



RENEWABLE ENERGY RESOURCES PROGRAM REPORT

January through December 2015

**Illinois Department of Commerce and Economic Opportunity
Illinois Energy & Recycling Office
Renewable Energy Resources Program
500 East Monroe
Springfield, Illinois 62701**



**Illinois
Department of Commerce
& Economic Opportunity**

Bruce Rauner, Governor

Executive Summary

Since its inception, the Renewable Energy Resources Program (RERP) has successfully facilitated over \$390 million of total investment in renewable energy projects in Illinois through \$65 million in RERP grant and rebate expenditures (see figure below). In 2015, about \$2 million in incentives was provided to support over \$8 million in renewable energy projects. This consisted of about \$1.2 million in solar and wind energy rebate incentives and about \$700,000 in grants for larger solar and wind energy projects (projects over \$100,000 in total cost).

Table 1: Projects Funded through the Renewable Energy Resources Program, 1999-2015

Fiscal Year	Incentives Awarded (\$)	Total Project Cost (\$)	Number of Grants Issued	Number of Rebates Issued
1999	\$40,265	\$90,381	2	3
2000	\$2,520,831	\$10,276,563	14	20
2001	\$2,462,423	\$5,666,165	23	35
2002	\$8,109,613	\$66,009,091	25	37
2003	\$6,394,456	\$69,126,237	32	52
2004	\$5,175,936	\$104,660,966	16	65
2005	\$1,366,560	\$3,063,006	5	68
2006	\$568,870	\$1,617,687	0	110
2007	\$3,500,021	\$11,045,159	35	165
2008	\$2,307,895	\$3,719,918	2	164
2009	\$4,876,068	\$35,035,919	24	184
2010	\$6,121,781	\$13,028,846	3	222
2011	\$2,220,457	\$5,469,831	3	109
2012	\$6,176,409	\$19,092,036	23	178
2013	\$5,866,395	\$13,677,182	13	184
2014	\$5,862,993	\$20,752,652	20	232
2015*	\$1,936,839	\$8,236,126	4	195
TOTAL	\$65,507,812	\$390,567,765	244	2023

* FY 2015 projects funded by 12/31/15

This investment has assisted in the development of over 25MW of solar photovoltaic and distributed wind development, over 180MW of wind farms (during early wind development in mid 2000s), as well as hundreds of solar thermal and biomass to electricity projects. In particular, for the last several years, RERP has largely supported distributed solar projects, leading to the addition of approximately 3-5 MW annually.

The Department of Commerce and Economic Opportunity (the Department) finds that the facilitation of renewable energy projects in Illinois brings economic development benefits to the state including new income streams, new jobs, new investments and new property tax sources.

The current annual value of the energy produced from the distributed renewable energy projects the Department has funded is estimated to be over \$4.7 million, and there is an additional \$28

million generated annually from the wind farms. Renewable energy projects also have significant employment impacts. For example, several of the early wind farms in Illinois received support through the RERP. Today, Illinois is 5th for wind energy development in the country, has supported 2,412 jobs for the construction of the wind farms, created 211 long-term jobs for the operations of the wind farm, and has supported thousands of indirect jobs as a result of the millions of dollars invested throughout the state. Furthermore, a recent survey by the Clean Energy Trust found that there are over 21,000 renewable energy sector jobs in Illinois, a 6.8% increase over 2014.

However, challenges with the State's Renewable Portfolio Standard (RPS) have led to a significant slowdown of wind energy development in Illinois. The current rules of the RPS have not allowed the Illinois Power Agency to procure renewable energy the last few years. Creating a stronger RPS was identified by clean energy businesses as the most important factor in the future growth of their businesses. Additionally, even though there is a solar carve-out as part of the RPS, little solar capacity has been procured by the IPA and growth in solar has remained slow. This did begin to change in 2015, when IPA began to implement a Solar Renewable Energy Credit (SREC) Procurement Program – \$15 million of SRECs were procured in 2015 (approximately 10-15 MW of solar capacity), and another \$15 million is slated to be procured in 2016. However, this is only a temporary measure, and to sustain a growing renewable energy industry in Illinois, it is vitally important that legislation to both fix and expand the RPS.

This report contains four parts:

- Part I: Authorization and Funding Sources
- Part II: Report on the Renewable Energy Resource Base in Illinois
- Part III: Report on Program Implementation
- Part IV: Report on Legislative Recommendations

Part I:

Authorization and Funding Sources

Authorization

The Renewable Energy, Energy Efficiency, and Coal Resources Development Law (20 ILCS 687, “the Law”) of 1997 directs the Department of Commerce and Economic Opportunity (the Department) to administer the Renewable Energy Resources Program (RERP) and to provide grants, loans and other incentives to foster investment in, and the development and use of, renewable energy resources. The Law directs the Department to establish eligibility criteria for the incentives and to review them annually and adjust them as necessary. The provisions of this law are to be repealed ten years after the effective date unless renewed by act of the General Assembly. The current sunset date is December 12, 2020.

The Law defines “renewable energy resources” to include energy from wind, solar thermal energy, photovoltaic cells and panels, dedicated crops grown for energy production and organic waste biomass, hydropower that does not involve new construction or significant expansion of hydropower dams and other such alternative sources of environmentally preferable energy. "Renewable energy resources" does not include, however, energy from the incineration, burning or heating of waste wood, tires, garbage, general household, institutional and commercial waste, industrial lunchroom or office waste, landscape waste, or construction or demolition debris.

Contributions to the Renewable Energy Resources Trust Fund

Funding for the Renewable Energy, Energy Efficiency, and Coal Resources Development Law is required by the Renewable Energy Resources and Coal Technology Development Assistance Charge as follows:

- 1) \$0.05 per month per residential electric service;
- 2) \$0.05 per month per residential gas service;
- 3) \$0.50 per month per nonresidential electric service taking less than 10MW of peak demand during the previous calendar year;
- 4) \$0.50 per month per nonresidential gas service taking less than four million therms of gas during the previous calendar year;
- 5) \$37.50 per month per nonresidential electric service taking 10MW or greater of peak demand during the previous calendar year;
- 6) \$37.50 per month per nonresidential gas service taking four million or more therms of gas during the previous calendar year.

Fifty percent of the moneys collected are deposited into the Renewable Energy Resources Trust Fund. The remaining fifty percent is deposited in the Coal Technology Development Assistance Fund for use under the Illinois Coal Technology Development Assistance Act. The Renewable Energy Resources Trust Fund receives approximately \$5to \$6.5 million per year to fund eligible projects.

Part II: Report on the Renewable Energy Resource Base in Illinois

The renewable energy resources in Illinois that have significant growth potential include biogas and biomass, solar and wind. The following sections discuss each of these renewable energy resources.

Wind Energy

Wind is a clean, inexhaustible energy resource and is one of the fastest-growing forms of electricity generation in the United States. The potential for wind energy development in Illinois is significant. According to the DOE Wind Vision report, Illinois could develop 30GW of wind energy by 2030. The American Wind Energy Association (AWEA) ranks Illinois 14th in the nation in potential wind resources. Modern wind generation investments, at current prices, can be competitive with more traditional sources of new electric generation and therefore a valuable hedge against higher electric costs that may result from over reliance on traditional energy resources. The federal production tax credit (or PTC, currently valued at 2.2 cents per kWh) was renewed late in the year through 2019; however, prior to the extension of the PTC, wind farm development had slowed down nationally.

Illinois is a leader in the wind industry. Over 3,842MW of wind energy capacity have been installed, ranking Illinois 5th in the country in wind power capacity. There are currently 250MW of wind farm projects under construction and about another 3,000MW of projects have been permitted (AWEA, <http://awea.files.cms-plus.com/FileDownloads/pdfs/Illinois.pdf> and Illinois Wind Working Group (<http://renewableenergy.illinoisstate.edu/downloads/databases/071714%20Permitted%20Wind%20Farms%20in%20IL.pdf>).

