



RECOVERING WITH SOLAR

HOW NORTH CAROLINA COMMUNITIES CAN BOOST THE ECONOMY BY INVESTING IN SOLAR POWER

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HOW NORTH CAROLINA COMMUNITIES CAN BOOST THE ECONOMY
BY INVESTING IN SOLAR POWER

**Environment North Carolina
Research & Policy Center**

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Executive Summary

North Carolina is perfectly poised to grow solar. With four hours of peak sun per day, the Tar Heel state has twice as much sun as Germany, the world's solar leader. The state's top-notch universities and technological centers are home to some of the world's best solar innovators. The largest installation of solar heating and cooling technology is already complete in Western North Carolina. And according to the NC Utility Commission's own study, solar energy creates three times as many jobs as coal-power per megawatt.

The recently-passed American Reinvestment and Recovery Act (ARRA) allocated \$134 million to North Carolina state and local governments specifically for energy efficiency and renewable energy, giving North Carolina cities, towns, and counties and other public entities an opportunity to invest in solar energy—while creating jobs, stimulating the economy, and starting the path towards a clean and prosperous energy future for the state.

This report details ARRA funding allocations; processes and application deadlines for receiving funds; and solar investment options for a range of public and private entities. The report highlights how some communities are already taking the lead in proposing solar projects. Finally, this report gives recommendations for other policies to encourage solar power and resources for further information.



Why Solar?

ception

North Carolina Has Potential

As a southeastern state, North Carolina has massive potential for generating solar power- twice the solar potential, in fact, of Germany, the world's current leader in solar generation. The state receives 4 hours of peak sun every day¹ and ranks 18th among the states with the greatest energy potential from solar power.²

Job Creation

Solar photovoltaic (PV) installations create more job-years for every megawatt installed than any other form of renewable energy studied. In fact, for each megawatt of solar PV installed, nearly 90 job-years are created³; three times as many jobs as comparable coal powered installations create.⁴ Because more than 80% of the cost of solar PV comes from labor,⁵ more of

those job years will be immediately available for North Carolina workers. Moreover, industry experts suggest that solar thermal installations create even more jobs per megawatt and many or most of the quality solar thermal panels are manufactured in the USA. As a whole, North Carolina's renewable energy and energy efficiency industry is already estimated to support 6,470 jobs. Additionally, a 24% increase in the number of reported jobs is expected for 2009.⁶ For example, in 2008, Vanir Energy LLC announced its plans to invest \$14 million in North Carolina for the "world's largest solar thermal installation for heating and cooling." The first project at the company's headquarters in Fletcher County was expected to create 58 jobs in less than 60 days.⁷ As the solar industry grows, so will demand for

North Carolina's top experts and innovators, creating new positions at universities and research facilities.

Investors

Solar entrepreneurs are already beginning to invest in North Carolina. In 2008, Progress Energy signed a 20-year contract to purchase all the power from a 1-megawatt solar power plant in Haywood County. North Carolina's own FLS Energy will own that \$8 million plant, currently under construction.⁸ In an agreement that will last 20 years, Duke Energy has signed on to purchase the entire output, over 16 megawatts, from Sun Edison's solar farm to be built in Davidson County.⁹ Duke Energy will also spend \$50 million on a project for which it plans to rent roof or land space from 425 commercial and residential sites in North Carolina. Duke will install solar panels on these sites in hopes of providing enough power for 1,300 homes.¹⁰

North Carolina's Technology Hub

In addition to solar potential, North Carolina has one particular asset that makes it well poised to grow solar: an extensive network of universities, experts, and innovators. North Carolina State University, University of North Carolina, and Duke University give the state unique access to world-renowned experts in the fields of science, technology, business, and policy. Research Triangle Park houses top research facilities and innovators, many concentrating their current efforts on energy technologies. North Carolina Solar Center already works with the United States Department of Energy to provide valuable policy information to the country.

A Clean Energy Future

Today, North Carolina gets over 90% of its energy from coal and nuclear power¹¹— posing numerous threats to the state's environment and public health.

