufacture of emerging energy technologies; programs to address barriers inherent in bringing new products to market; and a portfolio of initiatives to increase energy efficiency and renewable energy in New York. NYSERDA is helping to position New York businesses and industries to become leaders in the clean energy technology economy through innovative partnerships.

NYSERDA's Clean Energy programs, highlighted below, span the lifecycle of a successful business launch, from start-up to product development to commercialization. NYSERDA's recent investments underscore its commitment to seizing the opportunities and meeting the challenges facing today's clean energy leaders.

Clean Energy Business Incubators

When a new company is just starting out and resources are put to the test, a business incubator can provide much-needed support and infrastructure. Over the past year, NYSERDA has directly invested in six strategically located incubator sites and organizations that support early stage business growth. Incubators offer a structured program to startup companies to help them



Maple Ridge wind turbines,
Lewis County, New York

Photo courtesy of IBERDROLA RENEWABLES, Inc.

commercialize clean energy technology and reach viability. These programs include technical assistance, mentorship and entrepreneurial development, opportunity assessment, business planning, marketing and business development support, legal and financial planning support, networking and introductions to investors, and strategic partners.

“NYSERDA's work has helped thousands of New York State businesses develop clean energy products and create strong businesses that will help improve our environment, enhance our energy security, and build the clean energy economy of the future.”

Francis J. Murray, President

Saratoga Technology + Energy Park® (STEP®)

In addition to supporting these incubators, NYSERDA sponsors STEP® as a knowledge community with significant resources for technology companies involved in the research and development, commercialization, manufacturing, and distribution of clean energy and environmental products as well as services companies that are looking for a strategic location to build and grow. STEP distinguishes itself from other locations by including services, amenities, and collaboration opportunities in an eco-friendly setting on 280 acres in the heart of New York's Tech Valley.

Early Stage Research & Development

Developing innovative technologies can require a significant investment and carry significant risk. NYSERDA's programs help reduce those financial risks



Francis J. Murray
President

NYSERDA
17 Columbia Circle
Albany, NY 12203-6399

PHONE 866-NYSERDA • 518-862-1090
EMAIL info@nyserdera.org
WEB www.nyserdera.org



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by offering funding to support research, product development, and demonstration. In the case of research support, NYSERDA is providing \$250,000 each to four Energy Frontier Research Centers to conduct fundamental research in new energy technologies. In addition, over the past year, NYSERDA formed two research consortia to build public-private partnerships. The New York Battery and Energy Storage Technology Consortium (NY-BEST™) is an industry-focused coalition working to build a vibrant, world-class, advanced battery and energy storage sector in New York State. NY-BEST™ will be supported with approximately \$25 million in seed funding through the Clean Air Interstate Rule auction proceeds. The NYS SmartGrid Consortium, established in 2008, is focused on the creation of a fully visible, integrated “smart” electricity system for New York State. The consortium includes academic, industrial, and commercial members and the Board of Directors has representation from the New York major electric utilities and energy policy organizations.

Business Growth & Development

NYSERDA provides funding to innovative clean energy companies to engage in business projects that allow them to expand and grow. Such projects vary, typically including activities attendant to raising capital, entering new markets, or entering existing markets with new products and services. As such, the program is attractive to early stage companies. The program requires that product and service offerings be available in the market already, or within one year at the latest. In addition to direct financial support to companies, NYSERDA is funding a range of activities to expand services to early stage companies.

Business Expansion & Manufacturing Incentives

NYSERDA offers incentives to companies establishing clean energy manufacturing facilities in New York. The manufacturing incentive program provides up to \$1.5 million per project to companies that are establishing a new manufacturing plant or making a significant physical expansion to an existing one. Up to 25% of the funding may be used to support pre-manufacturing activities such as site selection and development, building improvements and facilities, and acquisition of equipment. The remaining 75% is paid out on a quarterly basis as the manufacturing line is operated, based on a percentage of the “New York State Value Added.”

Provided \$9 million to expand the focus of six **BUSINESS INCUBATORS** across New York State to focus on clean energy technology companies.

At the end of 2009, 10 companies with over 70 employees are located at the **SARATOGA TECHNOLOGY + ENERGY PARK**.

Over the past year, supported **EIGHT NEW COMPANIES** to begin manufacturing in New York. Three companies are in the solar business; one each in storage, lighting, and biomass gasification; and two projects involve electric vehicles.

Established a suite of **BUSINESS ASSISTANCE INITIATIVES** that target clean energy technology. These include an Entrepreneur-in-Residence program, entrepreneurial training and business coaching, preparation of a Cleantech Entrepreneurs Handbook, and Pre-Seed Workshops across New York.

Under the NYSERDA-administered **RENEWABLE PORTFOLIO STANDARD PROGRAM**, new wholesale renewable capacity installed since the onset of the RPS Program could reach nearly 1,164 MW by the end of 2009, of which 1,127 MW would be located in New York. The estimated total economic benefits that could accrue to New York from these in-state investments could exceed \$4 billion over the next 20 years. In addition, the average contract award prices (similar to a REC) under the second and third Main Tier solicitations were more than 30% lower than under the first Main Tier solicitation (\$15 per MWh compared to \$22.90 per MWh). On the customer side of the meter, NYSERDA has applications or installations for over 30 MW of new capacity. The bulk of the installations will be PV with almost 20 MW of installations.



Saratoga
Technology +
Energy Park

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Retrofitting manufacturing facilities for energy efficiency and installing photovoltaic panels and wind turbines to generate electricity at homes, farms, and businesses throughout Ohio are examples of the forward-looking projects that the AEF has made possible.

The Ohio Department of Development's Energy Resources Division administers the Advanced Energy Fund and ensures it is integrated with, complements, and leverages the federally funded State Energy Program, also administered by the Ohio Energy Resources Division. As of late 2009, the Ohio Energy Office was elevated to division status and aligns advanced energy as a top priority for the Ohio Department of Development and Governor Strickland.

As of March 30, 2010, the AEF supports the following programs:

- Distributed Energy Resources Projects (NOFA 07-01)
- Renewable Energy Program Notice of Funding Available (NOFA 08-09)
- Residential Wind Energy Incentive (NOFA 09-02)
- Solar Thermal Energy Incentive for Residential Housing Units (NOFA 09-03)
- Residential Solar Photovoltaic Energy Incentive (NOFA 09-04)
- Energy Efficiency Program for Manufacturers (NOFA 10-03)



The Toledo Museum of Art received a grant to complete the first phase of a 200 kW photovoltaic system in the spring. This first phase included 1,450 First Solar modules, totaling 101 kW, installed on the roof over the Peristyle and a portion of the museum's East Wing, which provides as much as 20% of the museum's electrical demand during the hours that the museum is open to the public, when the demand is greatest.

Since its inception in 1999 through March 2010, the AEF has invested more than \$49.4 million in nearly 600 advanced energy projects. These projects account for more than **410,000 MWh OF ELECTRICITY GENERATED ANNUALLY, EQUIVALENT TO POWERING 36,500 OHIO HOMES**, as well as an energy savings of nearly 1,118 trillion British thermal units (BTUs) of heat, equivalent to heating 15,971 homes in Ohio during the winter. These projects also reduced carbon dioxide emissions by more than 328,000 metric tons, which is equivalent of taking 56,949 cars off of the road for a year. (www.development.ohio.gov/Energy/Incentives/AdvancedEnergyFundGrants.htm)

The Advanced Energy Fund supports **WIRE-NET'S GREAT LAKES WIND NETWORK** to create and implement a comprehensive plan to identify, expand, and promote Ohio's wind energy supply chain. The Great Lakes Wind Network is also partnering with regional Edison Centers and Universities to offer technical and operational expertise, detailed analysis of wind turbine component parts, advice on how to work with wind Original Equipment Manufacturers, and supply chain and technology support. This project includes a web-based database of Ohio wind supply chain companies. To date, the Great Lakes Wind Network is working with more than 600 active and emerging Ohio companies. (www.wind.ohio.gov)

The Ohio Energy Resources Division issued two Advanced Energy Fund grants through its **OHIO WIND PRODUCTION AND MANUFACTURING INCENTIVE PROGRAM** for a total of \$5 million: (1) The Buckeye Wind Project developed by EverPower Renewables in Champaign and Logan Counties, and (2) the JW Great Lakes Wind Farm in Hardin County. This program was the first to support Ohio utility-scale wind projects through a production incentive. As a result of this program, these two projects have now become the first two projects to submit applications to the Ohio Power Siting Board, which has jurisdiction for the installation of utility-scale wind farms at 5 MW and above in Ohio.