However, the issues with the Renewable Portfolio Standard (RPS) have led to a significant slowdown of wind energy development in Illinois. The current rules of the RPS have not allowed the Illinois Power Agency to procure renewable energy the last few years. Creating a stronger RPS was identified by clean energy businesses as the most important factor in the future growth of their businesses.

Wind energy has a significant economic impact on the state. According to the most recent study conducted by the Center for Renewable Energy at Illinois State University (<http://renewableenergy.illinoisstate.edu/wind/pubs.shtml>), the wind industry has supported 2,412 jobs for the construction of the wind farms and 211 long-term jobs for the operations of the wind farms. The wind farm developments also provide indirect and induced economic impacts to the communities they are built in, supporting about 19,047 jobs during the construction phases and 814 long-term jobs. Furthermore, these wind farms have provided \$13 million per year in lease payments to landowners, and provide over \$28.5 annually in property taxes to local governments.

Illinois is also a leader in wind turbine manufacturing with major wind industry manufacturers such as Trinity Structural Towers and gearbox manufacturer Winergy. Over 30 other companies in Illinois are involved in some component of the wind energy supply chain, and there are also eight wind project developers with North American headquarters in Chicago. According to AWEA, there are 39 wind-related manufacturing facilities in Illinois with over 1,000 employees.

Table 3: Wind Farms in Illinois, Source: Illinois Wind Working Group

Wind Projects	Location (County)	Capacity (MW)	Year Online
Mendota Hills	Lee County	52	2003
Crescent Ridge	Bureau County	54	2005
Twin Groves Wind Farm I	McLean County	198	2007
GSG 1 Wind Farm	Lee (19 turbines) and LaSalle (21) Counties	80	2007
Camp Grove Wind Farm	Marshall (60) and Stark (40) Counties	150	2007
Twin Groves Wind Farm II	McLean County	198	2007-2008
Grand Ridge Energy Center Phase I	LaSalle County	99	2008
Providence Heights	Bureau County	72	2008
EcoGrove Wind Farm Phase I	Stephenson County	101	2009
Rail Splitter Wind Farm	Logan (29) and Tazewell (38) Counties	101	2009
Top Crop Wind Farm Phase I	LaSalle County	102	2009
Grand Ridge Energy Center Phases II, III, and IV	LaSalle County	111	2009
Lee-DeKalb Wind Energy Center	DeKalb (126) and Lee (19) Counties	218	2009
Steaator Cayuga Ridge South Wind Farm	Livingston County	300	2010
Top Crop Wind Farm Phase II (Blackstone Wind Farm II)	Grundy County	198	2010
Big Sky Wind Farm	Bureau (56) and Lee (58) Counties	239	2011
White Oak Energy Center	McLean County	150	2011
Shady Oaks Wind Farm	Lee County	110	2011
Bishop Hill I Wind Farm	Henry County	211	2012
Bishop Hill II Wind Farm	Henry County	81	2012
Settlers Trail	Iroquois County	150	2012
Pioneer Trail	Iroquois County (17) and Ford County (77)	150	2012
California Ridge Wind Farm	Vermillion (104) and Champaign (30) Counties	217	2012
Hoopston Wind	Vermillion County	98	2015
Pilot Hill	Iroquios and Kankakee Counties	175.1	2015

There is also interest in small-scale and community-scale wind turbines in Illinois. DCEO has provided rebates for small wind energy systems under 100kW, and has done several grant for projects ranging from 100kW to 1.5MW.

Solar Energy

Solar technologies use energy from the sun to provide heat, light, hot water, electricity and even cooling for homes, businesses, and industry. Illinois has a significant solar energy resource and installations of thermal and photovoltaic (electric) systems are vastly increasing, but the ability to truly capitalize on the potential development of this industry is stymied by state policy uncertainty.

With the new requirements for solar under the renewable portfolio standard (enacted in 2010), Illinois started to see the development of solar farms. Two solar farms received long-term contracts through the Illinois Power Agency in 2011, in order to help meet the requirements of the Renewable Portfolio Standard. This included Invenergy's development of a 20MW solar farm in LaSalle County, as well as Rockford Solar Partners' completion of a 3MW solar farm at the end of 2012. There has also been significant development of large distributed solar energy

projects to meet the needs of large energy users such as retailers, manufacturing facilities, and governmental agencies and non-profit entities. For example, over the last three years, the Department has committed funds to 37 large solar and wind distributed energy systems that will add about 4MW of solar in the state. With this significant development of solar in the last few years, there is now over 57MW of solar photovoltaic systems spread throughout the state of Illinois.