Large centralized coal and nuclear plants make up nearly 80% of North Carolina's use of fresh water¹²— an increasingly precious resource as droughts persist. North Carolina's coal and natural gas-fired power plants emit a total of over 420,000 metric tons of the air pollutants nitrogen oxide and sulfur dioxide and 78,533,282

metric tons of the global warming pollutant, carbon dioxide, each year.¹³ Extraction of coal is also increasingly destructive. Mountain top removal methods have scarred Appalachia with mines, some as big as the island of Manhattan, and destroyed the area's communities with polluted air and poisoned water.¹⁴

Solar power, by contrast, creates virtually no pollution, and requires little disturbance to the state's landscape. Every kilowatt-hour of electricity generated by solar power keeps 1.24 pounds of carbon dioxide pollution from being released.¹⁵

Current Policy Support

North Carolina policy makers have a long record of supporting solar power. In 1977 the state created one of the nation's most generous tax credits for investing in solar power and other forms of renewable energy.¹⁶ In 2007, North Carolina became the first southeastern state to adopt a Renewable Energy and Energy Efficiency Portfolio Standard (REPS). Through its REPS, the state requires utilities to provide 12.5% of electricity sold to come from renewable energy sources and efficiency measures, including 0.2% required from solar power, by 2020.¹⁷

More Work To Do

Despite all these resources and incentives, North Carolina's potential for producing solar energy is far from realized. And with energy prices fluctuating and global warming threatening future generations, North Carolina's imperative for producing solar energy is far from fulfilled. Funding from the American Recovery and Reinvestment Act is a critical step towards a dramatic increase in the use of solar energy in the state.

Solar Funding Opportunities

Few would dispute the economic and environmental benefits of solar power, but the up front capital costs of solar technologies have too often been prohibitive. Thanks to the recently passed American Reinvestment and Recovery Act, however, funds are now widely available to North Carolina communities to help them grow solar.

In all, the American Reinvestment and Recovery Act has allotted over \$134 million to North Carolina specifically for the promotion of energy efficiency and

renewable energy. An additional \$400 million nationwide is also available through federal competitive grants.

“The purpose of the State Energy Program is to create jobs, increase

energy savings, create jobs, increase renewable energy capacity, create jobs, displace petroleum, create jobs, reduce emissions and create jobs”- Larry Shirley, Director of the North Carolina State Energy Office¹⁸

Energy Efficiency and Conservation Block Grant

The Energy Efficiency and Conservation Block Grant Program provides funds for energy efficiency and promoting renewable energy through two means: direct allocation to cities, towns, and public entities; and competitive grants for which local governments and public and private entities may apply.

Direct Allocation

\$37 million has been directly allocated to North Carolina cities and towns with more than 35,000 citizens and the top ten most populated counties. Those eligible must submit their application to the federal government by June 25, 2009. Applicants have up to 120 days

after this date to turn in a Strategic Energy Plan that lists specific projects.

\$21 million will go to the State Energy Office, which has released a draft plan to divide the funds between 4 programs: energy efficiency and renewable energy for buildings, technical assistance, energy conservation programs in transportation, and implementation of methane and greenhouse gas technologies. The state must apply for these funds by June 25, 2009.

Competitive Grants

With a portion of the money allocated to it, the State Energy Office will establish two competitive grant programs for energy efficiency and renewable energy for buildings.

\$7 million will be available only for the 90 counties and 526 municipalities that did not receive direct entitlements.

\$7 million will be available to 58 community colleges and 115 K-12 public school districts.

Although the State Energy Office has not yet announced a submission deadline for these programs, eligible entities should prepare submissions in the next few months since the state must provide these subgrants within 180 days of federal approval of the state application.¹⁹

\$400 million will be available through a national competitive grant program. Any state or local government may apply for these funds after the federal government has determined the application process and deadlines.

