

STATE CLEAN ENERGY - ENVIRONMENT TECHNICAL FORUM
Call #15: Clean Energy Tax Incentives -- Background
April 20, 2006

I. Background

Tax incentives for clean energy support the adoption of energy efficiency/renewable energy (EE/RE), and combined heat and power (CHP) technologies by reducing net costs to consumers, and encouraging market acceptance of clean energy technologies and practices. Forty-one states currently have tax incentive programs for renewable energy and a number of states offer tax incentives for investments in CHP and energy efficiency.¹ In addition, at the Federal level, Title XIII of the Energy Policy Act of 2005 (EPAct) offers tax incentives for various EE/RE expenditures. Types of tax incentives include:

- Credits on personal income tax;
- Credits on corporate income tax;
- Exemptions from sales tax, excise tax, or property tax; and
- Production tax credits.

States have implemented a range of tax incentives to help meet their clean energy policy objectives. Tax incentives target multiple groups and technologies, including: manufacturers, purchasers, building operators, and commercial, industrial, and residential customers. For example, production tax credits or property tax exemptions might help to attract investment in large-scale wind, solar or geothermal projects. Energy conservation, demand management, and onsite generation on the other hand, might be encouraged by income tax credits for energy efficient building practices and sales tax exemptions for the purchase of solar photovoltaic (PV) systems or energy efficient appliances.

Many states have looked at pairing tax incentives with other policies and programs (for instance, net metering and standard interconnection rules for distributed generation) to deliver a coordinated package of programs and incentives to meet their clean energy policy objectives. In particular, it is important to recognize the difference between tax credits and rate-payer funded incentives (e.g., public benefits funds (PBFs)), which, while often used in conjunction, are fundamentally different approaches. Tax credits are offsets to tax liability that are offered by a government as an incentive for EE/RE. Ratepayer funded incentives depend on revenue generated by a surcharge on energy sold by utilities, and are earmarked for use on EE/RE programs.

Analyses of state tax incentives have looked into the strategies that make a program successful. For example, tax incentives appear to be most effective when linked to other policies (e.g., a building code or renewable generation requirement). There are also aspects of incentive design that can "make or break" a program (e.g., the complexity of the application process,

¹ See the Resources section for a link to the Database of State Incentives for Renewable Energy (DSIRE) database of energy efficiency and renewable energy financial incentives.

duration of funding, and whether incentives are coordinated with education and marketing activities).

Another important issue for states to consider when designing their tax incentive programs is how to most effectively leverage the tax credits in EPAct 2005. When designing or otherwise setting strategies for a tax incentive program, it is important to look holistically at the total tax impacts an incentive will have in relation to other programs. A particular type of financial incentive may change the impact of a program. Some federal tax regulations, for example, include anti-"double dipping" provisions designed to avoid encouraging relatively inefficient programs that are overly dependent on government funding.

Section III includes a Department of Energy (DOE) summary of tax provisions in EPAct 2005, as well as a summary of a DOE, National Renewable Energy Laboratory (NREL) study of the interactions among various state and federal financial incentives, and a brief discussion of the tax treatment of certain incentives and provisions to avoid "double dipping" (i.e., receiving more than one type of tax incentive for a given project).

II. State Programs

The examples below are a sampling of state tax incentive programs for energy efficiency, renewable energy, and/or CHP. In many cases, these programs cover more than one of these categories. Connecticut, for example, has a property tax exemption that includes renewable energy and/or co-generation (CHP²), and New York and Massachusetts both offer credits for projects that include solar energy and/or energy efficiency. Some states (e.g., Connecticut and Georgia) have offered sales tax "holidays" as an incentive for consumers to purchase energy efficient products. The effectiveness of these programs has not yet been evaluated.

A. Energy Efficiency

States encourage energy efficiency via the tax system through various provisions, including: income tax credits or deductions exemptions from sales taxes on efficient equipment and appliances, exemptions from property taxes, or exemptions for titling or other taxes on vehicles.³ For example, deductions are offered for residential energy efficiency in Arizona, interest on energy efficiency related loans in California, insulation in Idaho, and investment in energy conservation in Montana. Credits are offered for energy efficiency in Massachusetts, and for energy conservation in Montana. A sales tax exemption for residential weatherization products is available in Connecticut, and South Carolina offers a sales tax reduction for energy efficient manufactured homes. Green Buildings are eligible for tax incentives in several states, including Maryland, Nevada, New York, and Oklahoma.

The states described below provide examples of comprehensive tax incentive programs that include both EE and RE:

(1) California

² Combined heat and power (CHP), also known as cogeneration, is the simultaneous generation of electric and thermal energy from a single fuel source. For more information, visit http://www.epa.gov/chp/what_is_chp.htm

³ Examples drawn from DSIRE and other federal and state resources listed in Section V of this paper.

Since 2001, California has offered a personal income tax deduction of 100% of the interest on loans from publicly-owned utility companies for purchasing residential energy efficiency technologies including: lighting, chillers, furnaces, boilers, heat pumps, air conditioners, caulking/weather-stripping, duct/air sealing, building insulation, windows, and advanced metering. Also included are eligible renewable/other technologies including: solar water heat, solar space heat, photovoltaics, and daylighting. Note that this deduction may not be taken if a tax credit is taken for the purchase of the energy efficient equipment. See: CA Revenue and Taxation Code 17208.1 (2001 SB 75).⁴

(2) Massachusetts

Massachusetts offers a residential solar and efficiency 30% tax credit for up to \$600 for a single family home or \$1,000 for a multi-family building, that may be taken against state personal or corporate income taxes in 2005 or 2006 for eligible energy efficiency products purchased between November 2005 and April 2006. Eligible energy efficiency technologies include: equipment insulation, furnaces, boilers, programmable thermostats, duct/air sealing, building insulation, windows, and other unspecified technologies. Solar water heating systems are also eligible.⁵

(3) New York

New York's Green Building Tax Credit, enacted in 2000, is intended to spur growth in the commercial green building market, including energy efficiency measures and incorporation of solar energy. The New York State Department of Environmental Conservation (DEC) administers the \$25 million/yr program, and develops regulations in consultation with the New York State Energy Research and Development Authority (NYSERDA) and the Department of Health (DOH). The credit is available annually for buildings greater than 20,000 square feet with at least 10,000 sf of tenant space.