Since 1999, approximately 13MW of distributed photovoltaic systems and over \$25 million in solar thermal systems have been supported with over \$30 million in grants and rebates through the Renewable Energy Resources Program. While the price of solar photovoltaic systems have declined over 50% in the last few years, financial support through the Renewable Energy Resources Program is necessary to continue to encourage the development of solar energy resources throughout Illinois. Solar energy is becoming much more cost competitive, however, since the retail prices of electricity and natural gas have also fallen in recent years, in Illinois solar is not yet at “grid parity” with traditional generation resources.

Illinois is also trailing much of the country in solar development. Though Illinois has the fifth highest potential for rooftop solar PV in the country (estimated at 26,000MW), according to the Solar Energy Industries Association, Illinois ranks 25th in solar development. Illinois is considerably behind states ranked in the top 10 of solar development; for example, Illinois has a total solar capacity over 57MW, while Massachusetts installed about 69MW just in the 3rd quarter of 2015 alone.

There are several reasons for the lag in Illinois’ solar market. In 2011, the State legislated a solar carve-out as part of the Renewable Portfolio Standard that requires 1.5% of the Illinois eligible retail load come from solar energy by 2025. However, given the way the law was written, and with so many municipalities in the state deciding to provide aggregation services and purchasing electric power for their residence, the Illinois Power Agency customer base (which includes the ComEd and Ameren retail customers) shrank to the point that they did not need to procure renewable energy to meet the renewable portfolio standard. However, in the last year, some municipalities have gone back to ComEd as their electricity supplier. With a significant portion of electric customers in Illinois purchasing power from alternative retail electric service companies (ARES), these ARES must provide compliance payments that go into a renewable energy fund. However, due to a problem in the existing legislation, none of these renewable energy funds were used to purchase renewable energy, either through renewable energy credits or long-term power purchase agreements.