State Energy Program

ARRA allocated \$75 million to North Carolina through the State Energy Program. Governor Perdue has already released a draft plan for these funds that includes millions of dollars for investments in a green work-

force, green businesses, and renewable energy. The plan includes:

- Supporting small businesses and industry through energy savings
- Growing North Carolina’s green workforce
- Creating an energy investment revolving loan fund
- Improving government energy efficiency
- Promoting residential energy efficiency and renewable energy
- Fostering renewable energy technology and resource innovation ²⁰

residences seeking to utilize renewable energy. The plan also includes funds to train a green workforce that would continue to create jobs and ensure that North Carolina leads the way on all fronts of its growing solar industry. Once the State Energy Office has put these programs in place, local governments will be able to apply to the revolving loan fund for low or no-interest loans of up to \$1 million. Under “Improving Government Energy Efficiency,” local governments can apply for grants for efficiency upgrades, including cost saving solar applications.

This plan could offer incentives for solar power to local governments, green businesses and businesses and

FUNDING AVAILABLE

NC Energy Efficiency and Conservation Block Grant	\$58,050,300
Allocated to NC Cities and Counties*	\$37,125,000
State Energy Office ²¹	\$20,925,300
<i>Energy Efficiency and Renewable Energy for Buildings</i>	
Non-Entitlement Cities and Counties	\$7,150,000
K-12 public school districts, community colleges, and other local public authorities	\$7,044,124
<i>Technical Assistance</i>	\$450,000
Energy Conservation Programs in Transportation	\$2,500,000
Implementation of Methane and Greenhouse Gas Technologies	\$2,500,000
 Federal Energy Efficiency and Conservation Block Grant	 \$400,000,000
 State Energy Program²²	 \$75,989,000
Support Small Business and Industry	\$11,500,000
Green Workforce	\$8,850,000
Energy Investment Revolving Loan Fund	\$18,000,000
Improve Government Energy Efficiency	\$9,500,000
Residential Energy Efficiency and Renewable Energy	\$10,000,000
Renewable Energy Technology and Resource Innovation	\$13,500,000



Popular Options

Martin D. Vonka

With so many funding options available, local governments across the state have a tremendous opportunity to invest in a wide range of solar energy projects. Numerous applications for solar power exist, but a few eligible project ideas stand out.

Solar hot water is readily affordable for any municipality and creates energy and cost savings. Solar panels for electricity can generate public interest, allow utilities to learn about utilizing solar electricity, and provide power to buildings. Solar LED lighting can save costs on electricity and avoid the installation of new power lines.

Finally, a power purchase agreement allows government and commercial entities to utilize solar energy with no or low up front costs.



Solar Hot Water

"Solar thermal is the most cost-effective solar technology available and can significantly reduce utility costs. A financed solar thermal system can create a positive cash flow for our clients from day 1." FLS Energy²³

Solar hot water installations maximize the value of every ARRA dollar. The large amount of energy used to heat water can cost a great deal of money over time, especially in any building where people live or use hot water for job applications. Solar hot water systems are very affordable, can lower energy bills significantly and protect investors from the price fluctuations of traditional fuels.

- Solar hot water can save great amounts of energy and money when applied in fire stations, school cafeterias, recreation centers, health care facilities and jails.
- A solar hot water system for a firehouse can provide up to 80% of the facilities hot water energy needs and usually costs less than \$10,000.²⁴

Taking the Lead- Mecklenburg County

Mecklenburg County will install six solar hot water systems. The 6 systems will consist of a total of 186 collectors. They will provide hot water to four county facilities- the medical examiner and three social service centers; one Charlotte-Mecklenburg School, handling cognitively disabled students; and the culinary arts building at the Central Piedmont Community College Central Campus.²⁵

Mecklenburg County has worked with outside agencies such as Charlotte-Mecklenburg Schools and Central Piedmont Community College as well as other local governments, including Charlotte and Huntersville, to create the proposal, which will utilize all of the \$649,500 allotted to Mecklenburg through the Energy Efficiency and Conservation Block Grant Program.²⁶ In total, these systems will create approximately 7,440 square feet of collectors with generation capacity of 4,930 BTU* per square foot of collector per day.

Mecklenburg estimates that through these systems, it will save 644,096 kWh** of electricity and avoid 565 tons of CO2 annually, helping the county reach its goal of 50% energy savings and 28% GHG emission reduction of 2006 levels by 2020.²⁷

Taking the Lead - Durham

The city of Durham plans to install two solar hot water systems on fire stations. This \$30,000 investment is estimated to save around 54MWh and 38 metric tons of greenhouse gas emissions per year.³²

* A British Thermal Unit (BTU) is a unit of energy used to measure the output of solar hot water systems. 5,000 BTU equals roughly 1.5 kilowatt hours.

