State Initiatives for Clean Energy Development

Final Project Report
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Mainewatch Institute

Mainewatch Institute is an independent, nonprofit, nonpartisan research and educational organization which identifies, monitors, and analyzes long-term trends and issues affecting Maine's environment and economy. Mainewatch explores issues of economic and environmental sustainability facing Maine and the surrounding region, and offers alternatives and analysis for consideration by public policymakers.

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Table of Contents

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ADDITIONAL COPIES

To obtain additional copies of this report, please write to us at the Mainewatch Institute, P.O. Box 209, Hallowell, ME 04347, or send an e-mail to Jeff Edelstein at edeljeff@netscape.net or Sherry Huber at sfhuber@worldnet.att.net. The report can also be accessed at http://www.mecep.org/publications.htm on the internet.

EXECUTIVE SUMMARY

This report summarizes the clean energy agenda proposed by a representative group of Maine's clean energy advocates and stakeholders, including policy prioritization, research and analysis that has led to the project's final recommendations. Starting with a literature review in late 1999, the project consulting team examined an array of policy options, past and present, to support Maine's clean energy industry. The team researched the underlying barriers confronted by clean and renewable energy technologies in their bid to compete in the marketplace. They also reviewed the status of Maine's own efforts to support these technologies.

Phase I of the project concluded in 2000 with a two-part report that both summarized program design "fundamentals" and cataloged 39 different policy or program options that have been implemented elsewhere in the United States. The Phase I report was circulated to about 150 stakeholders for review. Phase II of the project includes the results of this survey and summaries of both the final prioritized slate of policy options and the feedback received at a stakeholder meeting held in January 2001.

Maine's Clean Energy Agenda is described more fully in Section II, beginning with a brief overview of the highest priority policies as identified by stakeholders. In the end, these priorities emphasize renewable energy resources. The priorities include:

- Reform the current Renewable Portfolio Standard.
- Implement a program of Customer Credits to spur purchases of clean energy.
- Target tax incentives to mitigate some of the barriers and costs faced by renewable energy generators.
- Promote transmission pricing and policy reforms at the regional level.

Although we tried to limit ourselves to three state options, many seemed important, and the last one is included because transmission is critical to a well-functioning wholesale market for renewable energy.

Taken as a whole, this package of supports for Maine's renewable energy industry would go far to ensure the continuation of the many benefits to Maine residents that the industry represents.

Since January, the consulting team has further explored the top four policy priorities. Each policy priority described in Section II concludes with analysis and recommendations for that priority. The final section of this report suggests steps toward the implementation of this clean energy policy agenda for Maine.

I. PROJECT OVERVIEW

A. GOALS AND OBJECTIVES

Thanks to regulatory policies in the 1980s, in 2000 Maine derives a greater proportion of its electricity from clean, renewable energy resources[1] than any other state. An earlier Mainewatch Institute study[2] examined the environmental and economic effects of the development of renewables and energy efficiency and found that the net effects were very positive. Clean, renewable energy technologies provide several benefits to Maine:

- Employment benefits – The renewable and energy efficiency industries directly and indirectly support about 6,000 jobs in Maine.

- Economic benefits – Gross State Product increased by $120 - $220 million in 1992 compared to strategies that might otherwise have been pursued by Maine's utilities.

- Environmental benefits – Air emissions were lowered between 2-6 million tons annually, and air pollution costs were reduced by $57-$202 million annually.

Other benefits from indigenous generation using clean, renewable resources are increasingly visible on the horizon, as Maine's deregulated electricity marketplace comes to full fruition. Two examples:

- Diversification of Maine's electricity supply portfolio – As Maine's supply is increasingly characterized by natural gas-fueled generation, Maine customers are vulnerable to higher electricity rates triggered by spiking natural gas prices. Renewables provide a hedge against these spikes and help to mitigate their extent.

- Protection against supply disruptions – Maine's renewable electricity generators also provide a measure of protection against generation interruptions if natural gas or oil supplies are seriously constrained or interrupted. This insurance value of renewables represents another benefit to Maine generators, customers and the state as a whole.

Yet as of 2000, these and other benefits are at risk. Both existing clean energy generators, as well as future generation using clean, renewable energy resources, are under threat from a combination of cost-related factors that place their generation at significant disadvantage to generation that uses more traditional sources of fuel. Maine risks losing these benefits if it loses either its existing clean energy producers or if it allows the continuation of an economic framework that places present or future clean energy generation at a continuing competitive disadvantage.

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[1] See sidebar defining *clean energy* on page 6.

[2] Mainewatch Institute, *Energy Choices Revisited: An Examination of the Costs and Benefits of Maine's Energy Policy*. Prepared by Economic Research Associates, American Council for an Energy Efficient Economy, and Tellus Institute. February 1994.

There is significant evidence that this uneven playing field is likely to continue and even worsen. The restructuring of Maine's electricity market in early 2000 serves as a backdrop for a new electricity marketplace in which competition now determines the price of electricity and environmental attributes play no role in dispatch cost calculations. Long-term supply contracts that previously provided stability to independently owned renewable generators have been bought out or renegotiated. Other market rules are changing in the state and region that also affect the ability of renewable and clean energy generation to compete. As a result:

- In the last twelve months, two of Maine's ten biomass generators have been without contracts and therefore unable to operate; long-term contracts (important to the financing of new renewable projects) have been and remain scarce.

- During the spring of 2000, several Maine small hydro facilities were forced to spill water while dirtier generators were dispatched through NEPOOL.

- Small renewable generators are faced with increasing costs due to NEPOOL-implemented charges for generators not located on Pool Transmission Facilities (PTF)[3]. These charges stand to add .5 - 1.5 cents per kWh to the generators' costs, costs that generators located on PTF lines do not have to bear.

- New NEPOOL rules to manage the transmission of electricity supply in heavily congested sections of the Northeast are expected to place congestion mitigation fees on suppliers selling power into those congested areas. Renewable suppliers, located in the uncongested areas of Maine, will have to pay these fees to sell into NEPOOL, another competitive disadvantage that their competitors already in those areas will not face.

Overall Study Objective

This study was undertaken to help preserve the benefits of clean energy development in Maine by reducing the risks to existing renewable energy providers and by encouraging new clean energy development. This purpose is sharpened by the sense of Maine's renewables community that the few measures in place (notably Maine's Renewable Portfolio Standard) are not having the beneficial and supportive effect originally envisioned. Against this backdrop of history and imminent threat, the overall goal of this project was to:

Stimulate the development of new renewable resources and high-efficiency cogeneration facilities and protect the environmental benefits from existing renewables and cogeneration that may otherwise not be economic to operate.

[3] Pool Transmission Facilities (PTF) lines are those larger transmission lines roughly equivalent to the "interstate highway system" for regional movement of electricity. Renewable energy facilities, placed to take maximum advantage of their wind, biomass, hydro or other renewable resource, are unlikely to be located on one of the larger main trunks of the PTF system.

Project objectives in support of that goal are:

- Identify policy and market options that support the production of electricity from clean energy resources.
- Inform policy makers and stakeholders about the options available to them.
- Raise public awareness of the benefits of clean energy to the State of Maine.

This study has been designed to serve policy makers in both elected and appointed public positions, their staffs, and clean energy supporters in non-governmental organizations. Specifically, legislators and legislative staffs, utility regulators, energy planners, policy and analytical staffs and environmental policy makers may all find the report useful in identifying ways to address a particular goal or barrier or to further a specific public policy objective.

Clean Energy Technologies

This report frequently refers to clean energy technologies. As used here, the term "clean energy technologies" refers to those technologies that use renewable energy resources to generate electricity, and to technologies that produce combined heat and power.

Combined Heat and Power (CHP), sometimes called cogeneration, offers dramatic advantages in efficiency and much lower air pollution than conventional electricity technologies. CHP systems generate electricity and heat simultaneously, at the point of use, while conventional generation of electricity throws away the heat generated in production. CHP systems capture this heat energy to use for a wide variety of thermal needs, including hot water, steam, and process heating or cooling. Because of this, CHP can achieve system efficiencies greater than 70 percent, compared to the national average of 30 percent efficiency in traditional generating plants. Generating electricity on-site can also avoid transmission and distribution losses, and reduce the need to expand the electricity transmission grid. The combination of greatly increased efficiencies, consequent lower fuel use, and improved low emissions technologies substantially reduces environmental emissions and provides economic benefits. The opportunities are also great, as a significant fraction of the nation's boilers will need to be replaced in the next decade, which creates a window of opportunity to upgrade this equipment with clean and efficient CHP systems.

Renewable Energy Technologies means technologies that use the sun, wind, water, tidal power, geothermal heat, and biomass (herbaceous crops or waste and animal wastes). To be truly renewable, the resource used by the technologies to generate electricity must be managed in such a way that average annual energy output levels can be sustained indefinitely. Most of these renewable resources (the exceptions being geothermal heat and tidal power) ultimately derive their energy from sunshine. This fact distinguishes them from fossil fuels and nuclear fission technologies that are based on finite resource stocks. The environmental benefits of renewable resources and renewable energy technologies result largely from the fact that, except for biomass, they do not rely on combustion to create electricity, and therefore release no air emissions. Sustainable management of biomass resources results in no net carbon emissions, which are the major factor in global warming. Technological advances in the use of renewable resources continue to increase generating efficiencies and lower costs.

Clean energy technologies is a relative term, however. No resource or technology is without any environmental impact. Our interest is in supporting those technologies that have the least environmental footprint.

B. PHASE I: RESEARCH AND OPTIONS CATALOG

To gain an understanding of how best to strengthen the renewable energy industry in Maine, the study began with an examination of several factors that play a role in the development of public policy toward renewables.
The first phase of the study looked at:

- Obstacles facing those seeking to develop clean energy facilities in Maine.
- Steps Maine has already taken to support in-state renewable energy development and the results of those efforts.
- Steps Maine can take today, given the authority vested in the state, private and non-profit entities, and potential sources of any needed funding.

The analysis and discussion of these and other questions is included in the Phase I report.[4] This 100-page report looked at the barriers to clean energy development and examined Maine's relevant energy policy and institutional history.

Phase I also reviewed, through an Internet and literature search, what other states have done. The resulting Options Catalog, contained as Appendix A of the Phase I report, describes 39 different types of identified programs and policy options. The profiled options cover the use of clean energy for electricity generation and use only; other uses of renewable resources, such as renewable transportation fuels, are not included. Included options may provide support to both small scale and bulk power clean energy facilities.

Also in Phase I the consulting team developed a set of preliminary criteria for evaluating the 39 options. Ten policy options emerged as potential near-term priorities for Maine:[5]

- **Net metering** – Net metering allows utility customers to offset their retail electricity purchases with their own electricity generation. Net metering usually uses a single bi-directional meter that registers the flow of electricity in both directions. The meter runs backwards when more electricity is being generated than is being consumed. This improves the cost-effectiveness of eligible technologies and thereby encourages the installation of small-scale (residential and business), grid-connected, on-site clean energy generation.

- **Disclosure and labeling** – Market research shows that electricity consumers want standardized information about the attributes of competing products in a uniform format. The key attributes of interest are price, contract terms, generation sources and environmental impact. Although generally labeling is a consumer issue, the latter two attributes may lead to greater consumer choice of clean energy products. Disclosure

[4] ***State Initiatives for Clean Energy Development*, Phase I Report,** October 2000. Copies are available from the Mainewatch Institute, P. O. Box 209, Hallowell, ME 04347, or by e-mailing Jeff Edelstein at edeljeff@netscape.net or Sherry Huber at sfhuber@worldnet.att.net or on the internet at http://www.mecep.org/publications.htm. Elsewhere in this report, this document will be referred to as "the Phase I Report."

[5] Each of these policy options was described in the Options Catalog appended to the Phase I Report.

and labeling policies require all retail suppliers to provide uniform information to all customers about their products, to aid comparison shopping.

- **Transmission access** – Transmission policy is made at the regional level by ISO New England (the Independent System Operator responsible for managing New England region's electric bulk power generation and transmission systems and administering the region's open access transmission tariff). In addition to operating the region's power grid and transmission reservation system, ISO New England also administers the restructured wholesale electricity marketplace for the region. Environmentally-friendly transmission policy would provide fair and low-cost access to the wholesale market for renewable generators by eliminating "pancaked" transmission rates and congestion management pricing for clean generation.

- **Interconnection policies – N**ew generation projects must be connected to the grid to be able to feed power to the local distribution or transmission systems. Getting connected, though, can be costly and time-consuming. While requirements relating to safety, reliability and power quality are essential, they should be standardized to lower costs. In addition, the cost of compliance can be disproportionately burdensome for smaller generation projects. Simplified rules would help.

- **Buyers groups for equipment** – A buyers group would aggregate consumer orders for qualifying renewable equipment such as photovoltaics or fuel cells. Bulk purchases would save the seller marketing costs so the seller can offer lower prices to the group.

- **General public education** – Education is a key component to success of clean energy markets. A statewide effort would deploy a variety of media, messages and approaches to increase consumer awareness and understanding of clean energy and its related topics: electricity choice, environmental and economic benefits, and technologies. The objective would be to overcome the lack of public familiarity with clean energy technologies, and consequent reluctance to purchase or invest in their use.

- **Renewable portfolio standard** – The RPS is a requirement that a certain percentage of a state's annual electricity use come from renewable energy. The purpose is to provide environmental, fuel diversity, energy security, and economic development benefits to the state. The RPS attempts to ensure that there will be sufficient demand for renewable energy to support existing and new renewable energy facilities, thereby reducing risk to generation owners and developers. Compliance is by individual electricity providers who must ensure that their energy portfolio meets the standard.

- **Buyers groups for green power** –Buyers groups are organizations or associations of (large or small) consumers with affinity ties that aggregate their loads to achieve an objective such as lower prices. In this case, the buying group would use the leverage of a large group purchase to lower the cost of purchasing clean energy. Typically a buyers group would enlist its existing members or, if it is a new aggregation, seek

interested consumers with a common interest in purchasing green power. The buyers group does not take title to the power for resale. Instead it solicits offers for its members, who then contract directly with the selected green power provider.

- **Government aggregations** – Government purchases of green power are a specific type of buyers group. Governments as a whole are the largest consumers of electricity in the United States. As a matter of policy, public entities and quasi-public institutions would pool their electric demand, solicit and purchase electricity that includes a minimum purchase from clean energy sources.

- **Distributed generation support** –Most utilities have areas within their distribution systems that need to be upgraded. Reliability may be suffering because demand has grown to exceed the capacity of substations, or equipment is old and needs to be upgraded. In some cases, distributed generation—small-scale, usually clean generation such as fuel cells, micro turbines, photovoltaic systems or small wind turbines with the distribution grid—offer cost, reliability and environmental benefits. Regulatory policy could encourage small-scale generation within the distribution system where it is most cost-effective.

In addition to these ten policy options, it must be stressed that other factors not specific to clean energy policies can have a big impact on clean energy development. Specifically, it is clear from the experience of several states that **standard offer prices** are enormously important to the health of retail competition, including green power markets. Customer choice in general, and green power markets in particular, will be best encouraged by setting standard offer prices at levels that include all costs of serving retail customers. This provides an opportunity for retail suppliers to compete and make a profit.

The Phase I Report concludes with the consulting team's analysis and discussion of the initial list of "leading contenders."

C. PHASE II: STAKEHOLDER COMMENT AND PRIORITIZATION

Once funding was confirmed for the second project phase, work immediately began to secure stakeholder review and comment on the effort thus far. Two rounds of stakeholder involvement had been built into the project design: a survey and written comment by a large group of stakeholders, followed by a day-long meeting with a smaller group to develop the final priorities for Maine.

1. First Stakeholder Review: Survey and Written Comment

Many groups and individuals in Maine are interested in supporting clean, renewable energy technologies. However, they approach the topic of renewable energy with different information, constituencies and action priorities. One of the objectives of this study was to share policy information about clean energy technologies across the diverse groups to build broad support for a common action agenda.

To further this objective, the consulting team identified as wide a group as possible to review the Phase I Report. After a broad solicitation of interest, copies of the report were sent to 145 individuals who represent the following clean energy constituencies:

- Renewable energy generators: hydro, biomass, wind and solar operators/ developers;
- Competitive electricity suppliers and regulated distribution companies;
- Large energy consumers and cogenerators;
- Clean energy advocates and environmental groups;
- Low-income advocates and low-income housing agencies;
- State agencies with relevant responsibilities: State Planning Office, Public Utilities Commission, Department of Economic and Community Development, Department of Environmental Protection and Public Advocate Office;
- Legislators;
- Public health community;
- Economic development and sustainable development interests.

To facilitate review and comment, a three-page survey form accompanied the report. The survey asked for comment on the program fundamentals as described in the report and on the criteria for evaluating the policy options. Finally, respondents were asked to rate the 39 options in terms of their own interest and priority. Appendix A contains a copy of the survey response form.

Twenty-five responses were received, for a response rate of 17%. Appendix B contains both the quantitative votes and final rankings for all 39 options, and the qualitative comments received.[6] In addition to the options ranking, many respondents included thoughtful written comments. Several respondents cautioned about the use of the term "clean" energy, as all technologies have some degree of environmental impact.

"Leading Contenders" Second List

The survey responses yielded a "leading contender" list somewhat different than that initially developed by the consulting team. Nine options rose to the top:

- Production Payments
- Consumption Credits
- General Public Education
- Renewable Portfolio Standard
- Transmission Access
- Net Metering
- Interconnection Rules and Fees
- Distributed Generation Support
- Loan Programs

[6] All responses have been coded to protect confidentiality.

2. Second Stakeholder Review: Prioritization Meeting

From the group to which the Phase I Report had been mailed, a smaller group was assembled to participate in the final prioritization meeting in January, 2001. An effort was made to ensure representation from all of the key constituencies, including particularly the renewable generators and retailers. Appendix C contains a copy of the agenda and presentation package.

Refining the "Leading Contenders"

The stated objective of the meeting was three-fold: a discussion of the possible options Maine might adopt; prioritization of the "leading contenders"; and consensus regarding those top priorities. To agree on leading contenders required a common understanding of the options, including program design, eligibility, funding and administration. To spark discussion on these and other points, the consulting team presented a "straw" proposal on each of the nine leading contenders. The participant handouts accompanying these presentations are included in Appendix C. Questions raised on each option during and after the presentations were recorded and are attached as Appendix D.

Based on discussion of those proposals, a "first cut" vote was taken to narrow the list to five. Results of that vote showed options grouped in three categories:

Ranking	Options
High/ Much Support	- Tax Incentives (+9) - RPS (+7) - Customer Credits (+5) - Transmission Access (+5)
Neutral	- General Public Education (-1) - Production Payments (-3)
Low/ Less Interest/ Not Now	- Interconnection Standards (-5) - Net Metering (-5) - Loans (-5) - Distributed Generation Support (-7)

Lower votes for some options did not necessarily translate into a lack of enthusiasm for that option in general. Rather, many participants focused just on those actions that would benefit *at this time* and *by or through this Mainewatch initiative.*

Options that are currently receiving attention by other entities were ranked as lower priority for Mainewatch. For example, distributed generation, and interconnection standards are currently under review by the Legislature and the Maine Public Utilities Commission. Maine's net metering legislation and rules are fundamentally strong although some clarification and improvements were suggested. General Public Education on behalf of renewables was thought to be extremely useful, but better implemented in the context of another initiative, program or policy option. As a result, the group did not support Education as a freestanding option but as a vital part of any and all other options.

Short List and Highest Priorities

Participants at the meeting broke into five small groups, each assigned to refine one of the options and identify the strongest rationale for its implementation. The five resulting programs and their respective "pitches" are summarized below:

Transmission Access

- Implementation includes:
  - → A "stronger voice" for renewable power at NEPOOL and Regional Transmission Organization (RTO) discussions; environmental expertise on any independent RTO board established; and an ombudsman for clean energy interests at NEPOOL and regional forums.
  - → Passage of the bill requiring the PUC to advocate for renewable energy at regional and federal forums. Expansion of that mandate to the State Planning Office and the Public Advocate Office.
  - → Environmental dispatch of energy resources by ISO New England by exempting renewables from congestion charges.

- The pitch:
  - → Some renewable power resources are at a significant competitive disadvantage in a competitive market.
  - → Market rules disadvantage small and renewable generators.
  - → Renewable resource representatives must have greater access to the rule-making process, and the rules themselves must be changed to support renewable power.

Interconnection Standards

- Implementation:
  - → Net metering must continue.
  - → Rules for connecting to the grid should be standardized consistent with IEEE interconnection standards.
  - → Connections for small generators (under 100 kW) should be simplified and standardized.

- The pitch:
  - → Generation must be connected to the grid following standard rules to ensure that it is safe for generators, transmission and distribution operators and customers alike.
  - → Standardized interconnection requirements will result in decreased costs.
  - → Allowing safe and easy interconnection of small, distributed resources helps build communities that are "disaster resistant."

Customer Credits

- Implementation – through legislation containing the following provisions:
  - → Eligibility – Maine-generated renewables, with the exception of cogeneration, waste to energy, and large hydro.
  - → Amount of the credit – 1.5¢/kWh through 2005, then 1.25¢/kWh through 2010. The program would be evaluated after the first 5 years.
  - → Funding – 3-2-1 mills surcharge on coal, nuclear and other fossil generation, according to relative environmental impact.
  - → Form – paid to the customers.
  - → Administration – through the PUC or Maine Revenue Services.

- The Pitch:
  - → A Customer Credit program will stimulate increased customer demand.
  - → The Credits approach is targeted – allows the benefit to go to Maine-based generators only.
  - → Incorporates customer education, choice and "renewables development support."
  - → Potentially broad support – environmentalists, global warming interests, health and economic development communities.
  - → Double "bang for the buck" – tax and incentive are combined in one concept.

- Questions/ Issues:
  - → How do customer credits dovetail with an RPS? The RPS is generator-based, the Credits focus on the customer demand side. States that do both do allow overlap, which increases the incentive value.
  - → This option relies on the Generator Information System (GIS), which supports tradable "green tags" or renewable energy credits. Would environmentalists find this option acceptable because of its reliance on tradable tags or credits?

Renewable Portfolio Standard

- Implementation – Through a legislative measure that would:
  - → Eliminate fossil-fueled facilities (cogenerators) from eligibility.
  - → Level the environmental playing field.
  - → Provide a clear definition of "renewable" with room for new technologies – e.g., define renewables around their emissions levels (NOx, particulates and CO2), so that clean, low-emission distributed generation options like fuel cells are included.
  - → Raise the RPS level from 30% to the existing baseline level of renewables sources, then add % for "new" renewable sources over time.
  - → Credits would be restricted to power that can be physically delivered to the NEPOOL system.
  - → Assumes GIS trading will come into general use.

- The pitch:
  → Infrastructure is already in place in Maine – in the form of both an existing RPS and existing in-state renewable suppliers.
  → Administratively simpler than customer credits.
  → As shown by the experience in other states, if done correctly it does work to build new capacity.
  → Economic contribution (jobs, local income, local taxes) of Maine's renewables industry is a good selling point.
  → A good RPS will create demand that will be met by generators; therefore little else is needed.

- Question:
  → Would the program be defined to allow small, net metered generators to sell their excess generation for tags?

Tax Incentives

- Implementation – Through a legislative package that would implement or restore the following tax incentives for qualifying renewables:
  → "3-2-1 Pollution Tax", similar to that proposed under Customer Credits.
  → Property Tax Credit – Restoration of eligibility for Business Equipment Tax Reimbursement (BETR) for equipment that supports clean or renewable generation.
  → Sales tax exemption for electricity sold back via net metering.
  → Production Tax Credit (PTC) similar to the existing federal PTC (will expire December 31, 2001 unless extended by Congress) – A Maine tax credit of 1¢/kWh to owners of clean facilities in Maine (costs $2.4M/ year).

Following final arguments by the proponents for and against these measures, a final vote was taken. The results showed a very close vote among the top five options, yet with three still gaining a solid majority (30) of the 42 votes cast:

Final Ranking	Option	Votes Received
#1	Tax Incentives	11
#2	Renewable Portfolio Standard	10
#3	Customer Credits	9
#4	Transmission Access	7
#5	Interconnection Standards	5

II. MAINE'S CLEAN ENERGY PRIORITIES

A. THE EMERGING CLEAN ENERGY AGENDA

Whether because of its historical economic and environmental contribution or its importance to our future, clean energy has a substantial community of support in Maine. This project has attempted to focus that constituency on a manageable list of priorities.

The priorities identified by stakeholders provide the core of a clean energy agenda. Following the January 2001 ranking meeting, the consulting team has looked further into each of the top four policy choices. In the sections that follow, the design and implementation issues associated with each are further discussed. Each section ends with a list of specific recommendations on how that policy might best be implemented in Maine.

In broad strokes, the three highest priorities work well as a package. Each provides a different form of support, through mechanisms that have proven themselves in other states. All three build upon the foundation Maine currently has in place to improve and broaden support for clean energy alternatives:

- **An improved Renewable Portfolio Standard** – Maine's current RPS attests to the interest in supporting this industry, yet its effectiveness has been widely questioned. A well-designed RPS will help to maintain existing clean generation and spark development of new renewables.

- **Credits for customers who purchase clean energy --** Customer credits build demand for the output of both existing and new clean energy generation. The accompanying consumer education helps ensure both successful implementation of the program and continued customer demand after the credits phase out.

- **Tax incentives for renewable energy** – Tax incentives help mitigate the costs that small, renewable generators must bear. Four specific tax incentives are high priority:
  - → Property tax rebate – Under the existing and popular Business Equipment Tax Reimbursement program, renewable energy generators and commercial purchasers of renewable energy equipment would be on the same footing as other businesses making capital purchases;
  - → Sales tax exemption – If applied to the electricity generated by renewable energy facilities, this provision would eliminate a supposed requirement (one that turns out to have been eliminated already, see page 38) thought to be a barrier to small energy producers;
  - → Production tax credit – A Maine version of the federal production tax credit would spur additional investment in renewable energy production capacity;

→ Pollution taxes – Levied on electricity generators according to their emissions rates, such taxes embody the "polluter pays" principle that characterizes other environmental protection measures. Such taxes provide clean energy producers an advantage over fossil-based producers, thereby redistributing the environmental and public health costs of generation-derived emissions from the general fund (where these costs are currently paid) to the electricity producers themselves.

Although we asked the group to focus on their top three choices, the fourth priority is also described because it is a fundamental underpinning to an effective and efficient market for renewable energy:

- **Transmission access policies** – Advocating at the regional level for fair and low-cost access to the wholesale generation market is critical to achieving competitiveness. Environmental and clean energy advocates need a voice in regional forums that set transmission policy, and renewable energy generators should be exempted from transmission congestion charges in recognition of their environmental benefits.

Together these policies represent a solid foundation of support for Maine's clean energy industry. Upon this base, Maine could hope to maintain if not grow the contribution of clean energy to both its economy and its environment. The following sections examine each of these policies in turn.

B. RENEWABLE PORTFOLIO STANDARD REFORM

Replacing Maine's present Portfolio Standard with an RPS that actually benefits Maine's clean energy producers is the highest single priority. This section explores the elements of that action, by looking at the structure of the current RPS, likely ways it might be reformed and some of the implications of those reform tradeoffs.

The Renewable Portfolio Standard (RPS) is a requirement that a certain percentage of a state's annual electricity use come from renewable energy. Its purpose is to ensure a minimum market for renewable resources, thereby providing environmental, fuel diversity, energy security, and economic development benefits. An effective RPS would attempt to ensure that there will be sufficient demand for renewable energy to support existing and new renewable energy facilities, thereby reducing risk to generation owners and developers. Compliance is by retail electricity providers who must ensure that their energy portfolio meets the standard.

Eleven states have established some form of an RPS: Arizona, Connecticut, Iowa, Maine, Massachusetts, Minnesota, Nevada, New Jersey, Pennsylvania, Texas and Wisconsin. The nature of the RPS requirement differs substantially by state, reflecting the different policy objectives, renewable resource endowments, and the existing level of renewables infrastructure in each jurisdiction.

The Maine Legislature enacted an RPS as part of its 1997 restructuring legislation. The current RPS is generally believed to be ineffective, however, for several reasons.

- It is set at a level (30%) that is lower than historic renewable energy use, and therefore it may not even sustain existing renewable energy plants.
- It is unlikely to produce any incremental benefits to what we were already receiving because it focuses only on existing renewable resources.
- The eligible resources include fossil fuel fired co-generation plants. While these are higher efficiency than traditional power plants because they also use the thermal energy for a useful purpose, their inclusion may also crowd out the greater environmental benefits from renewable sources.
- Some customers and marketers have complained that compliance with the RPS raises rates without any corresponding benefits to the state.

In September 2000, the Maine Public Utilities Commission (MPUC), acting on this last complaint, published a proposal to eliminate the RPS and replace it with a Systems Benefit Charge. Its rationale was that "the current portfolio requirement appears to have resulted in a substantial premium on the cost of electricity in Maine, without any clearly identifiable benefits to the State." The MPUC suggested that "the portfolio requirement may be increasing the cost of generation services in the range of 2% to 10% (or approximately 1 to 5 mills). We have no indication that this premium is supporting Maine facilities or causing eligible facilities to generate that would not have otherwise operated."

Public comment on the proposal did not support the proposed change, and as a result the MPUC decided not to introduce the legislation. A number of comments supported fixing the RPS rather than replacing it with something else. In that vein, this proposal is therefore focused on reforming the existing RPS to make it more effective.

1. The Current RPS

The rules implementing Maine's current RPS state that energy used to satisfy the portfolio standard must be generated by either a *renewable resource* or an *efficient resource*. A *renewable resource* is one that either qualifies as a small power production facility under the Public Utilities Regulatory Policy Act (PURPA), or is a generation facility whose nameplate capacity does not exceed 100 MW and uses one or more of the following technologies or fuels: fuel cells, tidal power, solar power, wind, geothermal, hydro, biomass or municipal solid waste in conjunction with recycling.[7]

[7] The PURPA eligibility for small power producers is similar except that the maximum size is 80 MW, it must be owned by a nonutility, and it does not include fuel cells. The Maine RPS rule may be found at Maine Public Utilities Commission, Docket No. 98-619, Renewable Resource Portfolio Requirement (Chapter 311), Supplemental Order Finally Adopting Rule and Statement of Policy Basis, September 28, 1999.

An *efficient resource* is a cogeneration facility that is a Qualifying Facility (QF) under PURPA. Cogeneration facilities generally burn fossil fuels or biomass to generate both electricity and thermal energy. Instead of a size limit on these facilities, there is an efficiency threshold that must be met.

Maine is well-endowed with renewable and efficient resources (cogeneration). Tables 1 and 2 show that, in 1998, 73% of Maine's total generation came from RPS-eligible resources. In 1999, RPS-eligible facilities supplied 63% of the state's total generation. More recent statistics are not yet available, but in 2000 and 2001 the percentages of in-state generation will be lower because of the addition of new gas plants in the state.

Table 1. Maine Electricity Generation, 1998

(kilowatt-hours)

Fuel or Resource	Utility[1]	Nonutility[2]	Total	RPS-eligible[3]
Petroleum	1,728,702,000	2,686,129,676	4,414,831,676	1,450,157,002
Coal	0	756,486,000	756,486,000	756,486,000
Natural Gas	0	0	0	0
Wood Waste & Black Liquor	0	3,010,018,164	3,010,018,164	3,010,018,164
Hydro (water)	1,820,306,000	940,288,784	2,760,594,784	2,616,847,784
Municipal Solid Waste	0	487,502,889	487,502,889	487,502,889
TOTAL	3,549,008,000	7,880,425,513	11,429,433,513	8,321,011,839

[1] EIA Form 759
[2] EIA Form 860B
[3] Notes: Petroleum, coal and natural gas is eligible to meet Maine's RPS if it is used in PURPA Qualifying Facilities (cogeneration). Currently all wood waste and black liquor is used either in QFs (cogen) or in facilities less than 100 MW capacity, either or both of which are eligible for Maine's RPS. Some of Maine's hydro exceeds the RPS-eligibility cap of 100 MW capacity.

Table 2. Maine Electricity Generation, 1999

(kilowatt-hours)

Fuel or Resource	Utility[1]	Nonutility[2]	Total	RPS-eligible[3]
Petroleum	673,031,000	5,593,287,702	6,266,318,702	1,494,864,333
Coal	0	707,843,000	707,843,000	707,843,000
Natural Gas	0	32,176,586	32,176,586	32,176,586
Wood Waste & Black Liquor	0	2,991,293,198	2,991,293,198	2,991,293,198
Hydro (water)	516,242,000	2,284,836,229	2,801,078,229	2,645,577,229
Municipal Solid Waste	0	455,494,902	455,494,902	455,494,902
TOTAL	1,189,273,000	12,064,931,617	13,254,204,617	8,327,249,248

[1] EIA Form 759
[2] EIA Form 860B
[3] Notes: Petroleum, coal and natural gas is eligible to meet Maine's RPS if it is used in PURPA Qualifying Facilities (cogeneration). Currently all wood waste and black liquor is used either in QFs (cogen) or in facilities less than 100 MW capacity, either or both of which are eligible for Maine's RPS. Some of Maine's hydro exceeds the RPS-eligibility cap of 100 MW capacity.

The RPS requirement is not a percentage of total *generation*, however. It is a requirement that 30% of electricity *sales* by each provider in Maine be from RPS-eligible resources or facilities. The relevant comparison is between Maine generation from RPS-eligible resources and total sales to ultimate consumers in Maine. On this basis, RPS-eligible generation was about 70% of total retail sales in Maine in both 1998 and 1999.

As gas-fired generation is added, renewable generation will decrease as a percentage of total generation, but renewable generation as a percentage of total Maine sales will remain fairly steady because Maine load growth (energy demand) is changing very gradually.

Another problem facing the establishment of an RPS in Maine (or any individual state within a regional power pool) is that out of state generators that meet the RPS eligibility criteria can sell into the state. This is a very big concern, because New England eligible generation outside of Maine produces about 23 million MWh[8] compared to Maine's eligible generation of 8.3 million MWh, and Maine's current RPS need of 3.6 million MWh. Even taking into account the Massachusetts and Connecticut RPS demand, there remains a very large surplus of eligible generation in New England unless modifications are made to eligibility.

2. Modifications to the RPS

There are several types of modifications to the current RPS that may improve its effectiveness. This section will explore main changes with variations: Changing the definition of eligible resources, in terms of fuel type and/or location; introducing a component for new renewables; and addressing compliance costs by allowing the use of tradable credits. Before discussing modifications, however, this section highlights attributes of the current RPS that should be maintained. Finally, this section ends with a summary of the five modifications that constitute our recommendation.

Maine's current RPS does have one valuable feature that should be retained. In writing the current RPS rules, the MPUC considered whether the requirement should apply to a marketer's total portfolio, or to each electricity product offered to consumers. The legislature was not specific about this distinction. Advocates of the product approach argued that unless the standard applied to all products, the cost of compliance could be charged only to those customers who felt strongly enough to pay a premium for cleaner energy. This view argued that the RPS as a general policy provided public benefits to all, and therefore should be supported by all customers. Customers paying a premium for green power should be able to do so with confidence that their purchase would support more clean energy than the minimum already required by law.

[8] Francis H. Cummings, Impacts of Maine Portfolio Requirement on Supply and Demand for Renewable Resources. Prepared for Union of Concerned Scientists, September 21, 1998.

In 1999 the Restructuring Act was amended to effectively adopt the product approach[9], and subsequently the Maine Public Utilities Commission amended the RPS rule:

> "Energy Requirement. Each competitive electricity provider, including standard offer providers, must provide no less than 30% of its total kilowatt-hour sales to customers in Maine with electric energy generated from eligible resources in accordance with the provisions of this Chapter. If a competitive electricity provider represents to a customer that the provider is selling to the customers a portfolio of supply sources that includes more than 30% eligible resources, the resources necessary to supply more than 30% of that customer's load may not be applied to meet the aggregate 30% portfolio requirement."

This, and the requirement that the RPS apply to Standard Offer providers, should be continued in any revisions to the RPS.

Changes to RPS Eligibility

It is plain that with 70% of Maine's total generation meeting RPS eligibility rules, an RPS requirement for 30% of Maine sales will have little effect on supporting Maine's renewable and efficient resources. Alternative definitions of eligible resources, and different percentage requirements, should be considered. Table 3 shows several RPS eligibility options and their recent contribution as a percentage of total Maine sales.

Table 3. Maine Resource Eligibility Options
(kilowatt-hours)

Resource Eligibility	Eligible Generation		Percent of Total Sales	
	1998	1999	1998	1999
Current RPS rules	8,321,011,839	8,327,249,248	71.7%	69.7%
Current rules less fossil cogeneration	6,114,368,837	6,092,365,329	52.7%	51.0%
Biomass and hydro (less than 100 MW)	5,626,865,948	5,636,870,427	48.5%	47.2%
Biomass and MSW	3,497,521,053	3,446,788,100	30.2%	28.9%
Biomass only	3,010,018,164	2,991,293,198	26.0%	25.0%
Total Sales in Maine	11,599,000,000	11,944,000,000		

From Table 3, it appears that without a change in the current eligibility rules, the RPS requirement should be set at 70%. There are various rationales for introducing stricter eligibility rules:

- Cogeneration might be excluded because although efficient it relies significantly on fossil fuels, which, in addition to being finite resources are also subject to price volatility, supply interruptions, dependency on non-indigenous resources, and higher air emissions.

[9] Maine Revised Statutes Annotated, Title 35-A, Section 3210 (Laws 1999). This amendment also retitled the Renewable Resources Portfolio Requirement to Eligible Resources Portfolio Requirement, presumably to reflect the broad range of eligible resources.

- Municipal solid waste (MSW) might be excluded because it emits harmful air toxics. On the other hand, it could be argued that MSW is vital to helping dispose of Maine's solid waste. Currently three of Maine's MSW plants benefit from a PURPA contract. Without these contracts, MSW plants might have to increase the tipping fees they charge communities to dispose of waste. It is not clear that including them in the RPS will provide a greater economic benefit to them, however.
- Hydro could be excluded entirely because they are mostly older plants that have paid for themselves (although most have been recently sold by the utilities to nonutility generation companies). The smaller hydro plants tend to be more at risk because they are less economic to operate.
- Biomass plants are included in all options in Table 3 because several of them are at risk financially, and are vital to jobs in a number of Maine's small towns.

Other eligibility approaches could include excluding any facilities on PURPA contracts. Because of the contracts, these plants have a guarantee of economic support. However, the RPS percentage requirement would need to be adjusted upwards, perhaps annually, as generators reach the end of their PURPA contracts. Another approach would be to include some hydro but to reduce the size that is eligible. For example, only hydro facilities that do not exceed 30 MW might be eligible on the assumption that they are the least economic. This capacity limit is also consistent with eligibility criteria for the Green-e renewable energy certification program.

Without addressing the eligibility of out of state generation, however, the eligibility options in Table 3 may still be ineffective. Some have suggested that RPS eligibility be limited to in-state generation. Nevada and New Mexico take this approach. In Arizona, out-of-state solar appears eligible, but landfill gas, wind and biomass must be in-state. Others are concerned that limiting eligibility to in-state generation might be a violation of the Commerce Clause of the U.S. Constitution.[10] Texas tries to get around this objection by allowing out-of-state generation only if the facility has a dedicated transmission line into the state. New Jersey allows out-of-state generation only if the facility is located in a state that is also open to competition. Out-of-state resources are eligible to meet the RPS in Connecticut and Massachusetts. Clearly, states with portfolio requirements have gone in both directions.[11]

Supporting New Renewable Generation

Many state RPS's require the development of new renewable resources. New resource development will provide both incremental environmental benefits and jobs for construction and operation. In addition, new renewable resource development will increase supply diversity. Although Maine and New England developed a more diverse

[10] See Nancy Rader and Scott Hempling, *The Renewables Portfolio Standard: A Practical Guide.* National Association of Regulatory Utility Commissioners, February 2001; and Kirsten Engle, "The Federal Constitution and State Implementation of Renewables Portfolio Standards: An Analysis of Commerce Clause Issues." Memorandum for the American Wind Energy Association, Washington, DC, March 13, 1996.

[11] Ryan Wiser, Kevin Porter, and Mark Bolinger, Comparing State Portfolio Standards and System-Benefits Charges Under Restructuring. Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory, October 23, 2000.

supply portfolio as a result of policies adopted in the early 1980's, some people are concerned that the large number of new combined cycle gas turbines being built in New England will lead to over-reliance on natural gas, and will subject consumers to price volatility if not supply interruptions.

To encourage new renewables development, most states that have adopted an RPS either explicitly require new resources (usually defined as coming on-line since restructuring was approved) or implicitly require new resources by creating a tier of preferred resources that currently do not exist in the state. Table 4 summarizes these requirements for eight states.

Table 4. New Renewables Requirements by State

State	New Renewables Requirement	Eligible Resources
Connecticut	**Class I resources:** 0.5% in 2000 rising to 6% by 2009 **Class II resources:** 5.5% in 2000 rising to 7% in 2009	**Class I:** solar, wind, fuel cells, landfill gas, new sustainable biomass **Class II:** MSW, licensed hydro, other biomass
Massachusetts	1% by 2003, 4% by 2009, + 1% per year thereafter until DOER decides otherwise	Solar, wind, ocean-based, fuel cells using renewable fuels, landfill gas, hydro, low-emission advanced biomass (gasification)
New Jersey	**Class I:** 0.5% in 2001 rising to 4% by 2012 **Class I or II:** 2.5% when BPU adopts interim standards	**Class I:** solar, wind, fuel cells, geothermal, wave or tidal, landfill gas and biomass **Class II:** hydro and MSW
Wisconsin	0.5% by end 2001 rising to 2.2% by 2011 (0.6% can come from pre-1998 facilities)	Wind, solar, biomass, fuel cells that use renewable fuel, hydro <60MW, geothermal, tidal
Minnesota	3.6% by 2002, 4.8% by 2012; applies to Northern States Power	800 MW of wind and 125 MW of biomass
Texas	2000 MW of new by 2009; effectively 2.2%	Solar, wind, geothermal, hydro, ocean-based, biomass, organic waste products, landfill gas
Arizona	0.2% in 2001 to 1.1% in 2007; may be offset by R&D in part	Solar, landfill gas, wind, biomass Half must be solar
Nevada	0.2% in 2001 rising 0.2% biannually to 1% in 2009	Solar, wind, geothermal, biomass; Half must be solar

Source: Ryan Wiser, Kevin Porter, Mark Bolinger. "Comparing State Portfolio Standards and System-Benefits Charges Under Restructuring." Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory. October 23, 2000.

Compliance Costs and Renewable Energy Credit Trading

The current rules of Maine's RPS require an annual report and certification by a corporate officer of each competitive electricity provider. The rules state simply:

> "At a minimum, the annual report must include the following information for the compliance period:
> 1. total retail kilowatt-hour sales in Maine;
> 2. total retail kilowatt-hour sales in Maine served from eligible resources;
> 3. a description of the eligible resources used to satisfy the portfolio requirement, including the fuel type and the amount of kilowatt-hour sales in Maine from each eligible resource;

4. demonstration that resources used to satisfy the 30% portfolio requirement have not been sold, or otherwise claimed as applicable to load served in other jurisdictions."

Exactly how retail providers will demonstrate that RPS resources have not been claimed or sold in other jurisdictions is not clear.

To support a more systematic verification system, and to help retail suppliers meet the minimum requirement more easily and efficiently, Maine's RPS rules should support a system of renewable energy credits. Renewable energy credits are the bundle of renewable energy attributes created by the generation of each unit of renewable energy. These credits are traded separately from the energy to increase compliance flexibility, lower costs, and verify that there is no double-selling (or double-counting) of renewable attributes. They are really integral to the functioning of an efficient RPS.

Without renewable energy credits, the RPS would be more difficult to meet, since renewable generators and retail providers could have to enter into hundreds of bilateral contracts. Having to manage a separate portfolio of renewable energy generation or contracts may be the source of some of the anecdotal evidence cited by the MPUC about the cost of compliance with the current RPS.

With tradable credits, retail suppliers need not own or even buy renewable energy. Instead they buy plain energy on the market, at the lowest cost possible, and purchase the necessary number of credits in a separate credit trading market. Credit trading would make compliance simple and transactions more efficient, obviating the need to develop or maintain a separate portfolio of renewable energy.

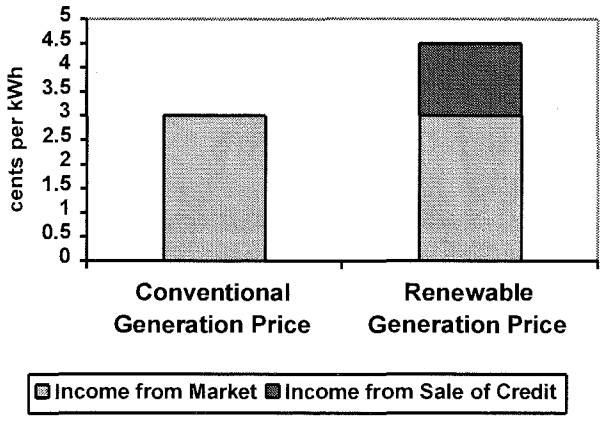
NEPOOL issued an RFP for establishment of a Generation Information System in March, 2001. When a regional GIS is operational, load serving entities will be able to demonstrate compliance with RPS's, disclosure and emissions performance standards that have been adopted by New England states. Both Connecticut and Massachusetts are considering credit trading as a part of their RPS. The selected program administrator would award certificates to renewable generators based on the number of kilowatt-hours produced. The fuel and other characteristics (emissions, location, vintage) of the energy produced ensure that reports filed by retail providers and generators can be reviewed for compliance with the RPS and other requirements. In addition to bilateral purchases and sales of renewable energy credits between generators and retail suppliers, an exchange and/or private brokers that buy and sell credits are likely to emerge, offering one-stop shopping for retailers and generators.[12] Such trading markets would provide greater liquidity, greater transparency of cost and lower cost of compliance.

As mentioned, renewable energy credits can be traded separately from the associated energy. Buying power from a generator that uses renewable sources is only one way of obtaining the necessary credits. Alternatively, a retailer may buy power from a fossil or other non-eligible generator, or from the spot market, then buy the necessary credits from

[12] Examples of private brokers include the Automated Power Exchange and NatSource.

a broker.[13] In this way a retailer can meet its RPS requirement without having to deal with multiple companies. Conversely a renewable generator can sell power to a local retailer on the spot market at the going rate for generic electricity, but sell its credits to a broker to make up for higher production costs. In this way, the renewable generator gains income from two sources: the sale of its electricity and the sale of renewable energy credits as illustrated in Figure 1.[14]

Figure 1. Two Sources of Income for Renewable Generators--Illustration Only



Cost Implications of the RPS

One criticism of the RPS, in fact one of the main reasons the MPUC considered replacing it, is the cost of compliance. Because market forces determine the actual cost of complying, it is unknowable in advance. Prices for renewable energy credits will be a function of supply and demand. The RPS will set the demand for credits, and generators will determine the supply of credits. Generators and retail suppliers, through negotiation, will set the price.

One way to control cost is to set a "circuit-breaker" price cap for the renewable energy credits. If the renewable energy credit price gets too high, as a result of either low supply or high demand, the program administrator can offer "proxy credits" for sale at a fixed price. The price should be set at a price high enough to encourage compliance through the acquisition of credits on the market, rather than buying them from the administrator at the circuit-breaker price.

Another way to look at the administratively-set price cap is to consider it as a penalty for non-compliance. It can be seen as a stick with which to ensure that suppliers take

[13] The New York Public Service Commission supports a type of renewable energy credits for purchases made through the state's spot market, but for purposes of electricity labeling about fuel sources.
[14] Alan Nogee, Steven Clemmer, Bentham Paulos, Brent Haddad. *Powerful Solutions: 7 Ways to Switch America to Renewable Electricity.* Cambridge, Mass.: Union of Concerned Scientists, 1999.

compliance seriously. They face either paying the market price, or paying a higher price, which some suggest should be three times the market price.

Whether the administrative price of a renewable energy credit is viewed as a price cap or as a penalty for non-compliance, the money collected by the program administrator would be used immediately to purchase renewable energy credits in the market. This would support renewable generation to the greatest possible extent.

Will narrowing the definition of eligible renewables increase the cost of complying with the RPS? As mentioned there is no way of knowing in advance. The market will determine what the cost is. However, incorporating renewable energy credit trading to meet the RPS should lower the cost, and a cost cap can help control the cost. Further, the implementation of Massachusetts' and Connecticut's RPS should help focus marketers on what they need to do to comply with such requirements.

Examples of Cost Caps or Penalties

- "The EPA's sulfur dioxide (SO2) allowance trading program, which has operated since 1995 under the 1990 Clean Air Act Amendments, provides a good model. Under this program, the EPA imposes an automatic $2,000/ton penalty (indexed to inflation) for each excess ton of SO2 produced. SO2 allowances trade at about $100 each, though costs were originally projected to fall between $500 and $1,000. Because it is far cheaper to purchase allowances than to incur the high penalty, the generation units subject to the law regularly achieve 100 percent compliance."*

- The Texas RPS includes a compliance penalty of the lesser of 5 cents per kWh or two times the average market value of renewable energy credits.

* Rader and Hempling, *op.cit.*, p.74.

Will the RPS become a barrier to competition in Maine? There is little evidence that the RPS presents a barrier in other markets. Most states with an RPS have yet to open for competition. Texas is already way ahead of schedule in meeting its RPS requirement even though it has not yet opened. Those states that are open, Connecticut and Massachusetts, have not yet adopted final rules on the RPS. Rather than the costs of compliance with the RPS, most observers suggest that the biggest barriers to competition in Maine appear to be:

- The low standard offer that does not reflect the cost of serving customers at retail by competitive suppliers.
- High (and potentially volatile) wholesale market prices that make switching unattractive to consumers.
- The difficulty for retailers to make a profit, because of both little headroom between the wholesale price and the standard offer price, and the high cost of customer acquisition.
- The small size of the Maine market relative to other opportunities that retailers can pursue. Maine needs nearby states (Massachusetts especially) to become competitively active, and then more marketers should begin to consider Maine.

3. Recommendations

Maine needs legislation to reform the current RPS, which is ineffective as written. Such legislation should include the following five elements.

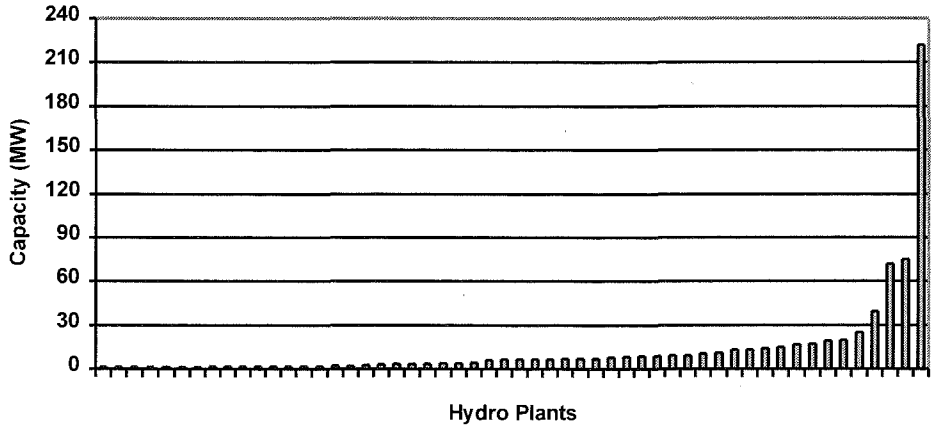
Tighten Resource Eligibility

To be eligible to meet the RPS for existing resources, the following criteria should be met:

- → Include biomass (including wood waste, organic agricultural waste, methane gas from landfills and sewage digesters), hydro less than 30 MW capacity, wind, solar and ocean-based (tidal and wave power); *and*
- → Exclude eligible generators that are covered by PURPA contracts; *and*
- → Limit eligibility to generators located in Maine. Because the constitutionality of a direct approach is questionable, language might be adopted that would require generation to benefit Maine, such as electricity that helps reduce pollution in the state, improves resource diversity in the state, provides economic benefits to the state, helps reduce transmission congestion, and is sold to meet in-state demand. Generator location may be a factor considered in determining benefits to the state, but it should not be the only factor considered.[15]

Figure 2 shows the capacity of Maine's hydro facilities. Setting the eligibility level at 30MW would have the effect of making ineligible four larger plants in Maine.

Figure 2. Maine Hydro Capacity



Adjust the standard

Adjusting the corresponding standard to 40%. This is consistent with the existing generation from resources that meet the proposed eligibility criteria, with the exception that facilities on PURPA contracts are not known for certain. If a large amount of

[15] See Rader and Hempling, *op.cit.*, Appendix A for a full discussion.

generation is on PURPA contracts, this standard would need to be lowered, or the exclusion of PURPA contracts would have to be dropped.

Incorporate New Renewables

To increase economic development (tax base and jobs), resource portfolio diversity, and additional environmental benefits, Maine's RPS should include a requirement for new renewables. As with the RPS for existing renewables, eligibility should be limited to new facilities in Maine. Eligible new renewables should be defined as solar, wind, ocean-based (wave or tidal power), sustainable, low-emission biomass, and fuel cells that utilize renewable fuels that become operational on or after January 1, 2000.

The standard for new renewables should start at a low percentage and gradually increase over time. We recommend 1% by 2004, 2% by 2006, 5% by 2009 and 10% by 2012. To translate this into capacity requires some assumptions about capacity factor (the percent of the time during a year that the plant is generating at full capacity). Table 5 shows how much new renewable capacity the RPS will create, assuming 30% and 50% capacity factors.

Table 5. New Capacity Under Proposed RPS Requirement for New Renewables

Capacity Factor	2004 (1%)	2006 (2%)	2009 (5%)	2012 (10%)
50% CF	27 MW	55 MW	137 MW	274 MW
30% CF	46 MW	90 MW	228 MW	457 MW

The new renewables capacity is not very much, compared to the 1,650 MW of new natural gas fired plants recently constructed or approved for construction in Maine, but it is enough to create demand and jump start new renewable construction.

Allow Credit Trading

Maine should incorporate renewable energy credit trading as the system for compliance verification. This recommendation would be dependent on the New England Generation Information System becoming operational to support disclosure and verification. This could also be used to verify compliance with the requirement for new renewables. Credits to meet Maine's RPS should only be recognized if the associated energy generated is physically delivered to the NEPOOL system.

Implement a Cost Cap

The RPS should include a cost cap (or penalty for noncompliance) at a price three times the average market price of renewable energy credits. This is to provide a circuit breaker on costs, encourage reliance on the market for compliance, and ensure generators that there will be a market for their power.

C. CUSTOMER CREDITS

1. Two Models: California and Rhode Island

A customer credit is a subsidy to encourage voluntary demand for green power generated from eligible renewable sources, by reducing the price of renewable energy to the customer. It directly addresses the problem, from a generator's or a marketer's point of view, of insufficient or uncertain demand for green power.

Depending on how it is implemented, it may also reduce the risk to renewable generators that their output will be priced above market, and it may increase retail provider profitability (or offset initial losses) due to the high cost of customer acquisition. Every marketer incurs a cost of marketing, finding and signing customers, but it is more difficult for green power marketers than for regular power marketers because green power marketers are trying to find and target a narrower market segment. Customer acquisition costs of several hundred dollars per customer have frequently been mentioned in the trade press. The lower the Standard Offer price as compared to the actual cost of serving retail customers, plus a profit, the more difficult the problem becomes.

Two different approaches to implementing customer credits have been identified. They differ principally in how the credits are calculated, and in how they are paid:

- **Payment per kWh** – In the first approach, a payment or credit is offered to a retail marketer (or directly to a customer) based on the number of kWh sold (or purchased) from eligible renewable resources. A per kWh credit, which can reduce the effective retail price, makes green power more competitive in retail markets and therefore makes it easier for a customer to choose green power.

- **Payment per customer** – The second approach is to make a fixed payment per customer signed up by a retail green power provider. The intent is to cover the cost of getting the customer, with the expectation that the marketer will lower the cost per kWh.

There is limited experience implementing a customer credit, but that experience has shown it to be very effective. The first approach is exemplified by the experience of California, described below. The second approach is described more fully, relying on a proposal for Rhode Island. These two examples are followed by a discussion of implementation issues, and then finally by our recommendations.

<u>The California Experience</u>

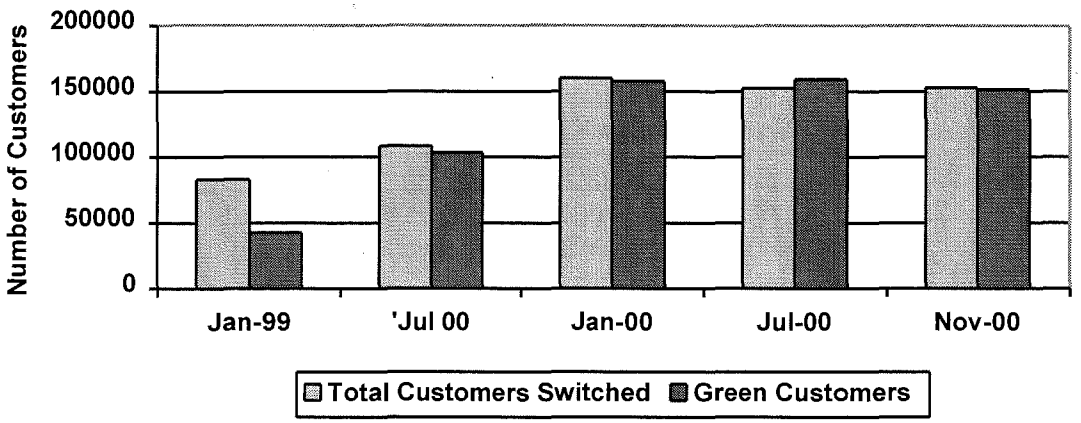
The California customer credit is paid to retail marketers based on the number of kWh sold from eligible renewable sources.[16] It reduces the price of renewable energy as seen

[16] In California, these sources are solar, wind, geothermal, small hydroelectric (less than 30 megawatts), biomass, digester and landfill gas, municipal solid waste and waste tires.

by the customer, currently by one cent per kWh, and for that reason it has been a powerful stimulus to customer demand in California.

As shown in Figure 3, residential customers buying eligible green power constitute a high percentage of all residential customers who switched providers in 1998-2000. From mid-1999, practically all residential customers that switched chose a green power product. From mid-1999 to mid-2000, about 80% of small commercial customers also chose green power, due to the customer credit that made green power competitive in price. Even as high as 80% of large customers chose to buy some green power, even thought they are limited to a credit of $1000 per year.[17]

Figure 3. Residential Customers Choosing Green



Source: For switching, California Public Utilities Commission, Direct Access Implementation Activity Reports; for customers choosing green, California Energy Commission, Historical Data for the Customer Credit Subaccount. Due to the variations in the timing of claims for customer credits, the number of customers choosing green may appear to exceed the number of customers that have switched.

Funding for the customer credit comes from a surcharge on kilowatt-hour sales collected by the state's investor owned utilities. California's original restructuring legislation enacted in 1996 provided for $540 million to support renewable energy development from 1998 through March 31, 2002.[18] Subsequent legislation placed these funds into the Renewable Resource Trust Fund, to be administered by the California Energy Commission, and to be divided into various accounts to support existing renewable resources, new renewable resources, emerging renewable resources and the customer purchases of renewable energy.[19] Overall, 14% or about $75 million is set aside to encourage customer demand for renewables. This past year the surcharge was extended,

[17] Of course, with the recent collapse and restructuring of the California market, the situation has changed drastically as marketers have temporarily left the market and turned hard-won customers back to the default providers (the utilities).

[18] Assembly Bill 1890, enacted September 23, 1996, codified in Chapter 854, Statutes of 1996.

[19] Senate Bill 90, enacted October 12, 1997, codified in Chapter 905, Statutes of 1997.

beginning at a level of $135 million per year, beginning in January 2002 and extending for 10 years, so the continuation of the customer credit appears assured.[20]

Customers are eligible for the credit only if they switch to a registered renewable provider to purchase electricity, and only for that portion of the green product that meets the Energy Commission's definition of renewable resources. In addition, eligible renewable electricity must be generated within California and must not be utility-owned.[21]

As shown in Table 6, the credit level is currently set at 1.0 ¢/kWh through June 30, 2001. The Commission periodically evaluates whether any changes in the credit level are necessary, and in December 2000 decided to maintain 1.0/kWh level for the period from January 1, 2001 through June 30, 2001. Whenever the customer credit level is reset, then the new credit level is held constant for at least a six-month period. Before the end of June 2001, the Commission will hold another public meeting to set the credit level for the six-month period from July to December 2001.

Table 6. Past and Current Renewable Energy Customer Credit Levels

Time Period	Credit Level
January 1998 - November 1999	1.5 ¢/kWh
December 1999 - June 2000	1.25 ¢/kWh
July 1, 2000 - December 31, 2000	1.0 ¢/kWh
January 2001 - June 2001	1.0 ¢/kWh
July 2001 - December 2001	To be determined in spring 2001

Residential and small commercial customers can automatically be credited for each kilowatt-hour of renewable electricity they purchase. Payments to larger commercial and industrial customers are capped at $1,000 per year per customer.

The credit is actually paid to the retail providers of green power. Some providers may reflect the value of the credit in their pricing schemes, while others may use the credit to give customers a monthly bonus, but the credit must be passed on to the end use customers. The Commission distributes funding to registered providers after they show that they have purchased eligible supplies AND have given the credit to their customers. This credit is shown as a rebate on the customers' bills. Generators submit reports on eligible kWh sold, the number of customers, and how much in dollars was paid or passed on to customers, for residential, small commercial and "other" (large commercial).

A Proposed Structure for Rhode Island

A customer credit has been proposed by the Rhode Island Renewable Energy Collaborative, and is being considered by NYSERDA in New York. This proposal

[20] Reliable Electric Service Investments Act, Assembly Bill 995 and Senate Bill 1194, enacted September 30, 2000, codified in Chapters 1050 and 1051, Statutes of 2000.

[21] It appears that a state showing preference by offering a subsidy only to in-state generators is a lesser barrier to interstate commerce than a state limiting eligibility for RPS compliance to in-state generators.

exemplifies the second type of credit program, where credits are paid on a per-customer basis. The Rhode Island proposal[22] is quoted below in its entirety:

> Retailer/customer incentives encourage the growth of the renewables market in two ways. First, they provide an incentive for power marketers to market quality renewables products to customers. Second, they help consumers overcome their initial resistance to purchasing green power. One of our proposed retailer/customer incentive programs is aimed primarily at residential and smaller business customers; a separate program is proposed for large businesses and institutions.
>
> *Green Power Customer Rebate* – For every small customer (residential and small general service) that signs up to purchase an eligible green power product in Rhode Island, the retail marketer will be offered a rebate equal to the levels specified below, until funds are exhausted:
> → Block 1: $125/customer for first 5,000 customers
> → Block 2: $75/customer for next 15,000 customers.
> The Parties anticipate that the green power retailers may use the rebate in many ways, including providing a one-time signing bonus for a customers, reducing the per kilowatt-hour cost to the customers, or underwriting the retailer's customer acquisition costs. By structuring these incentives to decline as increasing numbers of customers enroll, this program creates a sense of urgency intended to stimulate near term green power activity.
>
> *Eligible Products* – Green power products will be eligible if they meet one of two criteria. First, they may be Green-e certified. Green-e is a voluntary certification program created by the Center for Resource Solutions in collaboration with environmentalists, consumer advocates, and renewable energy experts. Electricity certified by Green-e must be based on at least 50% renewable energy, as clean or cleaner than typical power for any non-renewable part of the offering, and offered by a company committed to following the Green-e Code of Conduct on ethical treatment of customers, including using simple contracts and a disclosure label. The second criterion a green power product can meet is to consist of at least 10% eligible, post-restructuring renewable energy generated in New England on an annual basis. Post-restructuring renewables are defined as renewable generation units that came into commercial operation after January 1, 1998.
>
> *Fund Disbursement* – Funds are only expended to the extent that marketers are successful. Specifically, the rebate would be disbursed for customers that have been served with eligible products for a minimum of three months. The number of customers will be determined quarterly based on the number of incremental customers signed up in the preceding quarter, adjusted downward to account for customers who leave the green power marketer. This approach will mitigate against the possibility of gaming by retail green power marketers. If gaming by retail green power marketers

[22] State of Rhode Island and Providence Plantation Public Utilities Commission. Stipulation of Parties, November 30, 2000. Docket No. 1939, In re: Narragansett Electric Company Demand Side management and Renewable Energy Programs for 2001.

occurs, the Renewable Energy Collaborative can bar the marketer from receiving future incentives and require it to forfeit money that would otherwise be due under the program. Requests for funding would be accompanied by appropriate documentation for verification.

Large Customer Purchase Incentive RFP – The Renewable Energy Collaborative also proposes to fund a flexible incentive for larger customers, including business, government, and institutional customers, to motivate them to participate in the green market. This element of the program will be initiated with a 1st quarter 2001 RFP to large customers interested in purchasing green power and to marketers interested in serving large customers with renewable power. Proposals might include: a larger green power customer rebate than is otherwise available; a cents/kWh incentive; a green power employer matching program, or some other form of leverage (such as matching funds). The Renewable Energy Collaborative proposes to fund applications that best meet the following two criteria: low incentive level per new renewable kWh sold in Rhode Island and strong effort on the part of participating end-users to promote or expand green power purchases by others.

The proposed level of funding for Rhode Island for this incentive alone is $2,250,000 for one year: $1,750,000 for residential and smaller business customers and $500,000 for large businesses and institutions. The money would come from a surcharge of 2.3 mills on every kilowatt-hour sold in the state from 1997 to 2002. About $19 million was raised in 1998 for both energy efficiency and renewable resource development. There is no specific amount ear-marked for renewables, but it is expected to be about $2 million a year.[23]

2. Issues in Credit Design

Although there are always numerous issues that must be decided in establishing and implementing policy and programs, this section provides an elaboration on several choices that should be considered before recommendations are made.

Cents per kWh or Dollars per Customer

There are pro's and con's to designing the credit programs as a $/kWh versus a fixed amount per customer. The fixed dollar amount per customer is probably more attractive to a retail provider, because the full payment will be made up front when the customer is enrolled. On the other hand, this approach requires that standards for eligible green power products be established. One would only want to pay a credit to a retailer that signs up customers for products containing certain levels of renewable energy.

The credit per kWh avoids this question by paying just for the renewable energy contained in the product. Eligible resources must be defined, but not both eligible

[23] R. Wiser, K. Porter and M. Bolinger, "Comparing State Portfolio Standards and System-Benefits Charges Under Restructuring." Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory.

resources and eligible products. On balance, it seems that the cents per kWh approach is simpler, although it may be slightly less effective in attracting green power marketers to the state.

Pay Customer or Pay Provider

It seems clear that if the credit is intended to offset customer acquisition costs and is a fixed amount per customer, that it must be paid to the provider. This gives the provider more flexibility in how the money is used – to pay for marketing costs, for sign-up bonuses, or to lower the cost of energy. The opposing perspective is that there is no control over how the credit is used, but it is arguable that this should not matter to program designers. The provider will only get paid if it keeps the customer for at least three months, and is only paid going forward for net increases in the number of green customers.

A cents per kWh credit could be paid either directly to customers, or to providers. Indeed, some of the stakeholders that most strongly supported customers credits preferred that the credits be paid directly to consumers. However, paying customers directly would create a significant administrative burden to the administering agency, who may have to send out hundreds or thousands of checks monthly or quarterly. Alternatively, perhaps something could be arranged with the distribution utilities to credit the bills of participating customers. However, they would expect to be reimbursed their administrative costs. Furthermore, this method would require an exchange of information about the amount of eligible renewable energy in the product(s) being sold to customers. Giving the kWh-credit to the provider seems like the most sensible approach. The provider can be given the freedom to decide what do with it (as with the dollars per customer payment), or it can be required to pay it to participating customers, as in California. We lean towards this latter approach because it is more likely to result in lower green power prices to consumers, although providers could also decide to issue monthly or quarterly rebate checks or signing bonuses.

Funding the Customer Credit

Most states that have established renewable energy funds have done so by a surcharge (also referred to as a System Benefits Charge, or SBC) on retail kWh sold, collected by distribution companies and transferred to fund administrators. Several of these charges are levied at a rate of about one mill per kWh. Since Maine has total sales of about 12 billion kWh, this would result in annual revenues to the fund of about $12 million per year. The average cost per household, assuming an average energy use of 500 kWh per month, would be $.50 per month.

Another funding option is to tax energy with higher environmental impacts or external costs, and use that money to subsidize eligible renewable energy. For example, electricity generated from burning coal could be taxed at 3 mills/kWh, electricity from oil and nuclear energy at 2 mills/kWh, and electricity from natural gas at 1 mill/kWh. Since retailers are required to disclose the resources used for their energy portfolios, determining the impact of such formulas should not be difficult. It should be even easier when the New England Generation Information System is operational, since each

kilowatt-hour will be tagged with information about its generation characteristics. This approach has the advantage of reducing the revenue as the sales mix gets cleaner. Simultaneously, less revenue is needed to credit the purchase of renewable energy.

To calculate how much funding such a proposal would provide, Table 7 shows the generation mix for Maine in 1998 and 1999, and for NEPOOL in 1998. The NEPOOL regional mix is what is currently disclosed on the Maine electricity label for system power. Table 7 also shows the resulting revenue if coal-fired electricity were taxed at 3 mills/kWh, oil and nuclear generated electricity at 2 mills/kWh, and gas-fired electricity at 1 mill/kWh.[24] The generation mix percentages have been applied to the total sales in Maine for 1998 and 1999 to illustrate the potential revenues. The NEPOOL regional average generates more revenue than the Maine generation mix because it relies on more fossil fuel and nuclear energy. Finally, these percentages will change as the new gas-fired plants that have recently come on-line are included in the totals.

Table 7. Electricity Generation Mix and Resulting Revenue

Fuel or Resource	Maine 1998[1]	Maine 1999[2]	NEPOOL 1998[3]
Oil	38.6%	47.3%	29%
Coal	6.6%	5.3%	18%
Natural Gas	0%	0.2%	18%
Nuclear	0%	0%	21%
Wood Waste & Black Liquor	26.3%	22.6%	2%
Hydro (water)	24.2%	21.1%	7%
Municipal Solid Waste	4.3%	3.4%	4%
Renewable Fund Revenue	$11,263,787	$13,236,371	$19,950,280

[1] From Table 2
[2] From Table 3
[3] From MPUC Docket No. 98-708, Uniform Information Disclosure and Informational Filing Requirements (Chapter 306), Order on Universal Information Requirements Regarding Chapter 306, February 29, 2000.

The revenues generated by the 3-2-1 mills tax on coal, oil and nuclear, and natural gas are roughly equivalent to the revenues ($12 million) from a surcharge of 1 mill applied to all sales in Maine. But the 3-2-1 tax has the effect of taxing those sources of generation that have the largest environmental footprint. With the recent addition of new natural gas plants, the increased proportion of less environmentally-damaging generation will result in lower revenues than shown.

Some argue that generation should be taxed on its actual, measured pollution, rather than on its fuel source, which is a proxy for environmental impact. This might be possible if the New England GIS will support this data, and if there is a factual basis on which to set the initial level of tax. Data is available on air emissions from generation in Maine and in New England, but currently not on sales in Maine.

[24] Table 7 shows the *generation* mix, not the *sales* mix, because Maine generation could have been sold out of state, and Maine sales could have come from out of state. Actual sales in the state by type of resource is not available yet. For this reason, the regional generation mix is also shown.

Payment Level

Using data for 1999 sales in Maine, the cost of a customer credit is illustrated in Table 8. The calculations show the cost of both a kWh-credit and a customer acquisition credit. The table shows the effect of different range of cents per kWh payments, from 0.5 cents to 2.0 cents, assuming a 1%, 5% and 10% market penetration of eligible renewable resources. It also shows how much money would be needed to pay a $150 customer acquisition credit, assuming the same market penetration levels.

Table 8. Potential Cost of Customer Credit*

Green Market Penetration	Credit Payment				
	0.5 ¢/kWh	1.0 ¢/kWh	1.5 ¢/kWh	2.0 ¢/kWh	$150/customer
1%	$597,200	$1,194,400	$1,791,600	$2,388,800	$1,085,274
5%	$2,986,000	$5,972,000	$8,958,000	$11,944,000	$5,426,370
10%	$5,972,000	$11,944,000	$17,916,000	$23,888,000	$10,852,740

*Based on Maine's total sales and total customers, 1999.

Table 8 suggests that the revenue generated from either a surcharge on all kilowatt-hours, or the 3-2-1 tax, would be sufficient to pay for a customer credit in all but the highest market penetrations of renewable energy. In any case, the credit would be set higher initially to attract demand, and would be reviewed annually or semi-annually and adjusted downwards if necessary. If revenues were insufficient, they would be allocated on a first come, first served basis.

3. Recommendations

Eligibility

To be eligible for payment of a customer credit, the following criteria should be met:

- Eligible resources are biomass (including wood waste from logging and mill operations, organic agricultural waste, landfill gas), hydro less than 30 MW capacity, wind, solar and ocean-based (tidal and wave power).
- Eligible generators should not be on PURPA contracts.
- Eligible generation for payment of a subsidy must be located in-state. (The state cannot limit trade from out of state, as discussed for the RPS, but it can limit its support to in-state sources.)
- Members of buying groups that purchase renewable energy would be individually eligible for the credit.
- Customer credit claims may not be made for resources that are used to meet the RPS.

Type and Amount of Credit

The customer credit should be paid as cents/kWh, probably starting at no more than 2.0 cents, and capped at $1,000/year for larger customers. It would be reviewed periodically and is expected to decline over time as demand for renewable energy increases. Care

must be taken in setting the credit level. It should result in lowering the effective price below the standard offer, to encourage customer switching, but not so low as to undercut the wholesale price of power, or the renewable energy fund will be overwhelmed with demand.

Funding

The customer credit should be funded by a tax on generation sources with the greatest environmental impacts. Although it might be desirable to base the tax on actual levels of pollution, we recommend for simplicity that it be levied as follows: 3 mills/kWh coal, 2 mills/kWh oil and nuclear, 1 mill/kWh natural gas. As well as raising revenue to support clean energy, this approach also helps to internalize the environmental costs of environmentally-damaging generation. It puts the cost on the polluter instead of on all ratepayers.

Administration

As a tax, we believe the collection of the revenue is best handled by the Maine Revenue Service. Generators burning coal, oil and gas or using nuclear energy would complete a quarterly form showing kilowatt-hours sold by generation type, calculate the tax owed and remit it with the form. These revenues would be held in a renewable energy account. Claims for customer credits would be submitted by retail suppliers to the Maine Revenue Service, showing eligible kilowatt-hours sold (total renewables sold less the percent of total sales that are renewable for RPS purposes), number of customers, amount of money claimed, and amount of money rebated to customers. Claims should be net of renewable energy sales to meet the RPS.

Consumer Education

Consumer education about the generation sources and the benefits of renewable energy is critical to the functioning of customer choice. A strong educational element should be an inherent part of encouraging demand for renewable energy. Education about the customer credit, explaining its rationale, should also be part of this effort. To support this education activity, funds remaining from the MPUC's efforts to educate the public about electricity restructuring should be reprogrammed to this more targeted purpose. Also, education undertaken as part of utility-sponsored energy efficiency efforts could include information about renewable energy choices.

Policy Longevity

For policy to be effective, it must be stable with a gradual phase-out period as the market is transformed in the ways intended. As demand for renewable energy increases, the credit will fall and eventually be unnecessary. Realistically, this is probably not going to happen for at least 10 years. In addition, generators and renewable energy developers need policy certainty to be assured that their product will be competitive with the subsidy, and that there will be demand for their product. Legislation enacting a customer credit should therefore reflect a long-term commitment.[25]

[25] R. Wiser and S. Pickle, *Financing Investments in Renewable Energy: The Role of Policy Design and Restructuring*. Lawrence Berkeley National Laboratory, 1997.

D. TAX INCENTIVES

There are several tax incentives that would benefit clean energy sources. The stakeholder group that worked on these concepts emphasized four:

- Endorsement of the 3-2-1 tax on fossil fuel and nuclear sources of electricity.
- Property tax credit or rebate for renewable generation facilities.
- Sales tax exemption for customer-owned, net-metered generation.
- Production tax credit for renewable generation.

Each concept will be discussed in turn.

1. 3-2-1 Tax on Pollution

As discussed in the previous section, this concept follows the principle of those that cause the environmental impacts should pay for them. It its simple form, coal-generated electricity sold in Maine, regardless of where it was generated, would be subject to a tax of 3 mills/kWh. Likewise, electricity generated from oil or nuclear energy would be taxed at 2 mills/kWh, and natural gas-fired electricity would be taxed at 1 mill/kWh. This tax attempts to reflect the true cost of generating power from these resources by internalizing some of the environmental impacts; by doing so it makes clean renewable sources more competitive. The discussion contained in the section on the Customer Credit will not be repeated here.

The New Hampshire Department of Environmental Services is implementing an example of a pollution tax, though not as broad as proposed here. Focused on reducing NOx emissions, it levies a charge of one to several hundred dollars per ton of NOx emitted by certain internal combustion engines and combustion turbines not otherwise regulated. The fees are paid to a dedicated NOx Emissions Reduction Fund. How the funds will be used has not yet been decided, but disbursement will be at the discretion of the Department of Environmental Services.[26]

2. Property Tax Rebate

Maine's Business Equipment Tax Reimbursement (BETR) program was introduced in 1995 to encourage businesses to expand or locate in Maine. Since many states do not tax business equipment, the BETR program levels the playing field in the competition among states for job-producing investment.[27]

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[26] New Hampshire RSA 125-J:13. Rulemaking is still in progress, Env-A 3700 NOx Emissions Reduction Fund for NOx-Emitting Generating Sources.

[27] Title 36: Taxation, Part 9: Taxpayer Benefit Programs, Chapter 915: Reimbursement For Taxes Paid On Certain Business Property

Business equipment is subject to local personal property taxes. Under BETR, the business pays the tax to the local municipality and then files a form with the state for 100% reimbursement. This preserves an important source of revenue for many communities.[28] Eligible equipment is defined as qualified business property first placed in service in Maine after April 1, 1995. "Qualified" property is property used or held exclusively for a business purpose and subject to an allowance for depreciation. It does not include land or buildings or attachments to a building that are used to serve the building rather than the business.

When a number of large natural gas plants were proposed to be built in Maine,[29] legislators saw the potential loss of millions of dollars of revenue, and amended the law to exclude electricity generators from the BETR program. Although prompted by the anticipated natural gas plants, the text of the law was not particular:

> Except as provided in paragraph C [for cogeneration], reimbursement may not be made for property used to produce or transmit energy primarily for sale. Energy is primarily for sale if 2/3 or more of the useful energy is directly or indirectly sold and transmitted during the property tax year through the facilities of a transmission and distribution utility as defined in Title 35-A, section 102, subsection 20-B.[30]

As a result, smaller and renewable energy generation facilities that rely on Maine's indigenous resources are currently excluded from the BETR program.

Because of the cost of the program (the legislature appropriated $51.5 million for reimbursements in 2000), the general political trend is to further restrict the definition of eligible equipment. Nevertheless, to encourage capital investment in clean energy facilities, the law should be amended to make renewable energy generation facilities located in Maine and placed in service after December 31, 2000 eligible.

3. Sales Tax Exemption

Maine is one of some 25 states with net metering laws or rules.[31] Under Maine's net metering rules, customers with on-site small generation – less than 100 kW – are eligible if certain other requirements are met.[32] Net metering is usually accomplished with one meter operating in both directions. The meter spins backwards when the on-site generator

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[28] Edward D. Murphy, "Tax Rebates All Too Successful," *Maine Sunday Telegram,* February 4, 2001, p. 1F.

[29] In 1998, 11 gas-fired power plants with a total capacity of over 5,000 MW were proposed for Maine. Tux Turkel, "Power Play," *Maine Sunday Telegram*, Octogber 18, 1998, p. 1F.

[30] § 6652. Reimbursement allowed; limitation.

[31] Maine originally adopted net metering in 1987. Revised Code of Maine Chap. 36 Section 1(A)(18) and (19) and Section 4 (C)(4) . The Maine PUC issued new rules effective December 20, 1998.

[32] Resources or technologies eligible for net metering are solar electricity, wind, biomass, hydro, alternative fuels, geothermal, waste, and cogeneration. In practice, because of the 100 kW size limitation, only solar, wind and perhaps hydro are likely to take advantage of net-metering. Any residential, commercial or industrial customer is eligible. As of March 2001, Central Maine power was net metering 37 projects.

is producing electricity. The customer is billed by the utility only for purchases in excess of on-site generation. If generation exceeds use in any month, the customer is not paid directly, but any excess generation may be carried forward to apply against purchases in a future month within a year. However, with one meter, the amount produced and delivered into the distribution system is unknown; only the difference between generation and usage is known.

Stakeholders believed that net metering in Maine was being discouraged by a requirement of two meters. At one time, this was true because Maine Revenue Services wanted to tax the entire purchase of electricity, not just the net purchase.[33] However, Maine taxation law was recently revised to specify that only the net purchase by the retail customer is subject to the sales tax, obviating the need for a second meter.[34]

Central Maine Power does install two meters because its computer system can not handle negative numbers, which would arise whenever the customer-owned system generates more than the customer uses. Maine PUC rules address this situation also. The rules state:

> Second Meter. Nothing in this section shall prohibit a utility from installing additional meters to record purchases and sales separately, provided, however, that no customer that elects to be billed on a net energy basis shall be charged for the cost of the additional meters or other necessary equipment.[35]

Accordingly, we have concluded that current laws and rules provide adequate policy support on the issue of taxation applied to net metering.

4. Production Tax Credit

A production tax credit is intended to encourage the use of renewable energy to generate power. It does so by providing a subsidy for the actual amount of energy produced, thereby making investment in cleaner energy systems more financially attractive.

The production tax credit is taken by the owner of a renewable generation facility as a credit against the amount of taxes otherwise owed. The amount of the credit is based upon the actual kilowatt-hours produced by the eligible system. Production credits are generally seen as stronger incentives for clean energy systems than other forms of credits because reimbursement is pegged to actual system performance, not to capacity (which may be unused) or to investment cost.

Tax incentives based on production address multiple barriers. First, they assure investors in clean energy systems that a return on their investment is possible and even likely, assuming the system performs as designed. Second, barriers associated with pricing

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[33] Letter from Peter B. Beaulieu, Director, Sales/Excise Tax Division, Maine Revenue Services, to Robert K. Gaspar, Central Maine Power Company, January 7, 1998.
[34] Title 36 Maine Revised Statutes §1760 Exemptions, paragraph 80. Electricity Used for Net Billing.
[35] Maine PUC, Chapter 313: Customer Net Energy Billing, Section 3.F.

uncertainties or price competitiveness may also be reduced, as the production incentive may be used to subsidize prices at which the renewable supplier may sell.

Currently, there is a federal production tax credit (PTC) that offers 1.7 cents/kWh for ten years for wind and closed-loop biomass that begins operation by December 31, 2001. After that date, the PTC will expire unless it is renewed by Congress. Bills to extend the PTC have been introduced. A Bill to expand the eligibility to include traditional biomass has been introduced (by Senator Susan Collins) since there are no "closed loop" biomass plants in the United States.

The PTC is very important to the competitiveness of renewable energy. If the federal credit is extended, there would be no need for Maine to enact anything similar. On the other hand, if the federal PTC expires, Maine should offer its own version, as do Oregon, Minnesota and Missouri. Production incentives are also proposed for Colorado and New Jersey (See Phase I report, Appendix A.)

Maine's version of a production tax credit should follow this outline:

- The PTC is meant to encourage larger projects that are not intended for on-site use, and are operated primarily for sales to the electric grid. The tax credit would be applied to Maine's corporate income tax.

- Eligible technologies or resources are solar, wind, biomass (including wood waste, organic agricultural waste, landfill and digester methane gas), ocean-based and fuel cells that use these renewable resources. These resources must be located in Maine, of a capacity greater than 100 kW, but less than 40 MW. Hence, net-metered facilities would not be eligible. Finally, eligible facilities must be ineligible for the federal tax credit, so that plants could not take advantage of both the federal and the state PTC.

- The amount of the PTC should be 1¢/kWh for 10 years, indexed for inflation.

- The cost of the PTC in lost income tax revenues is hard to estimate because it is unknowable just how much capacity would be built. As an example however, assuming three 20 MW wind projects with a capacity factor of 30%, the annual cost would be about $1.5 million. On the other hand, localities would gain in property taxes.

- The PTC would be administered by the Maine Revenue Service.

5. Tax Incentives Summary

A tax incentive package to support renewable resources should consist of the following elements:

- A tax on fossil-fueled and nuclear energy sources, to reflect the environmental costs imposed on the state of Maine from electricity generation.
- Restored eligibility of renewable generation equipment for Business Equipment Tax Rebate program.
- A production tax credit of 1¢/kWh to corporate owners of qualifying renewable facilities.

E. TRANSMISSION POLICIES

Rules being adopted by the New England Power Pool (NEPOOL) put renewable power plants at a significant competitive disadvantage. NEPOOL is the regional body empowered by the Federal Energy Regulatory commission (FERC) to make policy regarding regional wholesale electricity markets and certain high voltage interstate transmission lines known as pool transmission facilities (PTF). The ISO-New England is the independent governing body charged with implementing that policy. Several NEPOOL rules not only threaten the continued operation of existing generation facilities, but they also impede the construction of new wind and solar facilities.

1. "Pancaked" Transmission Rates

New England classifies transmission lines into PTF and non-PTF lines. PTF lines are akin to the interstate highway system, while non-PTF lines are akin to local roads. PTF lines are generally over 69 kV and provide parallel flow capability; they are the major transmission lines interconnecting each New England state. Non-PTF lines are the smaller transmission and distribution lines crisscrossing rural Maine.

The large majority of existing renewable power producers are located on non-PTF lines. Wind generators will locate near non-PTF lines as well. This is in part due to the fact that renewable resources must locate near their fuel sources (water, wind and wood), and in part due to the fact that when the existing units were built the type of line on which they were located was irrelevant. In fact, siting these facilities on lower voltage lines provided reliability and line loss savings benefits to Maine's utilities, which encouraged them to site in the hinterlands.

Now, however, being on a non-PTF line is a distinct competitive disadvantage. Generators connected to non-PTF lines must pay a toll or wheeling charge to move their power to the PTF lines if they are serving customers outside the service territory in which they are located. Generators connected to PTF do not pay this charge, and pursuant to NEPOOL rules, consumers pay for all transmission over PTF lines. Thus, a coal plant in

Massachusetts can compete for a customer in Greenville free of transmission charges, but a biomass plant in Greenville must pay to serve a Massachusetts customer.

Going back to the highway analogy, most renewable generators are located on local roads rather than the interstate highway system. They are charged to use the local roads to get their power to the interstate highway. If a generator has to cross several utilities to reach the highway, each utility can charge for the use of its roads. This is called "pancaking" rates or fees because they are stacked one on top of the other.

The cost of wheeling power to PTF is significant; in some utility service territories it can add as much as one cent per kilowatt-hour. This charge puts renewable power on non-PTF lines at a significant competitive disadvantage compared to the large fossil and nuclear units in New England.

FERC has said that pancaked rates must be eliminated before it will certify a regional transmission operator (RTO) to operate the transmission grid. Discussions are underway in New England to form an RTO and renewable advocacy organizations are pushing for elimination of pancaked rates.

2. Congestion Management System

FERC has embraced a new kind of transmission pricing that will penalize renewable generation in many New England states, including Maine. New generators interconnecting to the system will no longer have to pay to upgrade the transmission system to accommodate their generation. As a proxy for transmission upgrades, NEPOOL has approved the implementation of a pricing scheme that creates lower energy prices in areas with excess generation (i.e., more generation capacity than load). Meanwhile, energy prices will be higher in areas where load exceeds generation. This is called "location marginal pricing." Generators in congested areas will compete against each other to serve areas on the other side of the congested interface.

Location marginal pricing sends an economic signal to generators to locate where power is needed. This is fine in principle; however, renewable resources cannot locate in downtown Boston or Hartford. They must locate where the wind, water and wood are found. On the other hand, location marginal pricing encourages the operation of old dirty fossil units in Boston and New Haven, as well as the construction of new fossil units in populated areas.

With the addition of approximately 1650 MW of new combined cycle natural gas-fired power plants, Maine will soon have considerable excess generation. This will drive down prices for power in Maine (a congested area), and it could drive out of business higher priced renewable power producers who will have to pay both a wheeling charge and a congestion charge to move their power south.

Some have argued that NEPOOL should adopt a system of environmental dispatch (giving priority to the cleanest plants) to ensure that during peak periods the cleanest facilities in New England run, regardless of congestion costs, or to exempt renewable resources from location marginal pricing.

3. Recommendations

Public benefits such as clean energy and resource diversity deserve a stronger voice at NEPOOL and Regional Transmission Organization discussions. Participation is time-consuming and therefore costly. This stronger voice should be accomplished by:

- State advocacy for renewable energy at regional and federal forums. Renewable energy should be supported in these forums by the Maine PUC, State Planning Office and Public Advocate Office. State legislation is required to accomplish this; LD 495 as amended was enacted by both the Maine House and the Senate in April 2001 and signed into law by Governor Angus King.
- Requiring environmental expertise on any independent RTO board established.
- Creating an ombudsman for clean energy issues at NEPOOL and regional forums.

In addition, specific positions to support renewable energy in these forums include:

- Elimination of pancaked rates that hurt facilities in areas remote from PTF lines.
- Exemption of renewable energy facilities from congestion charges in recognition of their environmental benefits and the fact that they must run when the water is flowing and the wind is blowing.

Taken together, these actions would help to provide fair and low-cost access to the wholesale generation market for Maine's clean energy resources.

III. GOING FORWARD

It must be stressed that the final product of this Mainewatch project is the education, analysis and action priorities that are taken from this effort by its participants and subsequent readers. Mainewatch, as a non-partisan educational institute, will not sponsor any of the legislatively-focused activities that may result from this initiative. It is nonetheless clear that a variety of steps are needed for this initiative to be realized.

The most immediate steps follow the completion and release of this report. These might include:

- Press release announcing completion of final report and its availability.
- Briefings for audiences with potential involvement in subsequent actions.
- Briefing to the Legislative Utilities and Energy Committee, and any other committees with interest, if invited; possibly the Taxation and/or Natural Resources Committees.

Given the timing of this project, the clean energy policy agenda is unlikely to receive any legislative consideration during either the remainder of this legislative term (2001) or next year (2002, the short or "emergency" session). Rather, the remainder of the 120th Legislative session can be used both "opportunistically," as relevant measures are introduced by others, and as a period of education and coalition-building in anticipation of introducing Maine's Clean Energy Agenda to the 121st Session in the fall of 2002.

Advocates for a state-based clean energy strategy should work closely with groups that have similar interests. To that end, throughout 2001-2002, the following steps might be considered:

- Briefings to such groups as the Sustainable Development Working Group, a coalition of organizations and individuals supporting sustainable development in Maine, and Maine Energy Consumers Coalition and its member organizations.
- Providing copies of the report and possibly summary materials suitable for republication to groups such as Natural Resources Council of Maine, Coalition for Sensible Energy and other stakeholders to this effort.
- Identifying supportive legislators, providing them with information and education on relevant topics, leading to creation of an informal "clean energy coalition" for the 121st Legislative session in 2003.

In addition to building in-state support for these proposals, clean energy constituents should also continue to work within the region to advocate for policies that reduce the barriers and level the competitive playing field for Maine's renewable energy generators.