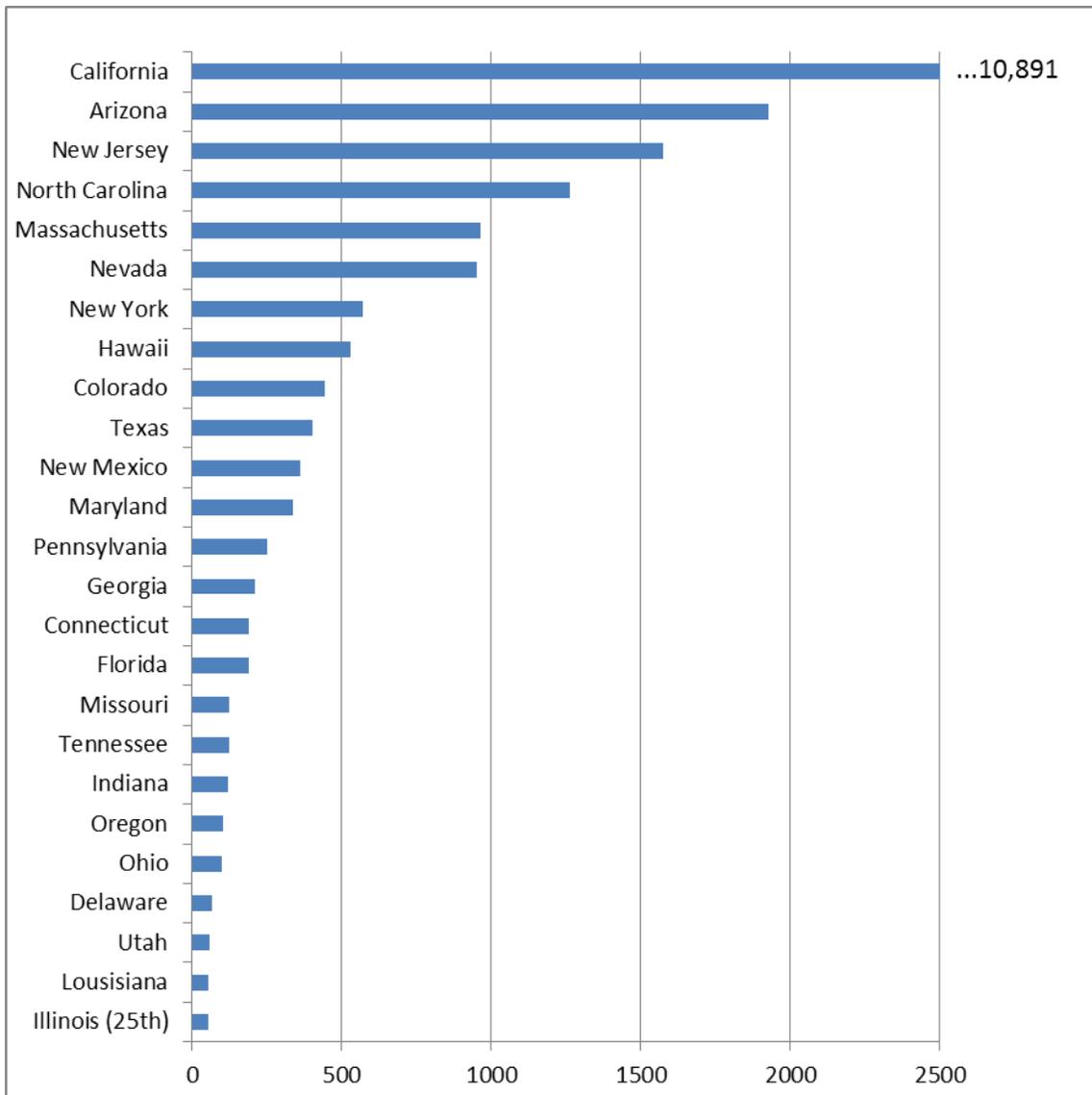


Figure 1: Cumulative Solar Capacity by State Thru 3rd Quarter 2015, Source: Solar Energy Industry Association.

However, in 2014, the Illinois Power Agency Act was amended (Public Act 098-0672) to authorize the Illinois Power Agency to spend up to \$30 million of the stranded compliance payment dollars, for a one-time procurement of Solar Renewable Energy Credits (SRECs). This \$30 million was done over two procurements for \$5 and \$10 million of SRECs in 2015, and a third procurement event in March 2016, for the remaining \$15 million. The results of the first two procurements should add 10-15MW of solar in Illinois. The IPA also procured, on behalf of the utilities, SRECs from new and existing systems through energy procurement events in 2015. Whenever the IPA purchases conventional power for the utilities they are also required to purchase renewable energy. The IPA elected to focus the 2015 procurement solely on solar asset procurement. There was \$28 million in funds for SRECs under these standard energy procurements. The IPA will also be purchasing SRECs for ComEd and Ameren, as well as distributed generation RECs for MidAmerica in 2016.

Consequently, in 2015-16, the Illinois Power Agency will invest \$58+ million in SRECs, which will spur growth in the solar photovoltaic market in Illinois. Questions remain on whether the SREC market will continue beyond 2016. Unless further legislation is passed to fix the Renewable Portfolio Standard, this SREC procurement may be limited beyond 2016, and the solar market in Illinois will go from boom to bust. A bill (HB2607/SB1485) was introduced in February 2015, to extend and ramp up the state's renewable standard by requiring 35 percent of energy consumed in Illinois to be generated by renewable sources by 2030. This bill would have also:

- Made technical fixes to the RPS so that funding to procure renewable energy would be available each year;
- Allowed the Illinois Power Agency to create a long-term plan for procuring renewable energy;
- Created programs for low-income and community solar, and solar farm development in brownfields;
- Funded solar job training programs; and
- Required the Illinois EPA to create a market-based auction system for CO₂ allowances, and use those funds towards more energy efficiency and renewable energy.