** A kilowatt hour (kWh) is a measure of the total amount of electricity used over time; electricity is billed by the number kWh used over a month.

Solar Photovoltaic

Solar photovoltaic (PV) technology provides an extraordinary opportunity for North Carolina communities to displace fossil fuels by using electricity generated by solar panels to power government or non-profit buildings. The funds provided through ARRA provide local and state governments an early opportunity to gain experience and insight into installing and maintaining panels, connecting these electricity sources to the electrical grid and into utilizing distributed power. As solar PV panels grow more efficient, they will continue to compose a growing part of North Carolina's energy mix- on local and commercial levels.

- A 10 kW solar PV system costs \$75,000-94,000. In North Carolina, that system could provide 1200-1250 kW h every month.

- This can save \$100-120 in electricity costs a month, even more if the credits for renewable energy can be sold to companies like NC Green Power.
- Over a system life of 35-40 years, a 10 kW solar PV system can generate up to \$100,000 in savings and revenue.²⁸

In some situations, the cost of solar PV can be combined with costs that are already necessary. For instance, if a building needs a new roof, an adhesive solar roof provides a new roof and solar PV installation and costs much less than the total to install a new roof and then install solar panels.²⁹

Taking the Lead- Fayetteville Public Works Commission

The Fayetteville Public Works Commission was established to manage, operate, and supervise Fayetteville's three utilities- electric, water, and sanitary sewer. The Commission intends to apply for \$250,000- 750,000 in competitive block grant money to install a 50 to 100 kW rooftop solar system on one of its sheds, providing the Commission an opportunity to learn more about solar efficiency and interconnection with the grid. The staff believe the more they can learn, the better positioned they will be to assist their customers with distributed generation as well as to extend their solar program.³⁰

Taking the Lead - Greensboro

Through the State Energy Program, Greensboro will seek \$1.5 million in order to install 150 kW of solar PV panels on the roof of the J Edward Kitchen Center. This system will generate electricity and reduce expenses for the facility, which is occupied by the Fire, Water Resources, and Police departments.³¹



Lighting streets, parking lots, sports fields and parks with solar LED lighting can provide a long lasting lighting solution that saves money on installation, maintenance, and the increasing costs of electricity while also supporting the solar industry and generating public interest in solar power. Solar LED lighting combines the high efficiency of LED bulbs, which use about one-tenth the energy of incandescent light bulbs, with solar power.

The units are equipped with a battery that stores solar electricity created by the solar panel during the day so that the light can be used at night, even during cloudy weather. Because these units provide their own power, they can save thousands of dollars in situations where additional light sources would require the installation new of electrical lines or transformers, as is the case in many new streets, parks, fields and parking lots. Both LED bulbs and solar panels have a long life expectancy, which means that an investment now will save future costs of energy, maintenance and replacement.

- During each solar LED light's lifetime, it will save over \$3,000 in electricity costs and 14, 600 lbs of CO2 compared with a comparable standard utility-powered leased streetlight in North Carolina.

Taking the Lead- Cary

The town of Cary will propose to use about \$400,000 of its block grant allotment to install solar lighting in some of its sports fields. Cary plans to propose spending another \$35,000 on other solar lighting installations and to install solar PV panels on some of its buildings.³⁴

- LED bulbs save money since they are changed every 12-15 years as opposed to every 2-3 years for traditional bulbs.
- Saves approximately \$1,000 per unit where new electrical wire would have to be laid for traditional lighting.
- Solar LED lighting units contain no mercury or other hazardous waste.
- A solar LED lighting unit costs between \$4,000 and \$5,000 with installation for a turnkey system that includes all lighting design, transportation, foundations, installation and guarantees.³³



Leveraging Recovery Dollars

Melanie bateman

A Power Purchase Agreement (PPA) allows a customer to pay a negotiated rate, equal to or less than market rates, for solar electricity. In this type of agreement, offered in North Carolina as well as many other states, a provider installs its own solar equipment on the roof of the customer's building. The provider owns and maintains the equipment while customer pays for the electricity the system generates. Contracts like this are available from several different providers for solar electric and solar hot water systems.

In this way, governments and businesses and can create jobs by invigorating North Carolina's solar industry while creating long-lasting energy cost savings and spending little or no additional money. Added to the economic benefits, are the promotion of energy security and avoidance of harmful and costly greenhouse gas emissions. This opportunity can create jobs, strengthen the economy, and provide clean energy for North Carolina, while reducing government overhead.

Taking the Lead- Kanuga Conferences Inc., Hendersonville

Kanuga Conferences, a 1,400 acre non-profit conference center in the mountains near Hendersonville, has entered into an agreement with FLS Energy to buy hot water generated by 131 solar panels on the roofs of 11 buildings on Kanuga's campus. The solar panels, owned by FLS Energy, will provide heat for water used by Kanuga Lake Inn's kitchen, laundry, and 62 guest rooms as well as for 10 other buildings. Each year, Kanuga uses approximately 1.5 million gallons of hot water. Even though Kanuga entered into this contract without the use of any ARRA funds, the center expects the arrangement to save over \$700,000 in the next 25 years.³⁵

Solar Investment Options

Solar Technology	Cost	Applications	Advantages
<p>Solar Hot Water Solar hot water collectors are placed on the roof of a building. They use heat from the sun to heat water, which is then sent to an insulated storage tank.</p>	Depends on system capacity. A typical fire-house installation costs less than \$10,000.	Fire stations, school cafeterias, recreation centers, health care facilities, and jails.	Low capital cost. High energy and cost savings.
<p>Solar Photovoltaic (PV) PV panels are installed on the roof of a building. They use energy from the sun to create electricity. They can be used to provide power for a building and can also be connected to the electrical grid.</p>	Depends on system capacity and installation. Between \$75,000 and \$94,000 for a 10 kW system.	Any building.	Reduced emissions from electricity. Opportunity to gain experience in solar integration.
<p>Solar LED Lighting Solar panels are installed on light poles to power highly efficient LED bulbs.</p>	Between \$4,000 and \$5,000 per unit.	Parks, sports fields, parking lots.	Avoided cost of new electrical wiring for lots. Reduced replacement and maintenance costs. Reduced electricity use.
<p>Power Purchase Agreement A contract allows the client to pay a reduced price for power generated by provider-owned solar panels installed on the client's property. Available for solar hot water and solar PV installations.</p>	Upfront costs of \$0 to 8% of installation. Rate for energy negotiable, but typically less than current market price.	Government and commercial buildings.	No or low capital cost. Reduced rate for energy used. No maintenance costs. Reduced emissions from electricity.

Conclusion and Recommendations



Conditions are ripe for an explosion of solar power production in North Carolina, decreasing pollution and boosting the economy. Allocations to North Carolina from the American Recovery and Reinvestment Act will provide critical support to North Carolina cities, towns, schools and other entities that are ready to grow solar.

Yet, with virtually unlimited potential for solar power, the planet in peril, and the economy in trouble, North Carolina policy makers can and should do much more to promote solar energy.

The following policies, in combination with the grants described in this report, will help North Carolina achieve 100,000 solar roofs, along with increasing numbers of solar hot water heaters, ground-mounted PV installations, and other solar technologies, by 2020:

Providing Incentives for installing and manufacturing solar technologies.

1. North Carolina's 35% investment tax credit for installation of renewable energy technologies expires in 2011. In 2007, the credit cost the state over \$440,000, and is expected to cost \$1 million in future years. The renewable energy investment tax credit should be extended until 2017. In addition, the tax credit should be made "recession proof" by allowing tax credits for renewable energy installations to include gross premium taxes.
2. The United States lags in solar energy component manufacturing. In North Carolina, suppliers and installers of solar energy components outnumber manufacturers 8 to 1.³⁶ To promote solar power and create more jobs here in the state, North Carolina should reinstate its renewable energy manufacturing tax credit, which expired in 2006.
3. The State of Texas recently adopted a policy that would allow local governments to use their borrowing power to help businesses and individuals finance solar power installations. Participants would pay the loan back through increased property tax assessments; the increase would be tied to the property, rather than to the owner. North Carolina should follow the lead of Texas.

Removing barriers for homeowners and small businesses to invest in solar energy.

North Carolina regulators recently adopted a net metering policy that allows customers with solar panels to sell back their excess power monthly if they produce more power than they use. But utilities may still assess prohibitive 'standby charges' for systems under 500 kW. Standby charges for these small systems should be removed.

Remarkably, some homeowners' associations and historic districts may still prohibit solar panel installations. Prohibitions on solar panel installations for residents should be lifted.

Creating vibrant solar markets by allowing regulators to set the price for the purchase of solar power.

In order to truly integrate distributed solar generation, solar providers must be paid a fair and predictable rate for the electricity they generate. This policy, known as a "feed-in rate," has catapulted solar power production in Germany and Japan; North Carolina should follow suit.

Appendix A: Resources

Energy Audits

For communities that have not yet created a Strategic Energy Plan, funds from the Energy Efficiency and Conservation Block Grant also provide for the hiring of an energy auditor or consultant. This professional can create a plan for how solar technologies can provide the most benefit to a particular area.

For More Information

Energy Efficiency and Conservation Block Grant

<http://www.eecbg.energy.gov/>

This official Department of Energy website can direct you to proper applications procedures and help from the DOE.

ICLEI Guide to Preparing Your EECBG Application

<http://www.icleiusa.org/action-center/financing-staffing/iclei-guide-to-preparing-your-eeecbg-application-part-i>
ICLEI

Local Governments for Sustainability provides a step by step guide explaining the EECBG application process and deadlines.

North Carolina Professional Directory

<http://www.greenprofessionals.org/site/profd//index.cfm?>

This online directory can be used as a starting point to identify professionals in North Carolina's solar industry.

North Carolina Recovery

<http://www.ncrecovery.gov/>

Official information about the recovery effort in North Carolina.

North Carolina Solar Center

<http://www.ncsc.ncsu.edu/>

919.515.5666

email: ncsun@ncsu.edu

The North Carolina Solar Center is staffed by experts in a number of areas including solar technologies and policies.

North Carolina Sustainable Energy Association

<http://www.ncsustainableenergy.org/>

The North Carolina Sustainable Energy Association has a large business membership. The online Business Member Directory can be used to identify North Carolina solar businesses.

State Energy Office

<http://www.energync.net/>

Official information from the North Carolina State Energy Office.

State Energy Program

http://apps1.eere.energy.gov/state_energy_program/

Department of Energy website for the State Energy program.

Appendix B:

North Carolina Energy Efficiency and Conservation Block Grant Direct Allocations

Name	Government Level	Allocation
North Carolina	State Energy Office	\$20,925,300
Asheville	City	\$804,700
Burlington	City	\$223,900
Cary, Town of	City	\$1,166,800
Chapel Hill, Town of	City	\$554,900
Charlotte	City	\$6,780,100
Concord	City	\$638,800
Durham	City	\$2,173,600
Fayetteville	City	\$1,652,900
Gastonia	City	\$705,700
Goldsboro	City	\$183,600
Greensboro	City	\$2,554,900
Greenville	City	\$777,600
Hickory	City	\$209,300
High Point	City	\$998,600
Huntersville, Town of	City	\$175,100
Jacksonville	City	\$781,600
Kannapolis	City	\$170,300
Raleigh	City	\$3,820,400
Rocky Mount	City	\$572,100
Wilmington	City	\$1,039,900
Wilson	City	\$214,900
Winston-Salem	City	\$2,262,000
Buncombe	County	\$624,800
Cumberland	County	\$590,700
Davidson	County	\$631,100
Gaston	County	\$525,600
Iredell	County	\$645,100
Johnston	County	\$636,200
Mecklenburg	County	\$649,500
Randolph	County	\$578,200
Union	County	\$751,800
Wake	County	\$3,030,300