The tax credit may be based on different compliance paths with specified allowable costs and maximum credit amounts per square foot. A green "base building," the area of the building not intended for occupancy, is eligible for 5% of allowable costs, worth a maximum of \$7.50 per square foot. Green tenant space is eligible for 5% of allowable costs, up to \$3.75 per square foot. If the base building is green and 100% of the tenant space is green, the building is eligible for a green whole building tax credit of 7% of allowable costs. In addition, under each of the measures, incentives increase by one percent for green buildings located in economic development zones.

Criteria for a building to qualify as "green" include: energy efficiency, indoor air quality, materials, commissioning, and appliances, as well as water quality in some areas. Credit is also available for fuel cells, photovoltaics, and air-conditioning equipment that uses green refrigerants. The fuel cell credit is 30% of the installed cost, up to \$1,000 per kilowatt. PV credit is for 100% of the incremental cost of "building-integrated" PV modules, and non-building integrated systems are eligible for up to 25% of cost with a cap of \$3 per watt. (Credits are given over a five-year period at 20% every year) Air-conditioning systems that use an EPA-approved

⁴ CA Revenue and Taxation Code 17208.1 (2001 SB 75) <http://www.dsireusa.org/documents/Incentives/CA34F.htm>

⁵ <http://www.mass.gov/legis/laws/seslaw05/sl050140.htm>

non-ozone depleting refrigerant or R-123 are eligible for an incentive of 10% of the equipment cost.

New York's energy efficiency component is performance-based. New buildings and tenant spaces must use no more than 65% of the energy use specification in the state Energy Code, and rehabilitated tenant space and buildings are limited to 75% of Code. Office buildings are given more stringent restrictions. Indoor Air Quality (IAQ) criteria include an IAQ plan for construction and management, operation and maintenance, and annual testing for carbon dioxide, carbon monoxide, volatile organic compounds, formaldehyde, particulates, and radon. Materials criteria include recycled content, rapidly renewable materials, maximum toxicity/VOC content, and construction waste management. Commissioning requirements draw on specifications from various organizations such as the United States Green Building Council (USGBC), and the American Society for Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE). Water conservation strategies are required in areas where water use is not metered and/or sewers are non-existent or inadequate. Record keeping is required for many measures, including annual energy consumption, air quality monitoring, and a variety of other performance criteria.

(4) Oregon

The Oregon Department of Energy (DOE) offers Business Energy Tax Credits (BETCs) and Residential Energy Tax Credits (RETCs) to Oregon businesses and residents that invest in qualifying energy-efficient appliances and equipment, recycling, renewable energy resources, sustainable buildings, and transportation (e.g., alternative fuels and hybrid vehicles). The BETC is for 35% of the eligible project costs and applies to the incremental cost of the system or equipment that is beyond standard practice. The RETC varies depending on the type of equipment purchased and amount of energy savings. Through 2004, more than 12,000 Oregon energy tax credits worth \$243 million have been awarded. Altogether, these investments save or generate energy worth about \$215 million a year. Business owners who pay taxes for a business site in Oregon are eligible for the tax credit. Oregon nonprofit organizations, tribes, or public entities that partner with an Oregon business are also eligible, as are residents who have an Oregon tax liability. The BETC offers an innovative Pass-Through Option, which allows a project owner to transfer the 35% BETC project eligibility to a pass-through partner for a lump-sum cash payment. The Pass-through Option rate for five-year BETCs is 25.5% and for one-year BETCs (those with eligible costs of \$20,000 or less) is 30.5%.⁶

An analysis of Oregon's Energy Tax Credit programs conducted by ECO Northwest found that the programs had the following net impacts on the Oregon economy in 2003:⁷

- Output in Oregon's economy increased by \$42.5 million
- 182 new jobs were created in Oregon
- Oregon wages increased by \$8.6 million
- Tax revenues for state and local government increased by \$2.7 million
- Oregon commercial and residential energy costs decreased by \$27.9 million

⁶ Also cite Oregon Department of Energy Web site:
EPA Clean Energy-Environment Guide to Action

⁷ Economic Impacts of Oregon Energy Tax Credit Programs (BETC/RETC) Final Report. February 2005
http://www.oregon.gov/ENERGY/CONS/docs/EcoNW_Study.pdf

The study also found that the annual energy savings achieved by the program (\$26.9 million in 2003) will increase Oregon's economic output by \$40 million and add more than 300 new jobs in the state.

(5) South Carolina

South Carolina's sales tax incentive places a \$300 maximum cap on taxes on the sale of manufactured homes that meet specific energy efficiency requirements, including heat-loss level guidelines based on American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) specifications: R-11 for walls, R-19 for floors, and R-30 for ceilings. Normally, after allowing for the exemption and any trade-in, the tax imposed on a sale is \$300 plus 2% of the remaining sales price exceeding \$6,000. However, the 2% may be waived if the mobile home meets the above energy efficiency levels.⁸

B. Renewable Energy and CHP

Forty-one states currently have tax incentive programs designed to encourage renewable energy projects that will enhance state revenues and create jobs. Michigan, for example, uses an alternative energy payroll tax credit to promote economic development, and Massachusetts offers a tax exemption for income from patents that benefit alternative energy or energy conservation. Programs may also be designed to reduce air pollution or other environmental impacts by reducing demand or meeting demand with cleaner energy.

Several states provide tax incentives for CHP. Connecticut, Iowa, Nevada, North Carolina, Oregon, and South Dakota offer property tax credits that apply to CHP systems. Idaho offers a sales tax rebate on CHP equipment, while New Mexico and Utah offer income tax credits for energy production from CHP systems. Iowa, Nevada, New Mexico, and North Carolina limit their tax incentives to biomass projects, while the other states allow a broader range of CHP system designs.^{9,10}

(1) Connecticut

Connecticut allows municipalities to offer property tax exemptions for certain renewable energy systems including cogeneration. To qualify, CHP systems must be installed on or after July 1, 1981, and before October 1, 2006. This exemption is good for 15 years and may be used on residential, commercial, or industrial property.

