



Distributed Generation Incentives for Colorado Consumers

Staff Report - Appendices

**House Bill 07-1228
Docket 07M-230E**

17 December 2007

Colorado Public Utilities Commission
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Denver, CO 80202

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Appendix A

House Bill 07-1228

NOTE: This bill has been prepared for the signature of the appropriate legislative officers and the Governor. To determine whether the Governor has signed the bill or taken other action on it, please consult the legislative status sheet, the legislative history, or the Session Laws.

An Act

HOUSE BILL 07-1228

BY REPRESENTATIVE(S) Gardner C., Balmer, Butcher, Curry, Frangas, Gibbs, Hicks, Kerr J., Labuda, Levy, Madden, Marshall, Rose, Solano, Sonnenberg, Stafford, and Summers;
also SENATOR(S) Shaffer, and Schwartz.

CONCERNING RENEWABLE ENERGY, AND, IN CONNECTION THEREWITH,
REQUIRING THE PETROLEUM STORAGE TANK COMMITTEE TO
ESTABLISH POLICIES REGARDING ABOVEGROUND STORAGE OF
RENEWABLE FUELS, AND MAKING AN APPROPRIATION.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. 24-30-1104 (2) (c) (II), Colorado Revised Statutes, is amended to read:

24-30-1104. Central services functions of the department - definitions - repeal. (2) In addition to the county-specific functions set forth in subsection (1) of this section, the department of personnel shall take such steps as are necessary to fully implement a central state motor vehicle fleet system by January 1, 1993. The provisions of the motor vehicle fleet system created pursuant to this subsection (2) shall apply to the executive branch of the state of Colorado, its departments, its institutions, and its agencies; except that the governing board of each institution of higher

Capital letters indicate new material added to existing statutes; dashes through words indicate deletions from existing statutes and such material not part of act.

education, by formal action of the board, and the Colorado commission on higher education, by formal action of the commission, may elect to be exempt from the provisions of this subsection (2) and may obtain a motor vehicle fleet system independent of the state motor vehicle fleet system. Under the direction of the executive director, the department of personnel shall perform the following functions pertaining to the motor vehicle fleet system throughout the state:

(c) (II) By ~~July 1, 2010~~ JANUARY 1, 2008, the executive director shall adopt a policy ~~that at least ten percent of all state-owned bi-fueled vehicles should be fueled exclusively with an alternative fuel~~ TO SIGNIFICANTLY INCREASE THE UTILIZATION OF ALTERNATIVE FUELS AND THAT ESTABLISHES INCREASING UTILIZATION OBJECTIVES FOR EACH FOLLOWING YEAR. To encourage compliance with this policy, ~~for one or more state fiscal years commencing before July 1, 2010~~, the rules promulgated pursuant to this paragraph (c) may establish progressively more stringent percentage mileposts and shall, for fiscal years commencing after July 1, 2004, require the collection of data concerning the annual percentage of state-owned bi-fueled vehicles that were fueled exclusively with an alternative fuel. BEGINNING JANUARY 1, 2008, THE EXECUTIVE DIRECTOR SHALL PURCHASE FLEXIBLE FUEL VEHICLES OR HYBRID VEHICLES, SUBJECT TO AVAILABILITY, UNLESS THE INCREASED COST OF SUCH VEHICLE IS MORE THAN TEN PERCENT OVER THE COST OF A COMPARABLE NONFLEXIBLE FUEL VEHICLE. THE EXECUTIVE DIRECTOR SHALL ADOPT A POLICY TO ALLOW SOME VEHICLES TO BE EXEMPTED FROM THIS REQUIREMENT. AS USED IN THIS SUBPARAGRAPH (II):

(A) "FLEXIBLE FUEL VEHICLE" MEANS ANY DEDICATED FLEXIBLE-FUEL OR DUAL-FUEL VEHICLE DESIGNED TO OPERATE ON AT LEAST ONE ALTERNATIVE FUEL.

(B) "HYBRID VEHICLE" HAS THE MEANING ESTABLISHED IN SECTION 39-22-516 (2.5) (a) (II.5), C.R.S.

SECTION 2. 8-20-201 (1), (1.1), and (1.2), Colorado Revised Statutes, are amended, and the said 8-20-201 is further amended BY THE ADDITION OF THE FOLLOWING NEW SUBSECTIONS, to read:

8-20-201. Definitions. As used in this part 2, unless the context otherwise requires:

~~(1) "Antiknock index" or "AKI" means the arithmetic average of the research octane number (RON) and motor octane number (MON): $AKI = (RON+MON)/2$. This value is called by a variety of names in addition to antiknock index including: Octane rating, posted octane, and (R+M)/2 octane~~ "ALTERNATIVE FUEL" MEANS A MOTOR FUEL THAT COMBINES PETROLEUM-BASED FUEL PRODUCTS WITH RENEWABLE FUELS.

~~(1.1) "ASTM" means ASTM international, formerly known as the American society for testing and materials. "ANTIKNOCK INDEX" OR "AKI" MEANS THE ARITHMETIC AVERAGE OF THE RESEARCH OCTANE NUMBER (RON) AND MOTOR OCTANE NUMBER (MON): $AKI = (RON+MON)/2$. THIS VALUE IS CALLED BY A VARIETY OF NAMES IN ADDITION TO ANTIKNOCK INDEX INCLUDING: OCTANE RATING, POSTED OCTANE, AND (R+M)/2 OCTANE.~~

~~(1.2) "British thermal unit" or "BTU" means a scientific unit of measurement equal to the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at approximately sixty degrees Fahrenheit. "ASTM" MEANS ASTM INTERNATIONAL, FORMERLY KNOWN AS THE AMERICAN SOCIETY FOR TESTING AND MATERIALS.~~

~~(1.3) "BRITISH THERMAL UNIT" OR "BTU" MEANS A SCIENTIFIC UNIT OF MEASUREMENT EQUAL TO THE QUANTITY OF HEAT REQUIRED TO RAISE THE TEMPERATURE OF ONE POUND OF WATER ONE DEGREE FAHRENHEIT AT APPROXIMATELY SIXTY DEGREES FAHRENHEIT.~~

~~(8.5) "RENEWABLE FUEL" MEANS A MOTOR VEHICLE FUEL THAT IS PRODUCED FROM PLANT OR ANIMAL PRODUCTS OR WASTES, AS OPPOSED TO FOSSIL FUEL SOURCES.~~

SECTION 3. 8-20.5-101, Colorado Revised Statutes, is amended BY THE ADDITION OF THE FOLLOWING NEW SUBSECTIONS to read:

8-20.5-101. Definitions. As used in this article, unless the context otherwise requires:

(2.5) "ALTERNATIVE FUEL" MEANS A MOTOR FUEL THAT COMBINES PETROLEUM-BASED FUEL PRODUCTS WITH RENEWABLE FUELS.

(14.5) "RENEWABLE FUEL" MEANS A MOTOR VEHICLE FUEL THAT IS PRODUCED FROM PLANT OR ANIMAL PRODUCTS OR WASTES, AS OPPOSED TO FOSSIL FUEL SOURCES.

SECTION 4. 8-20.5-101 (13), Colorado Revised Statutes, is amended to read:

8-20.5-101. Definitions. As used in this article, unless the context otherwise requires:

(13) "Regulated substance" means:

(a) Any substance defined in section 101 (14) of the federal "Comprehensive Environmental Response, Compensation, and Liability Act of 1980", as amended, but not including any substance regulated as a hazardous waste under subtitle (C) of the federal "Resource Conservation and Recovery Act of 1976", as amended; ~~or~~

(b) Petroleum, including crude oil, and crude oil or any fraction thereof that is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute);

(c) ALTERNATIVE FUEL; OR

(d) RENEWABLE FUEL.

SECTION 5. 8-20.5-202, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW SUBSECTION to read:

8-20.5-202. Duties of the director of the division of oil and public safety. (1.7) WITHIN ONE HUNDRED TWENTY DAYS AFTER JANUARY 1, 2008, THE DIRECTOR OF THE DIVISION OF OIL AND PUBLIC SAFETY SHALL PROMULGATE, AND THE DIVISION SHALL ENFORCE, RULES CONCERNING THE PLACEMENT OF UNDERGROUND STORAGE TANKS THAT CONTAIN RENEWABLE FUELS. SUCH RULES SHALL BE PROMULGATED WITH THE PURPOSE OF DEVELOPING A UNIFORM STATEWIDE STANDARD OF ISSUING PERMITS FOR UNDERGROUND STORAGE TANKS TO PROMOTE THE USE OF RENEWABLE FUELS SO THAT THE PROCESS OF OBTAINING A PERMIT FOR AN UNDERGROUND STORAGE TANK THAT CONTAINS RENEWABLE FUELS MAY BE MORE EFFICIENT AND AFFORDABLE.

SECTION 6. 8-20.5-302, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW SUBSECTION to read:

8-20.5-302. Duties of the director of the division of oil and public safety. (3) WITHIN ONE HUNDRED TWENTY DAYS AFTER JANUARY 1, 2008, THE DIRECTOR OF THE DIVISION OF OIL AND PUBLIC SAFETY SHALL PROMULGATE, AND THE DIVISION SHALL ENFORCE, RULES CONCERNING THE PLACEMENT OF ABOVEGROUND STORAGE TANKS THAT CONTAIN RENEWABLE FUELS. SUCH RULES SHALL BE PROMULGATED WITH THE PURPOSE OF DEVELOPING A UNIFORM STATEWIDE STANDARD OF ISSUING PERMITS FOR ABOVEGROUND STORAGE TANKS TO PROMOTE THE USE OF RENEWABLE FUELS SO THAT THE PROCESS OF OBTAINING A PERMIT FOR AN ABOVEGROUND STORAGE TANK THAT CONTAINS RENEWABLE FUELS MAY BE MORE EFFICIENT AND AFFORDABLE.

SECTION 7. Article 2 of title 40, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW SECTION to read:

40-2-109.5. Incentives for distributed generation - definition.

(1) THE COMMISSION SHALL DEVELOP A POLICY TO ESTABLISH INCENTIVES FOR CONSUMERS WHO PRODUCE DISTRIBUTED GENERATION, INCLUDING, BUT NOT LIMITED TO SMALL WIND TURBINES, THERMAL BIOMASS, ELECTRIC BIOMASS, AND SOLAR THERMAL ENERGY. THE COMMISSION SHALL CONSIDER WHETHER A CREDIT PROGRAM SIMILAR TO THE RENEWABLE ENERGY STANDARD SET FORTH IN SECTION 40-2-124 WOULD WORK FOR CONSUMERS WHO PRODUCE DISTRIBUTED GENERATION. THE COMMISSION SHALL PRESENT THE POLICY AND FINDINGS REGARDING A CREDIT PROGRAM TO THE HOUSE OF REPRESENTATIVES TRANSPORTATION AND ENERGY COMMITTEE AND THE SENATE AGRICULTURE, NATURAL RESOURCES, AND ENERGY COMMITTEE, OR THEIR SUCCESSOR COMMITTEES.

(2) AS USED IN THIS SECTION, "DISTRIBUTED GENERATION" MEANS A SYSTEM BY WHICH A CONSUMER GENERATES HEAT OR ELECTRICITY USING RENEWABLE ENERGY RESOURCES FOR HIS OR HER OWN NEEDS AND MAY ALSO SEND SURPLUS ELECTRICAL POWER BACK INTO THE POWER GRID.

SECTION 8. Appropriation - adjustments to the 2007 long bill.

(1) In addition to any other appropriation, there is hereby appropriated, out of any moneys in the general fund not otherwise appropriated, to the department of regulatory agencies, for allocation to the public utilities

commission, for the fiscal year beginning July 1, 2007, the sum of eight thousand four hundred five dollars (\$8,405) and 0.1 FTE, or so much thereof as may be necessary, for the implementation of this act.

(2) In addition to any other appropriation, there is hereby appropriated, out of any moneys in the petroleum storage tank fund created in section 8-20.5-103, Colorado Revised Statutes, not otherwise appropriated, to the department of labor and employment, for allocation to the division of oil and public safety, for the fiscal year beginning July 1, 2007, the sum of thirty-five thousand six hundred thirty-five dollars (\$35,635) and 0.5 FTE, or so much thereof as may be necessary, for the implementation of this act.

(3) In addition to any other appropriation, there is hereby appropriated to the department of law, for the fiscal year beginning July 1, 2007, the sum of one thousand six hundred twenty-five dollars (\$1,625), or so much thereof as may be necessary, for the provision of legal services to the department of labor and employment related to the implementation of this act. Said sum shall be from cash funds exempt received from the department of labor and employment out of the appropriation made in subsection (2) of this section.

(4) For the implementation of this act, the appropriation made in section 21 of the annual general appropriation act for the fiscal year beginning July 1, 2007, shall be adjusted as follows: The general fund appropriation to the controlled maintenance trust fund is decreased by eight thousand four hundred five dollars (\$8,405).

SECTION 9. Safety clause. The general assembly hereby finds,

determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.

Andrew Romanoff
SPEAKER OF THE HOUSE
OF REPRESENTATIVES

Joan Fitz-Gerald
PRESIDENT OF
THE SENATE

Marilyn Eddins
CHIEF CLERK OF THE HOUSE
OF REPRESENTATIVES

Karen Goldman
SECRETARY OF
THE SENATE

APPROVED _____

Bill Ritter, Jr.
GOVERNOR OF THE STATE OF COLORADO

Appendix B

Summary of Research into Other States' Incentive Programs

House Bill 07-1228

**Report on Incentives Included in the
Renewable Energy Portfolio Standards
Of the Various States**

And

Recommendations Regarding

**The Ability of a REC Program to Work for a New Class of
Distributed Generators
In Colorado**

Report to the Colorado Public Utilities Commission
Regarding House Bill 07-1228
June 29, 2007

Introduction and Background

House Bill 07-1228, sponsored by Representative Cory Gardner (R) [rural northeast counties] and Senator Brandon Shaffer (D) [Boulder County], was introduced on February 1st and assigned to the House Committee on Transportation and Energy and to the House Committee on Appropriations. The Bill as originally introduced amended the PUC statute by the addition of a new section 40-2-109.5, requiring the Commission to promulgate rules to establish a BTU Renewable Energy Credit (REC) program. This program would have provided for the conversion of BTUs produced from renewable energy resources (including biomass thermal and geothermal space heating and process heating) to RECs that could be sold to Utilities.¹ As introduced the Bill drew opposition from Wind and Solar electric producers because the new RECs would have diminished the value of RECs that their technologies could produce.

The bill was significantly amended in Committee. The section of the Bill applying to the PUC requirements did not change after it left Committee and the Bill was passed (with 16 House cosponsors and one Senate cosponsor) and signed into Law² on June 1, 2007. The new law amended Article 2 of Title 40 by the addition of a new section 40-2-109.5 C.R.S.. That new Section requires the PUC to:

- 1) Develop a policy to establish incentives for consumers who produce Distributed Generation (DG);
- 2) Consider whether a credit program similar to the REC program of 40-2-124, et seq. C.R.S., would “work”³ for consumers who produce DG; and
- 3) Present the policy and findings regarding the REC program to the House Committee on Transportation and Energy, and the Senate Agriculture, Natural Resources, and Energy Committee.

No specific due date or deadline was specified in the law.

¹ Included with this report is the Bill as introduced, signup sheet at House Committee Hearing, Bios of the Bill advocates, etc.

² See attached Section 7 of HB07-1228.

³ Used in the statute, 40-2-109.5(1).

The Devil is in the Details or in this case the Definitions

As an aid to the Commission in considering the scope of these tasks, an analysis of the definitions of the terms used is necessary.

First is the term "Distributed Generation." (DG)

This term historically meant any sort of electric generation at a customer site. These sort of installations included things like a natural gas fired micro-turbine, a reciprocating gas engine, a photovoltaic array, a combined heat and power production system, or a fuel cell system. Often the DG was installed because of the consumer's need for an uninterrupted power supply.

House Bill 07-1228 uses a different definition. **DG now is defined to mean any system by which a consumer generates Heat or Electricity using Renewable Energy Resources** for their own needs and **MAY** send surplus electrical power back into the power grid. Specific DG examples cited in the Law are small wind turbines, thermal biomass, electric biomass, and thermal energy.

The second defined term is Renewable Energy Resource: [40-2-124(1)(a) C.R.S.]

"**RENEWABLE ENERGY RESOURCES**" means solar, wind, geothermal, biomass, new hydroelectricity with a nameplate rating of ten megawatts or less, and hydroelectricity in existence on January 1, 2005, with a nameplate rating of thirty megawatts or less. The commission shall determine, following an evidentiary hearing, the extent to which such electric generation technologies utilized in an optional pricing program may be used to comply with this standard. A fuel cell using hydrogen derived from an eligible energy resource is also an eligible electric generation technology. Fossil and nuclear fuels and their derivatives are not eligible energy resources. For purposes of this section:

- (I) "Biomass" means:
 - (A) Nontoxic plant matter consisting of agricultural crops or their byproducts, urban wood waste, mill residue, slash, or brush;
 - (B) Animal wastes and products of animal wastes; or
 - (C) Methane produced at landfills or as a by-product of the treatment of wastewater residuals.

What's New and What does it Mean?

RECs are not new and are a part of existing law, Commission Rule and Utility practice in Colorado. What is added to be included in a policy of incentives and studied for inclusion in a REC program are non-electricity producing systems. For the first time in Colorado, and in the

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nation, standalone THERMAL systems are to be included as part of a State's RPS. Thermal energy means the production of British Thermal Units (BTUs). "Thermal Energy Systems" is a very broad and inclusive term, and is limited in this investigation only by the requirement that the source of energy be from a renewable source and used by a consumer at their site. Electricity is easily metered and a corresponding created REC can be audited. Thermal systems are completely different and add multiple layers of complexity including certification, measurement of output, and administrative cost.

It appears the intent of the new law was to specifically include sources like:

1. Geothermal: not only classic sources like hot springs, but also ground-loop heat pumps (aka geothermal linked heat pumps);
2. Solar hot water systems: domestic hot water, general heating; [and since the sun heats the air possibly even standard heat pumps];
3. Stoves that burn wood pellets made from beetle kill pine trees;
4. Thermal heat producing systems using any raw or processed plant-derived organic matter available on a renewable basis, including, but not limited to, dedicated energy crops and trees; agricultural food and feed crops; agricultural crop wastes and residues; wood wastes and residues, including landscape waste, right-of-way tree trimmings, or small-diameter forest thinnings that are twelve inches in diameter or less; dead and downed forest products; aquatic plants; nonnative phreatophytes; animal wastes; other vegetative waste materials; nonhazardous plant matter waste material that is segregated from other waste; forest-related resources, such as harvesting and mill residue, pre-commercial thinnings, slash, and brush; miscellaneous waste, such as waste pallets, crates, and dunnage; and recycled paper fibers that are no longer suitable for recycled paper production, but not including painted, treated, or pressurized wood, wood contaminated with plastics or metals, tires, or recyclable post-consumer waste paper.

From an analysis of the Bill advocates, it would appear that thermal biomass technologies were to be specifically targeted as a beneficiary of this change.

Commission Action To Date

On June 15th the Commission opened Miscellaneous Docket No. 07M-230E by Decision No. C07-0514 to fulfill the requirements of House Bill 07-1228's new Section 40-2-109.5. The decision set due dates for opening comments (July 6, 2007) and reply comments (July 20, 2007). The decision also announced that Staff of the Commission will conduct a workshop to present and receive additional comments on this matter, and that the workshop would be scheduled by the Director of the Commission at a time and location to be determined.

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Analysis of Possible Incentives

The following is a somewhat inclusive list of possible incentives derived from the practices in other states that the Commission might consider:

1. Set aside of certain percentage of annual Renewable Portfolio Standard for **DG**.
 - a. Include specific technologies that offset electricity production from conventional fuel sources.
 - b. Include standalone thermal energy systems (or technologies).
2. State-wide mandatory Load Serving Entity (LSE) participation.
3. Coordinate Incentive Policy with SB07-145 (which allowed local incentives):
 - a. Local Grants
 - b. Local Property tax Credits & Sales Tax Credits
4. State Grants for specific technologies
5. True Net Metering [State-wide]
6. Power Source Disclosure (generation mix) to customers
7. Public Interest Energy Research Programs/Grants
8. Supplemental Energy Payments - Valuing Externalities of **DG**
 - a. Externalities charge applied to consumer's bill
 - b. use of **DG** Trust [Administration] to make payments to producers
9. Rulemaking for Interconnection Standards
 - a. Size limitation for % of a individual feeder total of an LSE; or
 - b. Size limitation based upon the Total size of the LSE
 - c. Review/Waiver process for feeder review
10. Waive Stand-by Tariff Rates
11. Grant RECs for cofired Biomass fuel
12. Property Tax Rebates
13. Income Tax Rebates
14. Income Tax Deduction for Interest on Loans for **DG** facility construction
15. Waiver of Sales Taxes
16. Certification of Equipment and Certification of Installers
17. Establish by Commission Order that excess generation from a Net Metered DG produces a REC that belongs to the DG.

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18. Include **DG** in Demand Side Management programs
 - a. Gas &
 - b. Electric
19. Include **DG** in Energy Conservation Programs
20. Include Generation offset technology⁴ systems in the current REC Program

Incentive Programs across the United States

Attached are descriptive maps of the United States depicting which states have the following kinds of renewable incentives:

1. Renewable Portfolio Standards
2. Generation Disclosure Rules
3. Rebate programs for Renewable Energy Technologies
4. Local Property Tax Exemptions for Renewables
5. Public Benefit Funds for Renewables
6. Net Metering
7. Loan Programs
8. Solar Contractor Licensing Requirements
9. Grants for Renewable energy Technologies
10. Solar Energy Equipment Certification Requirements
11. State Sales Tax Exemptions
12. State Tax Credits & Deductions
13. Solar/DG Provisions in RPS Policies

In summary, 27 states have a Renewable Portfolio Standard of varying form.⁵ Three States, Washington, Arizona, and New York have specific RPS provisions regarding Distributed Generation (or customer-sited).

1. Arizona: Distributed Renewable Energy Resources are application of technologies that are located at a customer's premises and that displace conventional energy resources that would have otherwise been used to provide electricity.⁶
2. New York: The RPS encourages self-generation by establishing a customer sited tier.⁷

⁴ Generation offset technology is any renewable technology that reduces the demand for electricity at a site where a customer consumes electricity, such as solar water heating and ground-source geothermal heat pumps.

⁵ Included with this report are Summaries of the RPS of 12 germane states.

⁶ Arizona R14-2-1802(B), Docket No. RE-00000C-05-003, Decision No. 69127.

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3. Washington: DG facilities (Smaller than 5 megawatts in size) using eligible resources may count as double toward the annual requirement.

Seven states specify that solar water heating or solar thermal energy is eligible as part of the RPS.

1. Arizona: Qualifying solar thermal energy systems must displace conventional energy resources that would have otherwise been used to provide electricity.
2. Illinois: The Illinois Commerce Commission adopted a Resolution establishing a Renewable Energy Goal. It stated that 25% of the renewable goal should come from non-wind sources like solar thermal energy. The goal is unenforceable.
3. New Hampshire: Class I renewable includes the equivalent displacement of electricity, as determined by the commission, by end-use customers, from solar hot water heating systems used instead of electric hot water heating.
4. Nevada: Qualifying solar thermal energy systems must reduce the consumption of electricity.
5. Pennsylvania: Solar thermal energy is an eligible source for producing electricity.
6. Texas: Generation-offset, off-grid, or on-site distributed renewable facilities are eligible for the REC system if they otherwise meet the requirements of the RPS. Generation offset technology is any renewable technology that reduces the demand for electricity at a site where a customer consumes electricity, such as solar water heating and ground-source geothermal heat pumps.
7. Vermont: The renewable energy standard is set as incremental load growth through 2012. Solar water heating is not explicitly included, but offsetting electricity demand with this technology would help meet the goal.

Conclusion

No State defines Distributed Generation as does Section 7 of House Bill 07-1228. When solar thermal or other forms of heat are referenced in other state programs it is either associated with the production of electricity or in terms of off-setting the generation of electricity from conventional fueled sources.

⁷ The New York incremental RPS requirement is comprised of 98 percent main tier resources and two percent customer sited resources.

Recommendations Regarding a REC Program for DG

The language of Section 7 of HB07-1228 regarding what the Commission is to consider is vague. The use of the word “work” is problematic when referring to a REC program. Considering whether a credit program like the REC program in 40-2-124 C.R.S. will function is not a question at all because given a willingness to accept any level of administrative overhead cost, such a program can be made to function. Several of the states recognizing solar thermal as an offset to electricity generation already allow RECs for this production. The experience is somewhat small but the use of third party aggregators to market the solar RECs seems to function in New Jersey.⁸ The bureaucratic administration of a thermal REC program is not an insurmountable obstacle.

What really must be considered by the Commission is: What are the policy goals that are trying to be achieved by this piece of legislation? And then the Commission can consider whether a REC like program would achieve those goals.

The Bill seems to imply the following two new policy goals be considered:

1. Customer-sited electric generation from renewable energy sources should be promoted. [The assumption here is that there is some MW size limit per site.] A specific amount of MWs or percent may be assumed to be a part of this policy.
2. Technologies that produce heat from renewable energy sources (when that heat is used by the consumer at their site) should be promoted. Specific technologies such as solar thermal domestic water systems, geothermal sourced heat pumps, and biomass from forestry and agriculture should be specifically targeted.

Therefore, the following policy questions can be considered:

1. Will a thermal REC program produce a larger deployment of small customer-sited electric generation from renewable energy sources? and
2. Will a thermal REC program promote the deployment of technologies that produce heat from renewable energy sources and that is used by the consumer at their site?

⁸ See attached for a Summary of New Jersey’s REP Standard, a brief description of the NJ Board of Public Utilities – Solar Energy Certificate (SRECs), and a printout of the internet home page of the SREC Program.

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Answers:

No. 1. No. Customer sited electric generation from renewable energy sources are part of the REC program today, so nothing would be different.

No. 2 Probably not – it depends on the technology.

Giving RECs (even after discounting for administrative costs) to solar hot water collector systems and to geothermal sourced heat pumps would certainly make such systems more price competitive. A single household domestic hot water system could generate 2 MWh of RECs per year. However, a glut of systems could quickly dilute the value of RECs and the resultant market instability would be harmful in the long run. Customers who purchased a solar thermal system using one set of optimistic economic assumptions could find their pay-back period significantly extended if the value of the REC in future years dropped precipitously.

Giving RECs to users of thermal biomass technologies may not be sufficient to overcome the severe cost disadvantages that industry faces.⁹

Solutions

The following recommendations are based upon an analysis of the incentives that have been deployed across the United States. These recommended incentives are not just those that are administered by the various public service commissions or that are strictly part of a renewable energy standard or portfolio.

I. If the policy goal to be achieved is to promote more customer-sited small electric generation from renewable energy sources then several actions should be taken:

1. Article 2 of Title 40 C.R.S. should be further amended to specifically state a percentage set-aside of the total RPS for these customer-sited electric generation technologies. This set-aside should be universally applied statewide among all load serving entities. The set-aside standard should set an upper capacity size limit. Combined heat and electric production applications would be a part of the

⁹ See attached paper entitled “Biomass 101” that includes the status of the California biomass power industry and a page describing the California Supplemental Energy Payment Program.

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REC program to extent they produced electricity that would offset electricity that would have been produced from conventional fuel sources.

2. The Colorado statutes should be amended to implement true net metering state-wide among all load serving entities.
3. The Colorado statutes could be further amended to include thermal technologies that use renewable resources where there is an offset of electricity production from conventional fuel sources.
4. The Colorado statute could be further amended to specify that generation-offset, off-grid, or on-site distributed renewable facilities are eligible for the REC system if they otherwise meet the requirements of the RPS, where generation-offset technology is any renewable technology that reduces the demand for electricity at a site where a customer consumes electricity.
5. The Commission should review its interconnection standards for applicability and ease of use for distributed generation applications.
6. The Commission should approve standard interconnection contracts.
7. The Commission should review the tariffs of its jurisdictional utilities for their effect on customer-site generation and order changes as necessary.
8. The tax laws of Colorado should be amended to provide for property tax waivers, sales tax waivers, income tax waivers, income tax deduction of interest on loans, and accelerated depreciation methods for owner-businesses investing in on-site generation.

II. If the policy goal is to promote customer-sited thermal solar hot water collector systems, and geothermal sourced heat pumps then several actions should be taken:

1. The Commission and the State Legislature should not adopt incentives that are part of the current REC program.

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2. The tax laws of the Colorado should be reviewed toward the goal of providing additional incentives via the level of property tax waivers, sales tax waivers, income tax waivers, income tax deduction of interest on loans, and accelerated depreciation methods for owner-businesses investing in these technologies.
3. The Commission should consider whether these technologies should be considered as part of any demand side management or conservation programs of jurisdictional utilities.

III. If the policy goal is to promote specific technologies such as thermal biomass from forestry and agriculture pumps then several actions should be taken:

1. The Commission and the State Legislature should not adopt incentives that are part of the current REC program.
2. The tax laws of the Colorado should be reviewed toward the goal of providing additional incentives via the level of property tax waivers, sales tax waivers, income tax waivers, income tax deduction of interest on loans, and accelerated depreciation methods for owner-businesses investing in these technologies.
3. The Commission should consider whether these technologies should be considered as part of any demand side management or conservation programs of jurisdictional utilities.
4. The Legislature should consider revising the statutes to create a new program providing Supplemental Energy Payments to these above cost technologies. This program could then explicitly identify and value any beneficial externalities provided.

Appendix C

DSIRE Database of Colorado Homeowner Incentives for Renewable Energy



DSIRE

NC Solar Center | IREC | Contacts | About Us | NCSU

Incentives
[Incentives List](#)
[DSIRE Home](#)

Colorado Homeowner Incentives for Renewable Energy

Financial

Aquila - On-Site Solar PV Rebate Program

Last DSIRE Review: 05/25/2007

Incentive Type: Utility Rebate Program

Eligible Renewable/Other Technologies: Photovoltaics

Applicable Sectors: Commercial, Industrial, Residential, Nonprofit, Schools, (All Aquila customers)

Incentive Amount: \$2/watt DC plus REC payment of \$2.50/watt for systems up to 10 kW;
 \$2/watt DC plus \$1.50/Watt REC payment and additional REC payment based on annual production for systems greater than 10 kW up to 100 kW.

Eligible System Size: Up to 100 kW DC

Equipment Requirements: PV modules must be warranted for a minimum period of 20 years. All other components (with the exception of batteries), labor and installation must be warranted for a minimum period of 5 years. All equipment must be new, UL-listed, and meet IEEE standards.

Installation Requirements: Aquila recommends COSEIA or other qualified installer

Ownership of Renewable

Energy Credits: Aquila (if customer accepts REC payment)

Website: <http://pv.aquilaprograms.com>

Summary:

Aquila's On-Site Solar PV Rebate Program provides an incentive of \$2 per watt DC of installed photovoltaic (PV) capacity combined with a separate payment for the renewable energy credits (RECs) associated with the PV-generated electricity over a 20-year period. The rebate and REC payment incentive program are available to any Aquila customer who installs a new PV system up to 100 kilowatts (kW) in capacity for on-site use.

Rebates and REC payments for PV systems up to 10 kW will be calculated as follows:

- A rebate of \$2 per DC watt; and
- A one-time REC payment, currently set at of \$2.50 per DC watt. The REC payment may change depending on the total amount of PV already installed by Aquila's Colorado electric customers.

Rebates and REC payments for PV systems greater than 10 kW and up to 100 kW will be calculated as follows:

- A rebate of \$2 per DC watt; and
- a fixed REC payment of \$1.50 per DC Watt, but could change depending on application receipt date. A variable REC payment will be also be made annually based on the total amount of electricity generated by the PV system. The value of the variable REC payment will be determined by the average annual market price of solar energy RECs in Colorado for the calendar year.

All rebate and REC payments are subject to the availability of funds and a pre-installation site inspection. Expansions to existing systems are allowed if the expanded portions meet all technical requirements. Aquila recommends using a qualified PV installation contractor from a list furnished by the Colorado Renewable Energy Society, available at www.coseia.org.

Aquila's PV incentive program was initiated to comply with Colorado's Amendment 37, passed in 2004. Amendment 37 requires Colorado utilities with 40,000 or more customers to generate or purchase a percentage of their electricity from renewable resources to reach a level of 10% renewables by 2015. Of the electricity generated each year from renewable resources, at least 4% must come from solar electric technologies. At least one-half of this percentage must come from solar electric systems located on-site at customers' facilities. Under the initiative, utilities are required to offer customers a minimum rebate of \$2 per watt of installed PV capacity up to 100 kW and establish a net metering program.

Contact:

Aquila PV Rebate Program

Aquila, Inc.

105 South Victoria

Pueblo, CO 81003

Phone: (800) 454-8651

Web site: <http://www.aquila.com>

Aspen - Grid-Tied Micro Hydro Grant

Last DSIRE Review: 03/16/2007

Incentive Type: Local Grant Program
Eligible Renewable/Other Technologies: Small Hydroelectric
Applicable Sectors: Commercial, Residential
Amount: Varies by project

Summary:

Aspen's Community Office for Resource Efficiency (CORE) offers need-based grants for feasibility studies and project development to support new, grid-tied, micro-hydro systems for residents and businesses. Contact CORE for program details.

Contact:

Gary Goodson
Community Office for Resource Efficiency (CORE)
P.O. Box 9707
Aspen, CO 81612
Phone: (970) 544-9808
Fax: (970) 963-5691
E-Mail: gary@aspencore.org
Web site: <http://www.aspencore.org>

Aspen - Solar Pioneer Rebate Program

Last DSIRE Review: 03/16/2007

Incentive Type: Local Rebate Program
Eligible Renewable/Other Technologies: Solar Water Heat, Photovoltaics
Applicable Sectors: Residential
Rebate: Solar hot water: \$1,000 - \$2,000
PV: \$2.00/W
Max. Limit: Solar hot water: \$2,000
PV: \$6,000
Terms: Must be a full-time resident of the Roaring Fork Valley;
May participate in loan program or rebate program, but not both.
Website: <http://www.aspencore.org/sitepages/pid77.php>

Summary:

The Community Office for Resource Efficiency (CORE), a nonprofit organization promoting renewable energy and energy efficiency in western Colorado, offers residential rebates within the Roaring Fork Valley for the installation of photovoltaic or solar hot water systems.

Rebates for the purchase of new solar hot water heaters are as follows:

- two to three panels: \$1,000 rebate
- four to five panels: \$1,500 rebate
- six plus panels: \$2,000 rebate

Rebates for grid-tied PV systems are offered at \$2.00 per watt, up to \$6,000.

Installers must be COSEIA certified and must fill out a rebate application after system has been installed. Within two weeks of application receipt, CORE will issue a check for the rebate amount.

The program is sponsored by the Community Office for Resource Efficiency (CORE), in partnership with the City of Aspen and Holy Cross Energy, with funds from the Renewable Energy Mitigation Program. A [loan program](#) is also available for solar projects, but not in conjunction with this rebate program.

Contact:

Gary Goodson
 Community Office for Resource Efficiency (CORE)
 P.O. Box 9707
 Aspen, CO 81612
Phone: (970) 544-9808
Fax: (970) 963-5691
E-Mail: gary@aspencore.org
Web site: <http://www.aspencore.org>

Aspen - Solar Power Pioneer Loan Program

Last DSIRE Review: 03/16/2007

Incentive Type: Local Loan Program

Eligible Renewable/Other Technologies: Solar Water Heat, Photovoltaics

Applicable Sectors: Residential

Amount: Varies

Terms: Zero-percent interest; typical term of five years;
 Must be a full-time resident of the Roaring Fork Valley;
 May participate in loan program or rebate program, but not both.

Website: <http://www.aspencore.org/sitepages/pid77.php>

Summary:

The Community Office for Resource Efficiency (CORE) has partnered with the Community Bank of Colorado to provide zero-percent financing on loans for photovoltaic or solar hot water systems. The typical loan term is five years and loan amounts vary based on system size. After determining the system size, call CORE to advise loan amount.

Loan applications are available at Community Banks of Colorado in Aspen or Basalt. If loan is approved, participants are responsible for the principle payments, and CORE will pay the interest.

A [rebate program](#) is also available for solar projects, but not in conjunction with this loan program.

Contact:

Gary Goodson
 Community Office for Resource Efficiency (CORE)
 P.O. Box 9707
 Aspen, CO 81612
Phone: (970) 544-9808
Fax: (970) 963-5691
E-Mail: gary@aspencore.org
Web site: <http://www.aspencore.org>

Boulder - Solar Sales and Use Tax Rebate

Last DSIRE Review: 05/16/2007

Incentive Type: Sales Tax Refund

Eligible Renewable/Other Technologies: Solar Water Heat, Photovoltaics, Solar Pool Heating

Applicable Sectors: Commercial, Residential

Amount: 35% of unrestricted solar energy sales and use tax revenue (see below)

Website: http://www.bouldercolorado.gov/files/Environmental%20Affairs/climate%20and%20energy/Solar%20Rebate/solar_rebate_faqs-final.pdf

Authority 1: [Ordinance No. 7487](#)

Date Enacted: 11/14/2006

Effective Date: 12/14/2006

Summary:

In 2006, the City of Boulder established a solar sales and use tax rebate for PV and solar water heating installations. PV owners can receive a rebate (essentially a tax refund) drawn from the unrestricted tax revenues collected from solar

energy sales.

Approximately 55% of solar sales and use tax revenues go to restricted funds. Of the unrestricted revenues, 35% percent is refunded to the PV owner. The value of this refund was approximately 16% of the tax paid by owners in 2006 and is projected to be 15% in 2007. The City estimates that the refund equates to approximately 1% of "average" PV system costs.

The remaining 65% of the unrestricted revenues are used to fund a renewable energy reserve account, known as the Renewable Energy Fund. The Renewable Energy Fund will be used to rehabilitate or install solar energy systems on affordable housing developments and site-based non-profit organizations.

An application for Solar Energy Sales and Use Tax Rebate can be found [here](#)

Contact:

Yael Gichon
 City of Boulder
 Office of Environmental Affairs
 Boulder, CO 80306
Phone: (303) 441-3878
Fax: (303) 441-4070
E-Mail: gichony@bouldercolorado.gov
Web site: http://www.bouldercolorado.gov/index.php?option=com_content&task=view&id=43&Itemid=87

Colorado Springs Utilities - Renewable Energy Rebate Program

Last DSIRE Review: 03/02/2007

Incentive Type: Utility Rebate Program

Eligible Renewable/Other Technologies: Photovoltaics

Applicable Sectors: Commercial, Residential

Incentive Amount: \$3.75/watt AC

Eligible System Size: Residential: 10 kW maximum; Commercial: 25 kW maximum

Program Budget: \$300,000 for 2007

Ownership of Renewable Energy

Credits: Colorado Springs Utilities

Website: http://www.csu.org/residential/rebates/renew_rebate/index.html

Effective Date: 1/1/2006

Summary:

Through its Renewable Energy Rebate Program, Colorado Springs Utilities (CSU) offers a \$3.75 per-watt (AC) rebate to customers who install grid-connected solar electric (PV) systems with a minimum capacity of 500 watts and a maximum of 10 kW for residential systems and 25 kW for commercial systems. To calculate the system's AC output, a de-rating factor is used to account for shading and suboptimal orientation or tilt. All Renewable Energy Credits (RECs) generated from systems installed under this program are conferred to CSU for compliance with Colorado's Renewable Energy Standard*.

The program budget for 2007 is \$300,000. The utility plans to continue offering the rebate in future years pending approval by the Utilities Board, but the incentive amount is likely to decrease by \$0.25 to \$0.50 per watt per year. The application, interconnection agreement, and other documents are available at the program website above. Click [here](#) for the CSU net metering policy (see page 35).

Qualifying PV modules must be included in the California Energy Commission (CEC) *List of Eligible Photovoltaic Modules* found at www.consumerenergycenter.org/cqi-bin/eligible_pvmodules.cqi. Qualifying inverters must be included in the CEC *List of Eligible Inverters* found at www.consumerenergycenter.org/cqi-bin/eligible_inverters.cqi. Qualifying systems must also carry minimum manufacturer and/or installer warranties as outlined in the program guidelines.

Colorado Springs Utilities recommends (but does not require) that all systems be designed and installed by professional installers certified by the Colorado Solar Energy Industries Association ([CoSEIA](#)) or the North American Board of Certified Energy Practitioners [NABCEP](#). CSU also recommends taking advantage of the utility's energy efficiency programs – including rebates – before installing a PV system.

**Colorado's Renewable Energy Standard requires Colorado utilities with 40,000 or more customers to generate or purchase a percentage of their electricity from renewable resources to reach a level of 10% renewables by 2015. Of the electricity generated each year from renewable resources, at least 4% must come from solar electric technologies. At least one-half of this percentage must come from solar systems located on-site at customers' facilities. Under the initiative, utilities are required to offer customers a PV rebate and establish a net-metering program. Thus, CSU documents the RECs generated by its customers' PV systems to demonstrate compliance with the solar requirement of the Renewable Energy Standard.*

Contact:

Simon Eilif Baker
 Colorado Springs Utilities
 P.O. Box 1103
 Colorado Springs, CO 80947
Phone: (719) 668-8231
E-Mail: sebaker@csu.org
Web site: <http://www.csu.org>

Delta-Montrose Electric Association - Residential Co-Z Energy Loan Program

Last DSIRE Review: 09/26/2007

Incentive Type: Utility Loan Program

Eligible Efficiency

Technologies: GeoExchange

Eligible Renewable/Other Geothermal Heat Pumps

Technologies:

Applicable Sectors: Residential

Terms: Varies depending on the home's size, design and construction quality, as well as the type and condition of the existing heating system.

Website: <http://www.dmea.com/GeoExchange/GeoFAQ/tabid/103/Default.aspx>

Summary:

Delta Montrose Electric Association (DMEA), a distribution utility serving Western Colorado, gives its residential members an opportunity to improve their homes' energy efficiency. Through a program called "Co-Z", DMEA will pay for the installation of the components of a GeoExchange system which are outside a member's home (does not include ductwork or other "inside the house" elements). This upfront installation cost is recouped over time by DMEA through monthly payments applied to the utility bill. The exact monthly payment and energy savings potential varies depending on the home's size, design and construction quality, as well as the type and condition of the existing heating system. To calculate the monthly payment and savings, a DMEA representative can

1. Perform an energy analysis of the home
2. Create a custom system design engineered specifically for the home
3. Prepare a formal proposal that includes a calculation of the home's present energy consumption, an estimate of the potential energy savings, and a projected installation cost

Every Co-Z Energy Plan offers a custom system design and these three options:

- Platinum – includes installation and maintenance of outdoor portion of GeoExchange system, energy credit, and adjustable electricity rate lock
- Gold – includes installation and maintenance of outdoor portion of GeoExchange system only
- Silver - includes installation and maintenance of in-ground loop only with no energy credit or rate lock

Additional restrictions apply. See the program website or call the Co-Z Hotline at (970) 874-2300 for more information.

Contact:

Co-Z Energy Plan
 DMEA
 21191 H75 Road
 Delta, CO 81416
Phone: (970) 874-2300
Web site: <http://www.dmea.com/>

Fort Collins Utilities - ZILCH (Zero Interest Loans for Conservation Help) Program

Last DSIRE Review: 03/28/2007

Incentive Type: Utility Loan Program

Eligible Efficiency Clothes Washers/Dryers, Water Heaters, Furnaces, Heat pumps, Duct/Air sealing, Building Insulation,

Technologies: Windows, Doors, whole house fan, whole house evaporative cooler, electric demand controller

Eligible Renewable/Other Solar Water Heat, Solar Space Heat

Technologies:

Applicable Sectors: Residential

Terms: Loans range from \$500 to \$2,300. They include a \$25 dollar processing fee, and can be paid back over a time-span of 24 to 60 months depending on the amount of the loan.

Website: <http://fcgov.com/utilities/zilch.php#energy>

Summary:

Fort Collin's offers its residential customers interest-free loans that may be used to finance a variety of projects, including adding insulation, replacing a furnace, upgrading water and space heating systems, and improving energy efficiency of doors and windows. No more than 80% of the total project cost can be financed by the loan. The maximum loan amount is \$2,300, and the repayment schedule ranges from 24 to 60 months.

Most of the energy-saving projects are required to pay for themselves with savings in 10 years or less. Pay back time of the project is determined by a home energy rating performed by the company.

Contact:

Fort Collins Utilities
The Power-to-Save Team
330 S. College Ave.
Fort Collins, CO 80524
Phone: (970) 221-6700
E-Mail: powertosave@fcgov.com
Web site: <http://fcgov.com/electric/>

Gunnison County Electric - Renewable Energy Resource Loan

Last DSIRE Review: 09/17/2007

Incentive Type: Utility Loan Program

Eligible Renewable/Other Technologies: Photovoltaics, Wind, Renewable energy projects as approved by the Board

Applicable Sectors: Commercial, Residential

Terms: Up to \$25,000 for 10 years

Website: <http://www.gcea.coop>

Summary:

Gunnison County Electric Association's (GCEA) low-interest loan program was started January 1, 2003. Loans are available to members and non-members in the GCEA service territory for the installation of photovoltaic, wind, and other renewable energy projects as approved by the board of directors. A loan of up to \$25,000 over 10 years is available to qualifying participants. Current interest rates vary by month but are fixed at the time the loan is made.

Please contact GCEA for more information. The loan does not cover batteries, and is limited to systems 10kW or smaller.

Contact:

Program Information
Gunnison County Electric Association, Inc.
37250 Hwy. 50
P.O. Box 180
Gunnison, CO 81230
Phone: (970) 641-3520
Fax: (970) 641-5302
E-Mail: gcea@gcea.coop
Web site: <http://www.gcea.coop>

Holy Cross Energy - WE CARE Rebates

Last DSIRE Review: 06/29/2007

Incentive Type: Utility Rebate Program

Eligible Renewable/Other Technologies: Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric

Applicable Sectors: Commercial, Residential, Institutional, (Holy Cross customers)

Incentive Amount: \$2/watt DC

Maximum Incentive: \$50,000/installation, up to 50% of installed cost

Eligible System Size: No size restrictions specified

Program Budget: An additional \$200,000 was approved in June 2007

Ownership of Renewable Energy

Credits: Holy Cross Energy

Project Review/Certification: Post-installation utility inspection required

Website: http://www.holycross.com/qoto/Renewable_Generation

Summary:

Holy Cross Energy's WE CARE (With Efficiency, Conservation And Renewable Energy) Program offers a \$2.00-per-watt DC incentive for renewable energy generation using wind, hydroelectric, photovoltaic, biomass or geothermal technology. Payments are not to exceed 50% of actual installed costs, and the maximum rebate per installation is \$50,000. While systems larger than 25 kW are capped at the \$50,000 rebate level (and also exceed net metering eligibility) there is technically no capacity limit to participate in the rebate program. Systems must be connected to Holy Cross Energy's electric system to qualify for renewable energy incentives.

Contact:

Craig Tate

Holy Cross Energy Association

P.O. Drawer 2150

Glenwood Springs, CO 81602

Phone: (970) 947-5421

Fax: (970) 945-4081

E-Mail: ctate@holycross.com

Web site: <http://www.holycross.com>

La Plata Electric Association - Renewable Generation Rebate Program

Last DSIRE Review: 06/14/2007

Incentive Type: Utility Rebate Program

Eligible Renewable/Other Technologies: Photovoltaics, Wind, Small Hydroelectric

Applicable Sectors: Residential

Incentive Amount: \$2 per watt DC

Maximum Incentive: \$2,000

Installation Requirements: Systems must be grid-tied

Project Review/Certification: LPEA reserves the right to inspect any generating facility connected to the utility's system

Website: http://www.lpea.coop/company_info/Board%20Policies/300%20series%20PDF/Policy%20359.pdf

Summary:

La Plata Electric Association (LPEA) offers a one-time rebate, not to exceed the cost of the system, to residential customers who install a solar, wind or hydropower facility. To be eligible for the rebate, the system must be grid-tied and located in LPEA's service territory. The rebate is \$2 per watt; the wattage of the system is determined as follows:

- Solar – the total installed photovoltaic (PV) panel capacity
- Solar with tracking – the total installed PV panel capacity times 1.25. This factor represents the additional energy output obtained by the use of a tracking device.
- Wind – the nameplate capacity times 0.30. This factor represents the expected energy output given the wind resources of LPEA service territory. If 12 months of hourly, site specific anemometer data can be provided, this factor may be adjusted to represent the site's wind resource.
- Hydro – available head (in feet) times average annual flow rate (in cfs) times 84.64 (power conversion factor).

Customers retain ownership of the renewable-energy credits (RECs) associated with the electricity they generate.

Contact:

Richard Archuleta

La Plata Electric Association

45 Stewart St.

P.O. Box 2750

Durango, CO 81302

Phone: (970) 247-5786

Fax: (970) 247-2674
 E-Mail: rarchuleta@lpea.coop
 Web site: <http://www.lpea.com>

Local Option - Property Tax Exemption for Renewable Energy Systems

Last DSIRE Review: 05/25/2007

Incentive Type: Property Tax Exemption

Eligible Renewable/Other Technologies: Solar Thermal Electric, Photovoltaics, Biomass, Geothermal Electric, Other Renewables (not specified)

Applicable Sectors: Commercial, Industrial, Residential, Agricultural

Amount: Varies (local option)

Max. Limit: Varies (local option)

Authority 1: [2007 CO S.B. 145](#)

Date Enacted: 4/16/2007

Summary:

Colorado enacted legislation in April 2007 (SB 145) to authorize counties and municipalities to offer property or sales tax rebates or credits to residential and commercial property owners who install renewable energy systems on their property.

Eligible renewable energy property is defined as "any fixture, product, system, device or interacting group of devices that produce electricity from renewable resources, including, but not limited to, photovoltaic systems, solar thermal systems, small wind systems, biomass systems, or geothermal systems."

The program would be administered at the local level by individual cities and counties. Individuals should contact the cities or counties where their property is located to see if a tax rebate or credit will be established in their community. The legislation takes effect August 3, 2007.

Web sites for many Colorado cities can be found at the Colorado Municipal League website, www.cml.org.

Web sites for Colorado counties can be found at the Colorado Counties, Inc. web site, www.ccionline.org.

United Power - Energy Efficiency Credits Program

Last DSIRE Review: 07/20/2007

Incentive Type: Utility Rebate Program

Eligible Efficiency

Technologies: Water Heaters, Heat pumps, Air conditioners, Motors, Electric Heat

Eligible Renewable/Other Geothermal Heat Pumps

Technologies:

Applicable Sectors: Residential

Incentive Amount: Geothermal Heat Pump: \$2,500

Heat pump A/C: \$400 plus additional incentive based on type of pump

Terminal Units: \$150 (12,000 BTU per hr. min. capacity) plus additional incentive

Electric water heater: \$50 per unit plus \$25 - \$500 additional incentive with certain features

Electric heaters: \$6 - \$16 per kW

Electric Motor: Varied, may be negotiated based on size

Eligible System Size: Water heater: 2.5 kW minimum size of the unit.

Equipment Requirements: Heat pumps: Check with United Power's Energy Management Team for details on SEER Ratings before making any purchases
 Water heater: Must have R-16 manufacturer insulation or equivalent. Applies to both new or replacement units.

Project Review/Certification: Inspection and qualification report must be signed by an Energy Management Representative

Website: <http://www.unitedpower.com/documents/2007EnergyEfficiencyCredits.pdf>

Summary:

United Power, a Touchstone Energy Partner, serves approximately 100,000 people throughout Colorado's front range. Tri-state Generation & Transmission, United Power's energy supplier, is extending their Energy Efficiency Credits program. Customers should contact a United Power Member Services representative prior to purchasing and installing

any new equipment to ensure program requirements are met. All credits must be requested within 180 days of installation. An inspection report signed by a United Power Energy Management Specialist is required to qualify for any of these credits.

For more details about the program, download United Power's [Energy Efficiency Credits program flyer](#).

Contact:

Energy Management Team
 United Power
 500 Cooperative Way
 Brighton, CO 80603
Phone: (303) 659-0551
Phone 2: (800) 468-8809
Web site: www.unitedpower.com

Xcel Energy - Solar*Rewards Program

Last DSIRE Review: 02/08/2007

Incentive Type: Utility Rebate Program

Eligible Renewable/Other Technologies: Photovoltaics

Applicable Sectors: Commercial, Residential, Nonprofit

Incentive Amount: \$2/watt DC plus REC payment of up to \$2.50/watt for systems up to 10 kW
 \$2/watt DC plus REC payment of \$0.115/kWh for systems >10 kW up to 100 kW
 RFP for systems >100 kW is closed as of 1/11/07

Maximum Incentive: \$45,000 for systems up to 10 kW;
 \$200,000 for the rebate portion for systems >10 kW up to 100 kW

Eligible System Size: Small: 0.5 kW - 10 kW DC;
 Medium: 10.1 kW - 100 kW;
 Large: 100.1 kW - 2 MW

Equipment Requirements: Eligible modules and inverters are listed on the California Energy Commission web site; Solar systems must carry a five-year warranty from both the manufacturer and the installer, including parts and labor.

Ownership of Renewable

Energy Credits: Xcel Energy (if customer opts for the REC payment)

Website: <http://www.xcelenergy.com/solar>

Effective Date: 3/1/2006

Summary:

Xcel Energy's Solar*Rewards Program provides up to a \$4.50-per-watt (DC) incentive for Xcel Energy customers who install grid-connected photovoltaic (PV) systems ranging from 0.5 kilowatts (kW) to 10 kW-DC in capacity. The incentive is structured as a \$2.00-per-watt rebate and up to \$2.50-per-watt Renewable Energy Credit (REC) payment. The REC payment may be adjusted, either up or down, based on the calculation of expected kWh of electric output as compared with an optimally oriented, fixed (i.e., non-tracking) system at the customer's location, but only if the calculated system output differs from the optimally oriented system output by more than 10%. Battery storage is not covered by the rebate.

To qualify for a solar rebate, participants must submit an application and receive an approval letter prior to installing the system. A list of solar system modules and inverters eligible for the rebate is available on the [California Energy Commission's web site](#). All solar systems must carry a five-year warranty from both the manufacturer and the installer, including parts and labor.

Net metering to Xcel Energy's customers, with net excess generation (NEG) at the end of a monthly billing period credited to the next month's bill. If a customer has NEG at the end of a calendar year, the customer will be paid for the credit. The payment will be determined by multiplying the net kilowatt-hours of electricity fed into the grid by the current fuel charge.

In January 2007, Xcel Energy launched a program for medium-sized systems (over 10 kW up to 100 kW) for its residential and business customers in Colorado. The medium-sized program offers an upfront payment of \$2.00 per watt installed DC capacity and monthly payments of \$115 per measured MWh system production over the life of a 20-year contract. The program will have an initial limit of 1 MW, at which point Xcel Energy will review participation. Visit the program Web site above for the current availability of this program.

Finally, Xcel Energy plans to issue four separate RFP solicitations for the Solar*Rewards program during 2006 and 2007 for solar RECs from systems greater than 10 kW and up to 2 MW for a 20-year term. Bidders in this process are also eligible for a \$2/W rebate up to \$200,000. The RFP is open to current Xcel Energy Colorado electric customers, Colorado utility customers, off-grid respondents, and third-party developers who propose to develop one or more solar generating facility or solar energy and solar RECs. The most recent RFP was issued in December 2006 and is now closed.

The Solar Rewards Program was initiated to comply with Colorado's Amendment 37, passed in 2004. Amendment 37 requires Colorado utilities with 40,000 or more customers to generate or purchase a percentage of their electricity from renewable resources to reach a level of 10% renewables by 2015. Of the electricity generated each year from renewable resources, at least 4% must come from solar electric technologies. At least one-half of this percentage must come from solar systems located on-site at customers' facilities. Under the initiative, utilities are required to offer customers a minimum rebate of \$2.00/watt of installed PV capacity and establish a net metering program.

Contact:

Pam Newell
 Xcel Energy
 5050 N Service Drive
 Winona , 80202
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E-Mail: pamela.i.newell@xcelenergy.com
Web site: <http://www.xcelenergy.com/solar>

Rules, Regulations & Policies**Colorado - Net Metering**

Last DSIRE Review: 01/23/2007

Incentive Type: Net Metering Rules

Eligible Renewable/Other Technologies: Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Anaerobic Digestion, Small Hydroelectric, Fuel Cells using Renewable Fuels

Applicable Sectors: Commercial, Industrial, Residential, (Customers of utilities with +40,000 customers)

Limit on System Size: 2 MW

Limit on Overall Enrollment: None

Treatment of Net Excess: Credited to customer's next bill; utility pays customer at end of calendar year for excess kWh credits at the average hourly incremental cost for that year

Utilities Involved: Utilities serving 40,000 or more customers

Interconnection Standards

for Net Metering? Yes

Website: <http://www.dora.state.co.us/puc/rulemaking/Amendment37.htm>

Authority 1: [4 CCR 723-3, Rule 3664](#)

Date Enacted: 12/15/2005

Effective Date: 7/2/2006

Summary:

In December 2005, the Colorado Public Utilities Commission (PUC) adopted standards for net metering and interconnection, as required by Amendment 37, a renewable-energy ballot initiative approved by Colorado voters in November 2004. The CPUC standards apply to electric utilities that serve 40,000 or more customers.*

Systems up to two megawatts (MW) in capacity that generate electricity using qualifying renewable-energy resources are eligible for net metering. Electricity generated at a customer's site can be applied toward meeting a utility's renewable-generation requirement under Colorado's renewable portfolio standard (RPS). The RPS mandates that 4% of the renewables requirement be met with solar energy; half of this percentage must come from solar electricity generated at customers' facilities.

For Colorado's net-metering rules, net excess generation (NEG) in a given month is applied as a credit to the following month. If in a calendar year a customer's generation exceeds consumption, the utility must reimburse the customer for the excess generation at the utility's average hourly incremental cost for the prior 12-month period.

If a customer-generator does not own a single bi-directional meter, then the utility must provide one free of charge. Systems over 10 kilowatts (kW) in capacity require a second meter to measure the output for the counting of renewable-energy credits (RECs). Customer-generators retain ownership of all renewable-energy credits (RECs) associated with the generation of electricity.

** Municipal utilities and rural electric cooperatives may opt out of the Amendment 37 renewable-energy requirements if a majority of customers agree to do so, given that 25% of eligible consumers participate.*

Contact:

Richard Mignogna
 Colorado Public Utilities Commission
 1560 Broadway, Suite 250

Denver, CO 80202
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Web site: <http://www.dora.state.co.us/PUC>

Delta-Montrose Electric Association - Net Metering

Last DSIRE Review: 10/01/2007

Incentive Type: Net Metering Rules
Eligible Renewable/Other Technologies: Photovoltaics, Wind, Biomass, Hydroelectric
Applicable Sectors: Commercial, Residential
Limit on System Size: The lesser of: the nameplate rating of the transformer serving the member's meter, or the maximum measured demand of the customer in the previous 12 months, or 25 kW.
Limit on Overall Enrollment: 1 megawatt
Treatment of Net Excess: Credited to the member after every billing cycle
Interconnection Standards for Net Metering? Yes
Website: <http://www.dmea.com>

Summary:

Delta-Montrose Electric Association (DMEA), an electric cooperative utility, offers net metering* to residential and commercial customers who generate electricity using wind, biomass, solar or hydroelectric resources. A system is eligible if its total capacity does not exceed the nameplate rating of the transformer serving the member's meter, the maximum measured demand of the customer in the previous 12 months, or 25 kW. Net metering is accomplished by using a single, bi-direction meter that measures kilowatt-hour usage and production. Net metering is available on a first-come, first-served basis until the rated generating capacity owned and operated by eligible customer-generators in DMEA's service territory reaches 1,000 kilowatts (equal to 1 megawatt).

** DMEA offers "true" net metering to its customers. In 2002, Colorado enacted legislation (C.R.S. 40-9.5-304 et seq.) requiring the state's electric cooperatives to offer "net metering" to customers. However, the term "net metering" is a misnomer in this particular law. Under the law, customers receive a lower rate (the utility's avoided-cost) for all electricity generated, while customers must pay the full retail rate for all electricity they purchase from utilities. This practice, commonly known as "dual metering," is much less favorable to customer-generators than "true" net metering.*

Contact:

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Web site: <http://www.dmea.com>

Empire Electric Association - Net Metering

Last DSIRE Review: 09/26/2007

Incentive Type: Net Metering Rules
Eligible Renewable/Other Technologies: Photovoltaics, Wind
Applicable Sectors: Commercial, Residential, Nonprofit, Schools, Agricultural, Institutional
Limit on System Size: 10 kW
Limit on Overall Enrollment: First 50 customers
Treatment of Net Excess: Utility pays customer at a rate equal to the average cost of power from the utility's wholesale supplier for that year, excluding wholesale power sold to loads billed under the utility's SCS tariffs
Interconnection Standards for Net Metering? Yes
Website: <http://www.eea.coop/pdf/netmetering.pdf>
Date Enacted: 3/17/06
Effective Date: 5/1/06

Summary:

Empire Electric Association, a cooperative utility serving southwestern Colorado and a small portion of eastern Utah, offers net metering to customers with solar-electric (PV) or wind-energy systems up to 10 kilowatts (kW) in capacity. The program is open on a first-come, first-served basis to the first 50 customers who enroll, or until December 31, 2010.

Participating customers are billed on an estimated levelized kilowatt-hour (kWh) usage method. The estimated usage less generation is based a calendar-year period and levelized over 12 months. Customers are billed monthly at the applicable rate for levelized kWh usage. At the end of the calendar year, customers are billed for any usage exceeding the levelized kWh usage at the applicable rate. If a customer has net excess generation (NEG) at the end of a calendar year, Empire Electric Association will pay for the excess generation at a rate equal to the average cost of power from the utility's wholesale supplier for that year, excluding wholesale power sold to loads billed under the utility's SCS tariffs.

Empire Electric Association serves Cortez, CO; Mancos, CO; Dolores, CO; Dove Creek, CO; Towac, CO; and Monticello, UT. The net-metering program took effect May 1, 2006. Contact Empire Electric Association for an application and a copy of the net-metering tariff.

** Empire Electric Association offers "true" net metering to its customers. In 2002, Colorado enacted legislation (C.R.S. 40-9.5-304 et seq.) requiring the state's electric cooperatives to offer "net metering" to customers. However, the term "net metering" is a misnomer in this particular law. Under the law, customers receive a lower rate (the utility's avoided-cost) for all electricity generated, while customers must pay the full retail rate for all electricity they purchase from utilities. This practice, commonly known as "dual metering," is much less favorable to customer-generators than "true" net metering.*

Contact:

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Cortez, CO 81321
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E-Mail: Glen.Noble@eea.coop
Web site: <http://www.eea.coop>

Fort Collins Utilities - Net Metering

Last DSIRE Review: 01/22/2007

Incentive Type: Net Metering Rules
Eligible Renewable/Other Technologies: Photovoltaics, Wind
Applicable Sectors: Residential
Limit on System Size: 10 kW (manufacturer peak output rating); larger customer-owned parallel generation systems may also be considered, but other provisions apply
Limit on Overall Enrollment: 25 customers
Treatment of Net Excess: Credited to customer's next bill; granted to utility at end of 12-month billing cycle
Interconnection Standards for Net Metering? Yes
Website: <http://fcgov.com/utilities/parallel-generation.php>

Summary:

Fort Collins Utilities (FCU) offers residential customers the opportunity to participate in a net-metering pilot program. This program will enable FCU to learn more about the actual costs and operational impacts of serving small parallel-generation customers and, if appropriate, to design new policies and rates for such customers.

"Parallel generation" refers to an electrical generation system on the customer's side of the meter that operates at standard household voltages and is connected to the FCU electric distribution system. Electric needs in the home may be served by either the on-site generator or the FCU system.

FCU will allow a maximum of 25 residential generating facilities to be connected to its distribution system and will credit these customers, at the full retail rate, for electricity they generate. At the end of the five-year project, customers participating in the pilot program will be subject to the applicable parallel-generation rate. The special terms of the pilot program will apply until 12/31/09. On that date, interconnection terms will revert to the applicable FCU provisions in effect at that time. Qualifying generating facilities for this project are limited to residential applications 10 kilowatts (manufacturer peak output rating) or smaller in capacity. A single meter, which records the customer's net use of electricity, will be used for billing purposes. (An alternate load survey meter may be installed at the utility's expense to collect data for evaluation purposes.) Customers will be billed for net monthly energy consumption under the FCU "Residential Energy Service" rate. There are no standby charges. Net excess energy generation (NEG) is credited to

the customer's account on a monthly basis as a kilowatt-hour credit. Any unused NEG will be granted to FCU (without compensation to the customer) at the end of each 12-month billing cycle.

The customer's inverter must meet IEEE 1547 and UL 1741 standards. A lockable disconnect switch is required. FCU will have the option to install and maintain monitoring equipment on the customer's side of the meter to gather data about power production by the customer's system.

Larger customer-owned parallel-generation systems also may be connected to the FCU distribution system, but other conditions apply. Contact the FCU engineering staff at (970) 221-6700 for more information on larger systems.

Contact:

Norm Weaver
Fort Collins Utilities
P.O. Box 580
Fort Collins, CO 80522
Phone: (970) 416-2312
Fax: (970) 221-6619
E-Mail: nweaver@fcgov.com
Web site: <http://www.fcgov.com/Utilities>

Gunnison County Electric - Net Metering

Last DSIRE Review: 05/23/2007

Incentive Type: Net Metering Rules
Eligible Renewable/Other Technologies: Photovoltaics, Wind
Applicable Sectors: Commercial, Residential
Limit on System Size: 10 kW
Limit on Overall Enrollment: First 50 customers
Treatment of Net Excess: Credited to customer's next bill at retail rate; purchased by utility at avoided-cost rate at end of 12-month billing cycle
Utilities Involved: Gunnison County Electric
Interconnection Standards for Net Metering? Yes
Website: http://www.gcea.coop/Member_Information/
Effective Date: 2000

Summary:

Gunnison County Electric Association's (GCEA) net-metering pilot program* is available to the first 50 customers who install eligible photovoltaic (PV) or wind-energy systems with a capacity of 10 kilowatts (kW) or less. Any customer net excess generation (NEG) is carried over to the customer's next monthly bill. At the end of a 12-month period, GCEA reimburses customers at the utility's wholesale rate for any remaining NEG. GCEA does not install systems for customers, but does offer a low-interest loan of up to \$25,000 for PV and wind-energy systems. Customers can download the net-metering application and compliance form from the program web site above.

** GCEA offers "true" net metering to its customers. In 2002, Colorado enacted legislation (C.R.S. 40-9.5-304 et seq.) requiring the state's electric cooperatives to offer "net metering" to customers. However, the term "net metering" is a misnomer in this particular law. Under the law, customers receive a lower rate -- the utility's avoided-cost rate -- for all electricity generated, while customers must pay the full retail rate for all electricity they purchase from utilities. This practice, commonly known as "dual metering," is much less favorable to customer-generators than "true" net metering.*

Contact:

Chief Engineer - GCEA
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37250 Hwy. 50
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Gunnison, CO 81230
Phone: (970) 641-3520
Phone 2: (800) 726-3523
Fax: (970) 641-5302
E-Mail: gcea@gcea.coop
Web site: <http://www.gcea.coop>

Holy Cross Energy - Net Metering

Last DSIRE Review: 02/20/2007

Incentive Type: Net Metering Rules

Eligible Renewable/Other Technologies: Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric

Applicable Sectors: Commercial, Industrial, Residential

Limit on System Size: 25 kW

Limit on Overall Enrollment: None

Treatment of Net Excess: Credited to customer's next bill at retail rate; purchased by utility at avoided-cost rate at end of calendar year

Utilities Involved: Holy Cross Energy

Interconnection Standards for Net Metering? Yes

Website: <http://www.holycross.com>

Summary:

Holy Cross Energy, an electric cooperative, offers net metering to residential and commercial customers that generate electricity using photovoltaic (PV), wind, geothermal, hydroelectric or biomass systems up to 25 kilowatts (kW) in capacity. Customer net excess generation (NEG) is applied as a kilowatt-hour credit to the customer's following bill. If a customer has NEG credit at the end of a calendar year, Holy Cross will purchase the credit at a price equivalent to the cooperative's average cost of power, per kilowatt-hour, over the prior calendar year.

All grid-tied renewable-energy systems are assessed a monthly customer charge by the Holy Cross Energy. For systems greater than 10 kilowatts (kW) in capacity, an additional monthly minimum charge (MMC) is assessed to address the poles and wires cost component associated with the cooperative's distribution facilities.

With the exception of the annual financial limit imposed on rebates for renewable-energy systems, there is no limit on the overall enrollment in the net-metering program. However, if the total capacity of all net-metered energy systems exceeds 1% of the capacity necessary to meet Holy Cross Energy's annual peak demand, the cooperative may elect to discontinue providing net-metering service to any additional customers. Holy Cross Energy takes ownership of the renewable energy credits (RECs) associated with grid-tied renewable-energy generation by customers.

In conjunction with its net-metering policy, Holy Cross Energy also offers a rebate for renewable-energy systems installed in its service territory. The cooperative will pay up to \$2.00 per watt of installed capacity for systems up to 25 kW in capacity that generate electricity using biomass, geothermal technology, hydroelectric, photovoltaic or wind. The rebate payment may not exceed 50% of actual system cost. This program currently has an annual aggregate limit of \$75,000 for rebates.

Contact:

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 Holy Cross Energy Association
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 Glenwood Springs, CO 81602-2150
Phone: (970) 947-5430

La Plata Electric Association - Net Metering

Last DSIRE Review: 06/29/2007

Incentive Type: Net Metering Rules

Eligible Renewable/Other Technologies: Photovoltaics, Wind, Biomass, Hydroelectric

Applicable Sectors: Commercial, Residential

Limit on System Size: 25 kW

Limit on Overall Enrollment: 1% of utility's aggregate customer peak demand

Treatment of Net Excess: Credited at avoided-cost rate to customer's next bill; utility pays customer for any unused NEG at beginning of each calendar year

Interconnection Standards for Net Metering? Yes

Website: http://www.lpea.coop/billing_metering/netmetering.htm

Date Enacted: 3/19/2003

Effective Date: 5/1/2003

Summary:

La Plata Electric Association (LPEA), an electric cooperative utility, offers net metering* to residential and commercial customers who generate electricity using wind or solar resources. Systems up to 25 kilowatts (kW) in capacity are eligible. The system must be intended to offset part or all of the customer's electricity requirements at the same location, and it may not be used to offset electric consumption at another location.

Net metering is accomplished by using a single, bi-directional meter that measures kilowatt-hour usage and production. Net metering is available on a first-come, first-served basis until the rated generating capacity owned and operated by eligible customer-generators in LPEA's service territory reaches 1% of the utility's aggregate customer peak demand.

Customers with net excess generation (NEG) at the end of a monthly billing period are credited for the excess at the utility's avoided-cost rate. The credit will be carried over to the following month until the end of the calendar year, at which point customers will receive a check from the utility, at its avoided-cost rate, for any remaining NEG.

** LPEA offers "true" net metering to its customers. In 2002, Colorado enacted legislation (C.R.S. 40-9.5-304 et seq.) requiring the state's electric cooperatives to offer "net metering" to customers. However, the term "net metering" is a misnomer in this particular law. Under the law, customers receive a lower rate (the utility's avoided-cost) for all electricity generated, while customers must pay the full retail rate for all electricity they purchase from utilities. This practice, commonly known as "dual metering," is much less favorable to customer-generators than "true" net metering.*

Contact:**Dan Harms**

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Appendix D

DSIRE Database of Federal Incentives for Renewable Energy



Business Energy Tax Credit
Federal**Incentive Type:** Corporate Tax Credit**Eligible Renewable/Other:** Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat,**Technologies:** Photovoltaics, Geothermal Electric, Fuel Cells, Solar Hybrid Lighting, Direct Use
Geothermal, Microturbines**Applicable Sectors:** Commercial, Industrial**Amount:** For equipment placed in service from January 1, 2006 until December 31, 2008, the credit is 30% for solar, solar hybrid lighting, and fuel cells, and 10% for microturbines. The geothermal credit remains at 10%.**Maximum Incentive:** \$500 per 0.5 kW for fuel cells; \$200 per kW for microturbines; no maximum specified for other technologies**Eligible System Size:** Microturbines less than 2 MW; fuel cells at least 0.5 kW**Authority 1:** [26 USC § 48](#)**Authority 2:** IRS Form 3468 (Tax Year 2006)**Summary:**

The federal Energy Policy Act of 2005 ([H.R. 6](#)) expanded the federal business energy tax credit for solar and geothermal energy property to include fuel cells and microturbines installed in 2006 and 2007, and to hybrid solar lighting systems installed on or after January 1, 2006. These provisions of the tax credit were later extended through December 31, 2008, by Section 207 of the [Tax Relief and Health Care Act of 2006 \(H.R. 6111\)](#). (A 10% federal energy tax credit was available to businesses that invested in or purchased solar or geothermal energy property in the United States prior to January 1, 2006.)

For eligible equipment installed from January 1, 2006, through December 31, 2008, the credit is set at 30% of expenditures for solar technologies, fuel cells and solar hybrid lighting; microturbines are eligible for a 10% credit during this two-year period. For equipment installed on or after January 1, 2009, the tax credit for solar energy property and solar hybrid lighting reverts to 10% and expires for fuel cells and microturbines. The geothermal credit remains unchanged at 10%.

The credit for fuel cells is capped at \$500 per 0.5 kilowatt (kW) of capacity. The maximum microturbine credit is \$200 per kW of capacity. No maximum is specified for the other technologies.

Solar energy property includes equipment that uses solar energy to generate electricity, to heat or cool (or provide hot water for use in) a structure, or to provide solar process heat. Hybrid solar lighting systems are those that use solar energy to illuminate the inside of a structure using fiber-optic distributed sunlight. Geothermal energy property includes equipment used to produce, distribute, or use energy derived from a geothermal deposit. It does **not** include geothermal heat pumps. For electricity produced by geothermal power, equipment qualifies only up to, but not including, the electrical transmission stage. Energy property does not include public utility property, passive solar systems, or pool heating equipment.

To qualify, the original use of the equipment must begin with the taxpayer or it must be constructed by the taxpayer. The equipment must also meet any performance and quality standards in effect at the time the equipment is acquired. The energy property must be operational in the year in which the credit is first taken.

If the project is financed in whole or in part by subsidized energy financing or by tax-exempt private activity bonds, the basis on which the credit is calculated must be reduced. (The formula is described in the tax credit instructions.) Subsidized energy financing means "financing provided under a federal, state, or local program, a principal purpose of which is to provide subsidized financing for projects designed to conserve or produce energy." Therefore, a business must reduce the basis for calculating the credit by the amount of any such incentives received.

Contact:

Public Information - IRS
Internal Revenue Service
1111 Constitution Avenue, N.W.
Washington, DC 20224
Phone: (800) 829-1040
Web site: <http://www.irs.gov>

Clean Renewable Energy Bonds (CREBs)

Federal**Incentive Type:** Federal Loan Program**Eligible Renewable/Other Technologies:** Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Municipal Solid Waste, Small Irrigation Power**Applicable Sectors:** Local Government, State Government, Tribal Government, Municipal Utility, Rural Electric Cooperative**Authority 1:** IRS Notice 2007-26**Effective Date:** 4/2/2007**Expiration Date:** 12/31/2008**Website:** <http://www.elpc.org/energy/farm/crebs.php>

Summary:

The Energy Tax Incentive Act of 2005, under Title XIII of the Energy Policy Act of 2005, established Clean Energy Renewable Bonds (CREBs) as a financing mechanism for public sector renewable energy projects. The Act originally allocated \$800 million of tax credit bonds to be issued between January 1, 2006 and December 31, 2007. Over 786 applicants from 40 states applied for \$2.5 billion funds.

Following the passage of the Tax Relief and Health Care Act of 2006, the Internal Revenue Service made an additional \$400 million in CREBs financing authority available for 2008 through Notice 2007-26. The application deadline was July 13, 2007, and the CREBs must be issued by December 31, 2008. CREBS can be issued by cooperative electric companies, governmental bodies (states, territory, Indian tribal government, or any political subdivision thereof), or certain lenders. Of the \$1.2 billion of total CREBs made available, \$750 million is the maximum allocation for governmental bodies. The remainder is allocated to cooperative electric companies.

CREBs are issued with a 0% interest rate, the borrower pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest. Tax credit funds are allocated by the Secretary of the U.S. Treasury Department. The tax credit rate is set daily by the Secretary of the Treasury and can be taken quarterly on a dollar for dollar basis to offset the tax liability of the bondholder.

CREBs differ from traditional tax-exempt bonds since the tax credits issued through CREBs are treated as taxable income for the bondholder. The tax credit can be taken each year the bondholder has a tax liability as long as the credit amount does not exceed the limits established by the Energy Policy Act of 2005.

CREBs rates can be found [here](#).

For more information on CREBs, contact Tina Hill at the Internal Revenue Service at 202-283-9774.

Contact:

Public Information - IRS
Internal Revenue Service
1111 Constitution Avenue, N.W.
Washington, DC 20224
Phone: (800) 829-1040
Web site: <http://www.irs.gov>

Energy Efficient Mortgage

Federal**Incentive Type:** Federal Loan Program**Eligible Efficiency Technologies:** Yes; specific technologies not identified**Eligible Renewable/Other Technologies:** Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Photovoltaics, Daylighting**Applicable Sectors:** Residential**Website:** <http://www.resnet.us/ratings/mortgages/default.htm>

Summary:

Energy efficient mortgages (EEMs) can be used by homeowners to finance a variety of energy efficiency measures, including renewable energy technologies, in a new or existing home. The federal government supports these loans by insuring them through FHA or VA programs. This allows borrowers who might otherwise be denied loans to pursue energy efficient improvements, and it secures lenders against loan default and provides them with confidence in lending to customers whom they would usually deny.

The federal government also certifies private lenders to provide EEMs through the ENERGY STAR ® program, which does not provide the same security as the FHA or VA programs but offers ENERGY STAR ® certification. Other private lenders, like Fannie Mae and Freddie Mac, offer “conventional energy efficient mortgages” that may or may not require homes to meet Energy Star standards.

Federal Housing Authority (FHA) Energy Efficient Mortgages

The FHA allows lenders to add up to 100% of energy efficient improvements to an existing mortgage loan by insuring a loan of up to 5% of a home’s appraised value or \$4,000, whichever is greater, not to exceed \$8,000. FHA mortgage limits vary by county/state and the number of units in a dwelling; see www.fha.com/lending_limits.cfm for more details.

Loan amounts cannot be greater than the projected savings of the energy efficient improvements. This loan can be combined with FHA 203 (h) mortgages made to victims of presidentially-declared disasters and with financing offered through the FHA 203 (k) rehabilitation program. FHA loan limits do not apply to the EEM. Homebuyers must submit a Home Energy Rating (HER), contractor bids, and a FHA B Worksheet. Up to \$200 of the cost of the HER can be included in the mortgage, and borrowers can include closing costs and the up-front mortgage insurance premium in the total cost of the loan. The loan is available to anyone who meets the income requirements for FHA’s Section 203 (b), provided they can make the monthly mortgage payments. New and existing owner-occupied homes of up to 2 units qualify for this loan. Cooperative units are not eligible. Homebuyers can submit applications to their local HUD Field Office through an FHA-approved lending institution, or they can apply directly online at http://www.fha.com/energy_efficient.cfm. See also www.hud.gov/offices/hsg/sfh/eem/energy-r.cfm.

Department of Veterans Affairs (VA) Energy Efficient Mortgages

The VA insures EEMs to be used in conjunction with VA loans for either the purchase of existing dwellings or refinancing loans secured by the dwelling. Homebuyers can borrow up to \$3,000 if only documentation of improvement costs or contractor bids is submitted, or up to \$6,000 if the projected energy savings are greater than the increase in mortgage payments. Loans may exceed this amount at the discretion of the VA. Applicants cannot include the cost of their own labor in the total amount. No additional home appraisal is needed but applicants must submit a HER, contractor bids, and other documentation. The VA insures 50% of the loan if taken by itself, but it may insure less if the total value of the mortgage exceeds a certain amount.

This mortgage is available to qualified military personnel, reservists and veterans (see www.homeloans.va.gov/eliq2.htm for more details). Applicants should secure a certificate of eligibility from their local lending office and submit it to a VA-approved private lender. If the loan is approved, the VA guarantees the loan when it is closed.

ENERGY STAR ® Energy Efficient Mortgages

These mortgages, unlike those insured by the FHA and VA, are not guaranteed by a particular federal agency. At the time of this writing, the Environmental Protection Agency’s ENERGY STAR program listed 49 private lenders who offer homebuyer assistance, home energy rating assistance, special financing, and other assistance to applicants buying homes with the ENERGY STAR rating. The EPA requires ENERGY STAR-approved lenders who offer FHA EEMs to provide those to qualified borrowers. Borrowers should apply directly to those lenders listed on the [ENERGY STAR website](#).

Conventional Energy Efficient Mortgages

Like ENERGY STAR ®, conventional mortgages are not backed by a federal agency. Private lenders sell loans to Fannie Mae and Freddie Mac, which in turn allow homebuyers to borrow up to 15% of an existing home’s appraised value for improvements documented by a HER.

Fannie Mae also lends up to 5% for ENERGY STAR new homes. Fannie Mae EEMs are for single-family, owner-occupied units, and they provide EEMs to those whose income might otherwise disqualify them from receiving the loans by allowing approved lenders to adjust borrowers’ debt-to-income ratio by 2%. The value of the improvements is immediately added to the total appraised value of the home.

Freddie Mac offers EEMs for 1-4 unit dwellings and also helps raise the effective income of the borrower to qualifying levels by allowing lenders to increase the borrower’s income by a dollar amount equal to the estimated energy savings. Any energy efficiency improvements can qualify, and these mortgages can be combined with both fixed-rate and adjustable-rate mortgages. Borrowers should apply directly to the lender. See www.natresnet.org/resources/lender/default.htm for more details.

Modified Accelerated Cost-Recovery System (MACRS)

Federal

Incentive Type: Corporate Depreciation

Eligible Renewable/Other Technologies: Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Wind, Geothermal Electric, Fuel Cells, Solar Hybrid Lighting, Direct Use Geothermal, Microturbines

Applicable Sectors: Commercial, Industrial

Authority 1: [26 USC § 168 \(2005\)](#)**Effective Date:** 1986**Summary:**

Under the Modified Accelerated Cost-Recovery System (MACRS), businesses can recover investments in certain property through depreciation deductions. The MACRS establishes a set of class lives for various types of property, ranging from three to 50 years, over which the property may be depreciated. For solar, wind and geothermal property placed in service after 1986, the current MACRS property class is five years. With the passage of the the Energy Policy Act of 2005, fuel cells, microturbines, and solar hybrid lighting technologies are now classified as 5-year property as well. 26 USC § 168 references 26 USC § 48(a)(3)(A) with respect to classifying property as "5-year property" and EPAct 2005 added these technologies definition of energy property in § 48 as part of the business energy tax credit expansion.

For more information, see *IRS Publication 946, IRS Form 4562: Depreciation and Amortization, and Instructions for Form 4562*. The [IRS web site](#) provides a search mechanism for forms and publications. Enter the relevant form, publication name or number, and click "GO" to receive the requested form or publication.

Contact:

Public Information - IRS
Internal Revenue Service
1111 Constitution Avenue, N.W.
Washington, DC 20224
Phone: (800) 829-1040
Web site: <http://www.irs.gov>

Renewable Electricity Production Tax Credit (PTC)**Federal****Incentive Type:** Corporate Tax Credit**Eligible Renewable/Other Technologies:** Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Municipal Solid Waste, Refined Coal, Indian Coal, Small Hydroelectric**Applicable Sectors:** Commercial, Industrial**Amount:** 2.0¢/kWh for wind, geothermal, closed-loop biomass; 1.0¢/kWh for other eligible technologies. Applies to first 10 years of operation.**Authority 1:** 26 USC § 45**Date Enacted:** 1992**Authority 2:** [The Working Families Tax Relief Act of 2004 \(H.R. 1308\)](#)**Date Enacted:** 10/4/2004**Effective Date:** 1/1/2004**Expiration Date:** 12/31/2005**Authority 3:** [American Jobs Creation Act of 2004 \(H.R. 4520\) -- Sec. 710](#)**Date Enacted:** 10/22/2004**Effective Date:** varies by technology**Expiration Date:** 12/31/2008 for refined coal; 12/31/05 for others**Authority 4:** [Energy Policy Act of 2005 \(Section 1301\)](#)**Date Enacted:** 8/8/2005**Effective Date:** 8/8/2005**Expiration Date:** 1/1/2008 for renewables**Authority 5:** The Tax Relief and Health Care Act of 2006 (H.R. 6111)**Date Enacted:** 12/20/2006**Expiration Date:** 12/31/2008**Website:** <http://www.irs.gov/pub/irs-pdf/f8835.pdf>**Summary:**

The Renewable Electricity Production Credit (PTC) is a per kilowatt-hour tax credit for electricity generated by qualified energy resources. Enacted as part of the Energy Policy Act of 1992, the credit expired at the end of 2001, and was subsequently extended in March 2002 as part of the Job Creation and Worker Assistance Act of 2002 (H.R. 3090). The tax credit then expired at the end of 2003 and was not renewed until October 2004, as part of H.R. 1308, the Working

Families Tax Relief Act of 2004, which extended the credit through December 31, 2005. The Energy Policy Act of 2005 ([H.R. 6](#)) modified the credit and extended it through December 31, 2007. In December 2006, the credit was extended for yet another year (through December 31, 2008) by Section 207 of the [Tax Relief and Health Care Act of 2006 \(H.R. 6111\)](#).

Section 710 of the "American Jobs Creation Act of 2004" ([H.R. 4520](#)), expanded the PTC to include additional eligible resources -- geothermal energy, open-loop biomass, solar energy, small irrigation power, landfill gas, municipal solid waste combustion, and refined coal -- in addition to the formerly eligible wind energy, closed-loop biomass, and poultry-waste energy resources. The Energy Policy Act of 2005 (EPAct 2005) further expanded the credit to certain hydropower facilities and Indian coal (coal reserves owned by an Indian tribe or were held in trust by the U.S. government for the benefit of an Indian tribe). Note that as a result of EPAct 2005, solar facilities placed into service after December 31, 2005, are no longer eligible for this incentive.

REPC now applies to the following resources:

- wind
- closed-loop biomass
- open-loop biomass
- geothermal energy
- small irrigation power (150 kW - 5 MW)
- municipal solid waste
- landfill gas
- refined coal
- hydropower
- Indian coal

The REPC provides a tax credit of 1.5¢/kWh (in 1993 dollars and indexed for inflation) for wind, closed-loop biomass and geothermal. Currently, the REPC for these technologies is 2.0¢/kWh. Electricity from open-loop biomass, small irrigation hydroelectric, landfill gas, municipal solid waste resources, and hydropower receive half that rate -- currently 1.0¢/kWh.

The duration of the credit is 10 years. However, open-loop biomass, geothermal, small irrigation hydro, landfill gas, and municipal solid waste combustion facilities placed into service after October 22, 2004, and before enactment of EPAct 2005, on August 8, 2005, are eligible for the credit for a five-year period. Refined-coal facilities will receive \$4.375 per ton (indexed for inflation) for a 10-year term. Indian coal production facilities will receive an increase in tax credit during the 7-year period beginning January 1, 2006, in the amount of \$1.50/ton through 2009, and \$2.00/ton after 2009.

Note, however, that owners of geothermal projects who claim the federal business energy tax credit may *not* also claim the PTC.

A business can take the credit by completing [Form 8835](#), "Renewable Electricity Production Credit," and [Form 3800](#), "General Business Credit."

IRS Telephone Assistance for Businesses
Toll-Free, 1-800-829-4933

Renewable Energy Production Incentive (REPI)

Federal

Incentive Type: Production Incentive

Eligible Renewable/Other Technologies: Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Geothermal Electric, Livestock Methane, Tidal Energy, Wave Energy, Ocean Thermal, Fuel Cells using Renewable Fuels

Applicable Sectors: Tribal Government, Municipal Utility, Rural Electric Cooperative, State/local gov't that sell project's electricity

Amount: 1.5¢/kWh (1993 dollars, indexed for inflation)

Terms: 10 years

Authority 1: 42 USCS § 13317

Date Enacted: 1992 (subsequently amended)

Authority 2: 10 CFR 451

Website: <http://www.eere.energy.gov/repj>

Summary:

The Renewable Energy Production Incentive (REPI) provides financial incentive payments for electricity produced and sold by new qualifying renewable energy generation facilities. Qualifying facilities are eligible for annual incentive

payments of 1.5¢ per kilowatt-hour (in 1993 dollars and indexed for inflation) for the first 10-year period of their operation, subject to the availability of annual appropriations in each federal fiscal year of operation.

REPI was originally authorized under Section 1212 of the Energy Policy Act of 1992 and had expired for new projects as of September 30, 2003. However, Section 202 of the Energy Policy Act of 2005 ([H.R. 6](#)) reauthorized appropriations for fiscal years 2006 through 2026 and expanded the list of eligible technologies and facilities owners. See 42 USCS § 13317 above for the current REPI statute.

Eligible electric production facilities include not-for-profit electrical cooperatives, public utilities, state governments, Commonwealths, territories, possessions of the U.S., the District of Columbia, Indian tribal governments, or a political subdivision thereof, or Native Corporations that sell the project's electricity to someone else.

Qualifying facilities must use solar, wind, geothermal (with certain restrictions as contained in the rulemaking), or biomass (except for municipal solid waste combustion), landfill gas, livestock methane, and ocean (including tidal, wave, current, and thermal) generation technologies. Fuel cells using hydrogen derived from eligible biomass facilities are also considered an eligible technology.

If there are insufficient appropriations to make full payments for electric production from all qualified facilities for a fiscal year, 60% of appropriated funds are to be assigned to facilities that use solar, wind, ocean (including tidal, wave, current, and thermal), geothermal, or closed-loop biomass technologies; and 40% of appropriated funds for the fiscal year to other projects.

REPI complements Sections 1914 and 1916 of the Energy Policy Act of 1992, which provide tax incentives to certain private sector entities for certain types of new renewable energy generation facilities.

For questions concerning REPI policy issues and the availability of appropriations, email repi@ee.doe.gov. The point of contact on REPI implementation (facility qualifications, applications, and payments) is Christine Carter.

Contact:

Christine Carter
U.S. Department of Energy
Golden Field Office
1617 Cole Blvd.
Golden, CO 80401-3393
E-Mail: christine.carter@go.doe.gov
Web site: <http://www.eere.energy.gov/>

Information Specialist - REPI
Department of Energy
Weatherization and Intergovernmental Program
Washington, DC
E-Mail: repi@ee.doe.gov
Web site: <http://www.eere.energy.gov/>

Residential Energy Conservation Subsidy Exclusion (Corporate)

Federal

Incentive Type: Corporate Exemption

Eligible Efficiency

Technologies: Yes; specific technologies not identified

Eligible Renewable/Other Solar Water Heat, Solar Space Heat, Photovoltaics

Technologies:

Applicable Sectors: Residential, Multi-Family Residential

Amount: 100% of the subsidy

Terms: Applies to energy conservation measures on dwelling units only

Authority 1: 26 USC § 136

Website: <http://www.irs.gov/publications/p525/index.html>

Summary:

According to Section 136 of the IRS Code, energy conservation subsidies provided by public utilities, either directly or indirectly, are nontaxable: "Gross income shall not include the value of any subsidy provided (directly or indirectly) by a public utility to a customer for the purchase or installation of any energy conservation measure."

Energy conservation measure includes installations or modifications that are primarily designed to reduce consumption of electricity or natural gas, or improve the management of energy demand.

Dwelling unit includes a house, apartment, condominium, mobile home, boat, or similar property. If a building or structure contains both dwelling and other units, any subsidy must be properly allocated.

Given the definition of "energy conservation measure" there is strong evidence that utility rebates for residential solar thermal and solar electric projects may be nontaxable. However, the IRS has not ruled definitively on this issue. For taxpayers considering using this provision for renewable energy systems, consultation with a tax attorney is advised.

Other types of utility subsidies that may come in the form of credits or reduced rates are also nontaxable:

"Utility rebates. If you are a customer of an electric utility company and you participate in the utility's energy conservation program, you may receive on your monthly electric bill either: a reduction in the purchase price of electricity furnished to you (rate reduction), or a nonrefundable credit against the purchase price of the electricity. The amount of the rate reduction or nonrefundable credit is not included in your income." (IRS Publication 525)

Contact:

Public Information - IRS
Internal Revenue Service
1111 Constitution Avenue, N.W.
Washington, DC 20224
Phone: (800) 829-1040
Web site: <http://www.irs.gov>

Residential Energy Conservation Subsidy Exclusion (Personal)

Federal

Incentive Type: Personal Exemption

Eligible Efficiency

Technologies: Yes; specific technologies not identified

Eligible Renewable/Other: Solar Water Heat, Solar Space Heat, Photovoltaics

Technologies:

Applicable Sectors: Residential, Multi-Family Residential

Amount: 100% of subsidy

Authority 1: 26 USC § 136

Website: <http://www.irs.gov/publications/p525/index.html>

Summary:

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Contact:

Public Information - IRS
Internal Revenue Service

1111 Constitution Avenue, N.W.
 Washington, DC 20224
 Phone: (800) 829-1040
 Web site: <http://www.irs.gov>

Residential Energy Efficiency Tax Credit

Federal

Incentive Type: Personal Tax Credit

Eligible Efficiency Technologies: Water Heaters, Furnaces, Boilers, Heat pumps, Air conditioners, Building Insulation, Windows, Doors, Roofs, Circulating fan used in a qualifying furnace

Eligible Renewable/Other Technologies: Geothermal Heat Pumps

Applicable Sectors: Residential

Amount: 10% of cost of building envelope improvements; 100% for qualified energy property (heating, cooling, water heaters)

Maximum Incentive: Varies by technology; no more than \$500 credit for all energy property and envelope improvements for all tax years.

Equipment/Installation Requirements: Equipment must be new and in compliance with all applicable performance and safety standards; performance and quality standards vary by technology

Authority 1: [26 USC § 25C](#)

Date Enacted: 8/8/2005

Effective Date: 1/1/2006

Expiration Date: 12/31/2007

Website: <http://www.irs.gov/newsroom/article/0,,id=154657,00.html>

Summary:

Now available: [IRS Form 5695 & Instructions: Residential Energy Credits for Tax Year 2006](#)

The Energy Policy Act of 2005 established tax credits for energy efficiency improvements in the building envelope of existing homes and for the purchase of high-efficiency heating, cooling, and water heating equipment. Efficiency improvements and/or equipment must be placed in service from January 1, 2006 through December 31, 2007 and must serve a dwelling in the United States owned and used by the tax payer as a primary residence. The maximum amount of homeowner credit for all improvements combined is \$500 during the two-year period of the tax credit.

Building Envelope Improvements

Owners of existing homes can receive tax credits of up to 10% of the cost of upgrading the efficiency of the building's envelope. Components eligible for the credit include:

- insulation materials and systems designed to reduce a home's heat loss or gain;
- exterior doors and windows (including skylights); and
- pigmented metal roofs designed to reduce heat gain.

Credits for windows are not to exceed \$200, and the total amount of credits for building envelope measures and other qualified energy property outlined below must not exceed \$500.

Improvements should be expected to remain in use for at least 5 years. Roofs with pigmented coatings must meet Energy Star requirements, and all other improvements must meet 2000 International Energy Conservation Code criteria, including supplements. Manufactured homes conforming to Federal Manufactured Home Construction and Safety Standards also qualify.

Heating, Cooling, and Water Heating Equipment

Purchasers of qualified energy efficient property are eligible for tax credits up to the total expenditures on such property. The credit can also be applied to labor costs for assembly and original installation of this property. Eligible property and maximum credit amounts are as follows:

- electric heat pump water heaters [\$300];
- electric heat pumps [\$300];
- geothermal heat pumps [\$300];
- central air conditioners [\$300];
- natural gas, propane, or oil water heaters [\$300];
- natural gas, propane, or oil furnace or hot water boilers [\$150]; and
- advanced main air circulating fans [\$50].

Performance and quality standards for tax credit eligibility vary by technology. See 26 USC § 25C above for details. In addition, the Internal Revenue Service (IRS) has provided the following interim guidance, pending the issuance of regulations, relating to the credit: [IRS Notice 2006-26](#)

For more detailed information on qualifying products, visit the [Energy Star Web site](#).

Contact:

Public Information - IRS
Internal Revenue Service
1111 Constitution Avenue, N.W.
Washington, DC 20224
Phone: (800) 829-1040
Web site: <http://www.irs.gov>

Residential Solar and Fuel Cell Tax Credit**Federal****Incentive Type:** Personal Tax Credit**Eligible Renewable/Other Technologies:** Solar Water Heat, Photovoltaics, Fuel Cells, Other Solar Electric Technologies**Applicable Sectors:** Residential**Amount:** 30%**Maximum Incentive:** \$2,000 for solar electric and solar water heating; \$500 per 0.5 kW for fuel cells**Carryover Provisions:** Excess credit may be carried forward to succeeding tax year**Eligible System Size:** Not specified**Equipment/Installation Requirements:** Solar water heating property must be certified by SRCC or by comparable entity endorsed by the state. At least half the energy used to heat the dwelling's water must be from solar in order for the solar water heating property expenditures to be eligible.**Authority 1:** [26 USC § 25D](#)**Date Enacted:** 8/8/2005**Effective Date:** 1/1/2006**Expiration Date:** 12/31/2008**Summary:****Now available:** [IRS Form 5695 & Instructions: Residential Energy Credits for Tax Year 2006](#)

The Energy Policy Act of 2005 ([H.R. 6, Sec. 1335](#)) established a 30% tax credit up to \$2,000 for the purchase and installation of residential solar electric and solar water heating property. An individual can take both a 30% credit up to the \$2,000 cap for a photovoltaics system and a 30% credit up to a separate \$2,000 cap for a solar water heating system. A 30% tax credit up to \$500 per 0.5 kilowatt (kW) is also available for fuels cells. Initially scheduled to expire at the end of 2007, the tax credits were extended through December 31, 2008, by Section 206 of the [Tax Relief and Health Care Act of 2006 \(H.R. 6111\)](#).

Solar water heating property must be certified for performance by the Solar Rating Certification Corporation (SRCC) or a comparable entity endorsed by the government of the state in which the property is installed. Note that the tax credit does not apply to solar water heating property for swimming pools or hot tubs.

The credit is calculated based on the individual's expenditures excluding subsidized energy financing, which is defined as "financing provided under a Federal, State, or local program a principal purpose of which is to provide subsidized financing for projects designed to conserve or produce energy." *Consumers who receive other incentives are advised to consult with a tax professional regarding how to calculate this federal tax credit.*

If the federal tax credit exceeds tax liability, the excess amount may be carried forward to the succeeding taxable year. Expenditures include labor costs for the onsite preparation, assembly, or original installation of the system and for piping or wiring to interconnect the system to the dwelling.

To be eligible for the credit, a system must be "placed in service" or activated on or after January 1, 2006, and on or before December 31, 2008. Expenditures with respect to the equipment are treated as made when the installation is completed. If the installation is on a new home, the "placed in service" date is the date of occupancy by the homeowner.

Contact:

Public Information - IRS
 Internal Revenue Service
 1111 Constitution Avenue, N.W.
 Washington, DC 20224
 Phone: (800) 829-1040
 Web site: <http://www.irs.gov>

Tribal Energy Program Grant**Federal****Incentive Type:** Federal Grant Program**Eligible Renewable/Other Technologies:** Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric, Geothermal Heat Pumps**Applicable Sectors:** Tribal Government**Amount:** Varies**Max. Limit:** Varies**Terms:** Varies**Website:** <http://www.eere.energy.gov/tribalenergy/>**Summary:**

DOE's Office of Energy Efficiency and Renewable Energy's Tribal Energy Program provides financial and technical assistance to tribes for feasibility studies and shares the cost of implementing sustainable renewable energy installations on tribal lands. This program seeks to promote tribal energy self-sufficiency and fosters employment and economic development on America's tribal lands.

Tribal Energy Program funding is awarded through a competitive process. Each solicitation will include instructions on how to apply, application content, and the criteria by which applications will be selected for funding. Consult the program Web site above for current funding opportunities and past solicitations.

The program is managed by EERE's Weatherization and Intergovernmental Program, implemented by the DOE Golden Field Office, and technical support is provided by Sandia National Laboratories and the National Renewable Energy Laboratory.

Contact:

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 Golden Field Office
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 Golden, CO 80401
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 Web site: <http://www.eere.energy.gov/tribalenergy/>

USDA Renewable Energy Systems and Energy Efficiency Improvements Program**Federal****Incentive Type:** Federal Grant Program**Eligible Efficiency****Technologies:** Yes; specific technologies not identified**Eligible Renewable/Other Technologies:** Solar Water Heat, Solar Space Heat, Photovoltaics, Wind, Biomass, Geothermal Electric, Geothermal Heat Pumps, Hydrogen, Direct-Use Geothermal, Anaerobic Digestion, Renewable Fuels, Fuel Cells using Renewable Fuels**Applicable Sectors:** Commercial, Agricultural**Amount:** Grants: 25% of eligible project costs; Guaranteed loans: 50% of eligible project costs**Max. Limit:** Grants: \$500,000 per renewable-energy project; Guaranteed loans: \$10 million

Authority 1: [Farm Security And Rural Investment Act of 2002 \(Sec. 9006\)](#)

Date Enacted: 5/13/2002

Effective Date: FY 2003

Expiration Date: FY 2007

Authority 2: Renewable Energy Systems and Energy Efficiency Improvements Program (Final Rule: 7 CFR 42480)

Effective Date: 7/18/2005

Website: <http://www.rurdev.usda.gov/rbs/farbill/>

Summary:

Note: The deadlines for Grant Applications and Guaranteed Loan and Combined Guaranteed Loan and Grant Applications for FY 2007 have passed. This program is up for reauthorization in the 2007 Farm Bill. Click [here](#) for more information about 2007 Farm Bill proposals and analysis.

Section 9006 of the 2002 Farm Bill required the U.S. Department of Agriculture (USDA) to create a program to make direct loans, loan guarantees, and grants to agricultural producers and rural small businesses to purchase renewable-energy systems and make energy-efficiency improvements. Funding in the amount of \$23 million per year was appropriated for FY 2003 through FY 2007. This program is known as the *Renewable Energy Systems and Energy Efficiency Improvements Program*.

The maximum **grant** award is 25% of eligible project costs up to \$500,000 for renewable energy projects and up to \$250,000 for energy efficiency improvements. Assistance to one individual or entity is not to exceed \$750,000. The minimum grant request is \$2,500 for renewable energy projects and \$1,500 for efficiency projects. Eligible renewable energy projects include wind, solar, biomass and geothermal; and hydrogen derived from biomass or water using wind, solar or geothermal energy sources. Applications must be submitted to the appropriate [Rural Development State Office](#).

Under the **guaranteed loan** option, funds up to 50% of eligible project costs (with a maximum project cost of \$10 million) are available. The minimum amount of a guaranteed loan made to a borrower is \$5,000. A combined grant and guaranteed loan under this program cannot exceed 50% of eligible project costs, and the applicant or borrower is responsible for having other funding sources for the remaining funds. The maximum percentage of guarantee ranges from 70% to 85% depending on the loan value; the percentage for a given project will be negotiated between the lender and the Rural Business-Cooperative Service. The interest rate will be negotiated between the lender and the applicant and the repayment term must not exceed 30 years for real estate, 20 years for machinery and equipment, and seven years for working capital.

The USDA has implemented this program through a Notice of Funds Availability (NOFA) for each of the last five years. The fifth round of funding was made available in March 2007 in the form of grants, guaranteed loans, and combined guaranteed loans and grant applications. **Click [here](#) for the 2007 Notice Of Funds Availability.** Grant Applications were due May 18, 2007. Guaranteed Loans and Combined Guaranteed Loans and Grants Applications were July 2, 2007.

USDA announced in September 2007 that 345 proposals in 37 states were selected to receive a total of \$18.2 million for renewable energy and energy efficiency projects as a result of the FY 2007 solicitation. Of the \$18.2 million total, \$13.4 million are grants and \$4.8 million are guaranteed loans. Click [here](#) for a list of recipients.

Energy Reduction Goals for Federal Agencies

Federal

Incentive Type: Energy Standards for Public Buildings

Eligible Efficiency

Technologies: Comprehensive Measures/Whole Building

Eligible Renewable/Other Renewable Fuel Vehicles, Other Alternative Fuel Vehicles

Technologies:

Applicable Sectors: Fed. Government

Goal: The total energy reduction goal for every Federal agency is 30% by 2015, relative to the baseline of the agency's energy use in fiscal year 2003

Requirement: At least half of the required renewable energy consumed by the agency in a fiscal year must come from new renewable sources, New construction and major renovation of agency buildings must comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings set forth in the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (2006),

Electronic equipment purchased by agencies must be Electronic Product Environmental Assessment Tool (EPEAT)-registered products, unless there is no EPEAT standard for such product

Authority 1: Executive Order 13423

Date Enacted: 1/24/07

Effective Date: 1/24/07

Website: http://www1.eere.energy.gov/femp/news/news_detail.html?news_id=10538

Summary:

Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management was signed by the President on January 24, 2007. It establishes total energy reduction goals for every Federal agency, which includes the electricity consumed by their buildings as well as the fuel consumed by their fleets, provided their fleets consist of at least 20 motor vehicles. The executive order also establishes water reduction goals, mandates recycling programs within facilities, and requires agencies to purchase electronic equipment which is registered with the Electronic Product Environmental Assessment Tool ([EPEAT](#)).

Executive Order 13423 creates a schedule by which all Federal agencies should reduce their total energy intensity by 30% by the end of 2015, relative to the baseline of the agency's energy use in fiscal year 2003. The table below shows the annual energy reductions required to meet this goal:

Fiscal Year:
2006: 3%
2007: 6%
2008: 9%
2009: 12%
2010: 15%
2011: 18%
2012: 21%
2013: 24%
2014: 27%
2015: 30%

To help achieve these energy reductions, new construction and major renovation of agency buildings must comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings set forth in the [Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding \(2006\)](#), in addition to the [energy goals and standards established in The Energy Policy Act of 2005](#). These building standards include a target energy use of 30 percent below the average building performance for new buildings, and a target which is 20 percent below the average for renovations. The building standards also take into consideration indoor environmental quality, and a reduction in the environmental impact of the materials within the building in favor of bio-based and post-consumer products.

The executive order also calls for agencies to begin in fiscal year 2008 to reduce water consumption intensity when cost-effective, relative to the baseline of the agency's water consumption in fiscal year 2007. The target reduction is 2 percent annually through the end of fiscal year 2015, or 16 percent by the end of fiscal year 2015. Likewise, agencies that operate fleets of at least 20 motor vehicles are required to reduce their fleet's total consumption of petroleum products by 2 percent annually through 2015, while increasing their consumption of non-petroleum-based fuel by 10 percent per year. Agencies are also required to purchase plug-in hybrid vehicles when life-cycle cost analysis demonstrates their cost to be reasonably similar to other vehicles.

The Energy Policy Act of 2005 established [green power purchasing goals for the Federal government](#), whereby the 7.5% of their electricity must be obtained from renewable sources by 2013. Executive Order 13423 now requires at least half of the required renewable energy consumed by an agency in a fiscal year to come from sources placed in service since 1999.

Contact:

Public Information - FEMP
U.S. Department of Energy
Federal Energy Management Program
EE-2L
1000 Independence Ave., SW
Washington, DC 20585-0121
Phone: (202) 586-5772
Fax: (202) 586-3000

Interconnection Standards for Small Generators**Federal****Incentive Type:** Interconnection**Eligible Renewable/Other Technologies:** Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, CHP/Cogeneration, Anaerobic Digestion, Small Hydroelectric, Tidal Energy, Wave Energy, Ocean Thermal, Microturbines, Other Distributed Generation Technologies**Applicable Sectors:** Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, State Government, Tribal Government, Fed. Government, Agricultural, Institutional**Special Rules for Net-Metered Systems?** No**Limit on System Size/Overall Enrollment:** 20 MW**Standard Interconnection Agreement?** Yes**Additional Insurance Requirements?** Customer must obtain additional liability insurance "only if necessary as a function of owning and operating a generating facility."**External Disconnect Required?** No**Rules for Non-Net-Metered DG?** Yes**Authority 1:** FERC Order No. 2006**Date Enacted:** 5/12/2005**Authority 2:** FERC Order No. 2006-A**Date Enacted:** 11/22/2005**Authority 3:** FERC Order No. 2006-B**Date Enacted:** 7/20/2006**Summary:**

The Federal Energy Regulatory Commission (FERC) adopted "small generator" interconnection standards for distributed energy resources up to 20 megawatts (MW) in capacity in May 2005.* The FERC's standards apply only to facilities subject to the jurisdiction of the commission; mostly, these are systems that interconnect at the transmission level. The standards generally do not apply to distribution-level interconnection, which is regulated by state public utilities commissions. However, the FERC has noted that its interconnection standards for small generators should serve as a useful model for state-level standards.

The FERC's standards include a Small Generator Interconnection Procedures (SGIP) document and a Small Generator Interconnection Agreement (SGIA). The SGIP contains the technical procedures that the small generator and utility must follow in the course of connecting the generator with the utility's lines. The SGIA contains the contractual provisions for the interconnection and spells out who pays for improvements to the utility's electric system, if needed to complete the interconnection. The standards include provisions for three levels of interconnection:

- The "10-kilowatt (kW) Inverter Process," for certified inverter-based systems no larger than 10 kW;
- The "Fast Track Process," for certified systems no larger than 2 MW; and
- The default "Study Process," for all other systems no larger than 20 MW.

The standards include technical screens for each level of interconnection. Notably, the FERC standards do not require customers to have an external disconnect switch. Utilities and customers must follow specific timelines, and guidelines for interconnection and study fees are established. Customers must obtain liability insurance "sufficient to insure against all reasonably foreseeable direct liabilities given the size and nature of the generating equipment being interconnected, the interconnection itself, and the characteristics of the system to which the interconnection is made." Additional liability insurance must be obtained "only if necessary as a function of owning and operating a generating facility."

* The FERC adopted interconnection standards for facilities larger than 20 MW in July 2003. ([See FERC Order Nos. 2003, 2003-A, 2003-B and 2003-C.](#)) FERC's standards for larger generators include a standard Large Generator Interconnection Procedures document (LGIP) and a standard Large Generator Interconnection Agreement (LGIA).

Contact:

Public Information - FERC
Federal Energy Regulatory Commission (FERC)
888 First Street, NE
Washington, DC 20426
Phone: (866) 208-3372
Web site: <http://www.ferc.gov>

U.S. Federal Government - Green Power Purchasing Goal**Federal****Incentive Type:** Green Power Purchasing/Aggregation**Eligible Renewable/Other Technologies:** Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Municipal Solid Waste, Tidal Energy, Wave Energy, Ocean Thermal**Applicable Sectors:** Fed. Government**% Renewables:** 3% in FY 2007-2009
5% in FY 2010-2012
7.5% in FY 2013 thereafter**Source:** At least half of the required renewable energy must come from new renewable sources**Appropriation:** Commercialization Program - \$50,000,000 for each FY 2006 - 2010
Evaluation Program - \$10,000,000 for each FY 2006 - 2010**Authority 1:** Executive Order 13123**Date Enacted:** 6/3/1999**Effective Date:** 6/2000**Authority 2:** [EPACT 2005, § 203 et seq.](#)**Date Enacted:** 8/8/2005**Authority 3:** Executive Order 13423**Date Enacted:** 1/24/2007**Effective Date:** 1/24/2007**Website:** http://www1.eere.energy.gov/femp/about/eo_fedmgmt.html**Summary:**

Executive Order 13123, issued in 1999, required federal agencies to increase their use of renewable energy to a percentage determined by the secretary of energy. It also called for 20,000 federal solar roofs by 2010. In 2000, the secretary of energy directed federal agencies to obtain the equivalent of 2.5% of their electricity from renewable resources by 2005. Executive Order 13123 was intended to improve the federal government's energy management "in order to save taxpayer dollars and reduce emissions that contribute to air pollution and global climate change."

The federal Energy Policy Act of 2005 (EPAct 2005) reestablished and extended several earlier goals and standards to reduce energy use in existing and new federal buildings. Section 203 of EPAct 2005 requires that, to the extent it is economically feasible and technically practicable, the total amount of renewable electric energy consumed by the federal government during any fiscal year shall not be less than the following:

- 3% in FY 2007-2009
- 5% in FY 2010-2012
- 7.5% in FY 2013 thereafter

The amount of renewable-energy credits is doubled for electricity produced and used on-site at a federal facility, produced on federal lands and used at a federal facility, or if it is produced on Indian land as defined in title XXVI of the Energy Policy Act of 1992 and used at a federal facility.

Renewable electrical energy technologies defined in this section include solar, wind, biomass, landfill gas, ocean (including tidal, wave, current and thermal), geothermal, municipal solid waste, and new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project. Executive Order 13423, signed in January 2007, now requires at least half of the required renewable energy consumed by an agency in a fiscal year to come from sources placed in service since 1999.

Section 204 of EPAct 2005 establishes a photovoltaic (PV) energy commercialization program for the procurement and installation of PV systems in public and federal buildings. It requires the installation of 20,000 solar-energy systems on federal buildings by 2010, as contained in the federal Million Solar Roof Initiative of 1997. The commercialization program has been appropriated \$50 million annually for fiscal years 2006-2010, until funds are expended. An evaluation program has been appropriated \$10 million annually for fiscal years 2006-2010, until funds are expended.

See the Federal Energy Management Program (FEMP) [web site](#) for updates on progress in meeting these goals.

Contact:

Public Information - FEMP
U.S. Department of Energy
Federal Energy Management Program
EE-2L

1000 Independence Ave., SW
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Appendix E

Synopsis of Written Public Comments

HB07-1228 (Docket 07M-230E)
Synopsis of Written Comments
Initial Comments

Scott Haase:

Only large wind and PV solar has so far benefitted from A37.

Biomass electric and thermal technologies (biomass, solar, geothermal) have been left out.

PUC should consider carve-out for biomass thermal, direct use geothermal, small wind and non-PV (solar thermal?) resources.

Proposes a DG carve-out citing Arizona

Proposes conversion of thermal energy to RECs as an incentive

Colorado Solar Energy Industries Association:

Small wind, biomass (thermal and electric), geothermal, solar thermal have not been developed under A37.

Commission policy should foster the development of distributed renewable beyond solar and the expansion of distributed solar outside of IOU service areas.

Proposes a uniform state-wide policy for promoting customer-sited solar development.

Proposes solar thermal incentive program with a carve-out against the RES.

Southwest Windpower, Inc.:

Colorado RPS provided for distributed solar but overlooked residential wind.

Expand the Standard Rebate Offer (now applied only to small solar) to include all DG.

Create a set-aside for DB.

Create credit multipliers for customer-owned DG.

Extend Commission's net metering policy to all utilities in Colorado.

Rocky Mountain Farmers Union and Colorado Working Landscapes:

Emphasizes the need for expanded net metering to all utilities.

Foster segmented bidding by utilities to expand the market for RECs.

Investigate the usefulness of smart grid technologies to enhance the value of DG.

Explore the use of feed-in tariffs to promote community-based energy development and DG.

Cites Minnesota as a prime example.

Public Service Company of Colorado:

PSCo would support net metering tariffs for other than PV, such as wind and other DG.

Has a concern about how a REC-like credit program would work with technologies that do not produce electricity.

Concern about using the RES budget to provide incentives for DG that generates heat but not RECs to meet the RES.

With respect to DG that produces heat, PSCo may support incentives under its DSM programs as per HB07-1037.

Governor's Energy Office:

Supports incentives for deployment of DG.

Examine current disincentives that inhibit DG.

Advocates extending the Commission's net metering policies to utilities state-wide.

Interwest Energy Alliance:

The policy developed by the Commission should extend beyond PUC-jurisdictional utilities.

Adopt the Commission's net metering policy state-wide.

Modify rate structures to support DG, especially in the area of demand charges.

The DG customer is investing in his/her own capital assets therefore the demand charge should recover only the utilities costs of transmission and distribution.

Proposes a surcharge of perhaps 2% on electric bills to fund an incentive program for DG.

No need for a separate credit program for DG. Current REC trading system is adequate. But, RECs from DG should stay with the system owner and not allow utilities to require transferring them to the utility in return for interconnection and net metering.

Ratepayers United of Colorado:

Focuses primarily on specific technologies mentioned in HB07-1228 – solar heating, biomass heating, small wind, and biomass electric – that should be incentivized.

Identifies eleven additional DG technologies worthy of consideration for incentives.

Colorado Timber Industry Association:

Wind and solar have garnered most of the attention in the renewable arena thus far. Small wind, biomass (thermal and electric), geothermal (electric) and solar thermal have not been “developed and utilized to their maximum potential.”

Development of biomass resources would provide both renewable energy and aid in forest management and restoration.

Colorado State Forest Service:

Duplicates verbatim the comments of CTIA, above.

Reply Comments

Colorado Solar Energy Industries Association:

Agrees with Interwest that the transfer of RECs to a utility should not be a requirement for net metering.

Responds to PSCo's concern about credits for technologies that do not produce electricity stating that thermal RECs are possible and it would be straightforward to include solar thermal in the RES.

Cites nine states that include solar hot water in their RPS.

Suggests the use of engineering estimates for solar thermal production as is done with small PV.

Proposes adding a set-aside in the RES for solar thermal.

Proposes alternative mechanisms to incentivize solar thermal including system benefits charge, a tax on the transport of natural gas, or changing the RES rate cap to a fixed percentage transferring the additional funds to the GEO's Clean Energy Fund.

Colorado Rural Electric Association and Tri-State G&T, Inc.:

Any policies the Commission may develop for DG should not apply to the co-ops or Tri-State.

Disagrees with several parties who suggest that the Commission's net metering policies should be extended to REAs:

- There already exists a state-wide net metering law (40-9.5-301, C.R.S.) requiring co-ops to adopt rules for net-metered systems.
- In HB07-1169, the legislature rejected the notion that all co-ops should be subject to the same net metering rules as the IOUs.
- Given the diversity of co-op system characteristics, uniform net metering rules are inappropriate.

Rate related incentives for DG suggested by several parties cannot be recommended to the General Assembly by the Commission because the co-ops and Tri-State are not subject to the Commission's ratemaking jurisdiction.

Colorado Carbon Reduction Initiative:

PUC should consider a statewide carbon tax as a method of funding a DG program and describes two possible mechanisms for implementing such a tax. Either system would transfer the burden of funding a DG incentive program from IOU ratepayers to purchasers of all GHG-emitting fuels (including gasoline).

Environment Colorado:

Emphasizes that it is equally important to create incentives for DG systems that generate heat as well as electricity.

Agrees with CoSEIA that rebates should be offered for solar thermal systems.

Disagrees with Interwest that there is no need for a separate credit program for DG thermal resources. EC feels that it might be possible for separate credits to be created for solar thermal and other DG systems that produce heat.

Supports the comments of RMFU/CWL proposing up front rebates for solar thermal systems.

Supports uniform state-wide programs and consistent policies to foster renewable energy.

Nancy LaPlaca:

Supports the comments of RIC, Scott Haase and CCRI.

Echoes the recommendation of Scott Haase calling for an Arizona-style DG set-aside.

Notes the additional benefits from DG of increasing system reliability, reducing risk, and reducing transmission costs.

Governor's Energy Office:

No specific responses to other submittals.

Cites benefits of the diversified energy supply that would result from DG.

Notes the value of DG in new construction, both residential and industrial.

Encourages the evaluation of rebates to promote PV orientations west of south to offset demand closer to the time of utility coincident peak.

Forest Energy Colorado, LLC:

States that the intent of A37 was to promote renewable energy, not just electricity.

Supports a set-aside for DG in the RES as the most promising way to promote DG.

Emphasizes that all renewable energy resources (electrical and thermal) should qualify for RECs.

Believes that any renewable energy technology that displaces fossil fuels and reduces carbon emissions should qualify for RECs. The definition of RECs should be modified to include thermal energy.

Biomass provides benefits to the health of Colorado's forests and the economies of rural communities.