Endnotes

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- ¹⁸ *From the presentation given by Larry Shirley on June 4, 2009 at the Economic Recovery Workshop at Wake Technical Community College, Raleigh, North Carolina*
- ¹⁹ *"Draft Proposal To Create Jobs And Renew North Carolina Communities Through Energy Efficiency And Conservation Block Grant Funds Is Now Available For Public Comment," (June 8, 2009); North Carolina Office of Economic Recovery and Investment (accessed June 15, 2009), <http://www.ncrecovery.gov/calendar/publicMeetings.aspx>*
- ²⁰ *"American Recovery and Reinvestment Act (ARRA) State Energy Program (SEP) Formula Grants," (May 5, 2009), North Carolina Office of Economic Recovery and Investment (accessed June 15, 2009), <http://www.ncrecovery.gov/News/PressReleaseDetail.aspx?newsItemID=27>*
- ²¹ *"Draft Proposal To Create Jobs And Renew North Carolina Communities Through Energy Efficiency And Conservation Block Grant*

Funds Is Now Available For Public Comment,” (June 8, 2009); North Carolina Office of Economic Recovery and Investment (accessed June 15, 2009), <http://www.ncrecover.gov/calendar/publicMeetings.aspx>. The author assumes that the discrepancy between the amount of funds allotted to the State Energy Office and the amount accounted for by the draft plan is due to a 6% allotment for administrative costs and uncertainty about the final expenditures for each program.

22 *“American Recovery and Reinvestment Act (ARRA) State Energy Program (SEP) Formula Grants,” (May 5, 2009), North Carolina Office of Economic Recovery and Investment (accessed June 15, 2009), <http://www.ncrecover.gov/News/PressReleaseDetail.aspx?newsItemID=27>. The author assumes that the discrepancy between the amount of funds allotted to the State Energy Program and the amount accounted for by the draft plan is due to administrative and staff costs and uncertainty about the final expenditures for each program.*

23 *“Developing Solar Energy Cost-Effectively.” FLS Energy. Black Mountain, NC*

24 *“Developing Solar Energy Cost-Effectively.” FLS Energy. Black Mountain, NC*

25 *From an email message from Heidi Pruess, Mecklenburg County, on May 29, 2009.*

26 *“American Recovery and Reinvestment Act Update,” Mecklenburg County, NC (accessed June 15, 2009), <http://www.charmeck.org/Departments/County+Managers+Office/Recovery+Act.htm>*

27 *From an email message from Heidi Pruess on May 29, 2009.*

28 *From phone conversation with Jason Epstein, Baker Roofing, on May 28, 2009. Calculation assumes 40 year lifetime of system; 1250 kWh monthly generation; \$0.167 generated from cost to purchase electricity saved and revenue from selling REC per kWh.*

29 *From phone conversation with Jason Epstein, Baker Roofing, on May 28, 2009.*

30 *From email message from Keith Lynch, Fayetteville Public Works Commission, on May 26, 2009.*

31 *“City of Greensboro Economic Stimulus Priorities: PENDING;” City of Greensboro (accessed June 15, 2009), <http://www.greensboro-nc.gov/NR/rdonlyres/6F3305DB-7DC4-459F-8095-3F353FB73E05/0/Future.ApplicationsJune2.pdf>*

32 *From phone conversation with Tobin Fried, Durham City-County, on June 2 2009.*

33 *From email message from Dennis Isemonger, Progress Solar Solutions, LLC, on June 15, 2009.*

34 *From phone conversation with Philip Smith, Town of Cary, on May 19, 2009.*

35 *“Kanuga, FLS Energy Team to Bring Solar Hot Water to Nonprofit Retreat Center,” (January 26, 2009), FLS Energy (accessed June 16, 2009), <http://www.flseenergy.com/news/2009-01-26,%20Press%20Release,%20Kanuga%20FLS%20Energy%20them%20t.pdf>*

36 *Solar Energy Industries Association, North Carolina Fact (accessed June 16, 2009), http://www.seia.org/galleries/state-fact-sheets/North_Carolina_2008.pdf*

37 *“State and Local Grant Allocations;” US Department of Energy (accessed June 15, 2009), <http://www.eecbg.energy.gov/grantalloc.html>*