(2) Idaho

Section 63-3622QQ of Idaho Code provides sales/use tax rebate for qualifying equipment and machinery used to generate electricity from fuel cells, low impact hydro, wind, geothermal resources, biomass, cogeneration, solar or landfill gas that has a capacity of at least 25 kW of electricity. Taxpayers must pay any sales/use tax on purchase. Once a public utility, a

⁸ <http://www.sctax.org/NR/rdonlyres/717E7572-6233-4A56-A328-DB3EC658B5DC/0/pub3.pdf>

⁹ EPA Clean Energy Guide to Action [http://www.epa.gov/](http://www.epa.gov/http://www.epa.gov/cleanenergy/stateandlocal/guidetoaction.htm)
<http://www.epa.gov/cleanenergy/stateandlocal/guidetoaction.htm>

¹⁰ Partner Resources, CHP Partnership web site http://www.epa.gov/chp/funding_opps.htm

cooperative, a municipality, or the public utilities commission certifies that the project will generate at least 25 kW of electricity, the taxpayer may file a refund request with the state tax commission. This program continues through 2011.

(3) Michigan

Michigan's "NextEnergy" economic development legislation was designed to promote the research, development, commercialization, and manufacturing of alternative energy technologies through a combination of tax credits and exemptions. The credits and exemptions are administered by a state authority known as the Michigan Next Energy Authority. Certified businesses that locate in the "NextEnergy Zone" may claim a credit for a qualified payroll amount, as well as a nonrefundable credit for the tax year. As of 2003, the Authority had approved 14 Michigan companies as certified alternative energy technology businesses or having alternative energy related personal property, making them eligible for future Single Business Tax (SBT) credits and/or exemptions from the personal property tax.

(4) New York

New York provides a personal income tax credit for solar PV systems. The credit is for 25% of equipment and installation costs, with qualified expenditures capped at \$6 per watt. Any portion of the system cost that is funded by a grant (from any source) cannot be counted toward the tax credit. New York also provides a 15-year property tax exemption for solar, wind, and biomass systems installed before January 1, 2006.

(5) North Carolina

Under general statute, G. S. 105-129.16A, North Carolina offers a tax credit equal to thirty-five percent of the cost of renewable energy property constructed, purchased, or leased by a taxpayer and placed into service in North Carolina during the taxable year. The credit is subject to various ceilings depending on the renewable energy technology being used and whether the property served is residential or nonresidential. The credit can be taken against franchise tax, income tax, and/or gross premiums tax (for insurance companies), and cannot exceed 50% of the taxpayer's tax liability for the year, minus other credits. The unused portion of the credit may be carried over for the next five succeeding years.

In addition to corporate and personal renewable energy tax credits, North Carolina also offers an industry recruitment incentive for renewable energy equipment manufacturers, a NC GreenPower production incentive, the Tennessee Valley Authority (TVA) -- Green Power Switch Generation Partners Program, a property tax exemption for active solar heating and cooling systems, and an energy improvement loan program (EILP). Other EE/RE programs such as net metering and standardized interconnection rules complement North Carolina's financial incentives.

(6) Ohio

Ohio exempts certain equipment from property taxation, the state's sales and use tax, and the state's franchise tax where applicable. The exemption applies to tangible property used in

replacement of fossil-fuel resources with alternative fuels or technologies, recovery of waste heat or steam, and waste-to-energy projects.

(7) Rhode Island

A sales tax rebate is available for purchases of qualifying renewable energy systems. This tax incentive is complemented by a separate program, the Rhode Island Renewable Energy Fund (a public benefit fund), established by the Rhode Island Utility Restructuring Act of 1996, which is administered by the State Energy Office and funded through a surcharge on electricity bills. The fund offers several incentives for homeowners to install renewable energy systems in their homes, including solar and wind systems.

(8) Washington

Two Washington State Senate Bills offering tax incentives for renewable energy became law in 2005. Under Senate Bill 5101, Washington state utilities offer a renewable energy production incentive for which they are reimbursed with state tax credits. The bill establishes a renewable energy "feed-in" production incentive for homes and businesses with solar PV and wind power systems, which consists of a credit of 15 cents per kWh, up to \$2000 annually. If the project's components are manufactured in Washington, the 15 cent per kWh credit can increase to as much as 54 cents. This rate is available for power generated through June 30, 2014. Senate Bill 5111 provides tax credits for in-state renewable energy businesses, offering higher tax breaks to companies that locate in economically depressed areas. A third bill, Senate Bill 5916, also signed into law in 2005, creates a sales tax exemption for alternative fuel and hybrid cars and trucks purchased during 2009 or 2010.

III. State and Federal Tax Incentives and the Energy Policy Act of 2005

The Energy Policy Act of 2005 (EPAct 2005) includes provisions for about \$14.5 billion in tax incentives, including about \$2.7 billion for energy efficiency and conservation and about \$3.2 billion for renewable energy and clean energy.¹¹ A brief chart and a summary of these tax incentives appear below. For a somewhat less technical description of the tax incentives, see the ENERGY STAR summary chart listed among the resources in Section V. Several other organizations offer more detailed summaries. Section V, Resources, provides links to websites for EPAct 2005 summaries prepared by: the American Council for an Energy-Efficient Economy, the Alliance to Save Energy, the American Wind Energy Association, the Northeast Regional Biomass Program, and the Tax Incentives Assistance Project.

Final tax credit amounts are determined by the IRS. For example, the IRS has published tax credit guidance on energy efficient homes and hybrid automobiles.