There were also two alternative clean energy bills proposed by Exelon and ComEd in 2015. The Exelon bill provides financial support for the aging nuclear power fleet and the complementary ComEd bill supports community solar, microgrids, and electric vehicle charging infrastructure.

Furthermore, the Renewable Energy Trust Fund that supports the DCEO Renewable Energy Programs was set to expire in December 2015. However, Senate Bill 51, initially introduced in January 2015, was passed and therefore extended the sunset of the Programs to December 2020.

Biogas and Biomass

Biogas refers to the methane produced by livestock manures and wastes, municipal waste water sludge, and segregated organic wastes. Biogas produced by anaerobic digestion is a potential source of energy, and can destroy disease causing pathogens and reduce the volume of disposed waste products. Biomass refers to plant and plant-derived material that can be used either as a source of energy or for its chemical components and includes dedicated crops grown for energy production as well as agricultural residues. Biomass commonly refers to organic material grown to produce biofuels but also includes organic materials combusted to produce heat energy.

Although much of the resource is highly cost-constrained for electric generation in the near future (though not for transportation fuels, e.g., ethanol), the economics of biogas and biomass to energy systems are improving. Gasification and co-firing technologies with combined heat and power are technologically feasible for large-scale electric generation in Illinois. While such systems would likely create new markets for farmers, and reduce pollution levels for all traditional power plant pollutants, the economic feasibility of the systems, particularly in competition with other renewable energy resources such as wind energy, will hinge on further improvements that reduce collection and transportation costs.

Created in 2010, the Illinois Biomass Working Group (IBWG) continues to help link farmers, businesses, universities and public agencies in order to share information and collaborate to

advance biomass energy in Illinois. The working group is managed by the Value Added Sustainable Development Center at the Illinois Institute for Rural Affairs at Western Illinois University. The IBWG has periodic meetings and field visits to biomass-related businesses, and has also created a website for the working group to share information.

The continued support through the Renewable Energy Resources Program and other state and federal incentives, as well as research and development support through the Department of Agriculture and Illinois’ universities will be crucial in the further development of biogas and biomass resources in Illinois.

Part III: Report on Program Implementation

RERP Implementation Summary- January 1997 to December 2015

With the passage of the law in December 1997, the Department developed draft grant and rebate program guidelines and established eligibility criteria. The Department developed final program guidelines and released the program in November of 1998, with the first RERP grants and rebates awarded in March of the following year. As of December 2015, the Renewable Energy Resources Program has awarded a total of 244 grants and over 2023 rebates totaling more than \$65 million in incentives for renewable energy projects in Illinois.

2015 Renewable Energy Resources Program

Solar and Wind Energy Rebate Program

Demand for the Solar and Wind Energy Rebate Program continued to be very strong in 2015, with the Department receiving about \$4 million in rebate requests in the six weeks the program was opened in FY2015. One hundred and ninety-five projects were funded for the installation of solar thermal, solar photovoltaic (electric), or wind turbine projects in FY2015, compared to 232 projects in 2014, and 176 projects in 2013.

Table 4: FY2015 Solar and Wind Rebate Program Results

Type of System	Number of Projects	Rebate Amount	System Capacity (kW)
PV	172	\$1,100,841	1,248.59
ST	21	\$122,599	----
Wind	2	\$27,500	20

Even with incentives lowered three years ago, there is still very strong demand for rebate funds. The program received over 320 applications in 2014, and for FY2015, (accepted applications from August to mid-October 2014) the Department received a record number of over 600 rebate applications. However, in January 2015, an executive order was issue to freeze “non-essential” state spending, as a result of the existing state budget crisis, including freezing the funds for the

Solar and Wind Rebate program. Since the spending freeze on the rebate program was not lifted in 2015, there was a significant decline in the number of solar and wind projects supported by the rebate program in FY2015. Furthermore, since a state budget has not been enacted for FY2017, the rebate program has not yet opened for FY2016.

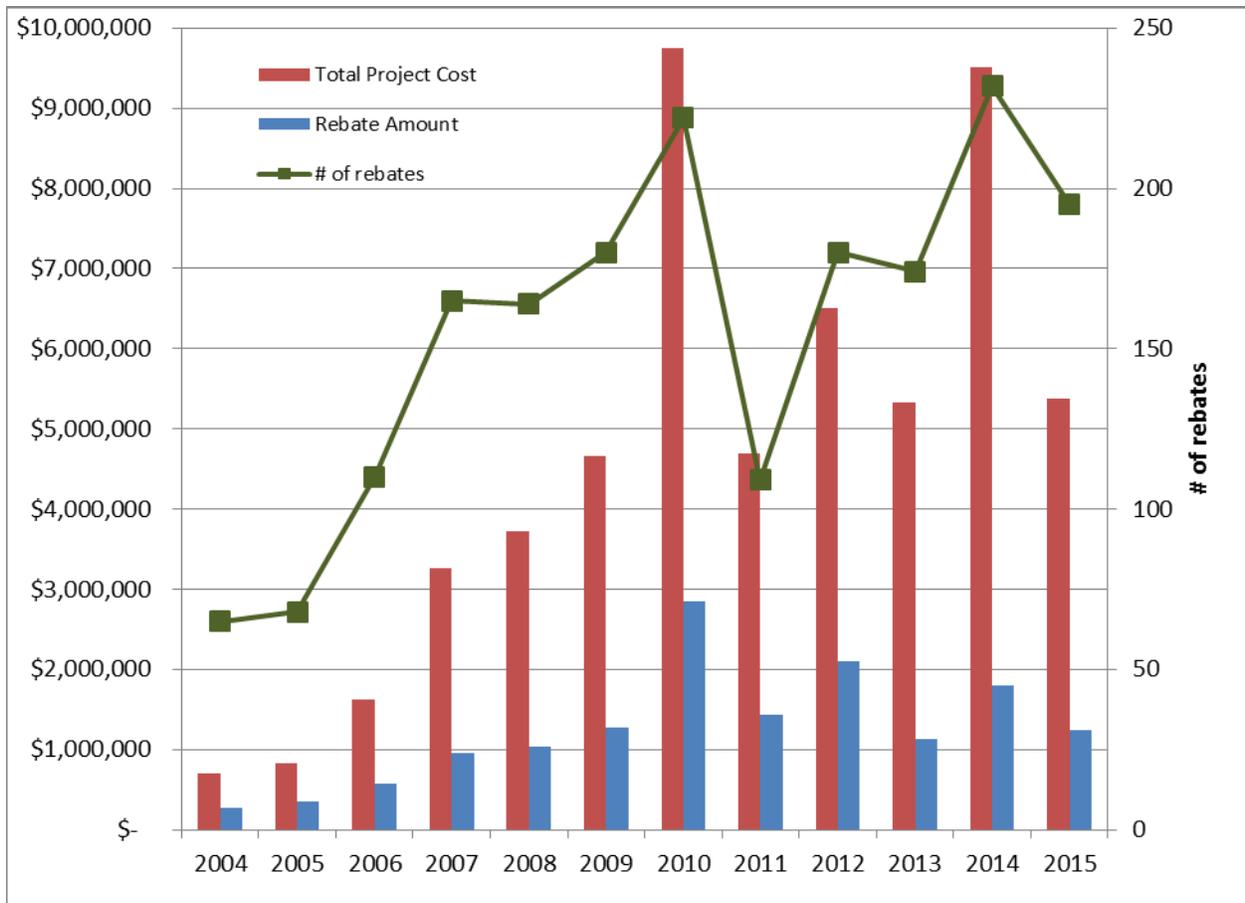


Figure 2: DCEO Solar and Wind Rebates Distributed by State Fiscal Year

Beginning in FY2010, DCEO started providing rebates for wind turbines less than 100 kW. Two rebates were paid to support about 20 kW of small wind projects in 2015.

Large Distributed Solar and Wind Grant Program

The Department issued a Request for Applications (RFA) in September 2013, for Community Solar and Wind projects. The program offers incentives to businesses, non-profit organizations and public sector entities interested in solar or wind energy systems to meet a portion of their energy needs. Businesses are eligible for incentives up to 30% of total project cost, and non-profit and public sector entities are eligible for incentives for up to 50% of the total project cost.



Continental Electrical Construction Company installed a 55kW solar photovoltaic system on the roof of their facility in March 2015.

The Department received 44 applications requesting almost \$7 million in incentives in FY2015. The Department selected 12 projects (all solar PV) for about \$2.3 million in support. These projects were expected to support the development of over 2.8MW of solar photovoltaic projects and will cost about \$9 million to complete.

However, with the executive order issued to freeze “non-essential” state spending as a result of the existing state budget crisis, only 4 of the 12 approved projects were provided grants. When completed, these four solar projects will have a total capacity of 630kW.

Year	Number of Projects	Grant Amount	Total Project Cost	System Capacity (MW)
2013	11	\$1,087,097	\$4,158,475	0.95
2014	15	\$2,566,377	\$9,603,770	2.62
2015	4	\$671,013	\$2,816,890	0.63

Other Renewable Energy Programs

The Department did not provide any grants under the Renewable Energy Business Development Program or the Biogas and Biomass to Energy Grant Program in 2015. The Renewable Energy Business Development program provides grants to promote the utilization of renewable energy in Illinois through research, education, outreach, and training programs. The biogas and biomass to energy grant program provides funding for feasibility studies and the installation of biogas and biomass to energy projects.

Future of Renewable Energy Resources Program

The Department may consider several changes to the program offerings, depending upon what happens with the implementation of the Solar Renewable Energy Credits, the proposed legislation to fix and expand the RPS, and the FY2016 and FY2017 budgets. In 2016, the Department will be working to design a solar finance program that can hopefully be piloted in FY2017, using federal funds. The program design effort will evaluate options (credit enhancements such as loan loss reserve and interest rate buy-down) that will leverage the limited public dollars available for solar, thereby attracting more private capital in order to both increase the pool of available funds and make financing more affordable. Should FY2016 or 2017 funding become available, the Department may also consider other changes such as different incentive levels for rebate and grant programs, changes to the renewable energy business development program, and a focus on specific market segments (low-income housing and public sector) that may need stronger incentives than other segments.

Part IV: Report on Legislative Recommendations

Demand for funds through the Department's Renewable Energy Resources Program has continually grown, especially over the last five years. For example, the FY2015 Solar and Wind Energy Rebate Program (open in September 2014) received over 600 applications requesting more than \$4 million in incentives within a six week period, and to limited funding, we were only be able to consider funding about 2/3 of these applications. In each of the last five program years, the rebate program has had overwhelming demand for the limited program funds.

In order to encourage further development of renewable energy and job creation in Illinois, action to fix and potentially expand the Renewable Portfolio Standard (RPS) is crucial. As discussed, the RPS, as it stands, is not accomplishing the policy goals it was established to achieve, and although temporary measures, such as the limited SREC procurements, have been a step in the right direction, permanent change is needed to truly grow the State's clean energy market. Further, a permanent fix to the RPS would position Illinois well to address potential requirements of the EPA's pending Clean Power Plan (Clean Air Act Section 111(d)) and allow us to continue to be an energy leader in the Midwest.

The Department is also currently leading an Illinois Energy Roadmap initiative with our fellow state agencies and energy industry stakeholders to develop a plan that will address: (1) the future direction of the energy sector in the state/region, with emphasis on the electric power sector, and (2) how energy efficiency and renewable energy fit into the vision for the future. With support from technical partners at the Illinois Institute for Technology's Galvin Center, we are evaluating various energy policy options by applying a rigorous statistical analysis across a range of potential energy market scenarios, to consider potential economic and environmental impacts. After robust stakeholder engagement, an inter-agency advisory group will then prioritize possible options and determine the extent to which the recommendations can be implemented through (1) individual agencies in the near term, (2) joint action between the agencies over the medium term, and/or (3) a longer term option requiring new statutory authority. The findings will be consolidated into a report to be completed by the end of 2016. Consequently, the findings from the Energy Roadmap project will likely lead to further policy recommendations for renewable energy and RERP programs.