The Advanced Energy Fund continues to provide financial support to **SMALL WIND AND RESIDENTIAL SOLAR PROJECTS** for Ohio residents across the state. For example, with the assistance of a \$19,980 Advanced Energy Fund grant, William Little of Deerfield, Ohio, installed a 5 kW wind turbine mounted on a 100-foot tower and a 2 kW solar array. This project cost approximately \$80,000 and enables the Little Family to reduce utility bills by 90%. (www.development.ohio.gov/Energy/Incentives/AdvancedEnergyFundGrants.htm)

TRF Sustainable Development Fund - Pennsylvania



TRF Development Partners built eight units of affordable housing in Baltimore that earned ENERGY STAR certification and used modular construction to bring down the cost and the construction time. TRF Energy Group provided technical support and information to the modular manufacturer and to the builder.

As The Reinvestment Fund's (www.trfund.com) energy finance arm, the TRF Energy Group operates the Sustainable Development Fund (SDF) (www.trfund.com/sdf), a \$32 million fund that uses its capital to make loans, energy performance contract leases, equity investments, and grants to commercial real estate projects, community facilities, and affordable housing, as well as companies involved in energy conservation and clean and renewable energy. The TRF Energy Group is also deploying other capital for high-performance buildings and additional clean energy projects

"CESA is one of very few places where managers of public clean energy funds can turn for timely, targeted advice. As a member of CESA, our fund enjoys increased national recognition and the opportunity to leverage additional resources."

Rob Sanders, Managing Director

beyond the southeastern Pennsylvania footprint of SDF.

Through the knowledge and experience of its staff, TRF Energy provides



SDF provided a modest grant to Rushforth Solar, Inc. to help reduce the sale cost of four solar domestic hot water systems in apartment buildings in the Philadelphia area. The key to these cost-effective solar installations for commercial buildings with centrally heated hot water is the hot water storage tank, which is at atmospheric pressure and can be assembled on-site at a low cost.



Rob Sanders
Managing Director

The Reinvestment Fund

718 Arch Street, Suite 300 North
Philadelphia, PA 19106

PHONE 215-574-5850

EMAIL energy@trfund.com

WEB www.trfund.com/financing/energy/energy.html



HIGHLIGHTS

high-quality information and policy ideas to government, major nonprofit institutions, and private sector partners. TRF staff serve on the Pennsylvania Energy Advisory Board and the Pennsylvania Energy Development Authority board. Staff have played leadership roles in the design and implementation of the Advanced Energy Portfolio Standard Act (Pennsylvania's legislation that establishes minimum amounts of clean electric energy to be sold over the next fifteen years) and Act 129 (Pennsylvania's legislation that directs electric utilities to meet energy conservation and demand response goals). Staff are also active on the board of directors and the executive committee of CESA.

TRF Energy has built innovative private partnerships to leverage its resources. With Blue Hill Partners, SDF created a special limited partnership (the Pennsylvania Advanced Industrial Technology Fund) to invest in early stage clean energy companies in southeastern Pennsylvania. TRF Energy is partnering with the Pennsylvania state energy office to manage a \$48 million green energy loan fund using Recovery Act dollars and with the City of Philadelphia to manage a similar fund for Philadelphia.



TRF Energy financed the energy retrofit of existing space and an energy-efficient addition at the Latin American Montessori Bilingual Public Charter School in Washington, D.C. The energy measures included a high-efficiency modular boiler heating system, a high-performance building envelope with daylighting features, energy-efficient lighting fixtures and controls, and a green roof for capturing storm water.

COMMERCIAL PV BRIDGE FUNDING. In the fall of 2009, TRF approved \$706,850 in financing for the installation of commercial solar PV systems at two locations in Delaware County. The first phase of the project closed in December, 2009. This will be the first time that a lender in the region has financed a solar project requiring bridge funding for the Pennsylvania Sunshine Program grant and the federal grant in lieu of the federal investment tax credit. As a result of the timely and professional way this financing request was handled, the borrower's bank of record has said they would be interested in considering participating in another commercial solar project that TRF will finance.

In December 2009, TRF approved \$2,099,457 in **LEASE FINANCING** through its private label entity, TRF Leasing. The ELEX Group, Inc. and the Sustainable Energy Fund of Central Eastern Pennsylvania are participating in this financing. TRF has executed a marketing agreement whereby The ELEX Group, Inc. will provide private label lease financing services for TRF, provide a 15% equity investment in every TRF Leasing transaction, and market TRF's energy-related lease financing program throughout TRF's market area, including all of Pennsylvania.

TRF CAPITALIZATION EFFORTS. TRF has submitted or been included in various proposals for DOE ARRA funds, including:

- \$12 million Pennsylvania Green Energy Loan Fund (formula SEP \$)
- \$4.5 million Philadelphia Greenworks Loan Fund (formula EECBG \$)
- \$18 million Project Energy Smart Regional Loan Fund (competitive EECBG \$)
- PA Treasury Department requested \$25 million as seed capital for its Educational Energy Efficiency leveraged loan fund (competitive EECBG \$), to be managed by TRF

Vermont Clean Energy Development Fund



Solar PV trackers installed at GWR Engineering, PC
Charlotte, Vermont

Photos supplied by GWR Engineering, PC

Founded in 2005 by the Vermont General Assembly, the Vermont Clean Energy Development Fund (CEDF) promotes the growth of sustainable electric power and thermal energy or geothermal resources, and emerging energy-efficient technologies. CEDF offers a portfolio of funding opportunities to accelerate the development, commercialization, and production of clean energy including grants, loans, equity investments, and contracts.

Funded by an agreement between the Vermont Department of Public Service and Entergy Nuclear Vermont and Entergy Nuclear Operations, Inc., the CEDF has awarded over \$18 million in grants to businesses, community

groups, institutions, farms, and individuals working to create the clean energy economy in the state. This public investment leveraged a total investment of over \$60 million in renewable energy since inception. In addition, the CEDF received \$31.5 million through the

“The information on CESA’s website (e.g., reports) has been helpful, as has access to members in other states at the conference.

Information gleaned by CESA staff in response to requests has proven useful at CEDF.”

Andrew Perchlik, Director

American Recovery and Reinvestment Act (ARRA) of 2009 to support its mission.

In 2009, the Clean Energy Development Fund granted \$5.4 million to 39 renewable energy projects in 2009 and provided \$3.1 million in low-interest loans to six renewable energy projects or businesses. The Fund also provided \$2.1 million for the Small-Scale Renewable Energy Incentive Program to promote clean energy at the residential scale leading to 612 kW of newly installed wind and solar PV, and 18,022 kBtu/day of solar hot water capacity in 2009. In total, CEDF grants and loans made in 2009 will lead to more than 6.9 MW of new renewable energy generation.



Andrew Perchlik
Director

Clean Energy Development Fund

c/o Vermont Department of Public Service
112 State Street
Montpelier, VT 05620-2601

PHONE 802-828-4017

EMAIL Andrew.Perchlik@state.vt.us

WEB http://publicservice.vermont.gov/energy/ee_cleanenergyfund.html



HIGHLIGHTS



Farm methane digester, Neighborhood Energy, LLC, Newport, Vermont

As a rural state with a strong agricultural heritage, Vermont prides itself on its working landscape. To assist farmers with manure management and to augment the state's supply of renewable power, CEDF provided over **\$5 MILLION IN GRANTS AND LOANS TO SUPPORT FARM METHANE DIGESTERS** at 17 locations. This funding helped create 5.4 MW of capacity and earned Vermont recognition as a leader in small farm methane energy production.

The Fund provided \$2.275 million in 2009 for the **VERMONT SMALL-SCALE RENEWABLE ENERGY INCENTIVE PROGRAM**, which has supported the installation of over 1,200 wind, solar PV, and solar thermal projects since 2003 with a total installed cost of \$23 million. The state set lower incentives levels compared with some other states. At a level of \$1.75 per Watt DC, the solar electric incentive level for individuals and businesses has proven sufficient to drive installation of nearly 2 MW of new and proposed solar PV installations.

The CEDF is designing a **PERFORMANCE-BASED WIND INCENTIVE** for wind turbines under 150 kW in order to maximize the wind power (kWh) generated per incentive dollar.

Within Vermont's 252 municipal jurisdictions, 92 Vermont community-based energy committees are exploring energy efficiency and renewable energy activities. CEDF received over 324 applications requesting a total of \$13 million in grant funds from municipalities and schools in response to a recent **ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANT (EECBG)** solicitation under the American Recovery and Reinvestment Act of 2009.

Wisconsin's Focus on Energy Program

Central Waters Brewing Company is the first brewery in Wisconsin to heat its in-house water using solar energy, thanks to a 960-square-foot hot-water system. With energy production estimated at 2,500 therms per year, the system is expected to meet more than 18 percent of the brewery's annual hot-water needs.



The Focus on Energy program (Focus) is a ratepayer-funded energy efficiency and renewable energy program that has been operating in Wisconsin since 2001. Focus serves customers of participating electric and natural gas utilities, including all investor-owned utilities, about 90% of municipal electric utilities, and a majority of the rural electric cooperatives. Focus funding is currently set at 1.2% of utility natural gas and electric revenues. Overseen by the Public Service Commission of Wisconsin, the program is administered by Wisconsin Energy Conservation Corporation (WECC) under contract to a consortium of the state's investor-owned utilities. Focus funding for 2009 was just under \$92 million; of this amount, 62% was spent on energy efficiency projects with

“Working with CESA has allowed the Focus on Energy program to collaborate and compare our program offerings to other states across the county. Both of these activities help to improve our programs and services, and validate our key accomplishments – such as the 2009 CESA SLICE Award for our biogas activities—to Focus on Energy policy and decision makers.”

Kathy Kuntz, Director of Energy Programs

business customers, 29% on residential energy efficiency, and 9% on customer-sited renewable energy projects.

Focus' Business and Residential program portfolios address efficiency across



As part of their Renewable Energy Outdoor Learning Center, The Wausau School District successfully completed their installation of a 100 kW wind turbine at Wausau East High School. Planning and support were provided by Seventh Generation Energy Systems and Focus on Energy. Focus staff presented the incentive check for \$100,000 in person at a ceremony at the site of the system. The turbine is expected to produce over 116,000 kWh per year.

all customer segments and technologies. Through 2009, the Renewable Energy program provided a variety of services and incentives to the solar electric, solar water heating, distributed wind, biogas digester, and non-residential biomass combustion renewable energy markets in Wisconsin.



Kathy Kuntz
Director of Energy Programs

Wisconsin Focus on Energy
431 Charmany Dr.
Madison, WI 53719-1234

PHONE 608-249-9322 x278
EMAIL Kathyk@weccusa.org
WEB www.focusonenergy.com



HIGHLIGHTS



ST Paper of Oconto Falls received \$237,500 from Focus on Energy to help defray the \$5.4 million cost of the company's new biomass combustion renewable energy system. Their new wood-fired boiler will replace an estimated 4.83 million therms with the use of about 50,000 tons of local wood residues.

The company's biomass system is a 1,500-horsepower, wood-fired boiler and is an alternative to using natural gas to produce heat, producing 95% of the steam needed for the paper plant's process requirements. This project is the largest natural gas-saving project in the history of the Focus on Energy program. Public Service Commission Chairperson Eric Callisto and Renewable Energy staff met in Oconto Falls to present a symbolic check to ST Paper Management.



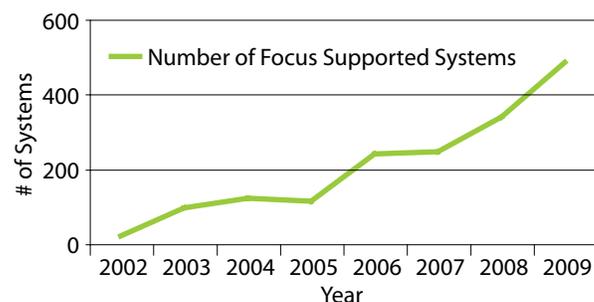
Gundersen Lutheran Health Systems and City Brewing Company, both based in La Crosse, partnered on an innovative cogeneration project fueled by biogas from the brewery's waste treatment process. Focus on Energy provided funding of \$237,500 for the \$2.3 million, 633 kW anaerobic digester system installed at City Brewery. The system, which started operating in October, is expected to generate three million kWh per year of electricity, equivalent to 8-10% of the power used on Gundersen Lutheran's La Crosse and Onlaska campuses. Heat generated from the engine is also captured and recycled back to City Brewery's wastewater treatment process to make it more efficient.

Gundersen Lutheran dedicated their City Brewery biogas system on October 7, 2009, in La Crosse. L&S Associates represented Focus at the ceremony. Other participants included the chief executive officer of Gundersen Lutheran, the mayor of La Crosse, and staff from the Office of Energy Independence (OEI).

In 2009, the program assisted **476 RENEWABLE ENERGY INSTALLATIONS**, including 267 solar electric systems, 164 solar water heating systems, 30 distributed wind systems, 8 dairy anaerobic digesters, and 7 biomass energy systems. In addition, 614 renewable energy projects were approved in 2009, an 83% increase from 2008.

Over the past eight-year time frame, renewable energy installations have increased significantly, with the **MAJOR INCREASES IN 2009**, as can be seen in the graph below.

Number of Focus on Energy Supported Renewable Energy Systems Installed each Year



The program has developed a strong **INFRASTRUCTURE OF RENEWABLE ENERGY MARKET PROVIDERS**. By the end of 2009, there were 57 solar electric installation companies, 88 companies offering solar water installation services, 21 distributed wind installers, 17 companies installing biomass combustion equipment, and 24 biogas development and installer companies. In addition, 100 Wisconsin renewable energy professionals were certified to do renewable energy site assessments. All told, about 275 renewable energy companies are now actively providing goods and services in Wisconsin and working with Focus on Energy. Thirty-one of the solar electric installers are Wisconsin-based and North American Board of Certified Energy Practitioners (NABCEP) certified, and the rest are working towards NABCEP approval (a Focus requirement). Wisconsin's 12 NABCEP-certified solar water heating installers represent the most of any state in the US.

Wisconsin continues to lead the nation in the number of **BIOGAS ANAEROBIC DIGESTERS** installed and operating, with a total of 31. These systems are now providing over 12 MW of electricity from 46,000 cows.

At the request of the Public Service Commission, the three Focus portfolios—Renewable Energy, Business Programs, and Residential Programs—launched an initiative in the last quarter of 2009 to integrate renewables into the two efficiency portfolios. The outcome of these efforts included strategies for **INTEGRATING RENEWABLES AND EFFICIENCY** into a one-stop approach for customers as well as some significant program design changes, such as tiered renewable energy incentives that encourage customers to do efficiency first. Changes also streamline some processes, including site assessments.

Xcel Energy's Renewable Development Fund (Minnesota)



Merrick Inc., a nonprofit organization located in Vadnais Heights, Minnesota, utilized a \$735,000 RDF grant to install a 100 kW solar PV project at their 52,000-square-foot office building/training facility. This solar geothermal project, completed during the summer of 2008, is a model of how to use renewable energy for a geothermal heating and cooling system to provide 100 percent of the heating and cooling needs of a facility. The solar array will reduce Merrick's use of non-renewable energy by at least 33 percent.

The Xcel Energy's Renewable Development Fund (RDF) was created by Minnesota legislation and is financed by Xcel Energy ratepayers in Minnesota and Wisconsin to promote the start-up, expansion and attraction of renewable energy projects and companies in its service area. The RDF also stimulates research and development into renewable energy technologies. Both efforts are designed to increase the market penetration of renewable energy resources at reasonable costs.

The RDF program has provided about \$149 million in grants and production incentives since 2001 for renewable energy production projects, renewable energy research and development projects, and renewable energy production incentive payments (up to 1.5 cents per kWh for small-scale wind, biogas and hydro projects). In addition, RDF dollars

"We greatly appreciate the timely information from CESA regarding federal energy legislation and U.S. Department of Energy programs. Also, the monthly conference calls are a great way to hear from national experts without having to incur the cost of travel."

Tim Edman, Manager

RDF Mission: To increase renewable energy market penetration, assist renewable energy projects and companies, and support emerging renewable energy technology through research and development.

are used for special Minnesota legislative initiatives that include renewable

energy education efforts, solar rebates, and Next Generation renewable energy technology development.

Knowledge Base

RDF projects have provided a public venue to discuss cutting-edge research and the demonstration of new technologies. Scientific publications and pilot projects have expanded the theoretical knowledge base of renewable energy technologies within the scientific community and improved the practical knowledge base of renewable energy technologies within the commercial community.

Environmental Benefits

One of the RDF's important environmental contributions is the avoidance of both air pollutant and greenhouse gas emissions when compared with alternative methods of generation.



Timothy Edman,
Manager

Xcel Energy
414 Nicollet Mall
Minneapolis, MN 55401

PHONE 612-330-2952
EMAIL timothy.j.edman@xcelenergy.com
WEB www.xcelenergy.com/rdf



2009 EMISSION REDUCTIONS

Emission	Total (pounds)
CO ₂	223,125
SO ₂	1,403
NO _x	796
VOCs	5.34
Hg	1.14
Pb	1.28

At the end of 2009, RDF energy production projects have resulted in several emission reductions, as shown on the chart at left.

Economic Benefits

RDF grants for renewable energy research and energy production initiatives generate significant economic

benefits. RDF expenditures promote and expand economic activity on both a local and a regional scale through the purchase of goods and services, expansion of employment opportunities, and, in some cases, the fostering of new or expanded business opportunities. In some cases, RDF investment can also expand the property tax base for a community because of added value to real estate.

RDF funds effectively leverage other funds to expand and/or enhance project activity. Since the RDF program’s inception, RDF grant awards have stimulated the investment of more than \$131 million in construction activity, goods, and services as a result of the start-up, expansion, and attraction of renewable energy projects and companies in Minnesota.

Job creation is another economic benefit supported through the RDF. Money invested into an area’s economy for the material delivery of goods and services results in the need to hire additional or retain existing employees. Job calculators estimate that the RDF has created or helped retain nearly 400 to 450 jobs during the past biennium.

Award Winning Projects

The National Renewable Energy Laboratory (NREL) and the University of Minnesota are developing an atmospheric and direct-write ink-based approach to thin-film solar cells. This project should lead to a novel, low-cost, scalable production technique for thin-film solar cells. The project received national recognition and was a recipient of the 2008 *R&D Magazine* 100 Award for one of the most technologically significant new products of the year.

With RDF support, Best Power installed a commercial-scale 400 kW PV electrical generation facility at Saint John’s University. Its tracking panels increased power generation by about 15% and can withstand up to 90 mph winds. It was awarded the *Commercial Renewable Energy Project of the Year* by the Minnesota Renewable Energy Society in February 2010.

Since its inception, the RDF program has awarded more than **\$67 MILLION TO ABOUT 70 RENEWABLE ENERGY PRODUCTION AND RESEARCH PROJECTS** via three funding cycles, including \$29.5 million for renewable energy production projects, \$38.3 million for renewable energy research and development projects, \$50.6 million for renewable energy production incentive payments, and \$30.1 million for special renewable energy legislative initiatives.

One of the RDF’s important environmental contributions is the avoidance of both air pollutant and greenhouse gas emissions when compared with alternative methods of generating electricity. Since the inception of the RDF and through the end of 2009, energy production projects have generated a total of **104,754 MWh OF ELECTRICITY** produced from a renewable energy resource.

The RDF investment in research continues to show dividends as demonstrated by publishing **23 JOURNAL ARTICLES AND 45 PRESENTATIONS** of scientific papers in conjunction with RDF research projects.

RDF funds effectively leverage other funds to expand and/or enhance project activity. Since the RDF program inception in 2002, RDF grant awards have stimulated the investment of over \$131 million in construction activity, goods, and services as a result of the start-up, expansion, and attraction of renewable energy projects and companies in Minnesota. Energy production projects **LEVERAGE \$3.37 FOR EVERY RDF DOLLAR** obligated. An additional \$12 million has been leveraged for research and development in Minnesota.

Job creation is another economic benefit supported through the RDF program. Money invested into an area’s economy for the material delivery of goods and services results in the need to hire additional or retain existing employees. Based on well-established job calculators, **THE RDF PROGRAM HAS CREATED OR HELPED RETAIN NEARLY 400 TO 450 JOBS DURING THE LAST TWO-YEAR REPORTING PERIOD.**



400 kW solar farm—Saint John’s University, Collegeville, Minnesota

CESA Additional Members

In addition to the clean energy funds featured in this report, three other funds: District Department of the Environment, Energy Administration; New Hampshire PUC—Sustainable Energy Division; and Sacramento Municipal Utility District, were either becoming members or unrepresented by a full briefing report at the time of publication. Brief descriptions of these important programs are presented below.

District Department of the Environment, Energy Administration

1200 First St., NE, 5th Floor
Washington, DC 20002
PHONE 202-535-2600
WEB <http://ddoe.dc.gov>, <http://green.dc.gov>

The District Department of the Environment (DDOE) helps residents, businesses, and visitors save money on their energy bills and reduce their impact on the environment as a result. DDOE's Energy Administration supports all residential, commercial, governmental, institutional, and transportation energy users and provides financial assistance to low-income customers. The DDOE Energy Administration also teaches residents, students, and businesses how to make energy-efficient decisions.

Green Energy DC, a service of DDOE, was authorized by the Clean and Affordable Energy Act of 2008 (CAEA). The Act requires the Mayor, through DDOE, to contract with a private entity to conduct sustainable energy programs on behalf of the District of Columbia. The CAEA authorizes the creation of a Sustainable Energy Utility (SEU) and designates the SEU to be the one-stop resource for energy efficiency and renewable energy services for DC residents and businesses. The SEU will serve under a performance-based contract with DDOE, with input and recommendations from the SEU Advisory Board, and oversight from the Council of the District of Columbia. The CAEA also established the Renewable Energy Incentive program, which provides rebates for the installation of new renewable energy generating systems in DC to increase the use and awareness of renewable energy generation technologies by residents, businesses, and institutions.

New Hampshire PUC—Sustainable Energy Division

21 South Fruit Street, Suite 10
Concord, N.H. 03301-2429
PHONE 603-271-2431
EMAIL puc@puc.nh.gov
WEB www.puc.nh.gov

The Sustainable Energy Division was created in 2008 to assist the New Hampshire Public Utilities Commission in implementing specific state legislative initiatives focused on promoting renewable energy and energy efficiency and to advance the goals of energy sustainability, affordability, and security.

These activities include the Renewable Energy Fund and the Greenhouse Gas Emissions Reduction Fund, which support energy efficiency and renewable energy projects and initiatives in New Hampshire.

The Renewable Energy Fund (REF) receives funding under the New Hampshire's RPS program, from alternative compliance payments made by utilities and competitive energy suppliers. Funding of \$4.5 million was received for the first year of the REF, along with supplemental American Recovery and Reinvestment Act (ARRA) funding from the Office of Energy and Planning. These funds are used to award rebates for small wind, solar electric, solar hot water, and wood pellet heating systems. The Sustainable Energy Division is also in the process of establishing a commercial and industrial renewable energy rebate program.

The Greenhouse Gas Emissions Reduction Fund (GHGERF) has received \$24 million to date from Regional Greenhouse Gas Initiative (RGGI) auctions and has awarded approximately \$20 million for programs that reduce greenhouse gas emissions through energy efficiency and conservation programs.

Sacramento Municipal Utility District

6201 S. Street
Sacramento, CA 95817
PHONE 888-742-7683
EMAIL customerservices@smud.org
WEB www.smud.org

The Sacramento Municipal Utility District (SMUD) is a publicly owned electric utility governed by a seven-member Board of Directors. Serving 592,000 customers and a total population of about 1.1 million, SMUD is the sixth-largest public utility in the country.

SMUD has been providing public power to the Sacramento region since 1946. The SMUD Board's vision is to empower its customers with solutions and options that increase energy efficiency, protect the environment, reduce global warming, and lower the cost to serve its region. SMUD's energy efficiency and renewable energy programs are recognized nationally for their leadership and innovation.

In 2008, SMUD added to its solar portfolio in launching SolarShares. By offering monthly, flat-fee subscriptions to portions of a 1-MW, locally sited solar "farm," customers no longer need to have a suitable site or own a home. Through the SolarShares program, 690 additional customers are participating in California's efforts to promote solar and one additional megawatt of solar power has been installed locally.

In January 2010, SMUD began implementation of one of the first utility Feed-in-Tariffs (FITs) in the country, and the only successful FIT that is based on the value of the electricity to the utility, rather than the underlying costs of the generating technologies. On the day that the FIT opened, SMUD received enough applications (all solar PV) to fill up the entire 100 MW of available capacity.

Clean Energy States Alliance

Summaries of Major Joint Projects

CESA JOINT PROJECTS

CESA's joint projects are designed to address cross-cutting clean energy program challenges and opportunities facing its state members, including:

- Mainstreaming solar and wind technologies, policies, and financing;
- Making RPS laws work;
- Advancing offshore, marine energy, and fuel cell technologies and regulatory frameworks;
- Making renewable energy a strategy for state economic development and job creation;
- Advancing cutting-edge financing tools and strategies to allow states to maximize the leveraging power and longevity of their clean energy funds.



The driving force behind CESA's efforts is collaboration—that common issues facing clean energy market development often can be addressed most effectively through collective state action and pooling of joint state resources, with unique, creative solutions resulting from this collaborative approach.

Moreover, the CESA value proposition to its members is delivery of quality information and assistance at lower cost that if pursued on an individual basis by a single state fund. CESA joint projects allow for consensus-building and standardization among and across the states to strengthen collective efforts to support clean energy. Several of CESA's major joint projects are described briefly below. For more information about CESA's joint projects and current Annual Work Plan, please visit our website at www.cleanenergystates.org.

Solar Project

PROJECT DIRECTORS

Mark Sinclair, Anne Margolis

The goal of the Solar PV project is to strengthen the ability of the states to further develop the market for solar photovoltaic (PV) and solar thermal systems.

CESA members are committed to expanding the use of solar technologies and driving down solar costs. The challenge is to develop the most effective state programs to create strong markets for solar use for decades to come. To reach this goal, CESA staff continues to survey and identify solar program best practices from around the country, to develop collaborative initiatives between the states, DOE, and national solar industry members, and to provide information and analysis to CESA members on solar program design.

We are partnered with DOE's Solar Energy Technologies Program to lead a three-year, focused initiative between the DOE and states to advance solar technology deployment across the country. The objectives of the initiative are to (1) provide information and technical assistance to state leaders and state energy programs in the development of new and expanded solar programs, and (2) identify and foster adoption by states of solar program best practices. CESA tracks, evaluates, publicizes, and facilitates state adoption of effective financial, policy, and technology activities and best practices that accelerate solar technologies.

See: www.cleanenergystates.org/Joint-Projects/pvcommercial.html and www.statesadvancingsolar.org for more information on the CESA Solar Project.

Wind Siting & Acceptance Project

PROJECT DIRECTORS

**Mark Sinclair, Anne Margolis,
Charles Kubert**

This project seeks to address priority regulatory, finance, and technology challenges facing wind siting. The project's major activities include:

1. Pursuant to a DOE Wind Powering America grant to CESA, provide technical assistance to state agencies and officials across the nation regarding the merits, approaches, and policy tools available to accelerate wind project development.
2. Work in a partnership with the Department of Interior, the U.S. Offshore Wind Collaborative, the Minerals Management Service, and Atlantic coast states to implement a coordinated, efficient regulatory program to facilitate the siting and permitting of offshore wind power.
3. Work in a partnership with DOE and states to advance cost reductions in offshore wind technology.
4. Participate in a multi-stakeholder collaborative to advance wind development in the Great Lakes region.
5. Serve as a steering committee member of the National Wind Coordinating Collaborative.

As part of this effort, CESA is currently working in partnership with DOE's *Wind Powering America State Technical Outreach Initiative* to facilitate peer-to-peer communication and learning among states to identify and promote adoption of best siting practices, innovative state wind policies, and effective finance programs to reach the national 20% by 2030 Wind Vision.

The specific objectives of the Wind Project are to:

1. Provide information and technical assistance to state leaders and state energy programs in the development of effective wind siting policies and finance programs.
2. Identify and foster state practices and strategies to accelerate acceptance of wind.

CESA is also working in collaboration with (1) the Department of Interior (DOI) and states on an *Offshore Wind Development Initiative* to implement an effective, coordinated, and efficient state/federal regulatory framework for the use of the ocean for wind project development, and (2) with DOE and states to accelerate cost reductions for offshore wind technology.

DOI/States Regulatory Partnership

The Energy Policy Act of 2005 amended the Outer Continental Shelf Lands Act to authorize DOI to grant leases on the Outer Continental Shelf for development of alternate energy resources. This authority is exercised by Minerals Management Service (MMS), under the Department of Interior. MMS is beginning to implement the new program but is creating an onerous, lengthy regulatory review process for projects that will slow the development of an offshore wind industry in the U.S.

To address this siting challenge, CESA is working with the DOI Secretary and the Atlantic coast states to implement a collaborative to establish a predictable, timely regulatory review process that facilitates and simplifies permitting and leasing for offshore wind projects.

DOE/States Offshore Wind Technology Partnership

Offshore wind technology is considerably less mature than land-based wind energy and has significant potential for future cost reduction. These cost reductions are achievable through technology development and innovation, learning curve

reductions that take advantage of more efficient manufacturing and deployment processes and procedures, and advancing cost effectiveness gains in specific priority areas such as project layout, electrical connections, installation, and operation and maintenance.

To address this technology challenge, CESA is implementing a joint initiative with DOE and the Atlantic coast states to address offshore wind technology-related information, challenges, and opportunities between the states and DOE.

The project's main objective is to reduce the costs of offshore wind energy by at least 10% through a combination of cost reductions and performance improvements to increase the amount of electricity delivered. The project involves the planning and establishment of a coordinated set of research, development, and demonstration activities by the states and DOE, in consultation with industry and the UK Carbon Trust, to focus on priority areas selected jointly by the participants.

Finally, CESA is working with the Great Lakes Wind Collaborative in order to guide efforts to establish a stakeholder-based collaborative initiative to support responsible development of wind energy projects in the Great Lakes region. This multi-sector partnership among stakeholders, states, and Canadian representatives is working to identify and address the technical, environmental, regulatory, informational, and educational issues necessary to support successful deployment of wind-energy systems in the Great Lakes region. CESA is working with DOE, the Great Lakes Commission, the wind industry, and officials from several states to support this effort.

See www.cleanenergystates.org/joint-projects.html#Wind for more information in the CESA Wind Siting & Acceptance Project.

RPS Implementation Project

PROJECT DIRECTORS

Charles Kubert, Mark Sinclair

A renewable portfolio standard (RPS) is an important tool that 29 states have established to encourage clean energy investment in the U.S. CESA members have an important stake in the success of these new laws as the state clean energy fund programs are sometimes the implementation agencies for RPS mandates.

In other cases, the funds play a critical role in addressing the implementation challenges involved with RPS requirements and filling key market gaps.

The objective of the State-Federal RPS Collaborative is to advance dialogue and cooperation among a broad network of state government officials and NGO experts. The Collaborative provides a forum for the exchange of experiences and lessons learned regarding the implementation of state RPS policies and the marketing of RECs or credits across the U.S. The Collaborative also provides an opportunity for participants to learn about and discuss other factors that impact the realization of RPS targets, e.g., transmission, greenhouse gas reduction initiatives, and the potential federal RPS. Finally, the Collaborative provides technical assistance to those states in the process of implementing an RPS as well as those that are considering passing RPS legislation.

Of critical importance in 2010 are the implications of a federal RPS on state RPS policies. The Collaborative will be used to inform states on the status of the legislation and to engage states in shaping the national legislation to best protect the existing state programs. If national legislation passes, the Collaborative will engage with DOE in program rulemaking to ensure an effective national program that complements state RPS efforts.

See www.cleanenergystates.org/JointProjects/RPS.html and www.cleanenergystates.org/JointProjects/State-Federal-RPS.htm for more information on CESA's RPS Implementation Project.



Renewable Energy Finance Project

PROJECT DIRECTORS

Charles Kubert, Ken Locklin

This project is designed to help states improve their clean energy program effectiveness by providing access to advice and expertise from the private financial sector on how states can best leverage their public funding and develop new financing tools to attract and support greater private investment in clean energy projects. This is particularly important because of the private financial credit challenges facing projects and also because of the states have federal stimulus program funding for projects.

Through this project, CESA is providing technical assistance, webinars, and new finance toolkits designed to assist states to (1) build greater understanding of how the private financial sector views clean energy projects today, and (2) explore use of innovative, flexible financing tools that can leverage available state clean energy funds.

See www.cleanenergystates.org for more information on CESA's Renewable Energy Finance activities.

State Leadership in Clean Energy Awards Program

PROJECT DIRECTOR

Anne Margolis

In 2008, CESA established the *State Leadership in Clean Energy Awards* to recognize state programs that are most effectively accelerating adoption of clean energy technologies and advancing clean energy markets. State funds and agencies from across the country nominated programs for *State Leadership in Clean Energy Awards*. A team of judges then selected five programs from among all the award nominations. The winning entries exemplify the groundbreaking work being done by the states. The awards were given out at the National Press Club in January 2009. Based on the success of the award program, CESA will conduct the nominations and awards process on an annual basis and feature the winning state programs at its CESA members' meetings.

Information about the 2009 SLICE Award Programs can be found on the CESA website at www.cleanenergystates.org/slice_awards.html.

DOE Hydrogen Education Project

PROJECT DIRECTORS

Jessica Morey and Charles Kubert

With the U.S. DOE EERE Hydrogen, Fuel Cells and Infrastructure Technologies (HFCIT) Program, CESA staff is working to track, identify, evaluate, communicate, and facilitate state adoption of effective financial, policy, and technology activities and best practices that accelerate fuel cell and hydrogen technologies.

CESA has been granted a three-year award by DOE to pursue this project that will emphasize efforts to develop and deploy stationary and portable fuel cell technologies without directly advancing transportation technologies (with the understanding that advancing stationary and portable fuel cell applications could facilitate the development and deployment of transportation fuel cells).

For more information, see www.cleanenergystates.org/JointProjects/hydrogen.html.

Recommendations/Report on Climate Change Policy and the Role of States

PROJECT DIRECTORS

Lewis Milford, Jessica Morey

A major CESA objective is to guide new federal and state climate policy initiatives to accelerate the commercialization and deployment of clean energy and low-carbon technologies. Climate change policy has the potential to provide a dramatic increase in funding for renewable energy. Whether through cap-and-trade auction proceeds, allowance set-asides, or carbon tax revenue, significant new funding will be available to fund advanced clean energy technologies. As states, regions, Congress, and the Administration explore and pursue new climate stabilization strategies, there is a significant opportunity to advance a more decentralized, state-primacy strategy towards low-carbon technology. With DOE funding, this new CESA project is examining and evaluating the best practices at the state and federal levels for transforming clean energy markets (including evaluation of the effectiveness of various financing mechanisms, institutional management structures, new funding sources, and possibilities for providing states with resources and collaboration opportunities) to drive large-scale deployment of renewable and energy efficiency resources, in the context of new federal climate policies.

See www.cleanenergystates.org/Joint-Projects/climatechange.html for more information on CESA's Climate Change Policy activities.

CESA National Clean Energy Database

PROJECT DIRECTOR

Mark Sinclair

CESA will continue to collect data and maintain a national renewable energy program database to summarize state support for the deployment of clean energy projects—utility-scale and distributed projects. The purposes of the Database project are to:

- Maintain a national clean energy program database to summarize and evaluate state support for the deployment of clean energy projects—both utility-scale and smaller, distributed generation projects. This database is designed to track important market measures such as installed cost of projects, system size, manufacturer share, etc.
- Maintain a template and compilation of key data and metrics on all state clean energy programs (incentive levels, funding levels, number of projects supported, total capacity and energy production annually and cumulatively, etc.).
- Maintain a common database and reporting system that all state clean energy programs can use to simplify the administration and public reporting of their program impacts and that provides a foundation for continued reporting by the states.

See www.cleanenergystates.org/Publications/cesa-database_summary_v8.pdf for the latest CESA National Clean Energy Database report.

DOE Marine Energy Technology Advancement Partnership Project

PROJECT DIRECTORS

Mark Sinclair, Jessica Morey

CESA, NASEO, and ASERTTI are working to implement a technology advancement partnership with DOE to design and facilitate a new process to expedite clean energy technology research, development and commercialization. The candidate technology area selected to prove the concept is marine energy technology. The objective of the initiative is to design and demonstrate a new strategic partnership among states and EERE technology programs to expedite the deployment of new clean energy technologies.

See www.cleanenergystates.org/Joint-Projects/marine_energy.htm for more information on this initiative.

CESA PROJECTS IN DEVELOPMENT States Energy Storage Deployment Partnership with DOE

PROJECT DIRECTOR

Anne Margolis

CESA is working to initiate a technology advancement partnership with DOE to design and implement a new process to expedite energy storage technology. The objective of the initiative is to design and demonstrate a strategic partnership among states and DOE programs to facilitate the deployment of energy storage technologies and applications.

CEG-LEVERAGED PROJECTS

Global Alliance of Public Clean Energy Funds—UNEP SEF Alliance¹

PROJECT DIRECTOR

Jessica Morey

Since 2005, Clean Energy Group has been working with the UNEP Sustainable Energy Finance Initiative (SEFI), the United Nations Environment Programme (UNEP), and the Basel Agency for Sustainable Energy (BASE) to identify new forms of public finance at the local, state, and national levels, primarily in the U.S. and Europe.

Modeled after CESA, the Sustainable Energy Finance (SEF) Alliance is working to develop a forum to foster collaboration and information exchange among public sustainable energy finance practitioners to improve public support for clean energy and catalyze private investment in the sector. The forum seeks a global geographic reach, initiated through a core set of participating institutions of which members of CESA are involved. The development of an international alliance of public clean energy funders could assist nations in optimizing their individual clean energy support strategies and increase deployment and implementation of clean energy technologies and help emerging markets strengthen their public finance approaches in the energy sector.

¹ This project is supported by Clean Energy Group and its funding partners. No CESA funds have been used to develop or support this initiative.

Clean Energy States Alliance

State Leadership in Clean Energy (SLICE) Awards 2009

Clean Energy States Alliance (CESA) established the *State Leadership in Clean Energy* (SLICE) Awards to recognize state programs that are most effectively accelerating adoption of clean energy technologies and advancing clean energy markets. Awards were given out to the following five exemplary programs at the National Press Club on January 13, 2009.

The Connecticut Clean Energy Fund's **Connecticut Clean Energy Communities Program** uses creative marketing, multi-sector collaboration, and grassroots action to build a large voluntary market for clean energy in Connecticut. The program rewards communities with solar photovoltaic systems when (1) a town commits to obtain 20% of its electricity from clean energy sources by 2010, (2) its citizens sign up for clean energy through the CTCleanEnergyOptions program, and (3) a town purchases clean energy. At the time 2009 SLICE Awards were made, 87 towns had committed to obtain 20% clean electricity by 2010 and more than 18,000 electricity customers had voluntarily chosen to pay a premium on their electric bills for clean electricity.

In Massachusetts, **Solar Energy for Green Affordable Housing** is a program that brings the environmental and economic benefits of renewable energy to low- and moderate-income residents. The Massachusetts Renewable Energy Trust (now Massachusetts Clean Energy Center) worked with and funded the leading affordable housing developers and financiers to help them pioneer third-party ownership of solar energy systems. The program is attracting significant interest from other affordable housing developers, owners, and public agencies in the state.

New Jersey's **Solar Renewable Energy Certificate (SREC) Program** is an innovative way to help the state meet its significant long-term commitment to solar energy. The NJ Board of Public Utilities (BPU) first instituted SRECs in 2004. Three years later, the BPU established an SREC-Only Pilot Program as an efficient, market-based financing approach to provide solar developers and building owners with financial incentives to install solar electricity systems. At the time SLICE Awards were made, 39 megawatts of solar capacity were in the pipeline, making New Jersey a national leader in solar electricity. The New Jersey Board of Public Utilities, through its Office of Clean Energy, created and administers the program.

The California Energy Commission initiated and funded the **Western Renewable Energy Generation Information System (WREGIS)** as essential infrastructure for a working market for renewably generated electricity. It tracks renewable energy credits from participating facilities over a large region that



The 2009 State Leadership in Clean Energy Award winners at the awards ceremony in Washington, DC (left to right): Phil Giudice, MA Dept. of Energy Resources; Don Wichert, WI Focus on Energy; Heather Raitt, CA Energy Commission; Lise Dondy, CT Clean Energy Fund; Michael Winka, NJ BPU Office of Clean Energy.

includes all or part of 14 states and three Canadian and Mexican provinces. It is the only system that spans the territories of multiple authorities that manage the transmission system and the electricity market. WREGIS was created through a partnership among the California Energy Commission, the Western Governors' Association, the Western Regional Air Partnership, and WECC.

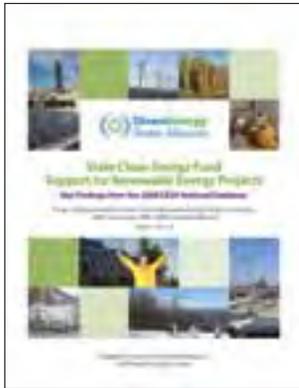
Because of the **Wisconsin Biogas Digestion Program**, implemented by Focus on Energy, Wisconsin leads the nation in the number of farm-based anaerobic biogas digesters producing electricity, heat, and pipeline-quality gas. Biogas digester systems enable farmers to produce distributed energy for a reasonable return on investment while controlling dairy manure odors, pathogens, and flies. The Wisconsin program provides information, education, technical assistance, and financing to promote digester installations. Focus on Energy encouraged biogas information exchange among the various stakeholders and developed a carefully crafted measurement and verification program. Technologies developed in Wisconsin have been used in Indiana and Vermont.

For two-page summaries on these exemplary programs, see www.cleanenergystates.org/slice_awards.html.

Clean Energy States Alliance

Major Reports 2007–2010

CESA works with states and partner organizations, including Lawrence Berkeley National Laboratory (LBNL), to provide its members with direct access to high-caliber analytical information and technical assistance related to clean energy issues. The following reports were prepared for or by CESA in the past four years. These reports can be downloaded at the CESA website at www.cleanenergystates.org/case.html.

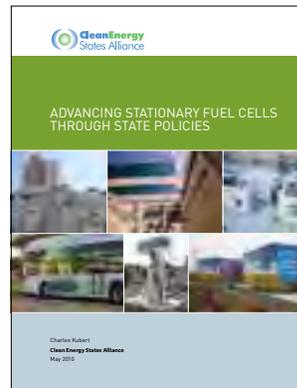


2010 State Clean Energy Fund Support for Renewable Energy Projects: 1998–2008, by CESA and Peregrine Energy Group, describes how state clean energy funds have emerged as a major driver of renewable energy projects across the U.S. in the past decade, funding 52,000 projects with \$1.9 billion and leveraging

\$10.1 billion in additional project investment, while adding 2.5 new, clean gigawatts (GW) to the grid. June 2010.

State-Based Financing Tools to Support Distributed and Community Wind Projects, by Charles Kubert and Mark Sinclair. This state wind energy program guide was created to help state clean energy fund managers and policy-makers examine the various ways states can provide financial support for distributed wind projects. The options available to states range from rebates and loans to bridge financing and renewable portfolio standards, and should be evaluated in light of the availability of tax and other incentives available at the federal level. The report also looks at third-party financing, which is increasingly being used by private and public entities alike to develop projects in tight financial times. May 2010.

Supporting On-Site Distributed Wind Generation Projects, by Charles Kubert and Mark Sinclair. CESA has prepared this state wind energy program guide for state clean energy fund managers and policymakers who support the installation of on-site, behind-the-meter wind turbines at private businesses and municipal and other public facilities. The program guide lays out the many policy actions that states can take to encourage the development of these projects. Among these are: project feasibility assessment support, grant and other incentive programs, interconnection and net metering policies, and model zoning ordinances. The guide also provides case studies of the leading state clean energy funds providing support to this market. May 2010.



Fuel Cell Technology: A Clean, Reliable Source of Stationary Power

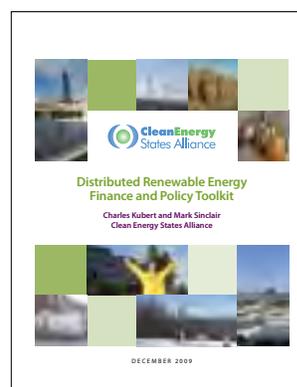
Stationary Fuel Cells and Critical Power Applications

Advancing Stationary Fuel Cells through State Policies

CESA has developed the above report series to provide state policymakers, clean energy fund managers, and other

interested persons with basic information on 1) fuel cell technologies, economics, and applications; 2) the value of fuel cells as a reliable power source for critical facilities; and 3) state policies to advance the fuel cell industry and installations. May 2010.

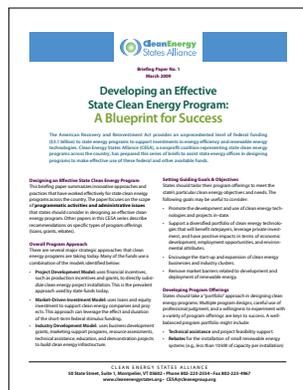
CESA State Clean Energy Program Guide: A Review of Emerging State Finance Tools to Advance Solar Generation, by Charles Kubert and Mark Sinclair. This report provides an overview and specific examples of three creative finance tools that any state can use to support PV in the context of an existing RPS: solar set-asides, feed-in tariffs, and reverse auction mechanisms. The authors contend that providing special treatment to PV projects in the context of an RPS is important if states are to build and maintain public support for their RPS programs, particularly in cases where solar is the most widely accessible in-state renewable energy resource. March 2010.



2009 Distributed Renewable Energy Finance and Policy Toolkit, by Charles Kubert and Mark Sinclair. This report describes the many financing options available to state energy offices, municipal governments, and other energy agencies for utilizing public funds for clean energy project support.

December 2009.

Smart Solar Marketing Strategies: Clean Energy State Program Guide, by Lyn Rosoff, SmartPower and Mark Sinclair, Clean Energy Group. This report provides marketing best practices on how to address barriers to solar market growth. According to the report, by acting more like retailers selling a product, state solar programs have the potential to sharply increase PV purchases and installations. August 2009. See www.cleanenergy.org/Reports/CEG_Solar_Marketing_Report_August2009.pdf



CESA Best Practice Briefing Papers—March 2009: *Developing An Effective State Clean Energy Program*. This series summarizes innovative approaches and practices that have worked effectively for state clean energy programs across the country and focuses on programmatic activities and administrative issues.

- **Briefing Paper No. 1: A Blueprint for Success**
- **Briefing Paper No. 2: Renewable Energy Incentives**
- **Briefing Paper No. 3: Competitive Grants**
- **Briefing Paper No. 4: Clean Energy Loans**

“Tracking the Sun: The Installed Cost of Photovoltaics in the U.S. from 1998–2007,” by Ryan Wiser, Galen Barbose, and Carla Peterman. The research was supported by funding from the U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy (Solar Energy Technologies Program) and the Office of Electricity Delivery and Energy Reliability (Permitting, Siting and Analysis Division), and by Clean Energy States Alliance. February 2009.

CESA “State Leadership in Clean Energy” (SLICE) Awards 2009. On January 13, 2009, CESA presented awards to the five winners of the 2009 SLICE Awards at a ceremony at the National Press Club in Washington, DC. See the press release, fact sheet, and summary case studies of the five winning programs at http://www.cleanenergystates.org/slice_awards.html.

2008 CESA State RPS Policy Report: Increasing Coordination and Uniformity Among State Renewable Portfolio Standards, prepared by Edward A. Holt, Ed Holt and Associates for CESA and the Northeast/Mid-Atlantic RPS Implementation Collaborative. This analysis seeks to examine and evaluate mechanisms and approaches to increase harmonization and/or coordination among state RPS programs as well as the merits and challenges they present. December 2008.

Review of State Renewable Portfolio Standard Programs in the Northeast and Mid-Atlantic Regions, prepared for the CESA Northeast and Mid-Atlantic States Collaborative on RPS Implementation by Exeter Associates. This report serves to review the progress to date of the states in the region in meeting their RPS objectives, to identify early successes and challenges, and to offer recommendations for future success. December 2008.

Shaking Up the Residential PV Market: Implications of Recent Changes to the ITC by Berkeley Lab and CESA. This 12-page report examines the implications of changes to the residential solar ITC. November 2008.

Clean Energy State Program Guide—Mainstreaming Solar Electricity: Strategies for States to Build Local Markets, prepared by Mark Sinclair, Clean Energy Group, and Steve Weisman, Peregrine Energy Group. This report describes the key policies and program strategies that have emerged as effective tools for states to advance widespread solar deployment. The report’s recommendations are based on the input and lessons learned of the members of the Clean Energy States Alliance. April 2008.

Property Tax Assessments as a Finance Vehicle for Residential PV Installations: Opportunities and Potential Limitations by Mark Bolinger, Lawrence Berkeley Lab. This LBNL-CESA Case Study describes the mechanics of a new type of PV financing program developed by the City of Berkeley that offers its residents the ability to utilize increased property tax assessments as a means of repaying over time the up-front cost of installing PV systems. February 2008.

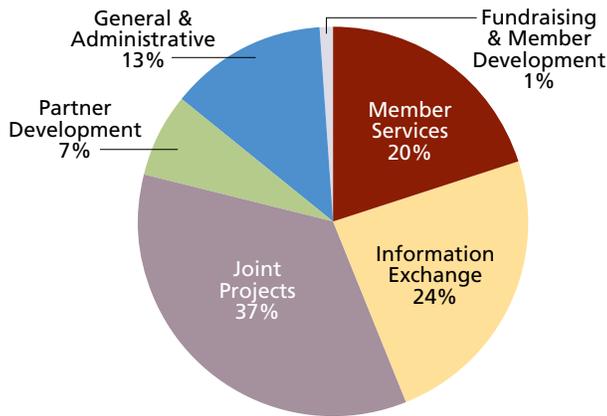
2007 State Strategies to Foster Solar Hot Water System Deployment, by Mark Sinclair. December 2007. This report describes a number of straightforward strategies that states can implement to support adoption of solar hot water technologies, including provision of financial incentives, training for installers, and education to help customers make informed decisions.

Using the Federal Production Tax Credit to Build a Durable Market for Wind Power in the United States, by Ryan Wiser, Mark Bolinger, and Galen Barbose. This article was published in *The Electricity Journal*, and was funded in part by the Clean Energy States Alliance. The purpose of this article is to review the developments from the PTC over time, assessing its impact on the wind power market, highlighting the potentially positive implications of a longer-term extension of the PTC, and discussing some possible changes to the design of the PTC that might help overcome some of its limitations as presently structured. November 2007.

Clean Energy States Alliance Financial Information

The following are selected financial highlights from the fiscal year ending June 30, 2009.

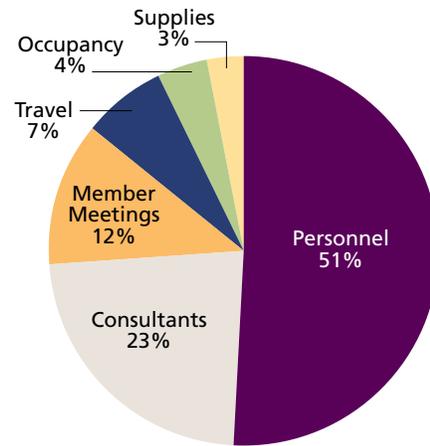
Program & General Expenses



CESA's operations can be characterized into four major program areas:

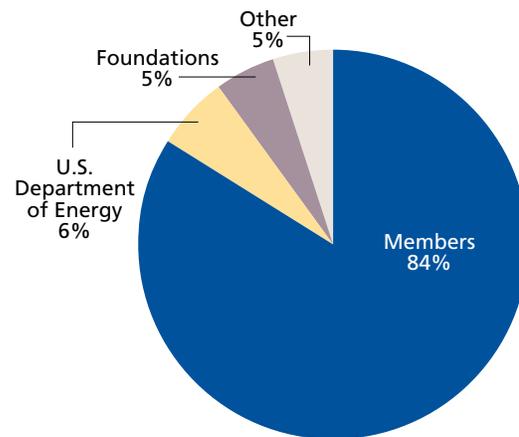
1. **Member Services**, which include both general member services that benefit all members and individual member services, when CESA staff respond to specific assistance requests from individual members.
2. **Information Exchange**, which includes providing members with current news and information about member funds as well as analysis and reports on clean energy program opportunities and initiatives.
3. **Joint Projects**, which include projects to find solutions and/or recommendations to key cross-cutting problems that most members face; and
4. **Partnership Development**, which includes activities and initiatives designed to encourage public/private partnerships to work on issues of mutual concern that will benefit all members.

Functional Expenses



Over 90% of CESA's FY09 expenses were direct expenses for staff (51%), consultants (23%), and meetings and travel (19%). Only 7% of expenses were for occupancy and supplies.

Funding Sources



During FY09, CESA continued to leverage member contributions with grants and contracts from foundations, nonprofit organizations, and the U.S. Department of Energy.

Clean Energy Group/Clean Energy States Alliance Staff



Maria Blais is the Program Coordinator for CESA and CEG. She is responsible for managing grants and contracts for CESA and CEG projects. She also coordinates grant reporting, publications, and special events. She previously worked at Conservation Law Foundation, where she served as the office manager for the Vermont office.

She graduated cum laude from the University of New Hampshire with a B.A. in Political Science. Maria@cleanegroup.org



Meghan Monahan LeBourveau is CEG's Executive Assistant and Office Manager. She also serves as a project assistant for CESA. Her duties include managing staff schedules, administrative support, research, and event planning. Meghan is a magna cum laude graduate of Champlain College, where she majored in Business

Administration. Meghan@cleanegroup.org



Kevin Cavanaugh serves as CFO for CEG and CESA, where his primary responsibilities include budgeting, financial accounting, external reporting/audit, and grant reporting. In addition, he works with staff in human resource management and benefits design/administration. He previously served as the chief operating officer

of The Reinvestment Fund, a nonprofit development finance corporation in Philadelphia. He holds a B.S. degree in accounting from the University of Delaware. Kevin@cleanegroup.org



Warren Leon provides consulting assistance to CESA and helped CESA organize last year's Governors' Clean Energy Innovation Forum in New Jersey. He is an Adjunct Professor at the Brandeis University International Business School. Warren was previously Director of the Massachusetts Renewable Energy Trust, Executive Director

of the Northeast Sustainable Energy Association, and Deputy Director for Programs at the Union of Concerned Scientists. He co-authored the influential book *The Consumer's Guide to Effective Environmental Choices*. He holds a Ph.D. from Harvard University. WLeon@cleanegroup.org



Charles Kubert, Project Director, joined CEG and CESA in November 2008. At CEG/CESA, he focuses on renewable energy project finance and manages the State-Federal RPS Collaborative. Prior to joining CEG/CESA, he worked for the Environmental Law and Policy Center, the Midwest's largest environmental and clean energy

advocacy organization. He has also spent 20 years in the private sector in management consulting and corporate financing planning. Charlie is based in Chicago. He has an M.B.A. in finance from The University of Chicago and a B.A. from Williams College. CKubert@cleanegroup.org



Kenneth R. Locklin, a senior investment executive with 30 years of finance experience, serves as the Director of Finance and Investment with CEG. Mr. Locklin previously served as the Senior Advisor to the Massachusetts Green Energy Fund, an innovative clean energy venture capital investment vehicle. He also

advises early stage clean energy technology companies on their development and planning. From 1997 to 2004, he was a Partner with EIF Group, the oldest and largest power investment management firm in the U.S. Mr. Locklin is a founding Co-Chair of the Finance Committee of the American Council on Renewable Energy (ACORE). Mr. Locklin is a graduate of Yale University. KLocklin@cleanegroup.org

Clean Energy Group/Clean Energy States Alliance Staff



Anne Margolis is Project Associate for CEG and CESA, where she focuses primarily on member services as well as outreach and communication efforts to members and external stakeholders. Prior to joining CESA, Anne was the Director of the Vermont Clean Energy Development Fund. She holds a B.A. degree in Environmental

Studies from Dartmouth College. Anne@cleanegroup.org



Lewis Milford is President of CEG and CESA. Prior to founding CEG, Lew was Vice President of Conservation Law Foundation, New England's leading environmental organization, where he directed the Energy Project. Previously, he practiced environmental law at a private firm and as the New York Assistant Attorney General. He

is co-author of *The Wages of War*, a social history chronicling America's treatment of its military veterans. He has a J.D. from Georgetown University Law Center and is a Phi Beta Kappa graduate of Rutgers College. LMilford@cleanegroup.org



Jessica Morey is Project Director for CEG and CESA and directs projects on technology innovation, both in the U.S. and internationally, as well as technology-specific projects for CESA on marine hydrokinetic energy. She is also leads CEG's work with the UNEP Sustainable Energy Finance Alliance, a coalition of international public

clean energy funds based on the CESA model. Prior to working with CEG, Jessica was a clean energy analyst at the World Bank and previously the International Fellow at the Pew Center for Global Climate Change. Jessica has M.A.s in International Affairs and Sustainable Development from American University and the UN University for Peace and a degree in engineering from Dartmouth College. Jessica@cleanegroup.org



Mark Sinclair is Executive Director of CESA and Vice President of CEG. Mark manages the strategic and day-to-day operations including oversight for all projects and staff. Prior to his work with CEG, he was senior attorney and Vice President with Conservation Law Foundation (CLF) for ten years. He also served as general counsel to

the VT environmental agency. He serves on the Board of the Vermont Clean Energy Development Fund, the U.S. Offshore Wind Collaborative, and the National Wind Coordinating Collaborative. He has written extensively on renewable energy policy, program, and finance topics. Mark earned his B.A. degree from Williams College and received his law degree from Cornell Law School. MSinclair@cleanegroup.org



Jenna Warren is CEG and CESA's Administrative Assistant. Her duties include managing staff schedules, data management, and administrative support. jenna@cleanegroup.org



Janine Loprete serves as the bookkeeper and human resources assistant for CEG and CESA.

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Clean Energy States Alliance
50 State Street, Suite 1
Montpelier, VT 05602

Phone: 802.223.2554
Fax: 802.223.4967
Email: cesa@cleanegroup.org

www.cleanenergystates.org

CONCEPT & DESIGN: NonprofitDesign.com
WRITING: Mark Sinclair
PRODUCTION & EDITING: Anne Margolis

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