MAINE ENERGY POLICY
OVERVIEW AND OPPORTUNITIES FOR IMPROVEMENT

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EXECUTIVE SUMMARY

In its 2003 Session, the Legislature directed the Energy Resources Council, a committee of heads of Departments and Agencies with energy-related missions, to conduct a review of the state's energy policy and make recommendations for its improvement:

> The Energy Reources Council shall undertake a review of state energy-related policy and its implementation and prepare and submit a report of its findings and recommendations to the Joint Standing Committee on Utilities and Energy no later than December 3, 2003…. In developing its findings and recommendations, the council shall identify the links between energy policy and environmental, transportation and economic development policy. The council also shall identify opportunities for improving the effectiveness of state policy implementation. The council shall focus its review on policies related to energy efficiency and renewable energy.[1]

This Report was prepared by Energy Advisors, LLC to assist the Council in fulfilling that directive.[2] The Report provides an overview of the nearly 100 statutes, regulations, programs and other initiatives that together define and implement the state's energy-related policy (Section I); discusses the tensions and synergies between energy policy and policies relating to the environment, transportation and economic development (Section II); provides data on Maine energy sources and use (Section III); and identifies opportunities for policy improvement (Section IV).

The information reviewed in preparing this Report reveals that Maine has not been inattentive to energy policy. In some respects, such as development of renewable power and electric energy efficiency programs, Maine has even been a national leader. To the extent Maine has ceded that leadership role to others, or passed up opportunities to implement aggressive energy related initiatives in other sectors, it is generally not due to lack of awareness of those opportunities or failure to appreciate their importance. Instead, it is due to the inherent tensions between those opportunities and other priorities of state government. Fiscal constraints limit the government's ability to fund policy initiatives; initiatives that raise energy costs conflict with economic development objectives.

The law directing the Council to undertake this Study and make recommendations to improve energy policy does not itself eliminate the tensions that have stood in the way of more aggressive policy initiatives. However, this comprehensive overview of existing policy may aid both in reexamining the balance of priorities underlying that policy, and in determining whether policy revisions are due.

A state energy policy which seeks to tackle overall energy use, and reliance on imported oil in particular, must confront the role of transportation. Petroleum accounted for nearly half of

[1] PL 2003, c. 487. The law is often referred to by its original legislative draft, LD 669.

[2] In preparing this report, Energy Advisors, LLC received assistance from Maine Tomorrow, Hallowell, Maine, and Hart Energy Consulting, Gardiner, Maine.

the state's energy use in 2000, and most of that is for vehicle fuel. The use of petroleum increased significantly over the 1980s and 1990s, notwithstanding a modest increase in average vehicle fuel efficiency (most of which occurred in the 1980s). Some of this is explained by population growth, but the lion's share relates to increased vehicle miles traveled per person. The reasons for the latter are complex, but certainly sprawl—which causes people to commute longer distances—is a major factor.

State policy should also take account of the dramatic changes in reliance on natural gas and uranium as energy sources. Prior to the construction of two pipelines from Canada into Maine in the late 1990s, very little gas was available in the State. Now five gas-fired plants generate roughly one half of the state's electrical output, and gas distribution to communities is spreading. Gas plants are causing Maine to resume its role as a net exporter of electricity to the region, but they are also posing competitive challenges for renewable power. In contrast, with the shutdown of Maine Yankee in 1997, the share of the state's generation fueled with nuclear energy has fallen from about one third to zero.

Ratepayer funded investments have produced significant gains in the efficiency of electricity use over the past two decades. However, in most cases those gains have been masked by other developments. The decline in electric space heat in the 1980s, as oil and other fuels became more competitive, was probably the major driver in a roughly 10 percent drop in per capita electricity consumption over the period. Other trends have had conflicting effects: appliances have become more efficient, but consumers are using more of them—especially computers. Electricity prices are also important—they rose in the late 1980s, driven in large part by purchases of non-utility power, but have been declining since then. They are now lower, in real terms, than in 1980.

The Report identifies four categories of opportunities to improve state energy policy:

Category 1: Opportunities with the highest potential to achieve energy savings through efficiency or to increase the use of renewable energy.
Category 2: Opportunities whose potential to achieve energy savings through efficiency or to increase the use of renewable energy is more difficult to predict, but which nonetheless appear worthwhile because they focus on a major energy use and do so on a large scale.
Category 3: Opportunities deserving consideration for symbolic or other value.
Category 4: Minor opportunities, including opportunities to revise or repeal obsolete statutes.

Category 1 opportunities to promote energy efficiency include expanding existing programs through new funding mechanisms or increases in existing mechanisms, and establishing a trigger for adopting appliance energy efficiency standards for products not subject to federal standards. Maine's considerable experience with existing programs demonstrates their potential to provide savings in electricity and oil that far exceed their costs. Additional funding could come through increasing the existing system benefits charge on electricity, broadening the charge to apply to other fuels, and issuance of bonds. A study of the potential savings of appliance standards indicates that they could save customers $5 million per year. A trigger tied to adoption of similar standards by other states in the region would help ensure that suppliers of complying products deem it worthwhile to sell those products in Maine.

A Category 1 opportunity to increase the use of renewable energy involves amending the existing renewable portfolio standard. The standard currently requires retail sellers of electricity to secure 30 percent of their supply from eligible sources. While higher than the standard of any other state, that figure is below the proportion of renewable power in Maine's current generation mix. Amending the standard, for example by requiring that a portion of the 30 percent renewable supply come from newly constructed renewable power facilities or by excluding non-renewable energy (such as fossil-fueled cogeneration) from the definition of eligible resources, would probably have more impact than any other reasonably practicable alternative. A one percent increase in renewables' contribution to the overall mix, however derived, would translate to approximately 22 MW of additional renewable resources.

The most promising opportunities to save energy in the transportation sector are found in Category 2. They include policies that address sprawl; support for alternative passenger and freight transportation; and adoption of the new California emission standards for automobiles. Data on the energy savings achievable through these policies is limited. However, there is a clear need for greater focus on vehicle petroleum use as a component of state energy policy, and measures targeted at transportation energy efficiency also tend to advance the critical state interest in reducing greenhouse gas emissions. Accordingly, these initiatives deserve serious consideration.

The Report stresses that the category in which an opportunity appears does not reflect a judgment as to the value of seeking to implement it. Opportunities in Categories 3 and 4 may have less immediate potential to achieve significant benefits than Category1 or 2 opportunities, but they may also come at a much lower cost. While the benefits of a Category 2 opportunity may be harder to predict than those of an opportunity under Category 1, the former may deserve support as the best means currently available to tackle a pressing problem. While opportunities listed in Categories 3 and 4 have smaller potential benefits, they may also be less costly and thus less controversial.

The full discussion of the four categories of opportunities to improve energy policy begins at page 97.

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I. MAINE'S EXISTING ENERGY POLICY

A. Backround

LD 669 calls for a review of existing energy policies and identification of opportunities for improvement. Implicit in the bill is a concern that Maine lacks a process to ensure that energy policies are comprehensive or that priorities are being set based on informed criteria. In fact, Maine's commitment to the goal of a comprehensive energy policy has varied since the abolition of the State Energy Office in 1989. At that time, many of the Energy Office responsibilities were transferred to the State Planning Office. The SPO was assigned the responsibility to:

- [c]oordinate the preparation of policies to guide and carry forward the wise and coordinated development of the State's economy and its energy resources and the conservation of the State's natural resources. …. They shall be developed in such areas as: Land use, natural resource development and conservation, public investment and taxation, energy resources and state regulatory policy. .. these policies shall not be in direct conflict with adopted local and regional plans;

- Undertak[e] special studies and plans, preparing or analyzing policy alternatives and identifying the immediate and long-range needs and resources to meet these needs in the areas of energy and natural resources and socioeconomics;

- Collect and analyz[e] energy data from all available energy sources in the State. ....

- Encourag[e] and direct or sponsor[e] research, experiments and demonstration projects within the State to develop alternate energy sources, particularly, but not limited to, those sources that rely on renewable natural resources of the State, such as solar energy, water of tides and rivers, forests, winds and other sources that to date have not been fully explored or utilized…[3]

As early as 1991, the Legislature saw fit to complement the SPO's role in energy policy by calling for the establishment of an ad-hoc Commission on Comprehensive Energy Planning, consisting of ten members of the Legislature and the heads of several state agencies with jurisdiction over energy issues.[4] The Commission was charged with assessing future demand for energy, options to meet the demand, and the state's energy situation in the context of regional power arrangements; and with formulating recommendations for "instituting a process whereby the State may update and evaluate in an ongoing manner its comprehensive energy planning."

After receiving public input, the Commission issued a Final Report in May 1992 which concluded that Maine energy policy should address the following four attributes:

- Cost
- Reliability

[3] 5 M.R.S.A. § 3303 and 3305-B.
[4] Resolves, Ch. 50, 1991.

- Environmental Impact
- Economic Impact

The Report proposed numeric targets for reducing dependence on oil, increasing reliance on renewables, and increasing statewide energy efficiency, as well as a goal of stabilizing long-term energy prices. In addition, it recommended several specific strategies, primarily focused on energy efficiency and renewables, but also in support of increased availability of natural gas, development of alternative transportation fuels, and coordination with regional efforts. It did not, however, recommend any specific "process whereby the State may update and evaluate in an ongoing manner its comprehensive energy planning." While elements of the recommendations found their way into state programs, as a general matter neither the Legislature nor the executive branch followed up on the Report in any concerted manner.

In 1999, the State Planning Office undertook to revisit the conclusions of the 1992 Report of the Commission on Comprehensive Energy Planning. The result was an Energy Action Plan, described by the SPO as "not a comprehensive energy plan in the traditional style of previous State Energy Plans, [but rather] a document that identifies the pressing energy issues confronting the State, and spell[ing] out the ongoing and appropriate actions that need to be undertaken in response to those issues."[5]

While characterizing existing policies supporting conservation and renewables as still valid, the Report noted that the changing marketplace required new approaches to planning:

> Maine has clearly moved well beyond the era in which its energy future could be molded by a specific energy "plan" that anticipates and implements energy choices on a deterministic basis. The broad array of uncertainties surrounding future energy demand, price trends, the penetration of new technologies, and changes in industry standards, act together to require a flexible planning process, rather than a detailed road map. The goal of energy planning, therefore, is to focus on the *process* of energy decision-making. This process must ensure that specific energy issues and resource options are discussed and decided upon in an open and balanced manner that weighs the positive and negative aspects of particular energy decisions against the State's broader policy goals and objectives.[6]

The document identified several proposed actions to implement state policy:

- An Energy Advisory Committee should be created to assist in the formulation of policy and recommendations on issues such as energy education, conservation programs, and siting of energy facilities;
- An energy education coordinator should be established within the Department of Economic and Community Development;
- The SPO should continue an active role in implementation of Electric Industry Restructuring;
- The SPO should continue to support efforts to expand natural gas availability;

[5] SPO 1999 Energy Action Plan, Foreword.
[6] *Id.*, p. 2 (emphasis in original).

- The SPO should support programs that ensure environmental protection for energy projects;
- The state should pursue conservation and efficiency benefits associated with transportation initiatives such as congestion mitigation, carpooling and alternative fueled vehicles;
- The state should adopt strategies to continue support for renewable energy generation in light of Electric Industry Restructuring;
- The SPO and DECD should work together to improve their capacity to establish and carry out energy conservation planning and delivery, possibly through the creation of a State energy conservation program coordinator position.[7]

While the SPO has not formally tracked the outcome of these proposals, several have been implemented. For example, as discussed below, with the SPO's support the Legislature created the Energy Resources Council, which fulfills the role intended for the Energy Advisory Committee. The SPO, in conjunction with the PUC and the OPA, has helped implement electric industry restructuring, and has supported natural gas availability, transportation initiatives and renewable energy generation.

The SPO has also continued its important role of serving as an objective information source to the Legislature on energy issues. While other entities share in that responsibility, it is noteworthy that 72 percent of legislators believe they have the information they need when faced with decisions that involve the balancing of interests related to conservation and development of Maine's resources, according to a 2002 poll.[8]

In May 2003, the Legislature passed a first-in-the-nation law calling for a state climate action plan to reduce greenhouse gas emissions.[9] The State is required to create an inventory of greenhouse gas emissions associated with state-owned facilities and state-funded programs and create a plan for reducing those emissions to below 1990 levels by 2010**.** Given the link between energy use and greenhouse gas emissions, there will inevitably be significant synergies between the development and implementation of greenhouse gas emission reduction policies and policies promoting energy efficiency and the use of renewable energy sources.

In July 2003, the Governor created a new position, Director of Energy Independence and Security, charged with (1) making Maine's development of energy policy and implementation, and delivery of energy programs, better coordinated and more efficient; (2) making Maine State Government a leader in its commitment to energy efficiency and renewables; and (3) working with the ERC to develop and implement new energy policies and programs that promote energy independence and security. [10]

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[7] *Id.*, pp. 11-32.
[8] SPO Survey, P&P.
[9] "An Act to Provide Leadership in Addressing the Threat of Climate Change," PL 2003, c. 237.

[10] See Announcement of Governor's Office of Energy Independence and Security And Appointment of Beth Nagusky as Director, July 8, 2003.

B. Current Objectives of State Energy Policy

Elements of Maine energy policy are found in nearly 100 statutes, regulations, executive orders, and department and agency initiatives. The fact that elements are so widely dispersed should not be surprising, since energy itself affects a wide range of human activities and needs, from transportation and housing to environmental quality and economic development. Notwithstanding the decentralization of policy implementation, a number of common objectives are apparent, which may be summarized as follows:

1. Energy efficiency, conservation, demand management and distributed generation are viable strategies for meeting energy needs in all energy-using sectors; when cost-effective, these resources should be used as part of a balanced resource portfolio;
2. Reliance on renewable and other clean energy resources, including in the electricity, transportation and space heating sectors, should be encouraged to increase Maine's energy security and independence;
3. State government should lead by example and action;
4. An adequate and reliable energy delivery infrastructure is critical to economic growth and to continued expansion of competitive energy markets.
5. Providing energy that is affordable is vital to the state's economy and the well-being of its citizens;
6. Maine people should be given adequate information on the costs, environmental, and other impacts of their own energy choices to ensure that informed decisions can be made;
7. Active interagency coordination on state, regional and federal energy policy offers an opportunity to make more efficient and effective use of State resources;
8. Competitive markets can be an effective means to promote efficiency and lower costs in the production, distribution and use of energy. However, when barriers prevent the effective operation of these markets or when these markets do not take the long-term environmental impacts of energy decisions into account, the State should look to other tools to achieve its goals, including: regulation, education, taxation policies, subsidies, and leadership by example;
9. Energy security is essential to the health and safety of Maine citizens, and should be promoted through programs to avoid disruptions in energy supply.

The next section describes the statutes, regulations, orders and other initiatives that provide the foundation for each of these objectives. To provide additional context for this discussion, Appendix A reviews recent major developments affecting energy markets in the areas of competition, technology and environmental change, and Appendix B shows the principal energy-related accountabilities of state departments and agencies in tabular format.

C. Foundations of Specific Objectives

1. Energy Efficiency, Conservation, Demand Management and Distributed Generation

Energy efficiency has been a focus of state energy policy since the oil embargoes of the 1970s. Initiatives can be grouped into four areas: general efficiency; building standards; transportation; and distributed generation.

a. **General efficiency**.

i. Electricity

Maine has devoted more attention to efficiency in the electricity sector than in other energy sectors, in part because of electricity's importance to the state's economy, but also because the longstanding pervasive regulation of electric utilities makes them a relatively easy target for efficiency programs.

Over the 1980s and early 1990s, utility spending on efficiency programs grew to over $20 million per year, only to decline as energy prices fell and deregulation was introduced. In deliberations leading to the enactment of Maine's Electric Industry Restructuring Act of 1997, the continued role of utility administered efficiency programs was a controversial topic: on the one hand, the legislation called for utilities to divest their generating plants and leave power generation to the competitive market; on the other, there was a concern that cost-effective opportunities to promote efficiency would be foregone absent a continued role for utilities in funding efficiency programs through charges in electric rates and implementing programs. As a compromise, the Legislature determined that funding of utility-administered efficiency programs should continue at levels in effect immediately prior to deregulation of the retail electric market, and responsibility for program oversight was given to the SPO. In 2002, the Legislature transferred responsibility for program development and implementation to the PUC, where it now resides as Efficiency Maine.

PUC regulations required ongoing evaluations of utility efficiency programs. Those evaluations showed most programs to be cost-effective, in that their savings in electricity use exceeded their cost. Programs found not cost-effective were terminated. The PUC recently cited an OPA study that examined the remaining potential for cost-effective efficiency programs and concluded that increased program funding, starting at $32 million per year (roughly twice current levels), and growing to about $100 million per year in 2012, could provide net savings of about $500 million over a ten year period.[11] This figure does not address the additional environmental benefits of conservation (*e.g.*, reduced power plant emissions).

While this figure is large, there are countervailing considerations. Perhaps most important, increased charges for efficiency programs result in higher electric rates. For example, a doubling of the current cap of 1.5 mils/kwh would translate to an increase in average electricity

[11] Docket No. 2002-162, Order on Conservation Program Funding, p. 6 (April 4, 2003).

cost of about 1.5 percent. This figure may seem small, but Maine's electric rates are high relative to the national average, and considerable effort has been directed in recent years to reducing them. High electric rates continue to place a burden on Maine residents and businesses, and are a damper on economic development.

Successful electric efficiency programs reduce consumption, translating to lower overall electric bills (unless offset by other uses). However, a criticism of utility funded efficiency programs is that they result in wealth transfer, *i.e.*, while the charges may be spread evenly over electricity sales, the benefits are not realized equally by all customers. Customers participating in programs reap benefits; others do not. In addition, charges on electric rates place electricity at a competitive disadvantage vis-à-vis other fuels if they do not bear comparable charges. The PUC has sought to keep wealth transfer issues to a minimum through a policy of having efficiency programs targeted as broadly as possible.

The 2002 legislation that transferred responsibility for efficiency programs from utilities to the PUC establishes broad goals and targets. As to the former, the PUC is directed to

> consider, without limitation, conservation programs that:
>
> (1) Increase consumer awareness of cost-effective options for conserving energy;
>
> (2) Create more favorable market conditions for the increased use of efficient products and services; and
>
> (3) Promote sustainable economic development and reduced environmental damage.[12]

The Act directs the PUC to target funding as follows:

> (1) … at least 20% of available funds to programs for low income residential consumers, as defined by the commission by rule ;
>
> (2) … at least 20% of available funds to programs for small business consumers, as defined by the commission by rule; and
>
> (3) To the greatest extent practicable, apportion remaining available funds among customer groups and geographic areas in a manner that allows all other customers to have a reasonable opportunity to participate in one or more conservation programs.[13]

To avoid delay in program implementation while the PUC prepared to comply with these and related requirements for new programs, Section 7 of the Act authorized the Commission to adopt interim programs under less exacting criteria. Under that directive, under the overall program name "Efficiency Maine," the PUC approved interim programs addressing the following 12 areas in 2002, with an overall budget of about $8 million[14]:

[12] 35-A M.R.S.A. § 3211A(2)(A).
[13] 35-A M.R.S.A. § 3211A(2)(B).
[14] Remaining funds collected in rates (about $7 million) were used to pay for previously committed efficiency projects.

- Low-income refrigerator replacement program-energy efficient replacement refrigerators provided at no cost to low-income residents; need established in energy audits conducted in connection with LIHEAP Weatherization Program.
- Building Operator Certification (BOC) program-trains personnel who operate public school facilities in the efficient operation of their electrical systems, including lighting and HVAC.
- State building program-supports ongoing efforts by Department of Administrative and Financial Services to increase the energy efficiency of state facilities.
- Department of Economic and Community Development (DECD)- provides capital for DECD's revolving loan fund to assist small businesses in financing energy efficiency improvements.
- Maine Energy Education Program (MEEP) funding- provides funding for K-12 energy education programs.
- Maine energy curriculum investigation-allows task force of professional educators to develop improved energy education curriculum for use in Maine schools.
- Residential lighting incentive- provides general media and point-of-sale information on efficient lighting products as well as coupons to encourage purchases.
- New school construction program- provides energy efficiency information and technical assistance to communities constructing new school facilities.
- Small business incentive program-provides financial assistance to small businesses for electric equipment retrofits, plus energy education to vendors of electric equipment.
- Low-income no-charge lighting program- provides free efficient light bulbs to low income residents, in connection with Weatherization Audits.
- Large commercial/industrial (C/I) program- program under design.
- Traffic signal replacement program-provides 2/3 of the cost of high-efficiency traffic signals to municipalities installing them.[15]

While these programs are designed and funded (or co-funded) by the PUC, many are administered by other state agencies under inter-agency Memoranda of Understanding.[16] The PUC's 2002 Conservation Report to the Legislature describes these programs in more detail, as well as cost-benefit analyses and early implementation results. Further annual reports, required under the 2002 law, will provide additional information.

In addition to adopting interim programs, the Commission has established the following principles to govern its efficiency efforts: "First, the portfolio of programs shall be cost effective. Second, the portfolio of programs shall create sustainable improvements in energy efficiency. Finally, the portfolio shall meet the Act's requirements on targeting programs to customer groups and geographic areas."[17] Based on these principles, the Commission set detailed goals, objectives and strategies, which are listed in Appendix D.

[15] 2002 PUC Conservation Report, p. 37.
[16] Email from Denis Bergeron, MPUC, to Arthur Adelberg, Energy Advisors, August 4, 2003.
[17] Docket No. 2002-162, Order Establishing Goals, September 24, 2002.

Through Efficiency Maine, the State is committing considerable focus and resources to electric efficiency. As discussed in Section IV of this Report, the major issue is whether the State should seek to devote more resources to this effort, given the potential for even greater efficiency savings.

ii. Oil

As noted above, the State funds electric efficiency programs through assessments in electric utility rates. Because oil prices are unregulated, the State lacks a comparable mechanism to fund programs targeted at efficiency of oil usage. Thus, while oil is a primary fuel for space heat in 80 percent of homes, efficiency issues are addressed only through the federally-funded Weatherization and Central Heating Improvement (CHIP) Programs, and only for a small percentage of Maine homeowners.[18]

As administrator of the federal Low Income Heating Assistance Program (LIHEAP), MSHA has decided to allocate 15 percent of LIHEAP funding to Weatherization and CHIP. The Weatherization Program, also funded by a $3 million grant from the US Department of Energy, provides insulation, air sealing, and air quality and energy efficiency enhancements in low-income households. The average weatherization cost is $2500, and approximately 1400 households receive services under the program each year. While an evaluation of the program's effectiveness by an independent consultant is currently underway, MSHA estimates that the program yields savings of $1.83 for every dollar spent.[19] Other benefits (*e.g.*, reduced water consumption, economic and environmental benefits) have been estimated to be roughly the same as the direct energy savings, making the overall benefit about $3.70 for every dollar spent.[20] Maine's Weatherization Program is nationally recognized.[21] The Central Heating Improvement Program, also administered by MSHA, provides up to $2500 per eligible household on a first come, first-served basis to repair or replace dangerous or inoperable heating systems. About 860 households receive assistance under this program annually.

Closely related to the LIHEAP Weatherization and Central Heating Improvement programs is the Residential Energy Assistance Challenge Program (REACH). REACH is funded by the US Department of Health and Human Services, and provides grants to states to undertake energy education and appliance repair programs to low income households. Also administered in Maine by MSHA and the CAAs, in recent years REACH has targeted low income households with high electricity consumption, and has provided education, energy audits, and appliance replacements, including replacement of electric water heaters with solar domestic hot water systems.[22] Maine received a three-year grant of $1.5 million for this program in 1999, and

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[18] There was a program administered by the Office of Energy Resources in the 1980s that paid rebates for oil related efficiency measures including weatherization, furnace modernization, and furnace service. This program was funded from payments received by the federal government from oil companies in settlement of overcharge litigation. The program was suspended due to the expiration of oil overcharge settlement funds.

[19] LD 669 Survey, MSHA.
[20] See http://www.eere.energy.gov/weatherization/ne_benefits html.
[21] *Ibid.*
[22] Summary of Maine REACH Program, published at http://www mainehousing.org/homerepair html.

applied the funds to provide energy conservation education to all rental LIHEAP applicants; to do energy audits of 350 households; and replace 350 home appliances. HHS recently announced that a very limited amount of funding would be available to current year applicants.[23]

State law also authorizes MSHA to issue loans to financial institutions to enable them to make mortgage loans to "rehabilitat[e] housing units or housing projects or to promote the conservation of energy resources."[24] MSHA is also charged with developing guidelines in consultation with DECD defining energy improvements which may be made with proceeds of home improvement financing.[25]

While not focused exclusively on oil, a 2002 study undertaken for the SPO examined what it would take to reduce Maine's per capita residential energy consumption by 25% by 2011.[26] The Report made the following findings**:**

- Energy used for space and water heating account for the greatest share of a household's total energy use, and therefore provide a significant opportunity for savings.
- Half of the savings target would likely be achieved by efficiency programming that would occur without new investment.
- The other half of the savings target would require new investment in efficiency programming

The Report offered three approaches to enhance or add new efficiency programs to the state:

- Promotion and consumer education on efficiency, leveraging existing programs;
- Investment in incentives or subsidies (*e.g.* tax credits, subsidies, grants and loans) to encourage adoption of a specific application or target a particular population group such as the low and moderate income households; and
- Adoption of more stringent appliance standards and/or more stringent building energy codes to improve the efficiency of the appliance stock as well as building performance in the new-construction market.

The Report concluded that a suite of programs designed to achieve the target could cost between $5 and $20 million annually over the next ten years, depending on program goals and implementation design. It also observed that the low and moderate-income households would require specific attention and investment to achieve the savings target.

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[23] See US Department of HHS, Transmittal Reach-AT No. 2003-1 (May 9, 2003), published at http://www.acf.dhhs.gov/programs/ocs/demo/reach/reach03/reach_cover html

[24] See 30-A M.R.S.A. § 4802 (2)(B).

[25] See 30-A M.R.S.A. § 4912.

[26] "Reducing Household Energy Consumption in Maine: What it would take to Achieve a 25% Reduction by 2001," January 15, 2002, by Patricia H. Hart, Hart Energy Consulting, published at http://www.state me.us/spo/energy/energycouncil/docs/Ressavings.pdf. The Study was undertaken at the request of the Legislature. See PL 2001, c. 439, Sec, GG-6. Patricia Hart is also a subcontractor to Energy Advisors, LLC in connection with the preparation of this Report.

Finally, there is a federal program that funds consumer education about efficiency in using home heating oil. Under federal legislation enacted in 2000[27], a fee is imposed on home heating oil sales of $.002 per gallon, with the proceeds flowing initially to an organization known as the National Oilheat Research Alliance (NORA). NORA redistributes a substantial portion of its revenue to non-governmental entities in the states from which the revenue was derived. Of the $16 million received by NORA in 2003, about $800,000 is being distributed to the Maine Oil Dealers Association (MODA). MODA is using the funding "to develop and execute public communications programs to enhance public knowledge of oil heat," and "to create expanded scholarship programs and programs for the training industry professionals."[28]

iii. **Other General Efficiency Programs**

Other State programs that address energy efficiency are Maine Industries of the Future, the DECD's program offering voluntary certification of energy auditors, and State Energy Program Grants for small business energy efficiency projects.

⇒ The Maine Industries of the Future (Maine IOF) program is a private-public partnership of the US Department of Energy (US DOE) Office of Energy Efficiency and Renewable Energy's Industrial Technologies Program, Maine Wood Products, Pulp and Paper and Metal Products industries, the University System and Maine State Government. Officially kicked off on April 23, 2001 by a Memorandum of Understanding (MOU) signed by Governor King and Denise Swink, Deputy Assistant Secretary for the U.S. Department of Energy, the purpose of the Maine IOF is to help Maine's energy and waste-intensive industries increase resource efficiency and improve industrial productivity through an industry-led vision for the future unique to Maine and its industries.[29]

The MOU established a framework for identifying and pursuing joint Research, Development, Demonstration and Outreach efforts that satisfy the common goals of the Department of Energy and the State of Maine, with respect to the IOF Program. Among the areas specifically targeted for action in the MOU was energy and process efficiency. As stated in the MOU,

> The Parties intend to demonstrate, evaluate and accelerate new technologies and scientific insights that …[a]ccelerate the development and adoption of energy-efficient technologies and processes, by working with industry, academia, Federal Laboratories and other State and local research institutions. Because, collectively, Maine industries participating in the Program account

[27] Energy Act of 2000, Public Law 106-469, Title VII, Section 701, codified at 42 U.S.C.A. § 6201 note.
[28] See http://www nora-oilheat.org/grants.htm.
[29] See http://www maineiof.org/html/welcome html.

> for a significant share of the energy use in the State of Maine, significant opportunities for energy-efficiency improvements exist.[30]

Funding for the Maine IOF's energy efficiency initiatives comes from DOE grants applied for by DECD on behalf of the IOF. (Responsibility for the program was transferred from the DECD to the PUC in 2003.[31]) Those grants were $200,000 in FY 2000 and $190,000 in FY2001.[32] The IOF has supported an Environment and Energy Center in Portland[33], and has provided a forum for leaders of the wood products, pulp and paper, and metal products industries to discuss energy issues and to develop strategies. It also conducts annual Energy Expos to disseminate information on best practices relating to energy efficiency.[34]

⇒ In order to "bring about increased utilization of energy conservation techniques", in 1981 the Legislature enacted a bill authorizing the DECD to establish a voluntary program to certify energy auditors.[35] DECD has adopted implementing rules.[36] An energy auditor is defined as "a person who is trained to prepare a report which delineates the energy consumption characteristics of a building, identifies appropriate energy conservation operations and maintenance procedures and recommends appropriate energy conservation measures." Separate certification requirements apply to auditors of residential and commercial facilities, respectively.

⇒ The State Energy Program (SEP) is funded by the Office of Energy Efficiency and Renewable Energy of the US Department of Energy.[37] Using SEP funds, the DECD has made 32 loans to small businesses for energy efficiency projects since 1996, totalling $600,000. The current interest rate is 3 percent, and the maximum loan amount is $35,000. FAME assists in the loan processing. [38] With the recent consolidation, this program is now administered by the PUC as part of Efficiency Maine.

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[30] See "Memorandum of Understanding Between the State of Maine and the U.S. Department of Energy Regarding Maine's Industries of the Future Program," April 23, 2001, published at http://www.maineiof.org/html/mou html.

[31] Email from Denis Bergeron to Arthur Adelberg, September 4, 2003.
[32] See http://www.oit.doe.gov/states/factsheets/success_me.pdf.
[33] The Maine Environment & Energy Center (Maine E2 Center) recently merged with the Environmental Business Council of Maine (EBCM) to create the Environmental & Energy Technology Council of Maine (www.E2tech.org). See http://www.environews.com/Features/innovation_Maine.htm.
[34] See "A Vision and Pathway for Maine's Forest Products Industry and Metals Industry," September 27, 2002, published at http://www maineiof.org/MIOF_Roadmap.doc.
[35] PL 1981, c. 597, codified at 32 M.R.S.A. § 8002 *et seq*.
[36] CMR 19-530, ch. 405.
[37] See www.state me.us/msep/index html.

[38] See 10 M.R.S.A. § 1041(16).

b. Building Standards

In 1979, Maine enacted a building energy efficiency standards law.[39] That law has been amended several times, and now includes provisions addressing the following matters:

- In 1985, a general policy statement was added to the law in favor of reducing energy consumption in buildings through conservation.[40]
- New residential construction and renovations, other than single family dwellings built by the owner and log homes, must meet specified thermal standards for walls, floors, ceilings, foundations, and windows.[41]
- New industrial and commercial construction (other than manufacturing facilities) must meet certain thermal standards established by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE). Maine's requirements have been updated as the ASHRAE standards have changed. [42]
- The Department of Economic and Community Development is charged with enforcement of the standards, in cooperation with other state, regional and local authorities.[43]
- Builders of commercial and industrial facilities must certify their compliance with the statutory building efficiency standards in order to receive permanent electric service from a utility.[44]

The most recent amendments to this law, enacted in 2003, require new multi-family dwellings to comply with the most recent applicable ASHRAE standards.[45]

The SPO obtained a $100,000 grant from the US Department of Energy in 1998 to attempt to address the issue of energy efficiency in owner-built single family homes. [46] Using these funds, SPO hired a consultant to develop a set of voluntary residential energy codes. Building on this effort, DECD recently obtained a $10,000 grant to conduct state-wide workshops to provide this information to Maine's builders, engineers, real estate agents, codes enforcement officers, architects, and technical college students about the advantages of complying with the various Maine and national energy codes and implementing these codes and standards in residential new construction state-wide. In addition, the day-long training sessions will address the basics of building science for new construction.[47]

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[39] PL 1979, Ch. 503.
[40] PL 1985, c. 370, codified at 10 M.R.S.A. § 1412.
[41] 10 M.R.S.A. § 1415-C. Waivers may be sought for renovations relating to historical preservation. *Id.*, subsection 4.
[42] 10 M.R.S.A. § 1415-D.
[43] 10 M.R.S.A. § 1415-E. The DECD's rules implementing building efficiency standards are found at 19-520 CMR Chs. 400 and 407.
[44] 10 M.R.S.A. § 1415-H.
[45] 121st Legislature, First Session, PL Ch. 151.
[46] PUC Survey Response, State Energy Program.
[47] *Ibid.*

The exemption of owner-built single family homes (which account for about 95 percent of all new residential construction[48]) from mandatory state-wide codes remains an issue. Equally important is the lack of enforcement of building codes generally. Section IV suggests possible opportunities to address these issues. These and related issues are also the subject of a current study being undertaken by the PUC, in consultation with the Energy Resources Council, at the direction of the Legislature.[49]

c. Transportation

Maine adopted a policy of promoting energy efficiency in transportation in 1991. The Sensible Transportation Policy Act (STPA), enacted in response to the Maine Turnpike Authority's proposal to widen the Maine Turnpike between Ogunquit and Portland, requires that due consideration be given to reasonable alternatives (such as demand management) in planning major road transportation network projects.[50] As reflected in the Act's Findings, energy conservation was a key motivation for the legislation:

> The people … find that the State's transportation network is heavily dependent on foreign oil, that such reliance is detrimental to the health of the State's economy and that the health and long-term stability of the State's economy require increased reliance on more efficient forms of transportation. [51]

To address this concern, the Act established a State policy that transportation system planning, including decisions relating to major capital expenditures, must "reduce the State's reliance on foreign oil and promote reliance on energy-efficient forms of transportation…"[52]

Regulations adopted by the Maine Department of Transportation (MDOT) implementing the STPA elaborate on the importance of energy conservation in transportation[53]:

> The rule provides a framework for examining a range of choices. It recognizes that there are benefits and costs (financial, energy and environmental). Mobility is no longer treated as an inexhaustible resource but rather as a resource that needs to be supplied as well as conserved.

The rule then captures the Act's policy of promoting energy efficiency in transportation planning decisions[54]:

> Planning for [transportation] facilities and services should be done to improve transportation efficiency, improve the efficiency of vehicles and vehicle usage, and reduce waste and unnecessary energy use….
>
> The following policies shall be used by MDOT in its planning, capital investment and project development decision making: …

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[48] See http://energycodes.gov/implement/state_codes/state_status.cfm?state_AB=ME.
[49] 121st Legislature, First Session, PL Ch. 497, Section 4.
[50] RR 1991, c. 2.
[51] 23 M.R.S.A. § 73(2).
[52] 23 M.R.S.A. § 73(3)(D).
[53] CMR § 17-229, ch. 103, Section 1.
[54] *Id.*, Section 4(B).

Reduce the State's reliance on foreign oil and promote reliance on energy efficient forms of transportation.

A prominent state policy shift relating to the conservation of mobility occurred in the late 1990s in the area of access management. In an effort to conserve highway capacity and in keeping with the spirit of the STPA, the State became focused on the number and placement of driveways on arterials. Driveways add turning movements which in turn impede through traffic, reduce highway capacity and ultimately, with enough driveways on an arterial, lead to congestion and the inefficient use of energy for transportation. The historic solution has been to build another road and go through this same cycle one more time. Building a new road has further negative energy implications. The State's change in policy seeks at a minimum to slow this cycle down and preferably end it.

Notwithstanding the STPA, improving efficiency in transportation remains a major challenge for Maine.[55] Increases in vehicle miles traveled and transportation fuel consumption have outstripped population growth by wide margins.[56] Reasons for this phenomenon are complex: development patterns are creating sprawl; mass transit is expensive, and federal funding has been limited; states are limited in their ability to influence fuel efficiency of new vehicles, since the federal government has pre-emptive regulations; and relatively stable gasoline prices, coupled with economic prosperity in the 1990s, have spurred demand for light duty trucks and SUVs.

Initiatives to promote transportation efficiency include ridesharing/park and ride, the Industrial Rail Access Program, the Transit Bonus Program, Boston to Portland Downeaster Rail Service, Explore Maine, the Island Explorer, 511 and the vehicle fuel efficiency labeling program:

⇒ Dating from1981, Maine's ridesharing program, previously administered by DECD, provided matching funds to eligible entities for up to 50 percent of the cost of measures such as "van pool financing and formation assistance, ride share promotion, creation of area ride share task forces, provisions of community ride share incentives, such as park and pool lots, preferential or reduced fare parking for pools on an area-wide basis."[57] Eligible entities included "individuals, individual groups, private employers, ride share businesses or programs, civic, service, municipal, county or regional organizations, neighborhood cooperatives, nonprofit corporations and other similar entities."[58] While the authority for the DECD program remains on the books, it has not been funded for several years.

⇒ Funded since the latter 1990's through Transportation Bond Issues, the Industrial Rail Access Program is designed to provide 50 percent matching grants to the private sector for projects that will connect, reconnect or expand rail service for industrial uses, build rail market share and consequently improve the financial viability of rail freight service.

⇒ The Transit Bonus Program reimburses municipalities on a dollar for dollar basis for increased municipal financial contributions to the operating costs of transit. This reimbursement is made through the Urban-Rural Initiative Program (URIP) which provides revenue sharing to municipalities out of the State Highway Fund. The Transit Bonus

[55] See "Maine Refocuses on Energy Usage," Portland Press Herald (September 18, 2003), p. B1.
[56] See Section III C.5 of this report.
[57] See 10 M.R.S.A. 1463(1).
[58] See 10 M.R.S.A. 1463(2).

Program began July 1, 2003. Total distributions cannot exceed 2.5 percent of annual URIP funding and must be prorated if entitlements exceed appropriations. In its first year, the Transit Bonus Program is oversubscribed.

⇒ The Downeaster/Amtrak passenger rail service was inaugurated in December of 2001 and has since nearly hit its long term ridership projections. Current plans to extend service to Brunswick and Auburn will expand access to a broader base of Maine's population. Connections with Freeport, Maine's largest destination attraction, will enhance overall service viability.

⇒ Explore Maine is a trademarked initiative launched by MDOT designed to build an alternative transportation network to support tourism but also be accessible to the general public. The network incorporates private sector providers like the CAT, Concord Trailways and the Scotia Prince with public sector providers like the Downeaster, the Island Explorer (which uses propane-fueled buses) and the Bethel Explorer. The Explore Maine Plan envisions the creation of intermodal passenger transportation facilities in Auburn, Bangor and Trenton. The existing Portland bus and rail terminal at Thompson's Point serves as an example of an intermodal facility with its connections to local bus services, its location at the I-295 Congress Street Interchange and its planned pedestrian/bicycle connections.

⇒ 511 is an emerging traveler information service that is sponsored by MDOT as part of a tri-state northern New England initiative that also involves numerous states across the nation. Its significance to energy conservation is manifold but includes traveler information on traffic bottlenecks to be avoided and how the public can access alternative modes of transportation.

⇒ The Cleaner Cars for Maine Program is a consumer labeling program that enables individuals seeking to purchase an automobile to easily identify the cleanest and most fuel efficient vehicles on dealer lots.[59] The Maine Department of Environmental Protection, the Maine Auto Dealers Association and the Natural Resources Council of Maine developed the Program in partnership. Maine's Program was the first in the nation when it began in November of 1999. To qualify for the program a vehicle must be a California Certified Low Emission Vehicle (LEV) or better that gets 30 miles per gallon or greater fuel efficiency. The DEP publishes a list on its website of all new vehicles that meet the qualifications.[60]

Other transportation initiatives are addressed below in connection with the indigenous fuels and government leadership-by-example objectives. Additional opportunities are identified in Section IV.

d. Distributed Generation

Distributed Generation (DG) refers to relatively small scale generators located near the source of the load they serve. While the concept of dispersed, small scale generators has existed for many years, recent technological advances are lowering its cost and improving its environmental characteristics. This has led to a renewed interest in DG as a resource with potential energy efficiency benefits.

[59] See http://www.maine.gov/dep/air/mobile/cleancar.htm.
[60] See http://www maine.gov/dep/air/mobile/fuelg.htm.

A White House Report by the National Energy Policy Group in May 2001 described those benefits:

> First, transmission and distribution line losses (about 5 percent) are reduced because the energy is generally used near the source. Second, the co-location with consumption makes it more feasible to use waste heat, displacing otherwise needed natural gas or electricity for heating purposes. And, third, the co-location with consumption allows for the integration of on-site energy efficiency and generating capabilities. For example, in the residential market, distributed energy applications can make possible the concept of the "net zero energy home," in which the overall level of energy produced at the home equals or exceeds the amount of energy used in the home.[61]

While not originally labeled "distributed generation", small-scale, dispersed generation was encouraged by PURPA and SPPA regulations allowing net-metering.[62] Net-metering essentially consists of an arrangement whereby a customer with a small generator at or near its premises uses the generation to offset purchases of electricity from the grid. If the generator's output is less than the customer's energy requirement in any given month, the customer is billed for the difference at the applicable utility tariff rate. If the generator output exceeds the customer's usage, the excess may be carried forward to offset consumption from the utility into succeeding months, up to the end of each annual period, at which point the cumulative excess is granted to the utility at no cost.

Maine regulations permit net-metering for generators of up to 100 kw capacity using "eligible technologies."[63] Eligible technologies are primarily those included in the Renewable Resource Portfolio Standard program, *i.e.*, fuel cells, tidal power, solar, wind, geothermal, hydroelectric, biomass, and generators fueled by municipal solid waste in conjunction with recycling. While the utility may install a second meter for billing purposes, the customer is only charged for a single meter.

Net-metering does not address the value of DG output in excess of the customer's needs at or adjacent to the DG unit. With deregulation of the generation market, owners of DG are free to sell their power to third parties; however, unless they qualify for a limited exemption, they must pay for the use of the local utility's transmission and distribution (T&D) system under anti-bypass policies designed to protect utilities' exclusive franchises. Because utility rates for T&D service typically cover not only the cost of T&D facilities but other charges as well (*e.g.*, costs of past investments rendered uneconomic by industry restructuring, or "stranded costs"), the advantage of avoiding the local utility's system can be considerable.

There are two limited exemptions to the anti-bypass policy. One is for so-called "behind-the-fence" sales by owners of cogeneration and small power production facilities. The SPPA permits those parties, regardless of size, to sell to affiliated parties and to tenants on the same

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[61] "Reliable, Affordable and Environmentally Sound Energy for America's Future: Report of the National Energy Policy Development Group", May 2001, p. 6-10, published at http://www.whitehouse.gov/energy/.
[62] PURPA and the SPPA are discussed at p. 27, below.
[63] See generally Chapter 313 of the PUC's Rules; PUC Docket No. 98-621, Customer Net Energy Billing, Order Adopting Rule (December 10, 1998).

property as the generation facility.[64] Thus, for example, a cogeneration facility owned by a party at a certain location may sell electricity to an adjoining industrial facility affiliated with that party, without using, or incurring charges for, the local utility's T&D system.

Maine law also permits bypass by generators—whether or not they qualify as cogenerators or small power producers under the SPPA—engaged in so-called "private" sales. Because an entity engaging in a private sale is not legally considered a public utility, its sale is not considered to violate the local utility's exclusive franchise. The PUC has articulated the following standards for determining whether a sale is private:

> To determine if the transaction is private in nature … we will consider whether:
>
> - the generator and customer are located on the same or physically adjacent property;
> - the generator and customer have a commercial or corporate relationship that goes beyond the sale of electricity;
> - the number of customers served or could be served is limited;
> - all the power sold comes from the generator as opposed to the utility grid; and
> - there are no sham transactions to create a private character regarding the sale
>
> We do not conclude that each of these considerations must be satisfied to find that a particular sale or transaction is a private rather than a utility service. However, if all the factors are satisfied, we conclude that the public use test is not met and the entity in question is not a public utility.[65]

The term Distributed Generation first found its way into Maine policy in the Electric Industry Restructuring Act of 1997. While generally prohibiting utilities from owning generation, the Act created an exception for DG deployed by utilities as a cost-effective means of avoiding the need for transmission and distribution upgrades.[66] While utilities have examined DG as an alternative to new transmission facilities, to date they have not found economic opportunities to deploy it.

Following the 1997 Act, utilities argued that deregulation of electric generation made it appropriate to eliminate net-metering. The PUC determined, however, that net-metering was a reasonable means of furthering the Restructuring Act's policy of continued support for efficiency and renewables. To address utility concerns that increases in net-metered generation might cause erosion of their revenues, the PUC adopted a provision in its rules requiring the utilities to notify the Commission if total net-metered generation exceeded 0.5 percent of their load. As of 1998, CMP had 31 customers with net-metering contracts (out of a total customer base in excess of 500,000).[67]

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[64] See 35-A M.R.S.A. § 3305 (2).

[65] Docket No. 2000-653, Order Denying Investigation Into Sales by Boralex to Stratton Lumber, p. 7 (April 6, 2001).

[66] See 35-A M.R.S.A. § 3204(1)(D).

[67] PUC Docket No. 98-621, above, Order at p. 6 n. 11.

In 2000, the Legislature enacted a Resolve directing the PUC to study policy implications associated with use of DG.[68] Pursuant to the Legislature's mandate, the PUC conducted an investigation and prepared a series of reports, culminating in Final Report in October 2001.

The Report covered a wide range of issues. In terms of renewables policy, two points are of particular significance. First, the lion's share of DG in Maine is fueled by non-renewable fuels, natural gas and diesel, and that is likely to remain the case for at least the near future. As to renewable powered DG, only wind and small hydros are cost-effective in the near term, and there is little potential for additional small hydros. DG powered by solar energy (photo-voltaics) and fuel cells remains uneconomic in most applications.

Second, the PUC advocated policies to enable DG to compete on its own economic merits. Barriers to DG participation in the market, such as overly stringent or inconsistent interconnection requirements, difficulties in finding markets for output in excess of the DG owner's needs, and inefficient utility rate designs, should be minimized to the extent possible. To the extent the economics of renewable-based DG improve, removal of these barriers will support their increased use.[69]

The Report recommended the enactment of legislation to address market barriers beyond the Commission's existing remedial authority. A bill incorporating the Commission's recommendations, LD 671, was introduced in the First Session of the 121st Legislature in 2003. The bill included provisions:

- defining DG as a generator under 5 MW in size whose output is primarily consumed by a local customer;
- clarifying the private sale bypass exemption to apply to all DG;
- authorizing the PUC to regulate sales of excess DG power;
- authorizing the PUC to require utilities to purchase a DG's excess output in the event there is otherwise an insufficient market for the power; directing the PUC to permit net billing arrangements for DG units under one MW and fueled by renewable energy; and
- requiring further monitoring of DG issues by the PUC.

Opposed by utilities[70], the bill was ultimately carried over to the 2004 session. The carryover leaves open an opportunity to promote DG, as discussed in Section IV.

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[68] 119th Legislature, Second Session, H.P. 1691 – L.D. 2397, Resolve, to Require an Examination of Distributed Generation.

[69] The PUC did note, however, that not all existing policies create disincentives for DG. In the case of existing utility rate design, the PUC noted that there may actually be artificial incentives to over-invest in DG, since existing rate structures may tend to exaggerate the economic benefits of installing DG. Final Report, Section VI.A.

[70] Memorandum of Jon Clark to Members, Joint Standing Committee on Utilities and Energy re: LD 671 (April 24, 2003), pp. 2-3.

2. Support for Renewable/Clean Fuels

a. Introduction

The principal renewable fuels currently used in electricity production are biomass (*e.g.*, wood, wood waste), hydro, and municipal solid waste. With improving technology and continued federal production tax credits, wind is poised to play a greater role. Other, less widely used renewable energy sources are fuel cells, tidal power, solar arrays and installations, and geothermal energy. In transportation and heating applications, the principal renewable fuels are methanol, ethanol and vegetable oils, derived from agricultural crops. Both are either used by themselves, or mixed with petroleum fuels.

The value of renewable fuels lies in their ability to displace imported oil, and the contribution of their production to the local economy. Depending on the particular renewable energy source in question, they often produce no air emissions, or emissions that are less harmful than emissions from fossil fuel combustion. The use of municipal solid waste as a source of fuel not only captures energy that would otherwise go unused, but helps reduce the need for landfills. The issue of local economic impact is of particular importance to Maine, with its considerable biomass resources.

The chief disadvantage of renewables is their cost. While costs vary both by the fuel source in question and, in some cases, their location, in most cases usable energy made from renewable fuels continues to be more expensive than energy produced from conventional fossil fuels. Environmental impacts of some renewable fuels are an issue as well. For example, hydro facilities disrupt riverine environments[71], and wind facilities disturb natural viewsheds.

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[71] The environmental trade-offs of hydropower development are recognized in the Maine Waterway Development and Conservation Act of 1983 (38 M.R.S.A. § 630 *et seq*.). The statute made the following findings:

> A. Hydropower is the state's only economically feasible, large-scale energy resource which does not rely on combustion of a fuel, thereby avoiding air pollution, solid waste disposal problems and hazards to human health from emissions, wastes and by-products. Hydropower can be developed at many sites with minimal environmental impacts, especially at sites with existing dams or where current type turbines can be used.
>
> B. Like all energy generating facilities, hydropower projects can have adverse effects; in contrast with other energy sources, they may also have positive environmental effects. For example, hydropower dams can control floods and augment downstream flow to improve fish and wildlife habitats, water quality and recreational opportunities.
>
> C. Hydropower is presently the state's most significant indigenous resource that can be used to free our citizens from their extreme dependence on foreign oil for peaking power.

Based on these findings, the Act declared that "hydropower justifies singular treatment. The Legislature further declares that it is the policy of the State to support and encourage the development of

As explained below, Maine has made great strides in promoting development of renewable electricity generation (although some retrenchment has occurred with the expiration of existing renewable generator contracts with utilities and as integrated resource planning has given way to a deregulated generation market). In the transportation and heating sectors, Maine's efforts are at the formative stage.

Also discussed in this section are clean, non-renewable fuels. While lacking the advantage of displacing fossil fuels, their use provides some of the environmental advantages of renewables, and they are grouped with the latter for certain policies.

b. Renewable Electricity

i. PURPA/SPPA

The Public Utility Regulatory Policies Act of 1978 (PURPA) established federal requirements for utilities to interconnect with, and buy power from, cogenerators and small power producers. In the following year, Maine enacted parallel legislation, The Small Power Production Act (SPPA). The SPPA included the finding that "the development of small energy production facilities using renewable resources and cogeneration facilities will have a significant and beneficial effect upon this State."[72] In 1983, the Legislature added provisions specifically targeted at small energy facilities using municipal solid waste as fuel. The law authorized the formation of solid waste disposal districts with the authority, among other things, to develop and operate MSW handling facilities, and "to provide for conversion of waste to one or more forms of energy and for the transmission thereof; [and] to generate revenues from those activities…"[73]

The PUC enthusiastically embraced the mandates of PURPA and the SPPA, making the State an early leader in renewable generation. Renewables accounted for about 50 percent of Maine's generation mix in 2000. However, the legacy of this enthusiasm is mixed. On the one hand, the policy achieved PURPA's goal of reducing reliance on fossil fuels—renewable energy generators displaced electricity that would have been produced by oil and possibly coal.[74] In doing so, they also contributed to reduced greenhouse gas emissions and other forms of

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hydropower projects by simplifying and clarifying requirements for permits, while assuring reasonable protection of natural resources and the public interest in use of waters of the State."

[72] 35-A M.R.S.A. § 3302.

[73] PL 1983, c. 820, codified at 38 M.R.S.A. § 1731. MSW energy facilities developed under this authority include the 13 MW Greater Portland Region Resource Recovery Facility in Portland; the 25 MW Penobscot Energy Recovery Company facility in Orrington; the 5 MW Mid-Maine Waste Action Corp. in Auburn; and the 22 MW Maine Energy Recovery facility in Biddeford. See http://www.eere.energy.gov/state_energy/opfacbytech.cfm?state=ME

[74] While this discussion focuses on the consequences of PURPA's support for renewable generation, PURPA also supported non-renewable cogeneration, *i.e.*, the simultaneous production of electricity and thermal energy for industrial processes.

pollution.[75] The policy was also instrumental in putting to rest concerns that reliance on renewable energy generators would compromise the reliability of electric supply or the transmission grid. With few exceptions, renewable generators have fulfilled their contracts and exhibited high levels of operational reliability.

On the other hand, the cost of PURPA contract power has been a concern. Prices at which renewable generators sold their power to the utilities were based on forecasts of the utilities' cost of generating the power themselves or securing it from other sources ("avoided costs"). Those forecasts were not borne out by experience—alternatives available to the utilities turned out to be far less costly than anticipated. With the advent of retail competition in the state's electricity market and the decline in market energy prices, utilities' obligations to fulfill existing contracts with renewable generators became a significant financial burden, which has been (and continues to be) passed along to customers of the utilities' distribution systems in the form of stranded cost charges.[76]

Many provisions of PURPA and the SPPA, including those requiring utilities to enter into long term contracts to buy energy from renewable power producers, have been repealed or mooted under deregulation. Notably, however, the 1997 Restructuring Act reaffirmed the SPPA policy of supporting renewable energy production facilities:

> **Policy.** In order to ensure an adequate and reliable supply of electricity for Maine residents and to encourage the use of renewable, efficient and indigenous resources, it is the policy of this State to encourage the generation of electricity from renewable and efficient sources and to diversify electricity production on which residents of this State rely in a manner consistent with this section

In 2001, the Legislature once again reaffirmed the state's commitment to "the development and use of the State's renewable energy resources to generate electricity for fuel diversity and economic and environmental benefits."[77] Recognizing that the continued viability of renewable generation had come to depend increasingly on the terms and conditions of access to the regional wholesale market, the legislation directed the PUC (with certain conditions) to support regional policies that support renewables. The PUC was directed to:

> Require, whenever the interests of competition, consumers of electricity and economic development in this State are not adversely affected, that the commission ensure that the goals of this section will be met following the restructuring of the electric utility industry by:
>
> > A. Proposing market rules and transmission pricing policies and practices at the regional and federal levels that encourage the generation and sale of

[75] Less than 17 percent of greenhouse gas emissions generated in Maine are from the utility sector, compared to 25 to 30 percent nationally.

[76] A 1994 Report submitted to the Mainewatch Institute suggested that power supply costs might have been as high or higher had utilities continued their "business as usual" policies of the early 1980s rather than buying PURPA power. Economic Research Associates *et al.*, "Energy Choices Revisited: An Examination of the Costs and Benefits of Maine's Energy Policy" (February 1994), p. 6. The Report also concluded that Maine's investments in conservation and renewable energy technologies had produced significant economic and environmental benefits. *Id., pp. 6-7.*

[77] PL 2001, c. 76, Summary.

> electricity from the State's renewable power producers and cogenerators;
>
> B. Opposing market rules and proposed transmission pricing policies and practices that place the State's renewable power producers and cogenerators at a competitive disadvantage compared with nonrenewable power generators; and
>
> C. Implementing the State's electric industry restructuring laws and other provisions of this Title in a manner that promotes generation of electricity from the State's indigenous renewable resources and cogeneration.[78]

ii. Eligible Resource Portfolio Requirement

The 1997 Electric Industry Restructuring Act established a renewable and efficient resource portfolio (RPS) requirement as a replacement for the PURPA and SPPA obligations on utilities to sign long term power contracts with renewable energy producers.

Section 3 of the Act[79] requires entities selling power at retail (including through the standard offer) to supply at least 30 percent of their total retail electric sales in Maine with electricity from renewable resources. Eligible resources include generation facilities of 100 MW or less that use fuel cells, tidal power, solar arrays and installations, wind power installations, geothermal installations, hydroelectric generators, biomass generators, or generators fueled by municipal solid waste in conjunction with recycling, as well as qualified cogeneration facilities.

While competitive energy providers have been complying with the RPS, the standard has come under criticism. A 2002 Report of the Maine Center for Economic Policy, the Natural Resources Council of Maine, and the MaineWatch Institute asserted that Maine's RPS is "broadly recognized as a failure."[80] Concerns include the fact that the standard does not maintain Maine's existing renewable base or foster development of new renewable generation, since existing renewable generation already exceeds the 30 percent requirement and new facilities cannot compete; that the scope of eligible resources is not properly focused; and that there may be more cost-effective means of encouraging investment in renewables.

The RPS has in fact not prevented a decline in renewables'market share. PURPA contracts have expired or been bought out, and biomass generators find it difficult to operate profitably in the competitive market. Some small hydro facilities are not profitable due to a variety of factors that may include high fixed costs, low energy prices and obligations to install fish passage. Regional transmission pricing rules have placed some small renewable facilities at a competitive disadvantage. Anticipated market demand and price premiums for green power have failed to materialize, and the rapid growth in gas-fired generation has lowered prices and the relative share of remaining renewable generators. Financing new energy projects without long term power purchase agreements is proving challenging.

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[78] *Id.*, § 2, codified at 35-A M.R.S.A. § 3302(3).
[79] Codified at 35-A M.R.S.A. § 3510.
[80] "Energy for Maine's Future: A Call for Leadership", Fall 2002, p. 18.

Not all external developments have been adverse to renewables, however. Gas prices have risen, driving up wholesale market prices for all energy sources, and many expect them to stay at least at current levels. In addition, with the active support of Maine policymakers, the region has adopted a mechanism that unbundles energy from its other attributes, known as the Generation Information System or GIS. Electronic certificates are created for each MWH generated, and the "green" attributes of renewable based generation can be traded. There also may be continued support from federal legislation as well as initiatives of other states for renewable portfolio standards that would include Maine renewable facilities.

Several bills have been introduced to amend the RPS statute. The Legislature carried them over until 2004, and adopted a Resolve calling on the PUC to study the issue and file a report by December 2003.[81] The PUC is directed to analyze alternatives to the existing requirement, including amending the requirement to make it more cost effective; funding renewables through a "system benefits charge" (*i.e.*, a surcharge on electric rates); using renewables to supply a portion of standard offer service; and mechanisms used to support renewables in other states.[82]

iii. Renewable Resource Fund

The Restructuring Act provides for regulations allowing ratepayers an opportunity to make voluntary contributions to a Renewable Resource Fund.[83] Administered by the Maine Technology Institute (MTI) under a contract with the State Planning Office, the fund now stands at about $70,000. Two types of projects are eligible for funding: 1) renewable resource R&D at the University of Maine System, the Maine Maritime Academy or the Maine Technical College System, and 2) community demonstration of renewable energy technologies by Maine-based non profit organizations, consumer owned electric cooperatives, or community action programs. MTI issued its first RFP to access the Fund in July 2003.[84]

iv. Renewable/Clean Transportation and Heating Fuels

As noted above, policies on renewable transportation and heating fuels are at a much earlier state of development than policies relating to renewable generation. Initiatives include studies, limited tax incentives, and federal grant programs. Programs to explore use of renewable fuels in government buildings and fleets are discussed separately in the State Leadership-by-Example section. Also noted in this Section are clean fuel programs.

⇒ Legislation adopted in 1999[85] provided authority for the creation of an 11-member Agricultural Products Utilization Commission to advise FAME on policies to

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[81] See NRCM, Environmental Report Card, 2003 Legislative Session, at http://www.maineenvironment.org/Legislature/2003reportcard htm.
[82] LD 1312, Resolve Relating to Renewable Resources (May 23, 2003).
[83] 35-A M.R.S.A. § 3510(5), (6).
[84] See http://www.state.me.us/spo/energy/energycouncil/renewable.php; http://www.mainetechnology.org/proposal-rrmf.asp; telephone conversation between Arthur Adelberg, Energy Advisors, and Janet Yancey-Wrona, Director, MTI, July 25, 2003.
[85] PL 1999, c. 474, codified at 10 M.R.S.A. § 997-A and B and 5 M.R.S.A. § 12004-I.

support the development of agriculturally-derived fuels, defined as "methanol or ethanol produced from organic matter that is available on a renewable basis, including agricultural crops and agricultural wastes and residues." The legislation also created an Agriculturally Derived Fuel Fund, to be used for "direct loans and direct subsidies to a business or cooperative for the design and construction of a facility to produce an agriculturally derived fuel."[86] The Commission conducted a feasibility study of the potential for developing an ethanol production facility at Loring. The Study found that a five million gallon ethanol plant would not earn an attractive return given the anticipated risks (*e.g.*, available feedstock at a predictable price, local and regional market demand for ethanol, development of local blending infrastructure, continued access to rail).[87]

⇒ A Resolve adopted by the Legislature in 2003 requires the Energy Resource Council to undertake a study, in coordination with DEP, of issues related to promoting use of renewable fuels.[88] The scope of the study is to include:

> 1. The costs and benefits of state government actions and options to stimulate an increase in the percentage of various alternative transportation fuels and alternatively fueled vehicles used in the State;
>
> 2. The costs and benefits of state government actions and options to stimulate an increase in the production of biofuels in the State;
>
> 3. The related goals, practices, results and markets that exist in other states and provinces, especially those that share fuel or vehicle markets with Maine;
>
> 4. The potential for synergies between alternative transportation fuel and alternative heating fuel sectors and infrastructure;
>
> 5. The costs and benefits and actual or predicted transportation energy efficiency results of other initiatives, including dense multi-use development, long-term traffic and modal demand management plans of the Department of Transportation, anti-idling campaigns and fuel economy standards for state fleets; and
>
> 6. Related federal initiatives, requirements and funding, and the implications for strategic planning and investment in the State …

The ERC has assigned the study to the DEP and DOT, and a working group has been set up.[89]

⇒ Maine is a participant in the Northeast Regional Biomass Program (NRBP), funded by the U.S. Department of Energy (DOE).[90] The program's mission is to evaluate biomass

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[86] 10 M.R.S.A. § 997-A(3).
[87] Email from Julie Hashem to Arthur Adelberg, August 13, 2003; "State of Maine Ethanol Pre-feasibility Study" (October 2002), published at . http://www famemaine.com/html/whatsnew/pdf/FAME-Final%20Report%2010-24.pdf.
[88] 2003 Resolves, c. 1684.
[89] Email from Julie Hashem to Arthur Adelberg, September 5, 2003.

technologies and fuels and to provide objective, reliable information to consumers and policy leaders. The NRBP carries out its mission through an extensive network of local, state, and national government organizations, and partnerships with private industry. Biomass in the context of this program is defined as renewable organic materials including: forestry and agricultural crops and residues; wood and food processing wastes; and municipal solid waste (MSW).

⇒ Maine's support for solar energy includes a voluntary training and certification program for solar equipment installers managed by DECD[91]; a law providing minimum warranty terms for sale and installation of solar equipment (to foster consumer confidence)[92]; and PUC participation in a DOE funded collaborative known as the Maine Million Solar Roofs Partnership that encourages the installation of solar roof heating systems for hot water, space heat and pool heating.[93] Maine hosted this year's Annual Regional Million Solar Roofs conference, and has applied for a DOE grant to fund public education, data collection, and related activities. The Maine Partnership has set a target of 500 new rooftop installations by 2010. [94]

⇒ Maine law grants a partial exemption from state sales tax for the purchase of "clean fuel vehicles",[95] and a 25 percent tax credit for installation of facilities to supply "clean fuels" to the public.[96] "Clean fuels" include "all products or energy sources used to propel motor vehicles… other than conventional gasoline, diesel or reformulated gasoline, that, when compared to conventional gasoline, diesel or reformulated gasoline, results in lower emissions... [They include] compressed natural gas; liquefied natural gas; liquefied petroleum gas; hydrogen; hythane…; dynamic flywheels; solar energy; alcohol fuels containing not less than 85% alcohol by volume; and electricity." The exemption and tax credit expire in 2006. FAME also had the authority beginning in 1997 to finance the acquisition or lease of clean fuel vehicles and related components or facilities.[97] No loans were made under this program, and the Legislature did not renew the authority upon its expiration in 2002.

⇒ Maine generally levies an excise tax (currently 24.6 cents per gallon) on motor fuel.[98] Prior to 2000, this tax applied to motor fuels regardless of their BTU content, with the result that cleaner fuels, which generally have lower BTU content per gallon, incurred an economic penalty. As an incentive for clean fuels, the Legislature amended the basic excise tax law to equalize the tax rate based on the BTU content of the fuel.[99] This has the effect of reducing the excise tax on compressed natural gas by 13 percent; propane by 27 percent; ethanol (E85) by 29 percent; and methanol (M85) by 43 percent.[100]

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[90] SPO Survey, NBRP; http://www nrbp.org/whoweare.htm.
[91] PL 1979, c. 277, codified at 32 M.R.S.A. § 8002 *et seq*.
[92] PL 1979, c. 299, codified at 10 M.R.S.A. § 1491 *et seq*.
[93] See http://www millionsolarroofs.com/partnerships_support/.
[94] *Ibid.*
[95] 36 M.R.S.A. § 1760(79).
[96] 36 M.R.S.A. § 5219-P.
[97] PL 1997, c. 500, codified at 10 M.R.S.A. §§ 1023-K and 1026-P(3).
[98] 36 M.R.S.A. § 3203(1). The excise tax on diesel fuel is 25.7 cents per gallon.
[99] PL 2001, c. 688.
[100] See http://www.gpcog.org/trnsprttn/cln_cts/cln_cts htm.

⇒ The DOT and DEP participate in a US Department of Energy sponsored coalition called Maine Clean Communities= MC^2 that promotes clean fuel vehicles and supporting infrastructure. The coalition has (among other things) developed a clean fuel vehicle rebate program, facilitated purchases of compressed natural gas and propane vans and buses, and partnered with Suburban Propane to build Maine's first publicly accessible propane fueling facility on Thompsons Point in Portland. [101] Maine's first publicly accessible compressed natural gas fueling facility, built primarily for the replacement of the Greater Portland METRO fleet with CNG buses, will be operational in late 2004.

⇒ In order to encourage its use, Maine has exempted natural gas used to fuel vehicles from PUC regulation.[102]

3. State Government Leadership by Example and Action

The State has led by example in a wide range of areas relating to energy policy, including adopting policies to improve the energy efficiency of state funded facilities, establishing rigorous efficiency standards for new, state-funded construction and vehicle purchases, and using renewable electricity and fuels.

a. Improving Energy Efficiency in Existing Facilities

⇒ State agencies have had the authority since 1985 to enter into agreements with private parties such as energy service or third-party financing companies for the design, installation, operation, maintenance and financing of energy conservation improvements at state facilities.[103] A similar provision has been in effect since 1987 authorizing county commissioners to enter into agreements with energy service companies to install energy efficiency improvements in county facilities.[104]

⇒ Under a law passed in 1991, the Bureau of Public Improvements (predecessor to the Bureau of General Services) was charged with developing a program "in which an eligible department or agency of the State may retain a portion of any first-year energy cost savings demonstrably attributable to energy efficiency improvements undertaken by that department or agency."[105] The Bureau was required to submit the proposed program to the legislative Committee on State and Local Government by January 1, 1992. It does not appear that this program was ever implemented.

⇒ In 1993, the Legislature attempted to spur efficiency improvements in schools and municipal buildings by directing the Maine Municipal Bond Bank to establish an Efficiency Partners Program.[106] The Bank was to issue requests for proposals from energy service companies and vendors of energy service products for "energy savings that could be achieved through cost-effective improvements to heating and cooling systems,

[101] DOT Survey, Clean Cities.
[102] PL 1993, Ch. 178, codified at 35-A M.R.S.A. § 4703-A.
[103] PL 1985, c. 128, codified at 5 M.R.S.A. § 1767.
[104] PL 1987, c. 737, codified at 30-A M.R.S.A. § 903.
[105] PL 1991, c. 246, codified at 5 M.R.S.A. § 1768.
[106] PL 1993, c. 605, codified at 30-A M.R.S.A. § 5953-C.

windows, insulation, lighting and equipment in municipal and school buildings." The legislation also required that the savings be based on "a comprehensive energy audit that has been performed within the previous 5 years by a professional engineer licensed in this State." After the legislation was enacted, the Bond Bank conducted a survey to determine the extent of demand for the program. The survey determined that there was not sufficient interest, and the program was never implemented.[107]

⇒ Legislation adopted in 1999 sets a goal of reducing energy consumption in state buildings by 25 percent over 1998 levels by 2010, and establishes a pilot program to seek to achieve that level of energy savings in ten facilities of over 40,000 square feet. [108] Under the pilot program, energy savings are to be achieved through performance contracts with energy service companies.[109]

In a January 31, 2003 Efficiency Report to the Legislature, the Department stated that it had solicited proposals from energy service companies; had received seven proposals; had pre-qualified three bidders to contract with the state; and was negotiating a contract with one of the bidders.[110] At the time of the Report, that bidder was evaluating potential energy savings at four facilities; once the potential savings are better defined, the scope of work for the contract will be finalized, and a contract will be executed.[111] DAFS has also engaged the engineering firm Harriman Associates to evaluate the potential for energy efficiency improvements in all State buildings larger than 10,000 square feet. More recently, the State contracted for the installation of "Vending Misers," equipment that reduces unnecessary energy usage in vending machines.

DAFS has also undertaken to obtain LEED (Leadership in Energy and Environmental Design) Certification for the Gov. Baxter School Building. LEED Certification is conferred by a voluntary organization, the US Green Building Council, on buildings that meet high standards of environmental responsibility and sustainability.[112]

⇒ As part of its effort to balance the state budget, in the spring of 2003 the Legislature passed the Governor's proposed appropriations bill that includes language requiring all state agencies to reduce their energy usage, both in their buildings and their vehicle use.[113] The Department of Administrative and Financial Services is also charged with informing state agencies of other energy saving measures. In subsequent appropriations legislation, the Department of Administrative and Financial Services was

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[107] Email from Robert Lenna to Arthur Adelberg, August 15, 2003.
[108] PL 1999, Ch. 35, codified at 5 M.R.S.A. § 1770. The legislation applies to facilities that consume energy and that are owned by the legislative, judicial or executive branches of government, any state department, agency or authority, the University of Maine System or the Maine Technical College System.
[109] *Id.*, § 1770(2)(C).
[110] See http://www.state me.us/bgs/energyefffinal.doc. Achieving the energy savings goal of this Act should also reduce greenhouse gas emissions, a goal of legislation enacted in 2003. See HP 622, LD 845, "An Act to Provide Leadership in Addressing the Threat of Climate Change", codified at 38 M.R.S.A. § 574 *et seq*. Like the 1999 Act, this more recent legislation calls for improvements in state facilities as an example for others: the Department is directed to "establish a lead-by-example initiative under which the department shall …[c]reate an inventory of greenhouse gas emissions associated with state-owned facilities and state-funded programs and create a plan for reducing those emissions to below 1990 levels by 2010." 38 M.R.S.A. § 575(1).

[111] *Ibid.*
[112] See http://www.usgbc.org/LEED/LEED_main.asp
[113] 121st Legislature, First Session, LD 1319, PL Ch 20.

directed to submit proposed legislation in the 2004 Session that includes savings of $1 million from "restructuring, consolidation and other efficiencies."[114] While "other efficiencies" is not defined, the Department interprets the term to include energy savings measures.[115]

⇒ While principally targeted at reducing nighttime glare, a law enacted in 1991 also ensures efficiency of outdoor lighting systems paid for with state funds by requiring that their maximum illuminance[116] not exceed the minimum recommended by the Illuminating Engineering Society of America or the Federal Department of Transportation.[117] The Maine DEP has been requiring the use of high-efficiency traffic signal lights (which use 90 percent less energy than incandescent traffic signals) for all new installations. DOT is also making the high-efficiency lights available to all Maine communities for retrofitting.[118]

b. Energy Efficiency Standards for New Facilities

Maine law has required since 1977 that new buildings and renovations above 5,000 square feet funded by the state, including schools, be designed with consideration of life-cycle energy costs.[119] A 1989 amendment directed state agencies to coordinate building standards they adopted "as far as practicable", and made the DECD responsible to assist other agencies in developing such standards.[120] In 1991, a provision was added prohibiting the installation of electric space heat in publicly subsidized multi-family dwellings, except where rigorous efficiency standards are met.[121] In 1997, the law was amended again to add greater specificity to the concept of life-cycle energy costs, and to direct the Bureau of General Services to adopt rules that include energy conservation guidelines that conform to building energy efficiency standards adopted by the DECD.[122]

In 2003, the Legislature once again amended the law to strengthen the efficiency requirements.[123] The new legislation directs the Bureau of General Services to promulgate rules by July 1, 2004 that require the planning and design for such renovations to:

> A. Involve consideration of architectural designs and energy systems that show the greatest net benefit over the life of the building by minimizing long-term energy and operating costs;
>
> B. Include an energy-use target that exceeds by at least 20% the energy efficiency standards in effect for commercial and institutional buildings pursuant to Title 10, section 1415-D; and

[114] 121st Legislature, First Session, LD 1614, PL Ch. 451, Part E, Section E-21.
[115] Email from Rebecca Wyke, Commissioner of Finance and Administration to Richard Davies, Office of the Governor, June 19, 2003.
[116] "Illuminance" means "the level of light measured at a surface." 5 M.R.S.A. § 1769(1)(F).
[117] PL 1991, c. 481, codified at 5 M.R.S.A. § 1769.
[118] DOT Survey, LED.
[119] 5 M.R.S.A. § 1762. The Bureau of General Services's implementing rules, last amended in the mid-1980s, are in CMR 18-554, ch. 3. In 1997, the law was amended to apply to leased facilities as well. 5 M.R.S.A. § 1763.
[120] PL 1989, c. 501, codified at 10 M.R.S.A. § 1414-A.
[121] PL 1991, c. 275, codified at 10 M.R.S.A. § 1415-G.
[122] PL 1997, c. 541, codified at 5 M.R.S.A. § 1764.
[123] PL 2003, c. 497, Section 1, codified at 5 M.R.S.A. § 1764-A.

> C. Include a life-cycle cost analysis that explicitly considers costs and benefits over a minimum of 30 years and that explicitly includes the public health and environmental benefits associated with energy efficient building design and construction to the extent they can be quantified.

Prior to 2003, state law directed at new construction and renovation of state-funded school facilities provided that such projects must meet "rigorous standards for the conservation of energy."[124] The 2003 legislation requires the State Board of Education to promulgate rules for those projects based on the above-listed criteria.[125]

c. Fuel Efficient Vehicles

Since the energy crisis of the 1970s, Maine has had a law requiring new vehicles purchased for the state's fleet meet federal energy standards.[126] A law enacted in 1991 required that new state cars and light duty trucks, other than for law enforcement and other "special use purposes," exceed the federal standards.[127] The targets increased in three stages: by 1993, cars had to be rated at 30 miles per gallon (mpg) or higher, and light duty trucks at 24 mpg. In 1997, the targets were 38 mpg and 30 mpg for cars and light duty trucks, respectively; and in 2000, the figures increased to 45 mpg and 35 mpg. Because as a practical matter vehicles meeting these targets have not generally been available, the State has not been observing these requirements.

In one of his last official acts before leaving office in 2003, Governor King issued an Executive Order which required all state agencies to undertake a number of measures designed to enhance fuel efficiency and reduce pollution. [128] While a major focus of the Order is air quality, the Order also indicates that the governor is acting because "energy efficiency contributes to energy security by reducing dependence on foreign oil."

The Order, which is effective from January 2003 through June 30, 2007, requires state agencies to evaluate the efficiency of their vehicle fleets and, when justified, to replace vehicles in accordance with certain standards. Those standards include requirements that subcompact and compact sedans be replaced with gasoline-electric hybrid technology vehicles, and that all other passenger vehicles meet a 30 miles per gallon or greater fuel efficiency rating. The Department of Administrative and Financial Services (DAFS) is charged with developing recommendations for fuel efficiency and emissions standards for heavier duty vehicles by January 1, 2004, and agencies are directed to promote the procurement of dedicated alternative fuel vehicles, dual-fuel vehicles and fueling infrastructures to support such vehicles. DAFS was also given until January 15, 2003 to ensure that these policies are reflected in the procurement policies of the State. DAFS reports that it is compliance with the Order.[129]

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[124] 20-A M.R.S.A. § 15908.
[125] *Id.*, Section 2, codified at 20-A M.R.S.A. § 15908-A.
[126] 5 M.R.S.A. § 7.
[127] PL 1991, c. 207, codified at 5 M.R.S.A. § 1812-E.
[128] Because the Executive Order does not specifically refer to renewable fuels, it is included in this section of the Report. There is no indication in the Order, however, that it was intended only to encourage efficiency in use of non-renewable fuels.
[129] Email from Domna Giatas to Beth Nagusky, Oct. 22, 2003.

d. Renewable Energy Initiatives

⇒ The Maine Department of Transportation (MDOT) has undertaken a pilot program in its Freeport facility to test biodiesel in its vehicles and for space heating.[130] The 'bio' component of biodiesel comes from soybeans grown in the Midwest.[131] DOT's interest was spurred by the decision of L.L. Bean to test the use of biodiesel on its own vehicles in Freeport.[132] Bean's began its pilot in April 2003; DOT followed in June. Both DOT and L.L. Bean are using a product known as B20 (meaning 20 percent of the fuel is derived from soy) purchased from Frontier Energy in South China. According to Frontier, Bean's is the first major Maine company to test biodiesel in a distribution fleet. DOT is conducting research to evaluate the effects of using biodiesel on both fuel efficiency and vehicle emissions. L.L. Bean's initiative is also receiving support from Maine Clean Communities, a Portland-based non-profit organization that receives funding from the US Department of Energy.[133]

The State has tested biodiesel as a heating fuel in certain State buildings in Augusta this fall, and will use B20 in some Augusta buildings this winter. It also plans to conduct an RFP next year to secure future supplies. In addition, MTI has funded a study to examine siting a facility to collect and reprocess used cooking oil into a biofuel. Maine restaurants generate about one million gallons of used cooking oil each year.

⇒ Governor Baldacci set a goal for state government to purchase 50 percent of its electricity supply from renewable power. In March 2003, the Governor announced that approximately 750 electric accounts using about 8 million kwh per year and representing 10 percent of the State's load had been switched to a 100 percent renewable product supplied by Maine low-head hydro and biomass facilities. The supplier has guaranteed it will offset the price premium through energy conservation measures in State buildings.[134] The recent electricity purchase for the remainder of the state's accounts in CMP and Bangor Hydro's service territories limited the 30 percent RPS requirement to renewable power, with a preference for Maine generators. This brings the overall state purchase of renewable power to 40 percent.

⇒ Under a law enacted in 1983, state agencies are authorized to enter into agreements permitting private parties to lease state property for the purpose of installing or operating energy production equipment that relies on biomass, solid waste, or some combination thereof, for at least 50 percent of its total energy input.[135] The private party may use the facility for

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[130] Legislation to promote biodiesel in Maine was introduced after DOT reached its decision to conduct its own pilot program. Source: telephone conversation between Arthur Adelberg, Energy Advisors, and Laurie Brann, DOT Department of Planning, July 24, 2003.

[131] DOT Survey, MTS.

[132] See http://www.afdc.doe.gov/documents/altfuelnews/7_1states.html.

[133] See http://www.eere.energy.gov/buildings/state_energy/projects/cfm/stateprojectdetail.cfm?pid=359.

[134] See Press Release, March 17, 2003 - Competitive Energy Services Announces Signing of Letter of Intent by State of Maine to Purchase Maine Renewable Energy, at http://www.energymaine.com/press/pressRelease2.asp.

[135] PL 1983, c. 803, codified at 5 M.R.S.A. § 1766.

cogeneration (production of heat and electricity), and may sell the output to the state. Any excess may be sold to third parties, and the agreements are subject to review by a subcommittee of the legislative committee with jurisdiction over appropriations and financial affairs.

4. Energy Delivery Infrastructure

⇒ Maine is a State with a strong environmental ethic, and has long emphasized conservation as a means of avoiding or postponing energy infrastructure investments. For example, a proposal to build a major new transmission line linking the State with Quebec in the 1980s was rejected, largely on the ground that conservation could avoid the need for the power. At the same time, however, the importance of infrastructure development to economic development and the expansion of competitive markets has not been ignored. Maine supported the construction of an electric transmission interconnection with New Brunswick in the 1960s, and that interconnection has served Maine well. More recently, the State generally supported the construction of major pipelines to bring natural gas from Canada in the 1990s, even though a significant portion of the gas flows to other New England states. Maine is also encouraging local gas distribution investment, as discussed in Section C.8.c below.

⇒ Maine is currently playing an active role in regional discussions concerning the establishment of a Regional Transmission Organization (RTO). Among the core functions of an RTO is regional transmission planning. While some regional planning has occurred under existing regional organizations, the establishment of an RTO would give a regional entity greater authority to override the interests of individual states in siting transmission. The Federal Energy Regulatory Commission, which sets policy for wholesale power markets, sees this centralization of authority as necessary to ensure that transmission is built to support marketplace competition. The recent Northeast blackout has given added impetus to the movement to strengthen regional control over transmission planning and operation, as decentralized control is believed to have created the conditions which allowed the blackout to occur.

⇒ Maine departments and agencies participating in the RTO discussions include the Office of the Governor, the State Planning Office, the PUC, and the Public Advocate. Maine has joined with other New England states in supporting the effort to form an RTO, in part because of an appreciation of the importance of transmission infrastructure development. In addition, Maine is working to ensure that states continue to have a meaningful voice in policymaking. However, Maine does not always agree with other states on issues of implementation. For example, Maine is in a minority of states that believe that the costs on new regional transmission facilities should be borne primarily by the parties who benefit the most from their operation. The contrary position, *i.e.*, that costs should be uniformly shared throughout the region, may lead in the near term to Maine bearing a disproportionate share of the cost of facilities chiefly needed to eliminate transmission congestion in southwestern Connecticut.

⇒ An even more current energy infrastructure issue is emerging in connection with a new proposal to site a liquefied natural gas (LNG) delivery facility off of Harpswell. LNG imports are seen as helping address growing demand for natural gas nationally, as gas has become a fuel of choice for new electric generation. Proponents of LNG stress the importance of new

facilities to competition in gas markets, and the Governor recently expressed support for siting for the Harpswell facility.[136]

5. Energy Affordability

a. General Policy on Electric Rates

Since its creation in 1914, it has been a core responsibility of the PUC to ensure that rates for electric service are "just and reasonable."[137] Under the Fifth Amendment to the United States Constitution, that standard has been interpreted to require a balancing of consumer and investor interests, and to allow regulators broad discretion in their choice of rate-setting methodologies, so long as the utility is accorded a reasonable opportunity to recover its prudently incurred costs, plus a return on its investment.[138] Within that context, however, there are competing goals in Maine energy policy: on the one hand, there is a policy of keeping electric rates as low as possible; on the other, there is a policy of funding socially desirable objectives such as cost-effective conservation and promotion of renewable energy in electric rates. In the Commission's view, the responsibility to balance those policies lies with the Legislature.[139]

With the advent of retail competition in Maine, the portion of electric rates that is subject to regulation under the just and reasonableness standard is limited to transmission and distribution service; the rates for the electric energy are set in the competitive market.

Methodologies used by the Maine PUC to determine the justness and reasonableness of rates have evolved over time. In recent years, the PUC has moved away from in-depth examination of utility costs of providing service, opting instead for multi-year rate plans, under which utilities offer rate stability in return for the opportunity to benefit financially from productivity improvements. Under these plans, utilities also are given flexibility to reduce rates for certain classes of customers or uses of electricity, to retain load that might otherwise be lost to competition or business closures. Utilities have put in place reductions worth tens of millions of dollars, for uses ranging from milling lumber to snow-making, and the economic consequences in terms of business activity and job preservation, while not quantified, have likely been substantial.

b. Special Rate Programs for Low-Income Consumers

Recognizing that electricity is a necessity of life, PUC regulations have required Maine's investor-owned electric utilities to maintain special rate programs to ensure affordability of electricity for low income customers for many years. Maine does not require sellers or distributors of petroleum products to maintain such programs; however, under the petroleum set-aside program discussed below, SPO can direct oil companies to distribute oil to customers facing hardship and emergencies.

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[136] "Residents Quiz Selectman on Terminal Plan," Portland Press Herald (Oct. 8, 2003).
[137] The current version of that standard appears in 35-A M.R.S.A. § 301(2).
[138] See generally FPC v. Hope Natural Gas Co., 320 U.S. 592 (1944).
[139] See, *e.g.*, letter of PUC to Sen. Hall and Rep. Bliss, April 10, 2003, published at http://www.state me.us/mpuc/2002legislation/testimony/EEF-LDs.htm.

With the advent of industry restructuring and retail choice, the Legislature wanted to ensure that electric low-income programs remain in place, even though the utilities would no longer supply electricity. The Restructuring Act included a provision, codified at 35-A M.R.S.A. § 3214, stating:

> In order to meet legitimate needs of electricity consumers who are unable to pay their electricity bills in full and who satisfy eligibility criteria for assistance, and recognizing that electricity is a basic necessity to which all residents of the State should have access, it is the policy of the State to ensure adequate provision of financial assistance.[140]

The legislation also required the PUC to ensure that funding for such programs continue at pre-Restructuring levels.[141]

The PUC undertook a proceeding in 2001 to update its rules governing utility low income assistance programs (LIAPs).[142] The updated rules differ from prior practice in several respects. Previously, only investor-owned utilities had such programs, and the funds each utility collected to finance the programs were only used for low income customers in each utility's own service territory. The new rules apply to consumer-owned utilities as well, and provide that funds for low income assistance collected in utility rates are to be put into a state-wide fund administered by the Maine State Housing Authority (MSHA). MSHA is then directed to make disbursements from the fund to each utility based on the number of low income customers in their service territory. As the PUC noted, "For the first time in Maine, every eligible person, regardless of where he or she lives, has access to an assistance program created to make electric bills more affordable."[143] The overall level of funding statewide is approximately $5.7 million per year, and provides benefits to 20,000 households.[144]

In addition to LIAPs, the PUC maintains regulations requiring utilities to offer special payment arrangements to customers having difficulty paying their utility bills, and restricting the right of utilities to disconnect customers in winter months, when lack of utility service could impose a severe hardship.[145]

c. Authority for Natural Gas Rate Programs

Under legislation enacted in 1999, the PUC has the authority to enact rate programs for low-income natural gas customers similar to those applicable to low-income electricity customers.[146] The PUC has used this authority to extend its rules regarding payment arrangements and disconnection of service in winter months to gas utilities.[147] Currently there is

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[140] 35-A M.R.S.A. § 3214(1).
[141] 35-A M.R.S.A. § 3214(2).
[142] PUC Docket No. 2001-702.
[143] PUC 2001 Annual Report, p. 21. .
[144] PUC 2002 Annual Report, p. 27; email from Jo-Ann Choate, MSHA, to Arthur Adelberg, August 4, 2003.
[145] CMR 65-810.
[146] PL 1999, c. 664, codified at 35-A M.R.S.A. § 4706-A.
[147] See CMR 65-810, Section 1(B).

no legislative policy supporting conservation efforts to be funded by gas customers, in contrast to electric utilities.

d. Home Heating Oil Programs

In addition to benefits provided through electric rate programs, low income households may receive direct financial assistance to meet their heating costs through the Low Income Energy Assistance Program (LIHEAP) administered by the Maine State Housing Authority (MSHA). LIHEAP funds are provided by a grant from the U.S. Department of Health & Human Services, and are distributed throughout Maine by 11 Community Action Agencies (CAAs), in most cases directly to the fuel vendors. Allocations to the CAAs are based on the number of households served by each of the Agencies in the prior year. The average fuel benefit per household in the 2001-02 heating season was $360. The overall grant to Maine for that period was $17.9 million, and about 48,000 households participated in the program out of the approximately 110,000 households that meet the income guidelines. The program also includes the Emergency Crisis Intervention Program (ECIP), which provides emergency fuel deliveries and heating system repair.

e. Data Tracking and Reporting

As part of an effort both to foster competition in home heating fuel markets and to provide consumers information on which to make informed buying decisions, the State Planning Office conducts monthly surveys throughout the winter of heating fuel prices across the state, and publishes the results of its surveys.[148]

Information reporting also occurs as a result of legislation enacted in 1999 to create a Heating Oil Emergency Management Program.[149] Under this legislation, suppliers of all petroleum fuels and entities owning or leasing storage facilities which receive such fuels by pipeline or ship are required to report their deliveries and inventories to the SPO on a monthly basis, and the SPO is charged with preparing an annual report of the adequacy of those inventories, as well as recommendations for state action to deal with any anticipated supply shortfalls.[150]

The same legislation included provisions designed to enable the Governor and the Legislature to address the financial impacts on low-income households in the event of sudden price spikes in home heating oil. Specifically, if prices increase by more than 40 percent in any 14-day period, MSHA is required to develop an estimate of the funds needed to provide "adequate assistance to residents eligible at that time to receive fuel assistance", and to notify the Governor and the Legislature of the estimated funding need.[151] If prices increase by more than 50 percent in any 14-day period, MSHA is required to develop such an estimate not only for

[148] Examples of recent SPO press releases with the results of surveys are published at http://www.state me.us/spo/energy/latestoilprices.php.
[149] PL 1999, c. 758.
[150] This part of the legislation is codified at 5 M.R.S.A. § 3307-C.
[151] 30-A M.R.S.A. § 4994(1).

customers eligible for fuel assistance, but those who, as a result of the price increase require assistance, and again to provide notification to the Governor and the Legislature.[152] The actions to be taken by the Governor or the Legislature following notification are not specified.

6. Consumer Information

Promoting public awareness of energy issues has been a longstanding value of Maine policy. With deregulation of retail electricity, however, public information took on added importance, as consumers were given the opportunity for the first time to choose their electric energy supplier. Following enactment of the 1997 Restructuring Act, the PUC and the OPA worked closely with public utilities to educate consumers about the implications of retail competition. In addition, to ensure that consumers have the information they need to make rational choices, the Act itself authorized the PUC to regulate consumer disclosures by retail power marketers. [153]

Section 4 of the Act (uncodified) requires that those disclosures include:

> 1. average prices at representative levels of kilowatt-hour usage in the most recent 6-month period;
>
> 2. the average duration of supply arrangements with retail customers in the most recent 6-month period;
>
> 3 whether pricing arrangements are fixed or will vary over a specified time period;
>
> 4. percentages of electricity supply over the recent 6-month period under categories of generation, including, but not limited to, oil-fired, nuclear, hydroelectric, coal, biomass or other renewable resources and regional spot market purchases; and
>
> 5. expected air emissions and a comparison of those emissions to a regional average, for nitrous oxide, sulfur dioxide, and carbon dioxide.

The PUC's final rules require marketers to make filings and provide residential consumers with quarterly notifications of the proportions of their power supply produced by each individual fuel source. The rules have been recently updated to reflect the regional Generator Information System (GIS) reporting requirements.[154] Disclosures now appear routinely in residential customers' electric bills.

Another source of consumer education is the energy efficiency programs formerly administered by the utilities, and now by the PUC and MSHA. Public information is a vital component of those programs, since participation is generally voluntary. Some programs are purely educational, such as the Efficiency Maine programs for K-12 energy education and curriculum development.

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[152] 30-A M.R.S.A. § 4994(2).

[153] See 35-A M.R.S.A. § 3203(3)("The commission by rule shall establish standards for publishing and disseminating…information that enhances consumers' ability to effectively make choices in a competitive electricity market").

[154] See Docket No. 2002-580, Order Adopting Final Rule (June 18, 2003).

Finally, MSHA maintains a website known as BundleMeUp devoted to energy conservation issues (http://www.bundlemeup.org/). The King Administration created the website in 2000 as part of a broader program to assist Maine residents in dealing with a winter energy crisis. The site currently has several features, including a message about energy from Governor Baldacci; a list of ten energy savings tips with a form to estimate potential savings from their implementation; information on and links to websites dealing with financial assistance for low-income people to pay heating bills, weatherize their homes, and repair their heating systems; and similar information relating to residential energy use and conservation. A measure of the program's success is that the website receives more 'hits' than any other Maine state government website.[155]

7. Inter-agency Coordination

As noted above, the SPO recommended the establishment of a multi-agency Energy Advisory Committee in its 1999 Action Plan. In 2002, the Legislature enacted a law directing the creation of the Energy Resources Council to involve agency heads more directly in policy coordination.[156]

The Council meets monthly and receives staff support from the SPO (funded with federal grants), as well as from the represented agencies on an as-needed basis. Legislation in 2003 added a ninth agency head, the Commissioner of Conservation, to its membership.[157] The Council has also published a directory of State energy programs and resources, established an informational website, consulted formally and informally with stakeholders, and mobilized member resources to undertake two substantial studies at the request of the Legislature.[158]

The ERC has been highly effective in bringing consistency to state energy policies, developing priorities, receiving public input, and undertaking projects to improve government effectiveness. Additional information on the Council's activities and accomplishments appears in Appendix E.

8. Competition

a. Electricity

While retail electric competition is a relatively recent phenomenon, competition has played a role in state energy policy for the past two decades. The enactment of PURPA and the SPPA discussed above introduced competition into the market for generation in Maine, by allowing cogenerators and small power producers to displace utility-owned generating plants. Competition took a step forward in 1984, when Central Maine Power began requiring developers

[155] PUC Survey Form, BundleMeUp.
[156] 120st Legislature, Second Session, Ch. 630, H.P. 506, LD 646, codified at 5 M.R.S.A. § 3327.
[157] PL 2002, c. 9.
[158] Energy Resource Council Survey Response.

of proposed PURPA projects to compete with one another to fill "decrements" of needed supply. A similarly competitive procurement process for energy efficiency projects was instituted in 1989. Even with these developments, however, electric utilities retained a monopoly on retail service, and regulation, not market forces, served as the principal constraint on retail prices.[159]

The pressure to allow retail competition was in significant part an outgrowth of dissatisfaction with high prices under regulation. Not surprisingly, the interest in substituting competition for regulation was strongest in states with high electric rates. California began serious consideration of opening its retail market to competition in 1994; Maine, another state with high electric prices, followed in 1995.

After two years of study, the Maine Legislature passed the Electric Industry Restructuring Act of 1997, which set a target date of March 2000 for the commencement of retail customer choice. To enhance the prospects that competition would succeed, the Act also required utilities to divest their generating assets, guaranteed their recovery of stranded costs, sharply limited their ability to participate in marketing electric energy through affiliated entities, and instituted a program to educate consumers on their competitive opportunities.

While the 1997 Restructuring Act represents a bold, pro-competition policy, it does retain elements of state control over a number of collateral issues related to energy policy, many of which are discussed under separate headings. These include:

- Requirements that energy marketers obtain 30 percent of their power from renewable and "efficient" resources (the Renewable Portfolio Standard);
- Requirements that ratepayers continue to fund energy efficiency programs; and
- Provisions for utilities to recover costs otherwise stranded by the introduction of competition.

In addition, the Act gave the PUC supervisory authority over certain aspects of the competitive marketplace, such as licensing of competitive suppliers, consumer disclosure requirements, and default (or standard offer) energy service (*i.e.*, energy service to customers who do not exercise their right to choose their supplier). While significant numbers of industrial and commercial customers have begun to buy electricity from competitive suppliers, only a handful of residential customers do so. The PUC has used RFPs to secure competitively priced supplies for standard offer service. The resulting residential standard offer service rates have been relatively low and stable; a possible trade-off is that retail marketing to residential customers has been limited to 'green' power offerings.

In its 2002 Annual Report, the PUC offered an upbeat picture of competition in the retail electricity market:

> By the end of 2001, the majority of large customers purchased their electricity supply from the competitive market and a significant number of medium customers had entered the

[159]By the mid-1990s market forces did begin to affect prices to some extent. As customers began shifting (or threatening to shift) their load to self-generation or other alternatives, utilities were forced to lower rates for particular uses of electricity in order to avoid losing the load.

> market. This continues to be the case for 2002, and migration of Maine's customers to competitive market suppliers has exceeded migration in all other states. There has been a modest diversity of retail suppliers for commercial and industrial customers in CMP's and BHE's territories, and our research indicates that there are retail suppliers that will offer service to any large or medium customer that wishes to purchase generation from the competitive retail market. After a period of volatility and occasional price spikes, wholesale electricity prices have decreased and have been more stable recently. For most customers, all-in electric prices are generally lower than or comparable to prices before restructuring. The business operations among retail entities (utilities, suppliers, and customers) have been generally efficient and effective. Finally, regional wholesale market rules, while complex and uncertain, appear to be progressing towards creating a sustainable, competitive and efficient market.[160]

While less positive about the extent of competition for residential customers, the PUC observed that state policies were nonetheless providing them reasonable rates:

> It has become apparent, however, both nationally and in Maine that a substantial retail market for small customers, whose acquisition and service costs are significant, will be slow to develop in the near term. Nonetheless, because Maine's standard offer providers are chosen through competitive bidding based on price, all residential and small commercial customers are receiving generation purchased from competitive market suppliers, and vigorous competition among bidders has resulted in attractive supply prices for these customers.[161]

Maine's support for competitive electricity markets is also reflected in the regional advocacy and monitoring activities of the Governor's Office, the State Planning Office, the PUC and the OPA. All have been actively involved in a wide range of activities relating to promoting competition in the regional wholesale power market. A common theme of the state's efforts has been that evolving market structures and rules should be fair to Maine consumers and producers, and that adequate safeguards should be maintained to protect against market abuses or failures. A particular focus of the state's regional involvement has been the negotiations designed to enhance the independence of the entity responsible for oversight and administration of transmission access and market rules. The FERC has recently endorsed an enhanced advisory role for state regulators in the regional markets, and Maine has joined with other States in advocating the formation of a Regional State Committee as a component of governance reforms for the regional grid to be considered by the FERC this winter.

One important aspect of the evolving regional wholesale market is the recent introduction of a pricing structure for energy known as locational marginal pricing (LMP) designed to take account of transmission congestion. Due to Maine's abundance of lower cost generation relative to the rest of New England and transmission congestion at the New Hampshire border, ratepayers in Maine are currently saving about $60 million a year on their electric bills under LMP. Low energy prices in Maine have been a problem for higher cost renewable producers and could be for new wind projects.

As a corollary to the participation in regional policy development, the Legislature has from time to time directed the PUC to examine whether Maine's electric consumers would

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[160] 2002 Annual Report at p. 19. See http://www.state.me.us/mpuc/annual%20report/2002-annual%20report.pdf.
[161] *Ibid.*

benefit by a realignment of Maine's electricity market to join with its neighbor to the north, New Brunswick, rather than remaining a part of the New England market.[162] The most recent legislative directive resulted in the development of a Report in 2002, which concluded that the benefits of alignment with New Brunswick were not sufficiently compelling to warrant action at this time.[163]

b. Maine Power Options

Maine Power Options (MPO) is a buyer's cooperative established through a partnership of the Maine Municipal Bond Bank and the Maine Health And Higher Education Facilities Authority (MHHEFA).[164] Its role is to assist hospitals, higher education and other non-profit entities take advantage of opportunities to buy electricity and oil from competitive suppliers. MPO undertakes negotiations with suppliers on behalf of its members, freeing them of the need to develop expertise in energy markets, and securing prices likely to be more favorable than would be available to individual buyers.[165]Entities eligible to participate are non-profit higher education institutions, non-profit healthcare organizations, cities, towns, counties, school systems, water and sewer districts, museums, cultural and scientific organizations, all other non-profit organizations and the University of Maine System.[166] MPO also plans to develop energy services and natural gas buying opportunities for its members.[167]

c. Natural Gas

Natural gas has played a far smaller role in the state's economy than electricity, and natural gas policy is far less developed than electric policy. Prior to 1999, Maine was served by a single gas pipeline from the South, and local distribution was available only in portions of Portland and Lewiston. In that year, the completion of the Portland Natural Gas Transmission System line from Quebec, and the Maritimes & Northeast Pipeline from Nova Scotia, significantly enhanced the prospects for gas use in the state. The most immediate impact was the siting of five gas-fired generating plants, with a combined capacity of 1600 MW. While Maine still ranks among the states with the lowest overall penetration of gas service, local distribution companies have been expanding service to a number of communities.

Although Maine has purported to have a policy in favor of increased gas availability for many years[168], for the most part it was market opportunities that led to the construction of the two major pipelines that brought new supplies to the state in 1999. However, the State has played

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[162] See, *e.g.*, 2002 Resolves, ch.81.
[163] See Energy Advisors, LLC, "A Maine/Canada RTO: Advantages and Disadvantages (Dec. 3, 2002), published at http://www.state me.us/mpuc/orders/2002/2002-299inquiry htm#_ftn2.
[164] The Maine Municipal Bond Bank's authority to engage in aggregation of energy buyers was conferred by PL 1999, c. 231, codified at 30-A M.R.S.A. § 5954-A.
[165] http://www mainepoweroptions.org/htmls/freq_ask_ques html.
[166] See http://www.mainepoweroptions.org/htmls/freq_ask_ques.html#who_is_eligble.
[167] See http://www.mainepoweroptions.org/htmls/member_benefits.html.
[168] The 1992 Final Report of the Commission on Comprehensive Energy Planning stated that "Maine regulators and policymakers should continue to encourage the increased availability of natural gas" (Report, p. 52).
June 30, 1998

a larger role in the expansion of local gas distribution service, *i.e.*, the transporting of gas from the major pipelines to end users. Even before the pipelines were completed, two electric utility affiliates and a third, non-affiliated entity expressed interest in developing local distribution facilities, and the PUC had to decide whether they should be allowed to compete with one another and with the one pre-existing LDC, Northern Utilities. While acknowledging that local gas distribution exhibited natural monopoly characteristics akin to local electric distribution, the PUC decided in 1997 that expansion of local distribution service was more likely to occur if entities otherwise technically and financially qualified to develop facilities were permitted to compete to provide new service:[169]

> We hold that an applicant seeking to serve an area which is unserved or to provide a type of service which is not being provided need make no further evidentiary showing to demonstrate that a need for the proposed service exists. Nor will such an applicant be required to demonstrate that existing service to the area is inadequate. This rule shall apply regardless of whether any other utility holds a franchise for the currently unserved area or has authority to provide the service not currently being provided.

Reviewing its policy a year later, the PUC concluded that it had succeeded in furthering its goal of stimulating growth in local gas distribution:

> The policy explored in *Mid-Maine* has inspired lively competition for service authority franchises before this regulatory agency, demonstrating significant value in opening the door to competition for this service. The policy has encouraged aggressive and innovative proposals for development of service to previously unserved areas. We see no benefit in cutting off competition at this point and foreclosing further benefits that it may provide.[170]

The PUC has taken a similarly light-handed approach to regulation of gas prices. As is the case with electricity, distribution and the energy commodity have been unbundled, *i.e.*, customers of an LDC are free to purchase the commodity from competitive marketers.[171] Also like electricity, as a practical matter virtually all competitive marketers supply to industrial and commercial customers; most residentials buy their gas from their distributor, rather than directly from a marketer. The PUC does not, however, administer the competitive solicitation of gas for customers who do not exercise their right to choose. Instead, LDCs arrange the bundled service, but are encouraged by state law to offer non-traditional rate structures (*e.g.*, indexed rates, price caps) as well as traditional cost of service regulation.[172] LDCs are afforded flexibility to enter into rate agreements below price caps with little or no PUC scrutiny.[173]

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[169] Docket No. 96-465, Mid Maine Gas Utilities Inc., Request for Approval to Furnish Gas Service, March 7, 1997.

[170] Docket No. 97-795, Bangor Gas Company, L.L.C., Supplemental Order, Petition for Approval to Provide Gas Service in the Greater Bangor Area, February 17, 1999, p. 6.

[171] Docket No. 96-786, Central Maine Power Company Order Petition For Approval To Furnish Gas Service In And To Areas Not Currently Receiving Natural Gas, , August 17, 1998, pp. 25-26; see also 2001 PUC Annual Report, http://www.state me.us/mpuc/ annual%20report/2001-annual%20report.pdf., p. 41.

[172] 35-A M.R.S.A. § 4706 (1997).

[173] The State also supports the development of local gas distribution through the Clean Government Initiative, under which the State has set a goal of converting state facilities to natural gas "whenever feasible." http://www.state me.us/cleangovt/buildings htm.

The PUC reports that natural gas service in Maine has expanded from 19 municipalities in 1999 to 34 in 2003. Alternatives to the LDCs as suppliers of the gas commodity are expected to develop as gas markets in Massachusetts and New Hampshire evolve.[174]

d. Petroleum

Maine policy has long supported competitive markets for petroleum products (*e.g.*, home heating oil, gasoline, kerosene, industrial fuel oil). No state agency has authority to regulate such products. However, the Attorney General is charged with monitoring petroleum markets for market power under the Petroleum Market Share Act.[175] In addition, recognizing that petroleum products are important to the state's economy generally as well as to individual homeowners and businesses, the State Planning Office publishes surveys of winter fuel prices and inventories. In that connection the SPO sees its role as "work[ing] with policymakers to identify alternative energy resources, to examine infrastructure development issues, to understand and monitor the impact of market design on operational efficiency and resource development."[176] In addition, as discussed below, the Governor has certain powers to deal with petroleum supply in the event of an energy emergency.

e. Antitrust/Price Gouging

The antitrust and unfair trade practice laws are an important component of the state's policy supporting competitive markets for energy. These laws prohibit a wide variety of anti-competitive activities, and are subject to enforcement by the Office of the Attorney General as well as in suits by private parties.[177] The Attorney General reviews mergers for antitrust compliance under 10 M.R.S.A. § 1102-A. For example, the Attorney General recently used its authority to impose conditions on Dead River Oil's purchase of certain home heating assets of Irving Oil in Aroostook, Washington and Penobscot Counties. To prevent Dead River from exercising monopoly power in heating fuels, the conditions essentially required Dead River and Irving to facilitate market participation by third parties.[178]

Maine law also prohibits "profiteering" in "necessities of life", which are defined to include "gas and electricity for light, heat and power" and "fuels of all kinds."[179] "Profiteering" is defined as "exact[ing] or demand[ing] any unjust or unreasonable profit in the sale, exchange or handling of the said necessities, or unreasonably discriminate[ing] against any person in the sale of said necessities." This provision is seldom invoked, however, and the lack of an objective definition for the term "any unjust or unreasonable profit" would make it difficult to enforce.[180]

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[174] PUC Survey Form, Natural Gas.
[175] 10 M.R.S.A. § 1671 *et seq*.
[176] SPO Survey Form.
[177] See 10 M.R.S.A. § 1101 *et seq*.
[178] See http://www.state me.us/ag/press_release_pop_up.php?press_id=138, Feb. 20, 2003.
[179] See 10 M.R.S.A. § 1105.
[180] During the 1998 Ice Storm, the Attorney General threatened to invoke this statute against a small power producer that sought to charge high prices; however, the matter ultimately was resolved without litigation.

Perhaps as a reflection of the inherent vagueness of the price gouging statute, legislation was introduced in 2002 that would have defined price gouging as "a 15% increase in the price of a necessity, such as electricity, during an "abnormal market disruption," such as an ice storm or terrorist attack." Compromise language worked out

9. Energy Security

Legislation adopted in 2001 confers on the Governor broad powers in the event of an energy emergency, defined as "an actual or impending acute shortage of energy resources [that] threatens the health, safety or welfare of citizens of the State."[181] Upon making a declaration that an emergency exists, the Governor has the power to:

> (1) Establish and implement programs, controls, standards, priorities and quotas for the allocation, conservation and consumption of energy resources;
>
> (2) Regulate the hours and days during which nonresidential buildings may be open and the temperatures at which they may be maintained;
>
> (3) Regulate the use of gasoline and diesel-powered land vehicles, watercraft and aircraft;
>
> (4) After consulting, when appropriate, with the New England governors and upon the recommendations of the Maine Public Utilities Commission, regulate the generation, distribution and consumption of electricity;
>
> (5) Establish temporary state and local boards and agencies;
>
> (6) Establish and implement programs and agreements for the purposes of coordinating the emergency energy response of the State with those of the Federal Government and of other states and localities;
>
> (7) Temporarily suspend truck weight and size regulations, but not in conflict with federal regulations; and
>
> (8) Regulate the storage, distribution and consumption of home heating oil.

The law also imposes certain limits on these powers, most notably that the Governor may not unilaterally override regulations of the DEP or LURC. However, the Governor is authorized to convene the Board of Environmental Protection into special session, and the latter is empowered to grant temporary waivers (not to exceed 60 days) of air and water quality regulations to the extent needed to relieve the energy shortages, provided the waivers do not result in any environmental degradation "of a permanent or enduring nature."[182]

The provision in the 2001 legislation authorizing the governor to establish allocation programs serves a role similar to a 1989 law that authorized the SPO to establish a state petroleum set-aside program.[183] Under that law, the SPO can direct suppliers of petroleum products to set aside a percentage of their inventory, and may direct that it be used to supply customers experiencing hardships or dislocations due to the shortage. However, the SPO is only directed to proceed with the development of such rules if

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between the Attorney General and potentially affected parties was rejected, however, and no bill passed. See http://www.iepm.org/annual02.htm.

[181] PL 2001, c. 353, codified at 37-B M.R.S.A. § 742. The definition of an energy emergency is in § 742(2)(A).

[182] 37-B M.R.S.A. § 742(D)(2).

[183] 5 M.R.S.A. § 3307-D(1)(H).

(1) The Federal Government terminates, suspends or fails to implement a national set-aside program; and

(2) The Governor finds that a set-aside system is necessary to manage an energy shortage within the State which threatens the continuation of essential services and the needs of priority users. The Governor shall direct the State Planning Office to implement only that portion of the state set-aside program necessary to prevent and alleviate any energy hardship shortages.[184]

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The SPO has not adopted regulations to implement this program.

Energy emergency preparedness has also been a focus of the Energy Resources Council. In light of "world events and threats against US energy interests," the Council set a goal in 2002 of completing an updated Maine Energy Emergency Management Plan, in cooperation with the Maine Emergency Management Agency. [185] With financial support of the US Department of Energy, the SPO and MEMA, with the assistance of other agencies, drafted a proposed revised Energy Emergency Management Plan, and submitted it to the Council for comment. The Council reviewed the Plan in 2002, and designated the SPO as lead agency to pursue this project. The SPO undertook several additional measures in 2002, including the following:

- Pursued a federal funding opportunity for an energy emergency simulation exercise to test Maine's energy emergency preparedness and identify areas for improvement. (The funding was not received.)
- Identified questions and issues concerning the Governor's emergency powers.
- Decided to schedule, as a regular Council agenda item, time to share information on energy price or supply issues of potential concern.
- Decided to continue maintenance and improvement of the BundleMeUp public information website.[186]

The Council's plans for this project in 2003 consist of the following actions:

- Update the PSA developed under the original interagency BundleMeUp effort to include a message from the new Governor, to ensure preparedness in the event of a winter fuels shortage or price spike.
- Provide staff assistance to the Maine Emergency Management Agency in planning the anticipated energy emergency simulation.
- Participate in the energy emergency simulation exercise. Incorporate lessons learned from the energy emergency simulation into the draft Maine Emergency Management Plan.

[184] 5 M.R.S.A. § 3307-D(2)(B).
[185] Energy Resources Council 2002 Annual Report, p. 30.
[186] *Id.*, p. 31.

- Request that the Office of Attorney General review the Governor's emergency powers.[187]

The Attorney General provided the requested review of the Governor's emergency powers in a memorandum to the Council on March 24, 2003.
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[187] *Id.*, p. 31.

II RELATIONSHIPS BETWEEN ENERGY-RELATED POLICIES AND ENVIRONMENTAL, TRANSPORTATION AND ECONOMIC DEVELOPMENT POLICIES

A. Introduction

Identifying opportunities to improve state energy policy requires not only an understanding of existing policy programs (the subject of Section I), but also the relationships of those programs to one another and to other state policies with significant energy implications. Foremost among the latter are policies dealing with the environment, transportation and economic development. The challenge of effective policymaking is to achieve a sound balance among policies. This purpose of this Section is to identify some of the key synergies and tensions affecting that balance, and to provide balancing tools for future policymaking.

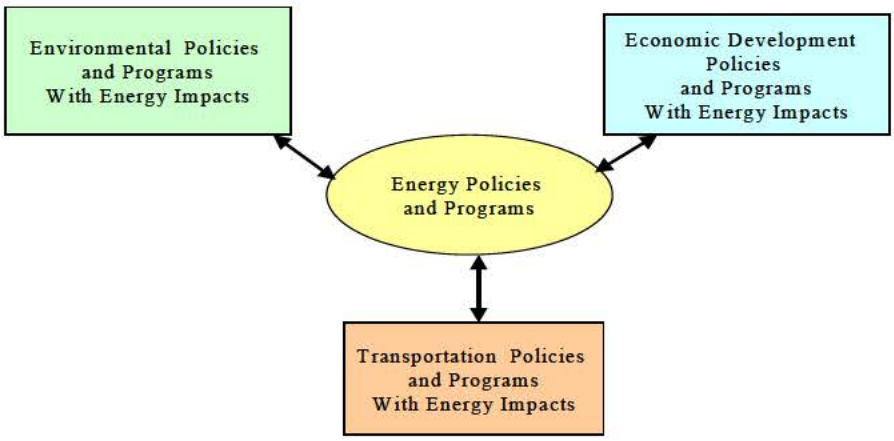
Past energy plans and reports discussed in Section I recognized the importance of balancing competing policies and priorities. For example, the 1992 Commission on Comprehensive Energy Planning stated in its Final Report that it **"**recognize[d] the need for well-balanced strategies that are coordinated within State, on an inter-agency basis, and the need to pursue energy related goals in the context of regional and federal policies."[188] Similarly, in its 1999 Energy Action Plan, the SPO noted "a great deal of controversy on how to achieve [energy goals], and how to balance objectives that are often in conflict with one another."[189] The SPO concluded that the goal of energy planning is

> to focus on the *process* of energy decision-making. This process must ensure that specific energy issues and resource options are discussed and decided upon in an open and balanced manner that weighs the positive and negative aspects of particular decisions against the State's broader policy goals and objectives.[190]

While relationships between policies can be examined from a variety of perspectives, the central focus of this Report is energy. Figure 1 depicts the position of energy policy relative to the other competing policies considered below.

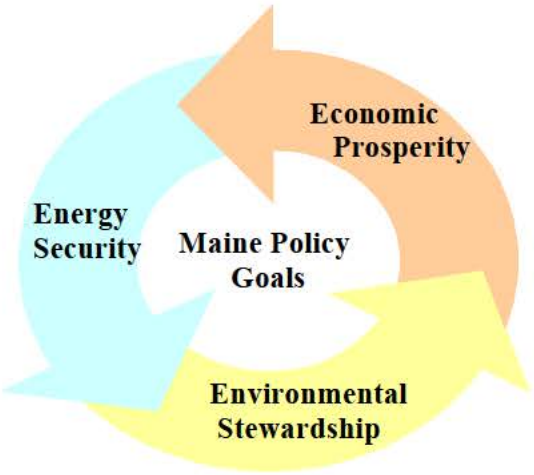
[188] 1992 Report, p. 1.
[189] 1999 Energy Action Plan, p. 1.
[190] Id., p. 2.

Figure 1. Identifying Synergies and Tensions
between energy-related policies and other state policies



It is within the context of balancing policy objectives that synergies and tensions occur. One may view the policies and programs related to energy as the tools by which policymakers achieve a balance among the State's broader goals. For illustrative purposes, those goals can be grouped into the categories of energy security, environmental stewardship and economic prosperity.

Figure 2. Tools for Achieving State Policy Goals



Tools for Achieving State Goals

- Competitive market policies
- Renewable energy policies
- Energy efficiency policies
- Energy affordability policies
- Energy security policies
- Environmental policies
- Transportation policies

The discussion of tensions and synergies that follows is intended to provide to assist the balancing process.

B. Discussion

A full discussion of the interrelationships between energy and energy-related policies would be voluminous. To contain the discussion within manageable limits, we approach the task in this section from two perspectives: first, we provide an overview of synergies and tensions between broad categories of policy objectives; and second, we identify (but do not discuss) synergies and tensions that exist between a list of more specific policy initiatives.

In addition, we have provided the SPO a workbook in diskette format that can be used for further analysis. The workbook, in EXCEL format, includes energy policy and program data submitted by several state agencies in response to a survey conducted as part of this study. This data has been entered into a worksheet for each agency, and is summarized in Appendix F . Within the agency spreadsheet, the primary objective of the program has been identified, along with the expected impact of the program on related policy objectives. A Program Inventory page then aggregates all the data from the agency worksheets into a single summary page that can be sorted and analyzed to provide useful information to policymakers. Periodic updates to the Energy Resource Council of each agency's worksheet will allow this tool to remain up-to-date with very little additional effort. The workbook inventory and analysis tool can be made available to every agency in the state by attaching the file to an email.

1. Synergies and Tensions between Broad Categories of Policy Objectives

In this section, we discuss the general synergies between energy policies and policies relating to the environment, economic development and transportation. At this high level of analysis, it is also useful to differentiate between energy policies that focus on security, and those that relate to cost.

More specifically, the five categories of policy discussed are:

Energy Security – refers to policies that relate to the adequacy and reliability of energy delivery infrastructure, and the adequacy and diversity of energy supply. This can include renewable sources, State self-sufficiency, energy mix, market functions and certain efficiency policies.

Energy Cost – refers to policies that relate to direct energy prices ($ per BTU) and overall energy cost (total bill). This can include cost allocation/rate design, low-income initiatives, efficiency programs used to offset consumption or production, externalities when reasonably quantifiable, and alternative energy sources.

Environmental Impact – refers to policies related to air, land, water and health impacts that result from energy production, transportation, and use. This can include efficiency programs used to reduce the amount of energy consumed to reduce environmental impacts.

Economic Impact – refers to how energy policy will affect the economy in terms of jobs, competitiveness and economic health in the state.

Transportation – refers to transportation policies that affect energy supply, use, availability or cost. While not directly an "energy policy category", transportation has been included in the scope of this report due to its importance and impact on total energy consumption and the environmental impacts of combustion engines.

It is important to note that a particular policy or program could be used to satisfy one or more one of these high level goals. As an example, electric energy efficiency programs could be implemented to:

- Reduce load in a congested delivery area as a means of improving the energy security of the grid, or
- Reduce load as a cost effective alternative to consumption for an industrial customer or school system, resulting in improved economic prosperity for that customer, or
- Reduce load to minimize the environmental impact from generation sources**.**

The multi-category impact of certain policies may result in finding them associated with more than one category, and the original intent of the program must be examined to determine its primary objective.

The table below shows the usual relationship among the five policy categories, given the preferred outcomes for the State - a high level of energy security, relatively low energy costs, a high quality environment, a robust, growing economy and a safe and efficient transportation infrastructure. When it is not clear whether there will generally be a tension or a synergy between two categories, the term "Impact" is used to recognize that a relationship exists, and careful attention is needed to produce the result intended by the policy.

Primary Policy Objective	Related Policy or Program Impacts				
	SECURITY (Highly Secure)	COST (Low prices and total cost)	ENVIRONMENT (High quality air, water, land)	ECONOMIC (Robust growing economy)	TRANSPORTATION (Adequate, safe and efficient systems)
SECURITY		Tension	Impact	Impact	Synergy
COST	Tension		Tension	Synergy	Tension
ENVIRONMENT	Impact	Tension		Impact	Impact
ECONOMIC	Impact	Synergy	Impact		Synergy
TRANSPORTATION	Synergy	Tension	Impact	Synergy	

The reasoning behind the relationships identified in the table is explained below. The reasoning is representative of the tensions and synergies that will usually be encountered, but is not meant to be an exhaustive list of every issue or concern. While these relationships generally hold true, there will be circumstances when certain factors result in a different outcome. However, the processes employed by lawmakers and regulators to develop policies and programs are designed to ensure full public input and comment so that all pertinent facts are on the table prior to making final decisions. Inclusion of stakeholders and outside experts in the policy making process continues to offer the best assurance that no unintended consequence will result from the introduction of a new policy.

To provide a "real-world" perspective and a more quantifiable context to the relationships described below, Appendix E sets forth excerpts from the Ninth Report of The Maine Economic Growth Council, 2003 Measures of Growth on the topics of energy, environment, economic development and transportation.

i. Energy Security - Policies that are intended to increase the reliability of the energy delivery infrastructure, the diversity of the energy mix, or reduce reliance on non-indigenous energy sources will generally result in the following relationships:

- **Energy Cost [Tension]** – An upward tension on costs, at least in the short term. Security is often synonymous with risk management, and managing risks generally has a cost premium associated with the choice to be made. Near term cost premiums may provide longer-term price stability, avoidance of supply shortages, and lower overall costs than an alternative strategy.

- **Environmental Impact [Impact]** – To the extent that energy infrastructure and diversity concerns are addressed by adding new transmission lines, substations, pipelines or indigenous energy production facilities, a tension will exist associated with land, water and air quality. On the other hand, renewable energy sources used to diversify the energy mix, or alternative transportation systems such as rail or mass transit options, could reduce the environmental impact of fossil fuels and would support environmental objectives.

- **Economic Impact [Impact]**– The upward pressure on the cost of energy associated with Energy Security will also create a tension with economic development in the area of cost competitiveness. The key is the position of Maine's energy prices relative to other states that compete with Maine for industry and jobs. However, when security policies favor the development of indigenous energy resources or improved energy infrastructure, including transportation systems and alternatives, the effect on the state economy will be positive.

- **Transportation [Synergy]** – The security objective to reduce the State's reliance on fossil fuels results in synergy with transportation policies of increasing the efficiency of transportation in Maine through alternative modes of transportation for passengers and freight, increasing the per unit efficiency of vehicles, purchases of hybrid vehicles, and improving the efficiency of vehicle movement (turnpike widening, bypasses for congested municipal roads).

ii. Energy Cost - Policies that are intended to keep the overall cost of energy low will generally result in the following relationships:

- **Energy Security [Tension]** - A tension exists to consider accepting risks in energy security to keep costs low and competitive within the region.

- **Environmental Impact [Tension] –** A tension exists to consider lower standards of environmental quality due to the cost of achieving a high level of quality. The cost associated with emission standards, permitting and licensing of energy facilities and infrastructure either directly or indirectly raises the cost of energy, at least in the short term.

- **Economic Impact [Synergy]** – Low energy costs enables money to be used for other activities such as investments in production or other goods and services.

- **Transportation [Tension]** –While low energy costs reduce the cost of transportation, making the movement of people and goods more affordable, a tension exists due to the increased flow of traffic, lower cost to live away from service centers (sprawl), reduced incentives to own fuel-efficient vehicles, and reduced incentives to pursue investments in rail and mass transit alternatives.

iii. Environmental Impact - Policies that are intended to minimize the environmental impact to air, land, water and health that result from energy production, transportation, and use will generally result in the following relationships:

- **Energy Security [Impact] -** A tension exists between air and water quality standards and land use regulations and the need for adequate, low cost energy production facilities and infrastructure. On the other hand, environmental objectives are in line with energy security polices that favor the use of renewable energy sources to diversify the energy mix, the development of alternative transportation systems such as rail or mass transit options, and implementation of efficiency programs designed to reduce dependence on fossil fuels.

- **Energy Cost [Tension] –** A tension exists between environmental quality and the costs that environmental regulations place on energy projects. The cost associated with emission standards, permitting and licensing of energy facilities and infrastructure either directly or indirectly raises the cost of energy, at least in the short term.

- **Economic Impact [Impact] –** The quality of Maine's environment directly or indirectly affects its economy. Tourism, natural resource based industries like pulp and paper, and marine resources all benefit from the quality of Maine's air, water and land resources. The tension between environmental objectives and the economy occurs, however, when the cost of doing business in Maine is adversely impacted relative to other states.

- **Transportation [Impact] –** Clean air policies support the efficient movement of goods and people. Environmental policies have a synergy with encouraging rail development, decreased single-occupancy vehicle use, higher miles-per-gallon standards, alternate fuels and an infrastructure that allow goods and people to move efficiently throughout the state. The tension arises when transportation efficiency projects, such as a bypass of a congested municipality, result in easier access to more remote areas of the State, or sprawl. There may also be tension between the policy's intent and the reality occurring in the marketplace, as is the case with declining use of rail versus truck, and the continued decline of competing rail providers.

iv. Economic Impact - Policies that are intended to improve the economy in terms of jobs, competitiveness and economic health in the state will generally result in the following relationships:

- **Energy security [Impact] –** The level of Maine's energy prices relative to other states that compete with Maine for industry and jobs is an important factor for many companies. The fact that there is an upward pressure on the cost of energy associated with Energy Security policies creates a tension with economic development in the area of cost competitiveness. However, economic development initiatives associated with energy-related R&D for Maine businesses or through the University system support the development of indigenous energy resources, alternative fuels, and improved energy infrastructure, including transportation systems and alternatives.

- **Energy cost [Synergy]** – Maine businesses and consumers benefit from low energy costs that enable money to be used for other activities, such as investments in production or other goods and services.

- **Environmental Impact [Impact] –** Increased economic activity will usually result in increase vehicle miles, production and consumption of energy, that create a tension with the quality of Maine's environment. Conversely, industries such as tourism, natural resource based industries like bottled water, pulp and paper and marine resources all benefit from the quality of Maine's air, water and land resources.

- **Transportation [Synergy] –** Maine's economy is highly dependent on the efficient movement of goods and people throughout the State. Tourists do not want to wait hours at tolls or be stuck in traffic while visiting Maine; trucks that deliver 90% of the freight in Maine can do so at a lower overall cost if they can move efficiently; and alternatives such as rail, water and air transit, provide cost effective delivery and export options for Maine's industries.

v. Transportation – Policies related to transportation that affect energy supply, use, availability or cost.

- **Energy security [Synergy]** – Transportation policies intended to increase the efficiency of transportation in Maine through alternative modes of transportation for passengers and freight, increasing the per unit efficiency of vehicles, purchasing hybrid vehicles, and improving the efficiency of vehicle movement (turnpike widening, bypasses for congested municipal roads) support the energy security objective to

reduce the State's reliance on fossil fuels.

- **Energy cost [Tension]** – A tension exists between transportation objectives and low energy costs due to the increased flow of traffic, lower cost to live away from service centers (sprawl), reduced incentives to own fuel-efficient vehicles, and reduced incentives to pursue investments in rail and mass transit alternatives.

- **Environmental impact [Impact] –** Transportation policies that encourage rail, water and air transit development; decreased single-occupancy vehicle use; higher miles-per-gallon standards; and cleaner/alternative fuels and an infrastructure that allow goods and people to move efficiently throughout the State, all support environmental policies.
  The tension arises when transportation efficiency projects, such as a bypass of a congested municipality, result in easier access to more remote areas of the State, or sprawl.

- **Economic impact [Synergy] –** Safe and efficient transportation facilities are essential to the economic growth of the State. Maine's economy is highly dependent upon the efficient movement of goods and people throughout the State. Transportation policies are designed to provide facilities to accomplish this goal.

2. Synergies and Tensions between Specific Programs

At the program level, the relationships described at the higher level generally hold true. Due to the fact that there are nearly 100 specific programs and initiatives that impact broader goals in some way, the data has been entered into a matrix to help manage the information. Information from each state agency that is involved with energy policies or program administration was gathered, either from new survey information provided or from information in the 2003 Directory of State Energy Programs and Resources. The purpose was three-fold:

1. To organize the entire inventory of programs related to energy
2. To provide a mechanism that allows the data to be sorted in a manner that will be useful to future energy policy discussions.
3. To identify the impact of each program on several categories of interest to policymakers, including energy, economic development, environment, leadership by state government, public education and sprawl.

To provide additional detail for policymakers, the energy category has been further split into six categories that represent the primary purpose of most programs and initiatives. These energy sub-categories include:

Energy security [E-SEC] –policies and programs that relate to ensuring the adequacy and reliability of energy delivery infrastructure, and the adequacy and diversity of energy supply.

Renewable energy [E-RENEW] –policies and programs that encourage the appropriate use of renewable energy sources.

Energy cost [E-PRICE] – policies and programs that relate to keeping the energy price ($ per BTU) and overall energy cost (total bill) at a reasonably low level.

Low income [E-L/I] – policies and programs that assist low-income customers obtain and use energy

Energy efficiency [E-EFF] – policies and programs that promote the efficient use of energy.

Competitive markets [E-COMP] – policies and programs that promote the development of efficient, competitive energy markets.

The matrix that results from compiling program data from state agencies appears complex because it captures a great deal of information. The benefit of managing the data in a spreadsheet is the ability to sort it quickly into more manageable and meaningful sets of information. Figure 3 is an overview of the information available on each program. A primary program objective is selected from the list on the y-axis, and each of the related policy impacts that can be attributed to the program are identified by category along the x-axis. The data can be sorted by agency, program description, primary objective or any of the related policy impacts. This will allow the user to quickly sort the data to see all programs that relate in some way to Energy Efficiency, as an example.

Figure 3. Overview of the Program Inventory Matrix

Primary Program Objective	Related Policy or Program Impacts S = Synergy T = Tension I = Impact										
	E-SEC	E-RENEW	E-PRICE	E-L/I	E-EFF	E-COMP	TRAN	EcDev	ENV	EDUCATE	SPRAWL
E-SEC											
E-RENEW											
E-PRICE											
E-L/I											
E-EFF											
E-COMP											
TRAN											
EcDev											
ENV											
LEGIS	Legislative activities set or direct State policy.										
EDUCATE	Educational efforts support policy objectives and could be coordinated for maximum effectiveness.										

A spreadsheet was developed for each agency that is involved with energy programs. The best data available has been entered into the table, with the intention of verifying and updating the information directly with each agency as time allows. While it is possible to identify a relationship between many of the programs and virtually all of the related policies, only the most direct relationships have been entered.

All updates and changes to program data must be made on the agency worksheets, not on the Analysis page or Program Inventory Page. If an individual proficient with EXCEL workbooks is assigned responsibility to maintain the database for the Council, it should prove to be a useful resource for future work.

A partial snapshot of the Analysis page is shown below, listing by agency all programs and their primary objective. The full spreadsheet provides additional details about the relationships each program or initiative has with related state policies, and is reproduced as

Appendix F in the electronic version of the Report, published on the State Planning Office website.

Program Number	Agency	Program/Initiative	Primary Objective
AG01	AG	Market Monitoring and Anti-Trust	OTHER
AG02	AG	Mediation Services	OTHER
DAFS01	DAFS	Clean Government Program(2)	ENVIRON
DAFS02	DAFS	Recycling State Waste	ENVIRON
DAFS03	DAFS	State Building Energy Use	E-EFF
DAFS04	DAFS	Energy Savings Pilot Program	E-EFF
DAFS05	DAFS	State Purchasing	E-EFF
DAFS06	DAFS	State Vehicles	E-EFF
DECD01	DECD	Small Business Energy Audit Program	E-EFF
DECD02	DECD	Energy Conservation Loan Program	E-EFF
DECD03	DECD	Building Performance Standards (see DECD for list)	E-EFF
DECD04	DECD	State Energy Program Grants	E-EFF
DECD05	DECD	Energy Related Publications(2)	E-EFF
DEP01	DEP	Clean Government Program (1)	ENVIRON
DEP02	DEP	Climate Action	ENVIRON
DEP03	DEP	Licensing, Permitting, and Siting Processes Applicable to Energy Facilities	ENVIRON
DEP04	DEP	Smart Production/STEP-UP	ENVIRON
DEP05	DEP	Mobile Source Initiative	ENVIRON
DEP06	DEP	Pollution Prevention Program	ENVIRON
DEP07	DEP	Small Business Technical Assistance Program	ENVIRON
DEP08	DEP	Community Sustainability Project	ENVIRON
DHS01	DHS	Emergency Assistance Program	E-L/I
DHS02	DHS	General Assistance Program	E-L/I
DHS03	DHS	Heating Utility and Non Heat Utility Allowance	E-L/I
DOT01	DOT	Explore Maine	TRAN
DOT02	DOT	Congestion Mitigation and (CMAQ) Funds	TRAN
DOT03	DOT	Ridesharing and Vanpooling	TRAN
DOT04	DOT	Park and Ride	TRAN
DOT05	DOT	GO Maine	TRAN
DOT06	DOT	Alternative Transit and Fuels	ENVIRON
DOT07	DOT	Alternative Transportation Infrastructure Development	TRAN
DOT08	DOT	Port System Administration	E-SEC
DOT09	DOT	Motor Carrier Rules	TRAN
DOT10	DOT	Fleet Energy Efficiency	ENVIRON
DOT11	DOT	Intelligent Transportation Systems	TRAN
DOT12	DOT	LED Traffic Light Program	E-EFF
DOT13	DOT	Transportation Improvement Delivery System	TRAN
DOT14	DOT	Transportation Enhancements	TRAN
DOT15	DOT	Motor Transport Services Efforts	TRAN
DOT16	DOT	Fleet Energy Consumption(Idling)	ENVIRON
FAME01	FAME	Electric Rate Stabilization Program (SUNSET 1999)	E-PRICE
FAME02	FAME	Underground Oil Storage Facility or Tank Replacement Program	ENVIRON
FAME03	FAME	Clean Fuel Vehicle Program (Not currently funded)	ENVIRON
FAME04	FAME	High Pollution Vehicle Retirement Pilot Program (frozen, lack of funds)	ENVIRON
FAME05	FAME	Waste Oil Furnace Loan Program (frozen, lack of funds)	E-SEC

Program Number	Agency	Program/Initiative	Primary Objective
FAME06	FAME	Agricultural Products Utilization Commission	E-SEC
FAME07	FAME	Northern Maine Transmission Corporation	E-SEC
LEGIS01	LEGIS	Joint Standing Committee on Appropriations & Financial Affairs	LEGIS
LEGIS02	LEGIS	Joint Standing Committee on Business and Economic Development	LEGIS
LEGIS03	LEGIS	Joint Standing Committee on Natural Resources	LEGIS
LEGIS04	LEGIS	Joint Standing Committee on Transportation	LEGIS
LEGIS05	LEGIS	Joint Standing Committee on Utilities and Energy	LEGIS
MEMA01	MEMA	Emergency Management	OTHER
MMBB01	MMBB	Energy Efficiency Partners Program (not currently running)	E-EFF
MMBB02	MMBB	Maine Health and Higher Education Facilities Authority	E-PRICE
MMBB03	MMBB	Maine Power Options	E-PRICE
MSHA01	MSHA	Low Income Home Energy Assistance Program (LIHEAP)	E-L/I
MSHA02	MSHA	Low Income Assistance Plan (LIAP)	E-L/I
MSHA03	MSHA	Residential Energy Assistance Challenge Program (REACH)	E-EFF
MSHA04	MSHA	Bundle Me Up	E-EFF
MSHA05	MSHA	Weatherization Program	E-EFF
MSHA06	MSHA	Central Heating Improvement Program (CHIP)	E-L/I
MSHA07	MSHA	Low Income Refrigerator Replacement Program	E-EFF
MSHA08	MSHA	Home Rehabilitation	E-L/I
MSHA09	MSHA	Preservation Financng Program	E-L/I
MSHA10	MSHA	Rental Loan Program	E-EFF
MSHA11	MSHA	Community Action Agencies	E-L/I
MSP01	MSP	Transportation Waivers	OTHER
OOGOV01	OOGOV	Emergency Powers	OTHER
OOGOV02	OOGOV	Regional Energy Policy	OTHER
OOGOV03	OOGOV	Energy Resources Council	OTHER
OPA01	OPA	Advocacy for Retail Utility Consumers	OTHER
OPA02	OPA	Advocacy in Wholesale Markets	OTHER
OPA03	OPA	Energy Related Publications (1)	E-COMP
PUC02	PUC	Consumer Assistance	OTHER
PUC03	PUC	Electric Energy Conservation Program (Efficiency Maine Portfolio)	E-EFF
PUC04	PUC	Energy Related Publications(3)	EDUCATE
PUC05	PUC	Low Income Assistance Plan	E-L/I
PUC07	PUC	Electric Restructuring	E-COMP
PUC08	PUC	Electricity Generation from Renewables	E-RENEW
PUC09	PUC	T&D Utility rates and rate design	E-PRICE
PUC10	PUC	Transmission oversight and approval	E-SEC
PUC11	PUC	Monitor ISO-NE and Regional Electricity Markets	E-COMP
PUC12	PUC	Natural gas LDC economic regulation	E-COMP
PUC13	PUC	Electric Utility Line Extension Policy	E-PRICE
SPO01	SPO	Energy Planning and Policy Development	E-SEC
SPO02	SPO	Emergency Petroleum Set Aside	OTHER
SPO03	SPO	Hydropower Relicensing	E-SEC
SPO04	SPO	Winter Heating Fuels Survey and Inventory	E-SEC
SPO05	SPO	Renewable Resource Fund (MTI Administers)	E-RENEW

III. MAINE ENERGY RESOURCES AND ENERGY USE

A. Introduction

This Section of the Report presents information on Maine's energy supply and use, by fuel types and sectors, as well as trends in prices and energy efficiency. While assembling comprehensive data remains a challenge, sufficient data is available to permit some observations that may be useful in evaluating Maine's energy policy and opportunities for improvement.

First, petroleum accounted for nearly half of the State's energy use in 2000, and most of that is for vehicle fuel. The use of petroleum increased significantly over the 1980s and 1990s, notwithstanding a modest increase in average vehicle fuel efficiency (most of which occurred in the 1980s). Some of this is explained by population growth, but the lion's share relates to increased vehicle miles traveled per person. The reasons for the latter are complex, but certainly sprawl—which causes people to commute longer distances—is a contributing factor. A state energy policy which seeks to tackle overall energy use, and reliance on imported oil in particular, must confront the role of transportation.

Unfortunately, however, transportation may also be the most difficult area in which to effect change. Mass transit alternatives are expensive, and have limited potential in areas of Maine where population density is low. Vehicle efficiency standards are largely the purview of the federal government, although there may be options for Maine to have some effect on the efficiency of vehicles purchased here. Disincentives for residents to buy highly fuel efficient vehicles are compounded by generally stable or declining real prices for gasoline as experienced over the past two decades, and the higher upfront and life-cycle costs of available high efficiency vehicles.

Trends in electricity also present an interesting picture. On the supply side, natural gas has quite suddenly become a major fuel source for generation, with the construction of two pipelines from Canada in the late 1990s. The rise of gas-fired generation is also causing Maine to resume a role it played in the 1980s as a net supplier of electricity to the region. In addition, distributed generation is expanding, although its overall role remains small.

As to electric demand, there have been efficiency gains due to considerable ratepayer funded investments over the past two decades. However, in most cases those gains have been masked by other major developments. The decline in electric space heat in the 1980s, as oil and other fuels became more competitive, was probably the major driver in a roughly 10 percent drop in per capita electricity consumption over the period. Other trends have had conflicting effects: appliances have become more efficient, but consumers are using more of them—especially computers. Electricity prices are also

important—they rose in the late 1980s, driven in large part by purchases of non-utility power, but have been declining since then. They are now lower, in real terms, than in 1980.

Renewables continue to be important as a percentage of Maine's installed generation capacity. Renewable generation in Maine is the highest of any State, but has leveled off in recent years. Reduced market prices for power are a large contributing factor, as is the availability of natural gas since the construction of the new pipelines. Wind generation is becoming more cost competitive, and is likely to account for the most significant additions to renewable electricity supplies.

Renewable fuels for transportation and heating are attracting more attention, but remain a *de minimis* component of the overall mix. Cost remains a significant barrier, with premiums of about 30 percent. Pilot programs are exploring increased opportunities for biofuel usage, and may help foster the infrastructure growth needed to make biofuels more available.

Supporting and more detailed data and source references for the figures and analysis in this Section are provided in Appendix I. Tables are provided in EXCEL format to allow for easy use by the reader.

B. Maine Energy Resources – Overview

1. Energy Consumption

Figure III.B.1.a.shows the overall energy mix in 2000 for Maine and the U.S. Maine's mix had some unique attributes:

- Renewables, in the form of hydroelectric and biomass, supplied 40 percent of the energy consumed, considerably higher than the national average of 6 percent.
- The dependence on coal at less than 2 percent was much lower than the national average of 23 percent.
- There was no nuclear power production in Maine, although some of the interstate flow of electricity is from nuclear power plants.
- Natural gas consumption was relatively low at less than 2 percent, compared to 23 percent nationwide. That figure has since risen, with the operation of several new gas-fired generation plants, and increased local gas distribution.
- Petroleum comprised 45 percent of Maine's energy mix, much of that for transportation.

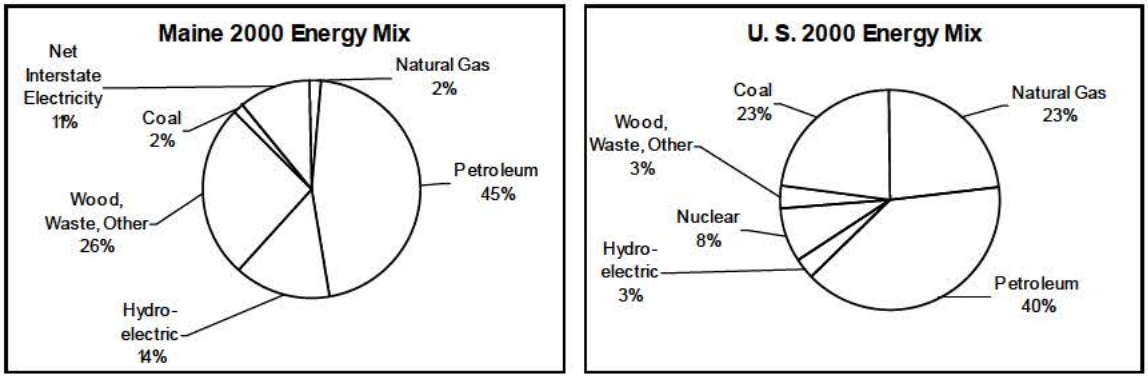


Figure III.B.1.a

Figure III.B.1.b shows energy use trends since 1980.

- Maine changed from being an annual net exporter of electricity during the 1980s, to a net importer in the 1990s, to once again becoming a net exporter over the past few years.
  - Reasons for this change in the 1990s included the privatization of electric generating plants, the shutdown in 1997 of Maine's only nuclear plant (Maine Yankee), the addition of gas fired generating plants throughout New England, and changing fuel prices.
  - The construction of gas plants in Maine over the past three years has reversed this trend, although transmission constraints remain a barrier.
- Petroleum use has fluctuated year-to-year, with consumption in both the transportation and electricity sectors showing sensitivity to fuel price variation.
  - Petroleum consumption in the late 1990s was about 25 percent higher than in the early 1980s. Sprawl, larger vehicles, and increased oil heat penetration all contribute to this trend.
- Wood and waste energy saw steady growth from the early 1980s until the mid 1990s, but has been level since then. The 2000 wood and waste contributions were about 50 percent higher than in 1980.
- Hydroelectric production varies mostly with precipitation. Production in the late 1990s was about the same as in the early 1980s.
- While still a relatively small part of the total energy mix, natural gas use grew over 400 percent from 1980 to 2000. New pipelines from Canada and the formation of a natural gas subsidiary by Central Maine Power Company were primarily responsible for this increase. Although not shown in this figure, natural gas consumption in 2001 was more than double that in 2000.

• Coal continues to be a small contributor to the energy mix at less than 2 percent.

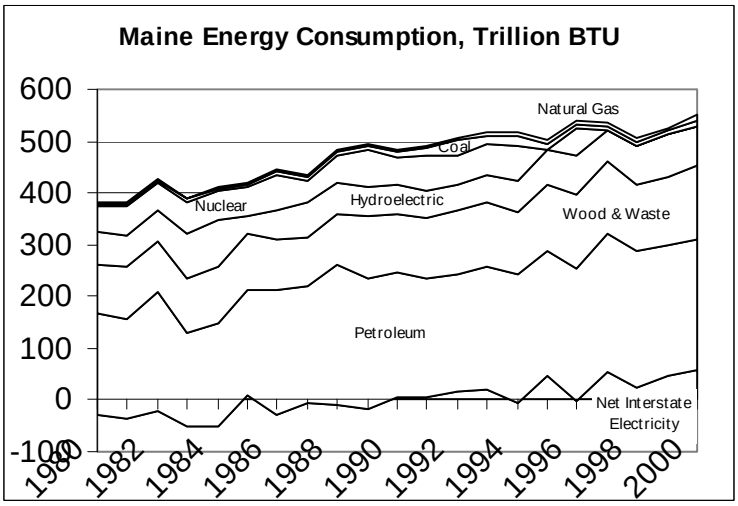


Figure III.B.1.b

Figure III.B.1.c shows energy use trends by sectors since 1980. Each of these sectors is discussed in more detail below. Losses in the production and delivery of electricity are included in this sector graph, but are excluded from the more detailed discussions.

- Industrial energy had somewhat steady growth from 1980 through the mid 1990s, but has leveled off, probably due to a slowdown in the paper industry. Energy use in 2000 was 64 percent higher than in 1980.
- Transportation energy use increased by 46 percent from 1980 to 2000.
- Residential energy use varied widely, probably due to high sensitivity to weather, the economy, and fuel prices. The use in 2000 was 9 percent higher than in 1980.
- Commercial energy use increased 62 percent from 1980 to 2000, most of that in the 1980s.

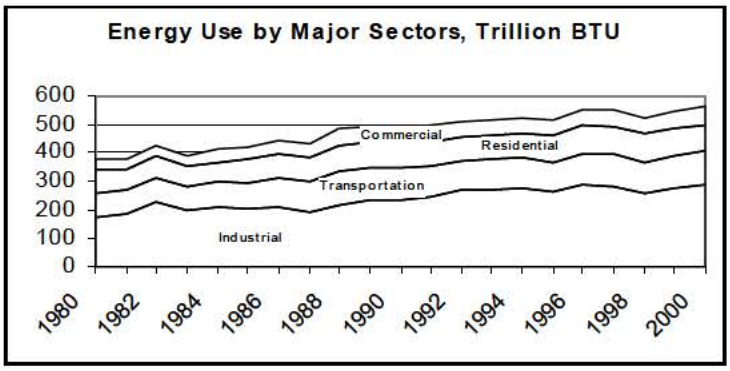


Figure III.B.1.c

Figure III.B.1.d shows the major sources of energy in each sector in 2000. The primary energy sources vary significantly from sector to sector.

- The transportation sector is completely dependent on petroleum.
- The industrial sector's primary energy sources are wood and waste.
- The commercial sector uses more electricity than any other energy source.
- The residential sector is highly dependent on both petroleum and electricity.

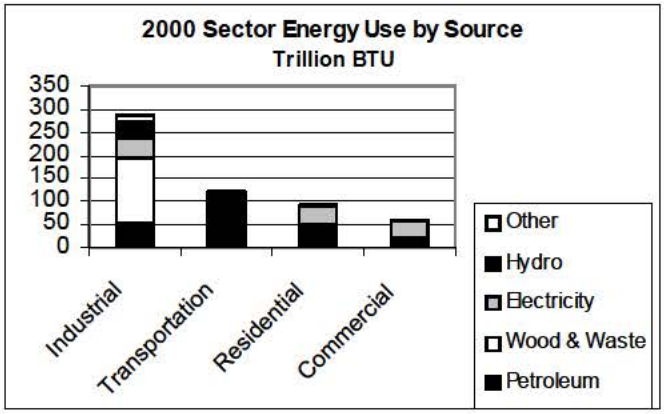


Figure III.B.1.d

2. Energy Cost

Figure III.B.2.a shows the overall cost of energy in Maine, several other states, and the U.S.

- The cost is about equal to the national average, and lower than in nearby states.
- The cost is higher than in some other states of comparable energy consumption.

The prices for the end-users of electricity and motor gasoline are shown in the transportation and electricity sector discussions that follow.

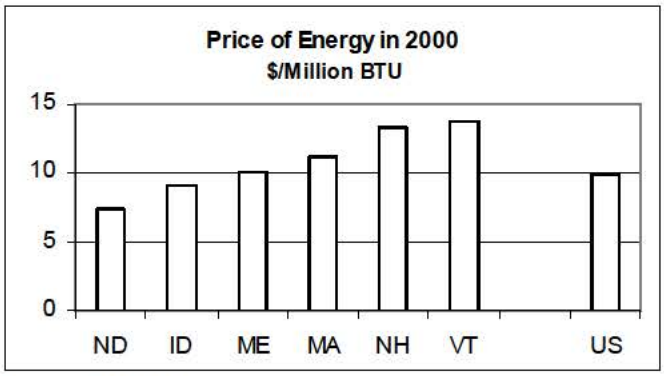


Figure III.B.2.a

In addition to the monetary cost, there is an environmental cost, or impact, to energy consumption. Figure III.B.2.b shows that impact in terms of the contributions to carbon dioxide emissions from various energy uses.

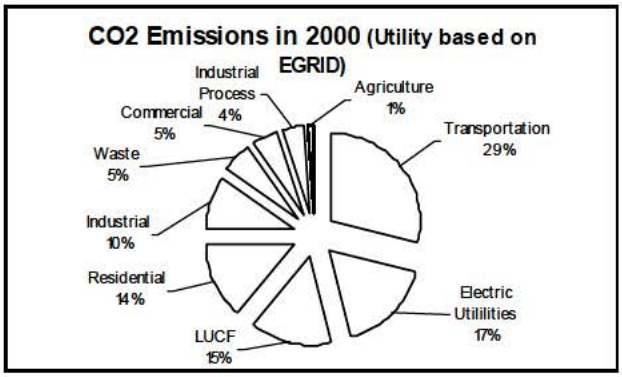


Figure III.B.2.b

3. Uses of Petroleum

Maine's high dependence on petroleum is largely driven by transportation, but other sectors are dependent on it also, as shown in Figure III.B.3.

- The commercial and residential sectors combined use 30 percent of the petroleum consumed in Maine. Most of this use is for heating and cooking.
- Process energy and electricity production are included in the industrial sector's use.

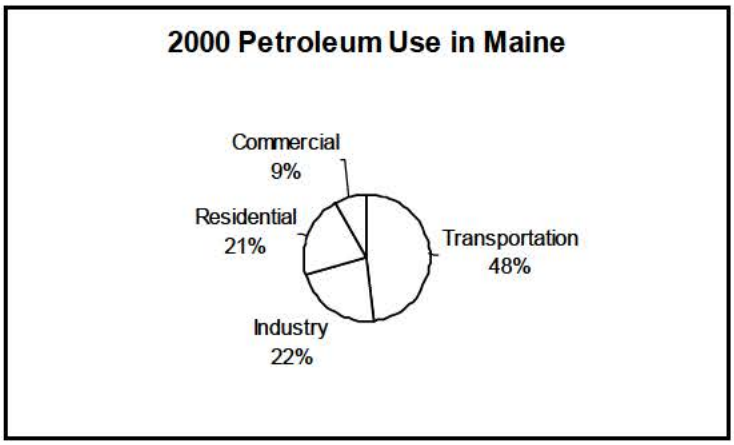


Figure III.B.3

C. Maine Energy Use by Type and Sector

1. Residential Sector Energy Use in Maine

Figure III.C.1.a shows energy use trends in the residential sector. Losses in the production and delivery of electricity are excluded from this figure. Residential energy use in Maine increased about 18 percent from 1980 to 2000. Most of this increase has been in oil, which continues to be the predominant heating fuel.

- 14 percent of the increase is due to population, which grew from 1.124 million in 1980 to 1.278 million in 2000.
- The remaining 4 percent reflects increased use per person.
- The use of wood as a heating fuel was only about half as much in 2000 as it was in the early 1980s, a period with higher oil prices. The impact of those higher prices on oil consumption in the mid 1980s shows dramatically.

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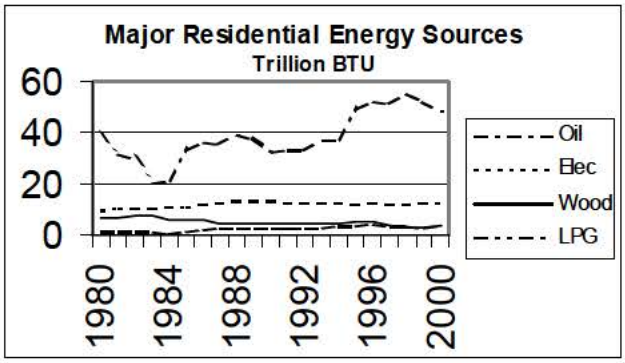


Figure III.C.1.a

Figure III.C.1.b shows the cost of heating fuels in Maine on a dollars-per-useful-million BTU basis.

- Wood has been somewhat less expensive than other fuels, but for many it is considered a less convenient fuel.
- Oil and natural gas have been competitive in price, but oil has had better availability.
- LPG has shown a price premium compared to oil.
- Electricity has been about three times as expensive as most other fuels.

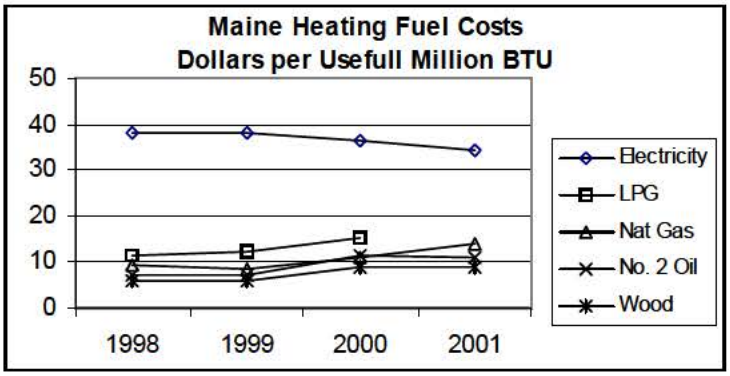


Figure III.C.1.b

2. Commercial Sector Energy Use

The commercial sector includes schools, hospitals, retail establishments, office buildings, and other businesses. Figure III.C.2.a shows energy use trends in this sector. Losses in the production and delivery of electricity are excluded from this figure.

- This sector has a heavy reliance on petroleum and electricity. The use of petroleum, primarily heating fuel, peaked around 1990, as the real price of oil dropped from what it was in the early 1980s.
- Total energy use was only 1 percent higher in 2000 than in 1990, with an actual decrease of 14 percent in petroleum usage. Increases in the use of electricity and natural gas offset the decrease in petroleum use.
- Natural gas use, while still a relatively low component of the total energy mix, tripled from 1980 to 2000.
- Given the growth in Maine's economy in the 1990s, the lack of a significant increase in commercial energy use during that decade was probably due to efficiency improvements.
- Despite little change in total commercial energy use in the 1990s, the use in 2000 was still 62 percent higher than in 1980.

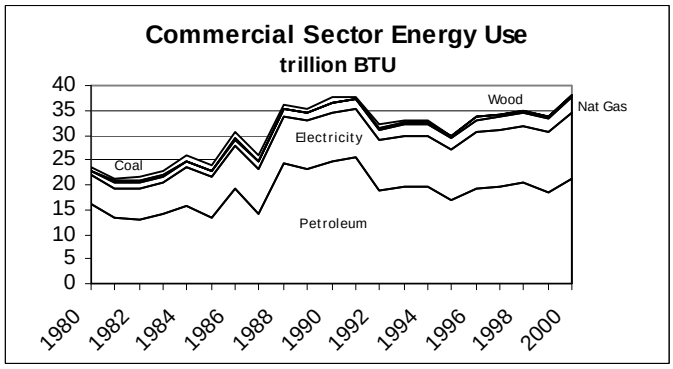


Figure III.C.2.a

Figure III.C.2.b gives a snapshot of commercial energy use in 2000. Coal is excluded from the chart because it contributed less than one percent to the mix.

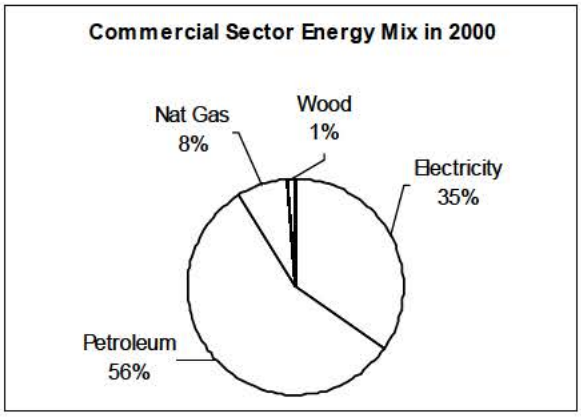


Figure III.C.2.b

State Government Energy Use

- Maine state government owns between 3000 and 4000 buildings, with about 1000 of those greater in area than 10,000 square feet.
- For the year ending April 2003, the total electricity use by the State of Maine accounts at Central Maine Power Company and Bangor Hydro Electric Company was 127,284 MWh. This is equivalent to about 3 percent of the total commercial sector electricity use in 2000.
- The table below shows the wide variation in building energy costs for a few of the State's facilities.
    - These variations are due in part to different use patterns. For instance, the Maine Criminal Justice Academy is used less than the other facilities.

	Fuel Oil Cost	Electricity Cost
	$/square foot	$/square foot
East Campus (AMHI)	$ 0.45	$ 0.84
Maine Criminal Justice Academy	$ 0.50	$ 0.46
West Campus	$ 0.52	$ 1.02

Table III.C.2 Energy Costs at Selected State Facilities

3. Industrial Sector Energy Use

Figure III.C.3 shows industrial sector energy use trends. Losses in the production and delivery of electricity are excluded from this figure.

- Wood and waste are the predominant energy source, making up 53 percent of total energy used in 2000.
    - Wood and waste increased by 60 percent from 1980 to 2000.
    - The pulp and paper industry is the predominant user of this energy. Hence, fluctuations in paper industry markets have a big impact on industrial energy use in Maine.
- Petroleum use has fluctuated since 1980, but has been relatively constant since the late 1980s, a period with reasonably stable petroleum prices.
- