

Washington County Energy Initiative Community Energy Plan



Prepared for the County of Washington, Maine
By the Washington County Energy Initiative Committee



With assistance from
**Washington County
Council of Governments**
Helping communities plan for their future in Washington County, Maine

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Introduction

Washington County received an Energy Efficiency and Conservation Block Grant in May 2009, funds from the American Recovery and Reinvestment Act provided through Efficiency Maine. This grant allowed the County to conduct energy efficiency planning and outreach. Due to various unforeseen circumstances, it was July of 2012 before the Washington County Energy Initiative (WCEI) was formed and an Energy Committee met for the first time. Staffed by the Washington County Council of Governments, the group is composed of Washington County residents with experience and/or interest in the field of energy efficiency, building maintenance, heating, cooling and ventilation, and community health. They met monthly during the summer and fall of 2012. The members of the Energy Committee are listed in Appendix A.

This Plan is the result of the work of the WCEI. It outlines Washington County's current energy use, future energy use goals, specific recommendations and actions that should be taken to achieve those goals, brief descriptions of alternative energy resources and their associated planning considerations and policy options, and a list of implementation incentives. With this plan, Washington County is presented with the opportunity to take control of its energy use, improve the County's economic and environmental resilience, and reduce the financial burden of high-energy prices on its operations, as well as its citizens.

A significant component of the Washington County Energy Initiative Community Energy Plan is the energy audits report of three County-owned buildings in Machias, Maine. These audits are provided in a separate document (see Appendix B) entitled Building Energy Audits for Washington County, Maine, prepared by Breakaway Energy Services LLC. The Building Energy Audits report includes energy audits for the County Court House, the District Attorney's Office and the Communication building that houses the Washington County Emergency Management Agency (WCEMA) and the offices for the Unorganized Territories and Cooperative Extension. The Sheriff's Building and the County Jail were also evaluated in this process as components of the courthouse building. The energy audits recommended detailed energy conservation measures in several categories: lighting, fixture controls, mechanical systems, building envelope improvements and conversion of heating systems, primarily to biomass.

Organization of This Report

In addition to contracting to have energy audits performed on three county buildings the Washington County Energy Initiative Energy Committee developed energy goals for the county to consider and adopt. The committee also sought to learn about alternative energy opportunities and summarize that experience along with implementation incentives that could help put projects into effect. This Community Energy Plan is therefore organized into the following sections:

1. Proposed energy and energy-related goals for Washington County.
2. A summary of energy use and recommended energy conservation measures.
3. Brief descriptions of alternative energy resources, their associated planning considerations, and policy options.
4. Implementation opportunities for the measures discussed above.

Washington County Energy Initiative Goals for Washington County

At the first organizational meeting in July, the Energy Committee (see Appendix A) supporting this work adopted the name Washington County Energy Initiative (WCEI) by consensus.

The group adopted the following **purpose statement** for the WCEI:

The Washington County Energy Initiative seeks to reduce energy consumption and develop more sustainable practices in Washington County.

With this purpose in mind, the WCEI identified the following goals to guide their work:

- Establish the Washington County Energy Initiative as a formal Washington County Committee.
- Arrange for a formal inventory and energy audits of county-owned buildings in Machias to identify any potential energy- and cost-saving changes that could benefit County operations.
- Initiate ongoing tracking of Washington County energy use and costs relating to energy use in County buildings, as well as tracking vehicles emissions in the future.
- Initiate accurate record keeping of both, energy saved and costs avoided due to completed energy efficiency and conservation improvements and policies in Washington County.
- Involve County management staff and employees in discussions about saving energy and keeping down energy-related costs.
- Establish outreach opportunities to educate Washington County residents, business owners and employees about energy use and costs.
- Utilize grants, rebates and other financial incentives from Efficiency Maine and from other resources in order to underwrite municipal energy efficiency upgrades.
- Arrange for energy- and cost-saving lighting upgrades in all Washington County buildings identified by energy audits.

Energy Use Summary and Recommended Energy Conservation Measures

Prior to the first meeting of the Washington County Energy Initiative, a Request for Proposals was issued seeking a professional energy auditor to conduct energy audits on three county-owned buildings in Machias and to provide a summary of current energy use and recommended energy conservation measures.

The WCCOG hired Breakaway Energy LLC (Breakaway) to conduct the energy audits and prepare

the energy audits report. Their report, Building Energy Audits for Washington County, Maine, is provided in Appendix B. Breakaway's report provides a detailed summary of current energy-related building practices and systems, operating issues, comfort problems in the buildings, and investigates future plans for building renovations and use. It describes potential energy savings for the three¹ buildings, projects to consider, and estimated savings that would result from project implementation.

The Breakaway report divides findings and recommendations for energy efficiency improvement into three priority levels:

- Priority 1 opportunities are recommended for immediate implementation. These are generally low-cost improvements spread across multiple areas in the audits, such as adding window sash weather seals and updating building insulation.
- Priority 2 opportunities require more planning and more capital investment, such as adding radiator thermostatic controls and extensive adding/updating of building insulation. Breakaway recommends that these improvements be installed within the next 1-5 years.
- Priority 3 opportunities are predominantly "wish list" items that will have longer payback periods and/or require significant additional consideration, such as installing a solar photovoltaic array.

Many of the Priority 1 opportunities identified by Breakaway are low-cost improvements that can provide a quick return on investment to the County. In a proactive effort to improve the efficiency and cost-effectiveness of its operations, the County is retrofitting window sash weather seals at the Communications at 28 Center Street. Pending the budget outcome, the County is committed to implementing low-cost Priority 1 opportunities, as recommended, such as installing attic insulation in the courthouse.

Washington County is in the early stages of collecting information and investigating an energy study funded by the Biomass Office of the US Forest Service, State and Private Forestry, Northeast Area, through the Maine Forest Service Wood to Energy Grants Program. Additional grant opportunities will be explored by the WCEI for some of the larger efficiency projects identified.

Community Outreach:

The WCEI is organizing ideas to increase awareness about energy issues, and engage the Washington County community through use of member websites. The Washington County Community Energy Plan, the Building Energy Audits for Washington County and alternative energy information will be posted to the websites of Washington County, the Washington County Council of Governments, and the Sunrise County Economic Council by the end of October 2012.

Alternative energy resource information will be provided to groups and organizations as requested

¹ NOTE: The Breakaway Energy Audits report refers to 5 buildings at times. This results from their provision of three separate audits for the Court House, the Sheriffs Office and the County Jail. All 3 are located at 85 Court Street and referring herein as one building. However they are of different vintage and construction materials and, therefore, varying energy audit considerations.

for display booths at Washington County functions. Articles are being prepared for the local newspapers to increase awareness and inform the public of Washington County's commitment to addressing energy efficiency and conservation in county buildings.

Alternative Energy Resources Summary

This report and the committee members who contributed their time recognize that the economic feasibility of implementing alternative energy measures varies by type and opportunity. The committee agreed that brief descriptions of alternatives would be valuable for future reference and consideration. The committee chose to review alternative and renewable sources in their examination of alternatives. Missing from the following discussion therefore are non-renewable alternatives to oil including coal, compressed natural gas, liquefied natural gas, coal, and nuclear. The committee also did not review hydroelectric sources of energy though, with electricity imports from Canada, hydroelectric power is a significant contributor to current energy use in Washington County.

This section offers a brief description of several alternative energy resources gathered from various outside sources² and committee members. The WCEI committee used their September 11, 2012 meeting to hear from a variety of alternative energy vendors, developers and interested individuals. The following alternative energy resources were discussed and/or investigated by WCEI: Biomass Energy, Solar Power, Wind Power, Thermal Energy, Geothermal Energy and Compressed Natural Gas. Copies of the September 11th presentations are attached in Appendix C.

Energy Conservation

The national movement to find alternative sources of energy is driven by the high and rising cost of oil and a desire to secure domestic sources of energy, whether based on fossil fuel or renewable sources. The least expensive energy is the energy you never use. Thus no discussion of alternatives is complete without starting with conservation. It is the foundation and the motivation for performing the audits included in Appendix B. As noted in those audits small changes can impact the bottom line and be instituted for little or no expense. Actions as simple as turning off the lights when leaving a room or unplugging electronic devices when not in use produce dividends when aggregated. Insulation in walls and attics can produce more noticeable savings.

The energy conservation projects recommended in Breakaway's energy audit report are designed to save the County energy and money. The most cost effective projects recommended include efficient lighting, programmable thermostats, insulation, weatherization, window treatments, and purchasing efficient appliances.

Biomass Energy

Biomass energy uses of a wide variety of organic material, such as wood, grass, dedicated energy

² *Energy Planning and Implementation Guidebook for Vermont Communities*. Vermont Natural Resources Council and Vermont Leagues of Cities and Towns; April, 2011.

crops, sewage sludge and animal litter. Biomass contains stored solar energy, captured and stored in growing material through the process of photosynthesis. Energy is released quickly through combustion (burning) or more slowly when the biological material eventually composts or rots. Maine has used wood and wood products as a significant source of thermal energy for years. Producing heat or steam for space or process heating by combusting biomass fuels is presently one of the most efficient and cost-effective applications for biomass. Failing to utilize the waste heat, however, is among the least efficient means of generating electricity.

Biomass currently provides about two percent of America's electricity and some of the heat and steam used by homes and businesses. (White, Eric M., *Woody Biomass for Bioenergy and Biofuels in the United States* – a Briefing Paper, Dec. 2009) With more energy crops and better conversion technology, it could gain a much larger portion of the market.

Presentations were provided to the WCEI Energy Committee on September 11, 2012 by:

- Tom Wood from the Maine Forest Service and Jon McNerney, member of WCEI from Eastport. Both are assisting the County with information and research as part of a Maine Forest Service Wood to Energy Grant (with funds coming originally from the Biomass Office of the US Forest Service, State and Private Forestry, Northeast Area). As neither were able to attend the September 11th meeting, Tom Wood forwarded the Wood to Energy Projects in Maine Summary, (See Appendix C), that discusses projects using the application of wood, as either chips or pellets, in small to medium sized buildings in Maine. The summary includes costs, return on investment, and impact to local economy.
- Jim Knight, from Pelletco (established 2 years ago by a research project at the University of Maine at Orono), provided a slide presentation on the development of a high-energy pellet product incorporating recycled plastic with wood chips to form pellets (see Appendix C).

Solar Power

The sun has several applications that make solar an attractive solution for Maine. Every building that gets direct sunshine receives some measure of free solar energy that reduces the amount of fuel needed for heat.

Passive Heating and Lighting - Capturing solar energy is known as passive solar because there are no pumps or moving parts required; collection and storage of solar energy is built into the structure. Active solar systems employ equipment such as collector panels, pumps, and fans. South facing buildings maximize available solar energy, if the solar radiation is not blocked. As much as sixty percent (60%) of a building's space can be heated from the sun with proper window glazing on the south wall, thermal mass installation (such as concrete, brick, quarry tile, or water), and adequate insulation. Careful design and placement of windows and clerestory can greatly reduce daytime lighting energy requirements.

Water Heating - Solar water heating is a well-established technology that is suited to Maine. A typical solar hot- water system includes collectors to capture the sun's energy, a nontoxic antifreeze solution circulation pump to extract heat energy, a regulating electronic controller, and a well-insulated storage tank to contain the solar-heated water. An existing system can be

integrated with a solar system to provide backup heating when solar energy is not sufficient. Solar hot water heating is fairly cost effective; typical payback period is between 5 and 8 years. Solar photovoltaic payback is longer, varying significantly, depending on energy incentives one secures.

Electricity Generation - Solar arrays are no longer limited to isolated “off-the-grid” locations. Typically, a solar electric system will consist of photovoltaic modules to convert solar energy to electricity, batteries to store electricity, and an inverter to convert DC electricity stored in the batteries to AC electricity that is used by conventional electric appliances.

A presentation was provided on September 11, 2012 to the WCEI meeting by Soni Biehl of Sunrise County Solar outlining conservation as the first step in any energy saving initiative, insulation as the second step, energy source choice next and finally education as an important component of any energy saving plan (See Appendix C).

Wind Energy

Wind power, is becoming an increasingly economically and viable form of renewable energy. Wind turbines utilize wind energy to produce clean, emissions-free power, coming in a wide variety of sizes for home, business, school, and community on-site electricity. In the windiest locations, utilities use larger scale turbines to generate electricity and add power to the grid.

Freestanding and building-mounted turbine types are available, although building-mounted wind turbines are usually situated on a building’s roof and are uncommon due to lack of reliable wind at lower elevations. Freestanding turbines come in an assortment of sizes from large (1-3 MW machines) typically used in wind farm developments, to smaller (<1 MW turbines) more suitable for on-site applications and net metering.

No speaker or vendor on wind energy was available for the WCEI September 11th meeting. A Natural Resources Council of Maine publication, *Contributions to Power in Maine* (See Appendix C), provides information about the status of wind energy in the State of Maine.

Geothermal Energy

Geothermal energy taps into heat from the earth and typically involves the use of heat pumps that take advantage of the relatively constant temperature below the frost line (45-55 °F) by using well water which has circulated through underground pipes. During heating months, the Earth acts as a heat source. Water is circulated through a heat pump that extracts and upgrades heat from the water for distribution to the building. Cooled water is then returned to the earth and re-warmed. The system is reversed in the summer, with the heat pump extracting heat from the building’s hot air and sending warmed water into the earth to be chilled.

The most common and most efficient geothermal heat sources are open loop; a single well where water is pumped from the bottom and returned to the top. The well is drilled deep enough for sufficient heat exchange, and can also serve as the domestic water well. Multiple wells may be needed for larger commercial projects. When sufficient groundwater is available,

water may be pumped from a source well and returned to the recharge well after heat is exchanged.

There are four types of closed loop systems generally available: horizontal, vertical, pond and standing column well systems. When adequate space is available, horizontal systems require loop pipes placed with enough depth to ledge to allow 6' deep trenches. This system requires large land area with suitable soils. Vertical systems minimize landscape disturbance or are used where ledge prevents horizontal configuration. Bore holes are drilled using conventional well drilling equipment. Pond systems involve at least eight feet of coiled pipe run under from the building into a nearby water body. A standing column well system is a hybrid of open and closed loop systems. Water is returned to the same well it was drawn from and relies on well depth rather than flow to regulate water temperature. (<http://www.elcogeothermal.com/>).

Conventional heating and cooling systems can be less expensive to install than geothermal installations but energy savings can return the additional costs in 5-10 years. Geothermal systems have a longevity of fifty-plus years for the well and approximately 25 years for the inside components. Because geothermal heat pumps require electricity, planning must consider if the energy savings can offset the electrical costs (unless it is generated from renewable sources). Operating costs can be considerably less than conventional systems and geothermal systems are not affected by seasonal air temperature changes.

After the September 11th meeting, Al May, Maine Center for Disease Control and member of the WCEI, supplied a short, general information sheet on Geothermal Energy (See Appendix C). The information sheet includes a list of several useful websites.

Tidal Energy

Tidal energy is a clean, renewable resource that can be harnessed wherever changing tides move a significant volume of water. It is one of the most reliable and predictable renewable resources available. Washington County is situated on Bay of Fundy, one of the world's most robust tidal energy resources. One hundred billion tons of water flows in and out of Cobscook Bay every day, with the force of 8,000 locomotives and tidal ranges of up to 50 feet. Leveraging a \$10 million investment from the Energy Department, Ocean Renewable Power Company (ORPC) deployed its first commercial tidal energy device into Cobscook Bay in the summer of 2012. This is the nation's first commercial, grid-connected tidal energy project located off the coast of Eastport, Maine. ([*Maine Deploys First U.S. Commercial, Grid-Connected Tidal Energy Project, July 24, 2012*](#)).

Thermal Efficiency Eastport

Jon Calame from Minerva Partners has been involved with the WCEI since its inception in July, 2012. Unable to attend the September 11th WCEI meeting, Jon provided: Thermal Efficiency Eastport (See Appendix C). This summary explains a year old project focused on Eastport, Maine to identify affordable heating resources.

Planning Considerations

As with all land use decisions, location is a major concern when planning for renewable energy facilities. For biomass generation, combined heat and power facilities are best suited for areas with a concentration of buildings, such as college campuses, downtowns, or industrial complexes. Proximity to adequate wood supply and utilization of the energy produced is integral for success. To ensure a sustainable wood supply, forest health is also a concern and can be addressed by promoting Best Management Practices for forestry.

For geothermal installations, the geological condition of a site is critical. Improper site locations for closed loop systems can require extensive drilling or digging. An open loop system installation can involve as little as drilling a new well or increasing the depth of an existing well.

Good wind conditions are obviously required for viable wind energy. High elevations with good exposure to prevailing winds are essential. An analysis of site feasibility is provided by anemometer data. This data can help businesses, developers, farmers, homeowners, and municipalities determine whether there is enough wind energy at a site to make a wind turbine investment economically feasible. Each anemometer collects wind-speed data in 10-minute intervals. Such data can also aid windfarm developers in determining whether an area is suitable for developing a large-scale wind farm.

For solar installations, building and site design must be considered, as building codes, zoning bylaws and subdivision regulations can have direct impact on solar energy promotion in a community. Maine law requires that any municipal ordinance, bylaw, or regulation adopted after September 30, 2009 regulating solar energy devices on residential property follow certain requirements. The rules, bylaws, and regulations of homeowner associations of property owners must also follow these requirements. Specifically, these legal instruments may not prohibit a person from installing or using a solar energy device (including a clothesline or drying rack) on residential property owned by that person. In the case of a leased/rented property, the policy protects the renters' right to use a clothesline or drying rack ([Solar Rights](#)).

Ordinances, bylaws, or regulations *may* reasonably restrict the installation and use of solar energy devices to protect public health and safety, buildings from damage, historic/aesthetic values (when a comparable alternate is available), and to protect shorelands (under shoreland zoning provisions). Legal instruments may restrict the use of solar energy devices on residential property that is commonly owned with third parties or in the common areas of condominiums.

As noted below the Maine State Planning Office developed the *Maine Model Wind Energy Facility Ordinance* in 2009 that includes a comprehensive wind energy facility review process and standards for voluntary adoption by Maine municipalities ([Microsoft Word 242KB](#), [PDF 200KB](#)). The intent of this model ordinance is to provide Maine municipalities with an example as information for review, reference, and consideration, at their sole discretion, regarding potential approaches to local regulation of wind energy development. Provided for informational purposes only, this model ordinance does not and is not intended to render any

legal advice.

In all cases, communities need to adhere to proper zoning policies and land use regulations that may impact planning project sites. Proactive community involvement in the siting and development process is essential when planning for energy facilities of all kinds.

Policy Options

Several policy alternatives are provided below for County and/or Municipal adoption. The assertiveness of the language can be modified depending on the urgency with which each jurisdiction chooses to pursue an alternative energy strategy. Different alternatives may be more or less appropriate given the location of the municipality and the type of energy facility being supported. The policy alternatives include:

Goal: Low-Vehicle-Use Employment Opportunities. Facilitate employment opportunities that minimize the need for automobile trips, such as live/work, telecommuting, satellite work centers, and home occupations, in addition to mixed-use development strategies.

1. **Promote Human-Scale Businesses.** Allow and encourage creation of studios and workspaces for artists, craftspeople, and other professionals, and encourage low-impact self-employment and home occupations, where they will be compatible with existing neighborhood character.
2. **Support Telecommuting and Satellite Work Centers.** Encourage businesses and public agencies to offer telecommuting as a work alternative, and allow corporate satellite work centers near housing concentrations to enable residents who are employees of out-of-county businesses to reduce their commutes.

Goal: Decreased Energy Use. Reduce total and per-capita nonrenewable energy waste and peak electricity demand through energy efficiency and conservation.

3. **Adopt Energy Efficiency Standards.** Integrate energy efficiency and conservation requirements that exceed State standards into the development review and building permit process.
4. **Offer Effective Incentives.** Continue to offer incentives such as expedited permit processing, reduced fees, and technical assistance to encourage energy efficiency technology and practices.
5. **Provide Public Information and Education.** Provide information, marketing, training, and education to support energy efficiency and energy conservation.
6. **Reduce Energy Use in County Facilities.** Continue to integrate energy efficiency and conservation into all County functions.
7. **Offer Information, Technical Assistance, Training, and Incentives.** Continue to expand energy efficiency information, marketing, training, and technical assistance to property owners, development professionals, schools, and special districts. Review and revise, as needed, existing incentives for incorporating energy reducing practices in remodels and new development, including fee reductions and expedited processing.
8. **Explore Regional Collaboration, Financing, and Other Incentives.** Explore regional and countywide collaborations among local governments, special districts, and other public

organizations to share resources, achieve economies of scale, and develop plans and programs that are optimized on a regional scale. Evaluate and implement opportunities for supporting new programs and promoting sustainable energy practices through financing mechanisms (e.g., pooled project financing, low-interest loans, other local government joint ventures, and State funds earmarked for energy efficiency and renewables).

9. **Support Key Legislation.** Monitor and support State and federal legislation that promotes energy efficiency and renewable energy sources.
10. **Support Low Income Weatherization.** Review and ensure that adequate low-income weatherization programs are being implemented in Washington County, and all available State and federal funds and programs are being used to the fullest extent possible. Provide information, training, and technical assistance to owners and tenants who may have incentives for implementing energy efficiency in low-income rental properties.
11. **Reduce Energy Use in Processing Operations.** Work with local commercial, industrial, and agricultural operations to identify opportunities for energy efficiency in the storage, transport, refrigeration, and other processing of commodities

Goal: Increased Renewable Resource Use. Utilize local renewable energy resources, and shift imported energy to renewable resources.

12. **Protect Local Renewable Resources.** Preserve opportunities for development of renewable energy resources.
13. **Adopt Renewable Energy Building Standards.** Integrate technically and financially feasible renewable energy requirements into development and building standards.
14. **Promote Renewable Energy.** Facilitate renewable technologies through streamlined planning and development rules, codes, processing, and other incentives.
15. **Provide Public Information and Education.** Provide information, marketing, training, and education to support renewable resource use.

Implementing Programs:

1. **Map Local Renewable Energy Resources, Utility Systems, and Demand Areas.** Use Geographic Information Systems (GIS) to map and assess local renewable resources, the electric and gas transmission and distribution system, community growth areas anticipated to require new energy services, and other data useful to deployment of renewable technologies.
2. **Protect Renewable Resources.** Identify possible sites for production of energy using local renewable resources such as solar, wind, small hydro, biogas, and tidal; evaluate potential land use, environmental, economic, and other constraints affecting their development; and adopt measures to protect those resources, such as utility easement, right-of-way, and land set-asides.
3. **Protect Solar Access.** Continue to require the protection of passive or active solar design elements and systems from shading by neighboring structures and trees.
4. **Facilitate Renewable Energy Technologies and Design.** Continue to identify and remove regulatory or procedural barriers to producing renewable energy in building and development codes, design guidelines, and zoning ordinances. Work with related agencies such as fire, water, and health that may impact the use of alternative

technologies. Develop protocols for alternative energy storage such as biodiesel, hydrogen, and/or compressed air.

5. **Provide Incentives for Alternative Energy Production.** Continue to provide incentives such as fee reductions and expedited processing for facilities that use renewable sources for energy production. Work with State and federal agencies to secure tax exemptions, tax rebates, or other financial incentives for such facilities.
6. **Use Renewable Energy in County Facilities.** Continue to develop and employ renewable energy and clean generation technologies such as solar, wind, biogas, tidal, cogeneration, and fuel cells to power County facilities using tax-free low-interest loans and other available financial options. Evaluate the feasibility of purchasing renewable energy certificates to reduce Washington County government's contribution to greenhouse gas emissions.
7. **Provide Information and Technical Assistance.** Offer technical assistance for renewable energy and clean distributed generation to businesses and homeowners.
8. **Explore Renewable Energy Financing Options.** Evaluate and implement as feasible local government financing options such as low-interest loans, pooled project financing, and joint ventures with other agencies with financing authority, such as the water districts.
9. **Explore Regional Collaboration.** Explore regional collaborations among local governments, special districts, nonprofits, and other public organizations to share resources, achieve economies of scale, and develop renewable energy policies and programs that are optimized on a regional scale.

Implementation Incentives

There are multiple sources of implementation incentives that can support an alternative energy future. A comprehensive list of implementation incentives for Maine is available on the DSIRE (Database of State Incentives for Renewables & Efficiency) website:

<http://www.dsireusa.org/incentives/index.cfm?re=1&ee=1&spv=0&st=0&srp=1&state=ME>

Summaries of that information are provided below regarding financial incentives; rules, regulations and policies; and related programs and initiatives.

Financial Incentives

PACE Financing

[Property Assessed Clean Energy](#) (PACE) financing allows property owners to borrow money to pay for energy improvements. The amount borrowed is typically repaid through a special assessment on the property over a period of years. Maine has authorized certain local governments to establish such programs, as described below. Not all local governments in Maine will choose to offer PACE financing; contact your local government to find out if it has or intends to establish a PACE financing program. [Maine PACE Loans](#)

Performance-Based Incentive

The [Community Based Renewable Energy Production Incentive \(Pilot Program\)](#) is intended to encourage the development of locally owned, in-state renewable energy resources. To be eligible for incentives, a generating facility must be 51% locally owned, use renewable energy resources (solar, wind, hydro, certain biomass, fuel cells, and tidal), be no larger than 10 MW in generating capacity, and be located in the State of Maine. Program participants will have a choice of one of two incentive options: long term contracts or renewable energy credit multiplier.

Sales Tax Incentive

The Maine Legislature enacted S.B. 477 (L.D. 1379) in May 2006 to encourage the development of community wind generation projects and defined community wind as having nameplate capacity of 10 megawatts (MW) or less. This bill also created a [Sales and Use Tax Refund for Qualified Community Wind Generators](#).

In most cases, the qualified community wind energy generator will present the exemption at the time of purchase and vendors will not charge the sales and use tax (the same process as any tax-exempt entity follows) on qualified purchases through December 31, 2011. However, in the event the vendor does not accept the exemption and charges the tax, the certified community wind generator may apply for a tax refund until December 31, 2014. The [Application Form](#) is submitted to Maine Revenue Services for the refund.

State Grant Program

Maine's [Voluntary Renewable Resources Grants](#), supported by the state's Voluntary Renewable Resources Fund and administered by the Efficiency Maine, provided funding for small-scale demonstration projects designed to educate communities on the value and cost-effectiveness of renewable energy. Maine's Voluntary Renewable Resources Fund, a public benefits fund, was established in 2000 and is supported by contributions made by consumers on their electric bills.

2012 Update: This program is subject to an open and pending rule making and will undergo changes. There are no requests for proposals open at this time.

State Loan Program

The [Efficiency Maine Small Business Loan Program](#) provides loans of up to \$35,000 at 1% interest to small businesses to support approved energy efficiency measures. Efficiency Maine Trust administers this program, with the assistance of the Finance Authority of Maine (FAME) who completes underwriting and credit rating. Businesses and non-profits that use less than 25 kilowatts of electricity per month are eligible.

2012 Update: Efficiency Maine advises that funding for this program is not currently available nor are they accepting loan applications at this time.

State Rebate Program

The [Efficiency Maine Business Program](#) provides cash incentives and free, independent technical advice to help *non-residential* electric customers save energy and money, and to improve Maine's environment. Efficiency measures eligible for prescriptive cash incentives

include qualified lighting, HVAC equipment, NEMA premium energy efficient motors, system controls and refrigeration. See the program web site for the current list of cash incentives available for prescriptive incentives. In addition, custom incentives are available for electricity-saving equipment that is not included on the list of eligible prescriptive incentives. Projects for these custom incentives must be pre-approved by Efficiency Maine.

The [Efficiency Maine Renewable Energy Program](#) accepts rebate reservations for all technologies eligible under the program, including wind, solar photovoltaics, and solar thermal. Once a reservation is approved for funding, the applicant has 120 days to complete the project. Funding is not guaranteed and is on a first come, first served basis.

The [Efficiency Maine Residential Lighting Program](#) works with retailers and manufacturers to encourage residential customers to purchase energy-efficient lighting. Rebate amounts average \$1.25/bulb and are available at the point of sale at participating retailers. Participating retailers will deduct the rebate amount at the cash register. (See the program web site for a list of participating retailers and additional information.)

April 2012 update: the rebate amounts have changed for all technologies eligible.

Rules, Regulations & Policies

Building Energy Code

The Energy Efficiency Building Performance Standards (EEBPS) ([Model Building Energy Code](#)) are statewide *minimum* requirements that all new construction and additions to existing buildings must satisfy. Exceptions include single-family homes built by an owner-builder (which includes anyone supervising the construction of that person's single-family dwelling or a general contractor hired to supervise the construction) and log homes. The commercial requirements apply to all new commercial and institutional construction. Manufacturing facilities are exempt.

Energy Efficiency Resource Standard

In June 2009, Maine enacted the Act Regarding Maine's Energy Future, which established the Efficiency Maine Trust. As a part of this Act, the Trust is responsible for creating a plan to reach the following [Energy Efficiency Targets](#):

- 100 MW reduction in peak-load electricity consumption by 2020
- 30% reduction in electricity and natural gas consumption
- 20% reduction in heating fuel consumption
- Weatherization of 100% of homes and 50% of businesses by 2030
- Capturing all cost-effective efficiency resources available for utility customers

In pursuance of these goals, the Efficiency Maine Trust must develop triennial plans describing a three-year plan, programs, and implementation strategies for reaching these goals, as well as other energy efficiency and renewable energy goals. The triennial plans must be approved by the Maine Public Utilities Commission, and will be reanalyzed annually. The first triennial plan

was approved by the Commission in July 2010, and will expire in June 2013. The overall goals and the programs are directed at consumers rather than utilities. Revisions to the plan were approved in February 2011, and again in January 2012. The plan includes a goal of saving more than 3.3 trillion BTUs of energy annually by fiscal year 2013. Efficiency Maine has made the [draft fiscal year 2014-2016 triennial plan](#) available. Efficiency Maine also publishes an annual report on its activities; [Fiscal Year 2011 Efficiency Maine Annual Report](#) was published in December 2011.

Energy Standards for Public Buildings

Maine requires [Energy-Efficient Building Standards for State Facilities](#) such that construction or renovation of state buildings incorporate "green building" standards that would achieve "significant" energy efficiency and environmental sustainability, provided that the costs of doing so are cost-effective over the life of the building. All branches of state government must cooperate with the Maine Department of Administrative and Financial Services (Bureau of General Services) in supplying the department with the necessary resources, information and other assistance to meet these requirements. School administrative districts and municipalities are not required to comply with these standards under this order.

Generation Disclosure

Maine's 1997 utility restructuring legislation directed the Maine Public Utilities Commission (PUC) to establish [Fuel Mix and Emissions Disclosure](#) rules for retail electric billing. The PUC rules require utilities to disclose to residential and small commercial customers details regarding the fuel mix and emissions of electric generation. Such information must be provided to customers at least once annually, in the form of a standard label, and upon request. In addition, competitive electricity providers must refer to the disclosure label in all written marketing materials promoting available generation service.

Green Power Purchasing

In 2003, Maine established a [Green Power Purchasing](#) goal for the state government to buy at least 50% of its electricity from "reasonably priced" renewable-power sources, paid for by energy conservation improvements in all state buildings. The goal was contained in the governor's "Vision" for meeting Maine's environmental needs. As of March 2007, Maine's state government was purchasing 100% of its power from renewable energy resources. The state's existing renewable energy portfolio standard accounts for 30% of this total. For the remaining 70%, the state is purchasing renewable-energy credits (RECs) from the Rumford Falls hydropower project in Rumford, Maine.

Furthermore, legislation passed in 2009 ([LD 1075](#)) requires that all electricity used in state-owned buildings must come from renewable energy and that state agencies may give preference to community-based generated renewable energy.

Mandatory Utility Green Power Option

Legislation enacted in 2009 directed the Maine Public Utilities Commission (PUC) to develop a [Mandatory Utility Green Power Option](#) that offers a green power option to residential and

small commercial customers in the state. Pursuant to a Request for Proposal process, the PUC selected 3 Degrees, an energy management company, to manage the statewide green power program for Maine's transmission and distribution territories. The program includes community-based renewable energy projects (to the extent possible). The green power program was launched in April 2012.

Net Metering

Net metering, or [Net Energy Billing](#), is an electricity policy for consumers who own (generally small) renewable energy facilities (such as wind, solar power or home fuel cells) or V2G electric vehicles. "Net", in this context, is used in the sense of meaning "what remains after deductions" — in this case, the deduction of any energy outflows from metered energy inflows. Under net metering, a system owner receives retail credit for at least a portion of the electricity they generate.

Net metering is available to owners of eligible, qualified facilities, including facilities generating electricity using fuel cells, tidal power, solar, wind, geothermal, hydroelectric, biomass, generators fueled by municipal solid waste in conjunction with recycling, and eligible combined heat and power (CHP) systems. CHP systems must meet efficiency requirements in order to qualify for net metering: micro-CHP 30 kW and below must achieve combined electrical and thermal efficiency of 80% or greater, and micro-CHP 31 kW to 660 kW must achieve combined efficiency of 65% or greater.

All of Maine's electric utilities -- investor-owned utilities (IOUs), consumer-owned utilities (COUs, which include municipal utilities and electric cooperatives) -- must offer net energy billing (net metering) for individual customers. Furthermore IOUs are required to offer net metering for shared ownership customers, while COUs may offer net metering to shared ownership customers at their discretion. "Shared ownership," allows for community net metering, where several people invest in an eligible system and are therefore allowed to collectively benefit. IOUs are required to offer net metering to eligible facilities with capacity limits up to 660 kilowatts (kW). COUs are required to offer net metering to customer-generators up to 100 kW, but they are authorized to offer net metering to eligible facilities with capacity limits up to 660 kW at their discretion.

In June 2011, Gov. Paul LePage signed legislation requiring the Maine Public Utilities Commission to amend the net energy rules to develop contract terms for net energy billing and interconnection agreements. The bill allows the PUC to amend net energy billing rules following "routine technical rules." This will enable the PUC to amend net energy billing without having to send the amendments to the legislature for approval. The final rules implementing the changes were adopted in January 2012. See [Docket 2011-398](#) for additional details and the order.

Public Benefits Fund

In April 2012, legislation was enacted to increase legislative oversight of the Efficiency Maine Trust (Public Law 637). That legislation became effective in July. The following is for informational purposes only, until this entry is updated.

Maine's public benefits fund for energy efficiency was authorized originally in 1997 by the state's electric-industry restructuring legislation. Under the initial arrangement, the administration of certain efficiency programs was divided among the State Planning Office (SPO), the state's electric utilities and the Maine Public Utilities Commission (PUC). However, general dissatisfaction by the Maine Legislature (and many other stakeholders) with the administration of the fund prompted revisions in 2002. As a result of the 2002 legislative amendments, the authority to develop energy-efficiency programs was effectively transferred from the SPO to the PUC, and the authority to implement these programs was transferred from the state's electric utilities to the PUC. Most recently, the *Act Regarding Maine's Energy Future* ([Public Law 372](#), June 2009) established a new entity, the [Efficiency Maine Trust](#), which became responsible for Maine's energy efficiency and renewable energy programs. All of the funds in Efficiency Maine were transferred to Efficiency Maine Trust July 1, 2010.

Maine's public benefits fund for renewable energy was established as part of the state's electric-industry restructuring legislation, enacted in May 1997. The law directed the Maine Public Utilities Commission (PUC) to develop a voluntary program allowing customers to contribute to a fund that supports renewable-energy projects. This fund was originally known as the [Renewable Resource Fund](#) (now it is part of Efficiency Maine Trust).

The PUC adopted rules requiring the state's utilities to offer customers the option of supporting the fund by checking off a contribution of \$1, \$5, \$10 or other amount each month on their electric bill. Every six months, each utility must notify its customers of the existence and purpose of the fund, the means to contribute to the fund, and summaries of projects that have been supported by the fund.

Renewables Portfolio Standard

Maine's original [Renewables Portfolio Standard](#) was passed as part of the state's 1997 electric-utility restructuring law. In 1999, Maine's Public Utility Commission (PUC) adopted rules requiring each electricity provider to supply at least 30% of their total electric sales using electricity generated by eligible renewable and certain energy efficiency resources. Actually, at the time of passage, the required percentage of renewables was actually lower than the existing percentage supplied.

Eligible facilities include those up to 100 megawatts (MW) in capacity that use fuel cells, tidal, solar, wind, geothermal, hydro, biomass or municipal solid waste in conjunction with recycling. Electricity generated by efficient combined heat and power (CHP) facilities and other systems that qualify as "small power production facilities" under the federal Public Utility Regulatory Policies Act of 1978 (PURPA) also are eligible.

Solar/Wind Access Policy

Maine allows for the creation of easements to ensure access to direct sunlight. Instruments creating [Solar Easements](#) may include, but are not limited to, a description of the space affected by the easement; any terms or conditions under which the solar easement is granted

or will be terminated; and a map showing the affected properties and the area protected by the easement. Solar easements must be created and will be recorded and indexed in the same way as other conveyances of real property interests.

Maine law requires that any municipal ordinance, bylaw, or regulation adopted after September 30, 2009 regulating solar energy devices on residential property follow certain requirements. The rules, bylaws, and regulations of homeowner associations of property owners must also follow these requirements. Specifically, these legal instruments may not prohibit a person from installing or using a solar energy device (including a clothesline or drying rack) on residential property owned by that person. In the case of a leased/rented property, the policy protects the renters' right to use a clothesline or drying rack.

[Solar Rights](#) ordinances, bylaws, or regulations *may* reasonably restrict the installation and use of solar energy devices to protect public health and safety, buildings from damage, historic/aesthetic values (when a comparable alternate is available), and to protect shorelands (under shoreland zoning provisions). Legal instruments may restrict the use of solar energy devices on residential property that is commonly owned with third parties or in the common areas of condominiums.

Solar/Wind Contractor Licensing

In be eligible for Maine's solar thermal rebate program, a system must be installed by a licensed plumber who has received additional certification for solar thermal systems. To receive certification, plumbers must participate in the Public Utilities Commission (PUC) three-day [Solar Hot Water Contractor Licensing](#) workshop, pass the state exam, and submit corresponding fees. Certification is valid for two years and may be renewed if the individual has installed at least one system since the time of certification and pays corresponding renewal fees. The PUC also recommends that installers seek certification from the North American Board of Certified Energy Practitioners (NABCEP) in addition to the state certification, but it is not required at this time. The state solar thermal rebate program maintains a list of certified installers. Experience and/or prior certification may be accepted in lieu of participation in the class, contact the PUC for more information.

Solar/Wind Permitting Standards

In 2009, the State Planning Office (SPO) issued a [Model Wind Energy Facility Ordinance](#) for use by local governments to help facility wind development in the state. The SPO completed the model wind ordinance in August 2009. This model ordinance was designed to provide guidance to local governments that wish to develop their own siting rules for wind turbines. While it was developed as part of a cooperative effort involving several state agencies, the model itself has no legal or regulatory authority. The model ordinance provides for four types of wind energy facilities and identifies the corresponding authority responsible for reviewing and approving/denying wind energy facility plans. Additional guidance was issued in February 2010 in [Guidebook for the Maine Model Wind Energy Ordinance](#).

Related Programs & Initiatives

The U.S. Department of Energy's [Alternative Fuels and Advanced Vehicles Data Center](#) (AFDC) provides a wide range of information and resources to enable the use of alternative fuels and other petroleum-reduction options, such as advanced vehicles, fuel blends, idle reduction and fuel economy. The AFDC site offers a database of state and federal laws and incentives related to alternative fuels and vehicles, air quality, fuel efficiency, and other transportation-related topics.

The U.S. Department of Energy's [Green Power Network](#) provides news and information on green power markets and activities, including opportunities to buy green power. This site provides state-by-state information on green power marketing and utility green power programs. In addition, the site lists marketers of renewable energy credits (RECs), also known as green tags or renewable energy certificates, which represent the environmental attributes of the power, produced from renewable energy projects.

The U.S. Department of Energy's [Weatherization Assistance Program](#) (WAP) enables low-income families to reduce their energy bills by making their homes more energy-efficient. Through this program, weatherization service providers install energy-efficiency measures in the homes of qualifying homeowners free of charge. The WAP program web site offers a state-by-state map of opportunities, projects and activities.

The U.S. Department of Energy's [Wind Powering America](#) site provides state-by-state information on wind projects and activities, including wind working groups, validated wind maps, anemometer loan programs, small wind guides, state-specific news, wind for schools, workshops and web casts.

Appendix A

Washington County Energy Initiative – Energy Committee

Name	Affiliation
Jon Calame	Thermal Energy Eastport/ Minerva Partners
Bob Farris	University of Maine Maintenance Department
Betsy Fitzgerald	Washington County Manager
Lois Grossman	Interested Individual
Eleody Libby	Washington County – One Community
Al May	Maine Center for Disease Control
Sara McConnell	Washington County – One Community
Jon McNerney	Interested Individual
Heidi Nelson	Washington County Council of Governments
Janet Robertson	Washington County – One Community
Larry Saunders	Sunrise County Economic Council

Appendix B

Building Energy Audits for Washington County, Maine

(Attached as separate document)

Appendix C

Alternative Energy Opportunities – Private Vendor Presentations

The WCEI committee used their September 11, 2012 meeting to hear from a variety of alternative energy vendors, developers and interested individuals. The following list of alternative energy resources were discussed and/or investigated by WCEI at this meeting. Presentations or submitted summaries from the following are attached.

Biomass Energy – Tom Wood, Maine Forest Service. “Wood to Energy Projects in Maine Summary”

Biomass Energy – Jim Knight, Pelletco. Slide Presentation

Solar Power – Soni Biehl, Sunrise County Solar. Summary: “Solar Design, Energy Audits & Education”

Wind Power – Natural Resources Council of Maine. “Wind Power’s Contribution to Maine Renewable Power: An Update on Operations to Date”

Geothermal Energy – Al May, Maine Center for Disease Control. Geothermal Information Sheet

Thermal Energy – Jon Calame, Minerva Partners. “Thermal Energy Maine”