¹¹ <http://www.mwalliance.org/energypros/activities/conference/2005/documents/GeorgePhelps.pdf>

Table 1
Key Energy Efficiency and Renewable
Energy Tax Incentives in Title XIII the Energy Policy Act of 2005

Subject	Item	Agency	Funding	Timing	Section
Renewable Production Tax Credit	Wind, solar, geothermal, and closed-loop biomass	FERC	1.9¢/KWh	through 2007	1301
	Landfill gas, cogeneration, and other	FERC	0.9¢/KWh	through 2007	1301
RE Bonds	Allows clean, RE bond issue	Treasury	800 mil	2006-2007	1303
Energy Efficiency Income Tax Credits	Comm. bldg. PV and solar hot water	Treasury, DOE	\$1.80/sf	2006-2007	1331
	EE home credit	Treasury, DOE	\$1,000-\$2,000	2006-2007	1332
	EE home improvements credit	Treasury, DOE	Sum of 10% of improvement plus year's energy expenditures	2006-2007	1333
	EE appliance credit	Treasury, DOE	Based on appliance	2006-?	1334
	Credit for photovoltaic, solar water heating, and fuel cell expenditures in residential bldgs	Treasury, DOE	30%; \$500-\$2,000 max credit	2006-2007	1335
	Credit for installation of fuel cells and microturbines by businesses	Treasury, DOE	\$1,000/kW - fuel cells; \$200/kW - microturbines	2006-2007	1336
	Credit for investment in solar power by businesses	Treasury, DOE	NA	NA	1337
Alternative Motor Vehicle Tax Credit	Alternative motor vehicle credit	Treasury, DOE	Varies with vehicle type	Begins 2006	1341
Alternative Fueling Stations Tax Credit	Credit for installation of alternative fueling stations	Treasury, DOE	Up to \$30,000 if depreciable, \$1,000 if not	Begins 2006	1342
Biodiesel Tax Incentives	Extends excise tax provisions and income tax credit for biodiesel in 26 USC 40A	Treasury, DOE	NA	2006-2008	1344
	Eligible small agri-biodiesel producers receive credit for first 15 mil gallons	Treasury, DOE	10 cents/gal	2006-2008	1345
	Biodiesel provisions also apply to "renewable diesel" from biomass	Treasury, DOE	NA		1346

Note that the renewable energy bonds listed in the chart are a form of public sector power project financing that is outside the scope of this discussion. For more information on clean renewable Energy Bonds, see the summaries at:

<http://www.treasurer.ca.gov/caeatfa/crebs.pdf> and
<http://www.abanet.org/enviro/committees/renewableenergy/teleconarchives/101905/HencksPP T.pdf>.

A. DOE Summary of Available Federal Tax Incentives¹²

(1) Automobile Tax Credits

Individuals and businesses who buy or lease a new hybrid gas-electric car or truck are eligible for, and can receive, an income tax credit of \$250-\$3,400 -- depending on the fuel economy and the weight of the vehicle. Hybrid vehicles that use less gasoline than the average vehicle of similar weight and that meet an emissions standard qualify for the credit. "Lean-burn" diesel vehicles could also qualify, but currently available diesel vehicles do not meet the emissions standard. There is a similar credit for alternative-fuel vehicles and for fuel cell vehicles.

If individuals and businesses buy more than one vehicle, they are eligible to receive a tax credit for each. If a tax-exempt organization buys such a vehicle, the retailer is also eligible to receive another credit. Companies that buy heavy-duty hybrid trucks are also eligible for a larger tax credit. Currently, there is a \$2,000 tax deduction for hybrid vehicles for the remainder of 2005.

This tax credit is available beginning January 1, 2006 and will be phased out for each manufacturer once that company has sold 60,000 eligible vehicles. At that point, the tax credit for each company's vehicles will be gradually reduced over the course of another year.

(2) Home Energy Efficiency Improvement Tax Credits

Consumers who purchase and install specific products, such as energy-efficient windows, insulation, doors, roofs, and heating and cooling equipment in the home can receive a tax credit of up to \$500 beginning in January 2006.

The EPAct also provides a credit equal to 30% of qualifying expenditures for purchase for qualified photovoltaic property and for solar water heating property used exclusively for purposes other than heating swimming pools and hot tubs. The credit shall not exceed \$2,000.

Improvements must be installed in or on the taxpayer's principal residence in the United States. Home improvement tax credits apply for improvements made between January 1, 2006 and December 31, 2007.

(3) Business Tax Credits

Businesses are eligible for tax credits for buying hybrid vehicles, for building energy-efficient buildings, and for improving the energy efficiency of commercial buildings (as outlined in the Energy Policy Act of 2005).

(4) Small Producer Biodiesel and Ethanol Credit

¹²This text is slightly modified (updated) from the DOE summary. See: <http://www.doe.gov/taxbreaks.htm>

This credit will benefit small agri-biodiesel producers by giving them a 10 cent per gallon tax credit for up to 15 million gallons of agri-biodiesel produced. In addition, the limit on production capacity for small ethanol producers increased from 30 million to 60 million gallons. This is effective until the end of 2008.

(5) Credit for Installing Alternative Fuel Refueling Property

Fueling stations are eligible to claim a 30% credit for the cost of installing clean-fuel vehicle refueling equipment, (e.g., E85 ethanol pumping stations). Under the provision, a clean fuel is any fuel that consists of at least 85% ethanol, natural gas, compressed natural gas, liquefied natural gas, liquefied petroleum gas, or hydrogen and any mixture of diesel fuel and biodiesel containing at least 20% biodiesel. This is effective through December 31, 2010.

(6) Credit for Business Installation of Qualified Fuel Cells, Stationary Microturbine Power Plants, and Solar Equipment

This provides a 30% tax credit for the purchase price for installing qualified fuel cell power plants for businesses, a 10% credit for qualifying stationary microturbine power plants, and a 30% credit for qualifying solar energy equipment. This is effective January 1, 2006 through December 31, 2007.

(7) Business Credit for Energy-efficient New Homes

Home builders are eligible for a \$2,000 tax credit for a new home that achieves 50% savings for heating and cooling over the 2004 International Energy Conservation Code (IECC). There is also a \$1,000 tax credit to the producer of a manufactured home achieving 30% energy savings for heating and cooling over the 2004 IECC or a manufactured home meeting the ENERGY STAR requirements. This tax credit applies to homes whose construction is substantially completed after August 8, 2005 and that are acquired after December 31, 2005 and before January 1, 2008, for use as a residence.

(8) Energy-efficient Commercial Building Deduction

This provision allows a tax deduction for energy-efficient commercial buildings that reduce annual energy and power consumption by 50% compared to the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) 2001 standard. The deduction would equal the cost of energy-efficient property installed during construction, with a maximum deduction of \$1.80 per square foot of the building. Additionally, a partial deduction of 60 cents per square foot would be provided for building subsystems.

(9) Energy-efficient Appliances

This provides a tax credit for the manufacturer of energy-efficient dishwashers, clothes washers, and refrigerators. Credits vary depending on the efficiency of the unit. This is effective for appliances manufactured in 2006 and 2007.

B. DOE Study of Interactions among Financial Incentive Programs

To identify key factors that influence effectiveness, NREL sponsored an analysis by North Carolina State University (NCSU) of state financial incentive programs for renewable energy.¹³ The study concluded that tax incentives worked best as a component in a comprehensive approach to creating a sustainable market. Education and outreach, standardized and quick interconnection rules, and combination with other complementary incentives such as net metering and low-interest financing would help to ensure the effectiveness of tax incentives in stimulating the renewable energy market. Partnerships and alliances among program administrators, advocates, equipment dealers and installers, lending institutions, utilities and public utilities commissions, and others with authority over the financing or installation also appeared to be important for success.

The analysis covered tax-credit programs including: the New York Solar Electric-Generating Equipment Tax Credit, North Carolina's Renewable Energy Tax Credit, and Oregon's Business Energy Tax Credit and Residential Energy Tax Credit. The paper also looked into buy-down programs in Florida, Illinois, and New York, and loan programs in Iowa, New York, and Oregon.

The report considered the role of incentives in stimulating and reducing barriers to renewable energy deployment. Key findings included:

- (1) Varying levels of difficulty in connecting renewable energy systems to the utility grid. Utility support and cooperation, particularly in interconnection process, is important to program effectiveness.
- (2) A shortage of qualified installers and inadequate training for building inspectors can discourage consumer interest in renewable energy systems.
- (3) In addition to financial incentives, concerns about environmental issues, dependence on utilities, power reliability and security threats also motivate purchases of renewable energy systems.
- (4) A comprehensive renewable energy education campaign may be needed to increase market acceptance of renewables, as their benefits are still not widely known.
- (5) A set of complementary incentives that could include net metering, low-interest loans, tax credits, property and sales tax exemptions, and/or buy-downs, may increase the market for renewable energy more than a single financial incentive.

¹³ For more information on this analysis of the effectiveness of state tax incentives in FL, IL, IA, NY, NC, and OR, see: Case Studies on the Effectiveness of State Financial Incentives for Renewable Energy. <http://www.nrel.gov/docs/fy02osti/32819.pdf>

An analysis of effectiveness of tax-credit programs in New York, North Carolina, and Oregon found:

- (1) Tax credits were not the primary motivating factor influencing purchasing decisions, but could be an added factor in the final decision.
- (2) It is important to administer a tax credit through the most appropriate agency. A state energy office may be in the best position to coordinate the tax incentive with the design and administration of other energy programs and outreach activities, and may be capable of detailed tracking of program performance data and of fostering partnerships and promotional efforts with industry. These activities might be more difficult if the program were administered, for example, through a revenue department.
- (3) Caps on eligible project costs, low maximum amounts for higher cost technologies, and other credit limitations may reduce the effectiveness of the incentive.
- (4) Some mechanism for guaranteeing performance as designed is necessary. It is not yet clear how various technology and installer requirements impact program effectiveness.
- (5) Mechanisms to allow for non-taxed entities such as schools, nonprofits, and government agencies to partner with businesses that take advantage of tax credits could lead to increased renewable energy resources.

The study concluded that unique socioeconomic, political, climatic, and infrastructure conditions preclude a one-size-fits-all approach. Their recommended principles for incentive programs to incentive programs included:

- (1) Work with other state programs and relevant stakeholder groups to educate the public about renewable energy technologies and to market the incentive program.
- (2) Offer a generous incentive level with stable, long-term funding that decreases over time as the market matures.
- (3) Design an easy and concise application process without compromising quality assurance.
- (4) Establish a consistent but cost-effective quality-assurance mechanism to protect consumers by guaranteeing adequate system performance.
- (5) Incorporate incentives into an overall infrastructure development strategy.
- (6) Develop a coordinated package of incentives.
- (7) Allow flexibility for program modifications.
- (8) Track the details of program use, costs, and energy savings/production to enable program evaluation and improvement.

C. Tax Incentives and Anti-"Double Dipping" Provisions

Various rebates and grants are treated differently as taxable or non-taxable, depending on issues such as whether they are available to residential or commercial entities and whether they are offered by a utility or a government agency. Taxability and anti-"double dipping" provisions have ramifications for the program's overall value to recipients. While the rules vary depending on the particular section of the EAct and the Internal Revenue Code (IRC) involved, several incentives contain "double dipping" clauses that prevent a recipient from receiving more than one type of tax incentive for a given project. For example, under IRC Sections 45 and 48, production tax credit recipients and investment tax credit recipients, respectively, are both subject to anti-"double dipping" rules. Credits can be reduced by up to 50% for projects with construction and acquisition costs that receive tax exempt bond financing, government subsidized energy financing, government grants (whether taxable or not), or other credits. Similarly, Section 168, Accelerated Depreciation, does not allow a depreciation deduction for property acquired with a tax-free grant. For more on tax incentive interactions and anti-"double dipping," see: listings in Section V, Resources, for the Lawrence Berkeley National Lab (LBNL)/Clean Energy States Alliance report, "Exploring the Economic Value of EAct 2005's PV Tax Credits" and the American Bar Association Presentation "Chief Federal Business Tax Incentives for Renewable Energy Projects and the Reduction for State Assistance."

IV. Questions for Discussion

- How can states take advantage of the tax incentives in EAct 2005?
- What are the implications for program design of the short timeframes (2 years) for many of the incentives in EAct 2005?
- How can states design incentives so as to not trigger 'double-dipping' provisions (that prevent a recipient from receiving a federal and state tax credit)?
- What are the primary policy drivers for implementing EE/RE and CHP tax incentives in your state?
- What factors did you consider in developing tax incentives, e.g., interaction with other state and federal incentives programs and utility concerns? Are incentives aligned with ENERGY STAR product specifications and consumer education and outreach campaigns (e.g., Cool Your World)?
- On which market segments and technologies should states focus (i.e., tax incentives for manufacturers, for appliances with EAct credit, or for consumers)? Should states look beyond consumer appliances to other products (e.g., lighting fixtures) that could offer low-cost energy savings?
- Has your state attempted to quantify the actual or potential benefits of providing tax incentives for EE/RE and CHP? (Or, how do we know if a tax incentive program is successful?)

V. Resources

A. State Resources

(1) Arizona

Arizona Solar and Wind Equipment Sales Tax Exemption A.R.S. § 42-5061
<http://www.azsolarcenter.com/benefits/solarsalestax.html>

(2) California

California Revenue and Taxation Code

Energy efficiency personal income tax deduction
<http://www.dsireusa.org/documents/Incentives/CA34F.htm>

(3) Colorado

Colorado Department of Revenue
Alternative Fuel Vehicle Income Tax Credit
<http://www.revenue.state.co.us/fyi/html/income09.html>

(4) Connecticut

Connecticut Sales Tax Holiday
<http://search.cga.state.ct.us/2005/TOB/S/2005SB-02100-R00-SB.htm>

(5) Georgia

Georgia Sales Tax Holiday
http://www.legis.state.ga.us/legis/2005_06/sum/hb559.htm

(6) Idaho

Idaho Renewable Energy Equipment Sales Tax Refund
Section 63-3622QQ of Idaho Code
<http://www.dsireusa.org/documents/Incentives/ID08F.htm>

(7) Maryland

Maryland Income Tax Credit for Green Buildings Chapter 628 (HB 8, 2001)
<http://mlis.state.md.us/2001rs/billfile/hb0008.htm>

(8) Massachusetts

Massachusetts Residential Solar and Efficiency Tax Credit
<http://www.mass.gov/legis/laws/seslaw05/sl050140.htm>

(9) Michigan

Payroll Tax Credit Incentive for Alternative Energy in a NextEnergy Zone
<http://www.michigan.org/medc/cm/attach/F815CBED-04EB-4D6D-98C0-E0634C2536D0/GuidebookJune17.pdf>

(10) Nevada

Nevada Energy Efficiency and Green Buildings AB 3, 2005
http://www.leg.state.nv.us/22ndSpecial/bills/AB/AB3_EN.pdf

(11) New York

New York Green Building Tax Credit Program
<http://www.dec.state.ny.us/website/ppu/grnbldg/>

New York Solar Sales Tax Exemption S.4962-a (2005)
<http://www.dsireusa.org/documents/Incentives/NY24F.htm>

(12) North Carolina

Guidelines For Determining Tax Credit For Investing In Renewable Energy Property

North Carolina Department of Revenue
<http://www.dor.state.nc.us/practitioner/individual/directives/renewableenergyguidelines.html>

NC State Income Tax Credits for Renewable Energy

NC Tax credit Information from the North Carolina Sustainable Energy Association
<http://www.ncsustainableenergy.org/renewable/policy-primer.html>

(13) Ohio

Ohio Office of Energy Efficiency, Ohio Revised Code Section 5709.46
The Conversion Facilities Tax Exemption
<http://www.odod.state.oh.us/cdd/oeec/cife.htm>

(14) Oregon

Oregon Department of Energy BETC and RETC Pass-Through Option rates
<http://egov.oregon.gov/ENERGY/CONS/BUS/BETC.shtml>
<http://egov.oregon.gov/ENERGY/CONS/RES/RETC.shtml>

(15) Rhode Island

Rhode Island State Energy Office
<http://www.riseo.state.ri.us/riref/programs/supplysupport.html>

(16) South Carolina

South Carolina Tax Incentive for Energy Efficient Manufactured Homes
<http://www.sctax.org/NR/rdonlyres/717E7572-6233-4A56-A328-DB3EC658B5DC/0/pub3.pdf>

(17) Washington

Tax Incentives for Renewable Energy
<http://www.eere.energy.gov/news/archive.cfm/pubDate=%7Bd%20'2005-05-11'%7D#9042>

B. Other Resources

(1) Alliance to Save Energy Index of State Energy Efficiency Tax Incentives

<http://www.ase.org/content/article/detail/2607>

(2) Analyzing the Interaction between State Tax Incentives and the Federal Production Tax Credit for Wind Power

This 2002 LBNL/National Conference of State Legislatures (NCSL) paper analyzes the interactions between state and the federal production tax credit for wind power
<http://eetd.lbl.gov/ea/EMS/reports/51465.pdf>

(3) American Council for an Energy-Efficient Economy and Consortium for Energy Efficiency - conference presentations on residential tax credits

<http://www.aceee.org/conf/mt06/mt06program.pdf>

(4) American Council for an Energy-Efficient Economy Summary of Energy Efficiency Tax Incentives in Energy Policy Act of 2005

Table summarizing the key energy efficiency incentives offered under EPAct
http://www.aceee.org/press/Tax_incentive05.pdf

(5) American Wind Energy Association Summary of the Energy Policy Act of 2005

"Plain language" summary and analysis of EPAct provisions that affect the wind industry
http://www.awea.org/aweapriv/AWEA_Summary_of_Energy_Policy_Act.html

(6) Case Studies on the Effectiveness of State Financial Incentives for Renewable Energy

This 2002 NREL/NC State University study reviewed and assessed financial incentives, and offers lessons learned about designing tax incentive programs.
<http://www.nrel.gov/docs/fy02osti/32819.pdf>

(7) Chief Federal Business Tax Incentives for Renewable Energy Projects and the Reduction for State Assistance

Edwin T.C. Ing's presentation summarizing RE incentives tax effects for a 2004 American Bar Association conference call
<http://www.abanet.org/enviro/committees/renewableenergy/teleconarchives/121504/ingppt.pdf>

(8) Clean Energy-Environment Guide to Action

The Guide identifies and describes 16 clean energy policies and strategies that states have used to meet their clean energy objectives.
<http://www.epa.gov/cleanenergy/stateandlocal/guidetoaction.htm>

(9) Database of State Incentives for Renewable Energy (DSIRE)

This regularly updated database includes charts of state personal income tax incentives, production incentives, property tax incentives, rebate programs, and sales tax incentives; buttons on the chart are linked to brief descriptions of state policies.
<http://www.dsireusa.org/summarytables/financial.cfm?&CurrentPageID=7&EE=0&RE=1>

(10) DOE Information on Tax Breaks Available Through the Energy Policy Act

<http://www.doe.gov/taxbreaks.htm>

(11) DOE Energy Efficiency and Renewable Energy (EERE)

Distributed Energy Program Financial Opportunities
<http://www.eere.energy.gov/de/financial.html>

(12) EEI Member and Non-Member Residential/Commercial/Industrial Efficiency and Demand Response Programs for 2005/2006

Utility energy efficiency and demand response programs listed by state
http://www.eei.org/industry_issues/retail_services_and_delivery/wise_energy_use/programs_and_incentives/progs.pdf

(13) ENERGY STAR Tax Credits Web page

This Web site describes tax credits for consumers, including home improvements, cars, solar energy systems and fuel cells; as well as for homebuilders; appliance

manufacturers, and commercial buildings. It also provides a useful chart breaking out all consumer products, and compares the tax credit criteria to the ENERGY STAR criteria.

<http://www.energystar.gov/taxcredits>

(14) Exploring the Economic Value of EAct 2005's PV Tax Credits

A Lawrence Berkeley Lab/Clean Energy States Alliance report that analyses the implications of federal photovoltaic system tax incentives for other state and utility incentive programs along with their real value to purchasers

<http://eetd.lbl.gov/ea/ems/cases>

(15) Funding Opportunities: A Directory of Energy Efficiency, Renewable Energy, and Environmental Protection Assistance Programs

EPA State and Local Capacity Building Branch, February 2006

http://www.epa.gov/cleanenergy/pdf/eere_fun.pdf

(16) Guide to New Federal Tax Credits for Solar Energy

Solar Energy Industries Association (SEIA) tax manual

<http://www.cleandedge.com/story.php?nID=4012>

(17) Internal Revenue Service Press Release on EAct Residential Tax Credits

<http://www.irs.gov/newsroom/article/0,,id=154658,00.html>

(18) Renewable Electricity Production Tax Credit Chart

Compiled by the Northeast Regional Biomass Program, August 2005

http://www.nrbp.org/pdfs/energy_policy_act_2005.pdf

(19) Residential/Commercial/Industrial Efficiency and Demand Response Programs for 2005/2006 (Edison Electric Institute)

http://www.eei.org/industry_issues/retail_services_and_delivery/wise_energy_use/programs_and_incentives/progs.pdf

(20) Tax Incentives Assistance Project (TIAP)

Information on federal income tax incentives for energy efficient products and technologies under EAct from a coalition of public interest nonprofit groups, government agencies, and other organizations

<http://www.energytaxincentives.org/tiap-about-us.html>

(21) US EPA Combined Heat and Power Partnership: Funding and Regulatory/Rates Opportunities

Chart including tax incentives for CHP
http://www.epa.gov/chp/funding_opps-chp.htm

(22) Economic Impacts of Oregon Energy Tax Credit Programs

ECO Northwest Study
http://www.oregon.gov/ENERGY/CONS/docs/EcoNW_Study.pdf

Appendix A
State Energy Efficiency and Renewable Energy Tax Incentives¹⁴

State	Property Tax	Sales Tax	Corporate Tax	Personal Tax	Energy Efficiency Tax Incentives
Alabama				Wood-Burning Heating System Deduction	
Arizona		Solar and Wind Equipment Sales Tax Exemption		<ul style="list-style-type: none"> • Qualifying Wood Stove Deduction • Solar and Wind Energy Systems Credit 	Income Tax Subtraction for Energy Efficient Residences
California	Property Tax Exemption for Solar Systems			Tax Deduction for Interest on Loans for Energy Efficiency	Tax Deduction for Interest on Loans for Energy Efficiency
Connecticut	Local Option for Property Tax				Residential Weatherization Product Sales Tax Exemption
Florida		Solar Energy Equipment Exemption			
Hawaii			Corporate Solar and Wind Energy Credit	Residential Solar and Wind Energy Credit	
Idaho		Renewable Energy Equipment Sales Tax Refund		Solar, Wind, and Geothermal Deduction	Insulation Income Tax Deduction

(cont.)

¹⁴ This table is based on listings in the Database of State Incentives for Renewable Energy (DSIRE). The database provides offers more detailed summaries of these incentive programs as well as websites and other contact information. See: <http://www.dsireusa.org>.

Appendix A
State Energy Efficiency and Renewable Energy Tax Incentives (cont.)

State	Property Tax	Sales Tax	Corporate Tax	Personal Tax	Energy Efficiency Tax Incentives
Illinois	Special Assessment for Renewable Energy Systems				
Indiana	Renewable Energy Systems Exemption				
Iowa	<ul style="list-style-type: none"> • Local Option Special Assessment of Wind Energy Devices • Methane Gas Conversion Property Tax Exemption • Property Tax Exemption for Renewable Energy Systems 	Wind Energy Equipment Exemption	Renewable Energy Production Tax Credits (Corporate)	Renewable Energy Production Tax Credit (Personal)	
Kansas	Renewable Energy Property Tax Exemption				
Louisiana	Solar Energy System Exemption				
Maryland	<ul style="list-style-type: none"> • Local Option - Corporate Property Tax Credit • Special Property Assessment 	Wood Heating Fuel Exemption	Corporate Income Tax Credit for Green Buildings	Personal Income Tax Credit for Green Buildings	

(cont.)

Appendix A
State Energy Efficiency and Renewable Energy Tax Incentives (cont.)

State	Property Tax	Sales Tax	Corporate Tax	Personal Tax	Energy Efficiency Tax Incentives
Massachusetts	Local Property Tax Exemption	Renewable Energy Equipment Sales Tax Exemption	<ul style="list-style-type: none"> • Alternative Energy and Energy Conservation Patent Exemption (Corporate) • Residential Solar and Efficiency Tax Credit - Corporate • Solar and Wind Energy System Excise Tax Deduction • Solar and Wind Power Systems Excise Tax Exemption 	<ul style="list-style-type: none"> • Alternative Energy and Energy Conservation Patent Exemption (Personal) • Renewable Energy State Income Tax Credit • Residential Solar and Efficiency Tax Credit - Personal 	<ul style="list-style-type: none"> • Alternative Energy and Energy Conservation Patent Exemption (Personal) • Residential Solar and Efficiency Tax Credit - Personal
Michigan	Alternative-Energy Personal Property Tax Exemption				
Minnesota	Wind and Solar-Electric (PV) Systems Exemption	<ul style="list-style-type: none"> • Solar Sales Tax Exemption • Wind Sales Tax Exemption 			
Missouri			Wood Energy Production Credit		

(cont.)

Appendix A
State Energy Efficiency and Renewable Energy Tax Incentives (cont.)

State	Property Tax	Sales Tax	Corporate Tax	Personal Tax	Energy Efficiency Tax Incentives
Montana	<ul style="list-style-type: none"> Corporate Property Tax Reduction for New/Expanded Generating Facilities Generation Facility Corporate Tax Exemption Renewable Energy Systems Exemption 		Alternative Energy Investment Corporate Tax Credit	<ul style="list-style-type: none"> Residential Alternative Energy System Tax Credit Residential Geothermal Systems Credit 	<ul style="list-style-type: none"> Deduction For Energy-Conserving Investment Energy Conservation Installation Credit
Nevada	<ul style="list-style-type: none"> Property Tax Abatement for Green Buildings Renewable Energy Producers Property Tax Abatement Renewable Energy Systems Property Tax Exemption 	Renewable Energy/Solar Sales Tax Exemption			
New Hampshire	Local Option Property Tax Exemption for Renewable Energy				
New Jersey		Solar and Wind Energy Systems Exemption			

(cont.)

**Appendix A
State Energy Efficiency and Renewable Energy Tax Incentives (cont.)**

State	Property Tax	Sales Tax	Corporate Tax	Personal Tax	Energy Efficiency Tax Incentives
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New Mexico		Biomass Equipment & Materials Deduction	Renewable Energy Production Tax Credit		
New York	Solar, Wind & Biomass Energy Systems Exemption	Solar Sales Tax Exemption	Green Building Tax Credit Program - Corporate	<ul style="list-style-type: none"> Green Building Tax Credit Program - Personal Solar and Fuel Cell Tax Credit 	
North Carolina	Active Solar Heating and Cooling Systems Exemption		Renewable Energy Tax Credit - Corporate	Renewable Energy Tax Credit - Personal	
North Dakota	<ul style="list-style-type: none"> Geothermal, Solar, and Wind Property Exemption Large Wind Property Tax Reduction 	Hydrogen and Large Wind Sales Tax Exemption	Geothermal, Solar, and Wind Corporate Credit	Geothermal, Solar and Wind Personal Credit	
Ohio	Conversion Facilities Property Tax Exemption	Conversion Facilities Sales Tax Exemption	Conversion Facilities Corporate Tax Exemption		

(cont.)

**Appendix A
State Energy Efficiency and Renewable Energy Tax Incentives (cont.)**

State	Property Tax	Sales Tax	Corporate Tax	Personal Tax	Energy Efficiency Tax Incentives
Oklahoma			<ul style="list-style-type: none"> Zero-Emission Facilities Production 	Energy Efficient Residential Construction Tax Credit	

			Tax Credit		
			<ul style="list-style-type: none"> Tax Credit for Manufacturers of Small Wind Turbines 		
Oregon	Renewable Energy Systems Exemption		Business Energy Tax Credit	Residential Energy Tax Credit	
Puerto Rico		Excise Tax Exemption for Farming Businesses		Tax Deduction for Solar and Wind Energy Equipment	
Rhode Island	Solar Property Tax Exemption	Renewable Energy Sales Tax Exemption		Residential Renewable Energy Tax Credit	
South Carolina					Sales Tax Reduction on Energy Efficiency in Manufactured Homes
South Dakota	<ul style="list-style-type: none"> Renewable Energy Systems Exemption Wind Energy Property Tax Exemption 				
Tennessee	Wind Energy Systems Exemption				

(cont.)

Appendix A
State Energy Efficiency and Renewable Energy Tax Incentives (cont.)

State	Property Tax	Sales Tax	Corporate Tax	Personal Tax	Energy Efficiency Tax Incentives
Texas	Renewable Energy Systems Property Tax Exemption		<ul style="list-style-type: none"> Solar Energy Device Franchise Tax Deduction Solar Energy Business 		

			Franchise Tax Exemption		
Utah		Renewable Energy Sales Tax Exemption	Renewable Energy Systems Tax Credit - Corporate	Renewable Energy Systems Tax Credit - Personal	
Vermont		Sales Tax Exemption			
Virginia	Local Option Property Tax Exemption for Solar				
Washington		Sales and Use Tax Exemption	Tax Abatement for Solar Manufacturers		
West Virginia	Special Assessment for Wind Energy Systems		Tax Exemption for Wind Energy Generation		
Wisconsin	Solar and Wind Energy Equipment Exemption				
Wyoming		Renewable Energy Sales Tax Exemption			

(cont.)

**Appendix B
Federal Energy Efficiency and Renewable Energy Tax Incentives**

State	Property Tax	Sales Tax	Corporate Tax	Personal Tax	Energy Efficiency Tax Incentives
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Federal			<ul style="list-style-type: none"> • Business Energy Tax Credit • Modified Accelerated Cost-Recovery System (MACRS) • Renewable Electricity Production Tax Credit • Residential Energy Conservation Subsidy Exclusion (Corporate) 	<ul style="list-style-type: none"> • Residential Energy Conservation Subsidy Exclusion (Personal) • Residential Energy Efficiency Tax Credit • Residential Solar and Fuel Cell Tax Credit 	<ul style="list-style-type: none"> • Energy Efficient Commercial Buildings Tax Deduction • New Energy-Efficient Home Tax Credit for Builders • Energy Efficient Appliance Tax Credit for Manufacturers
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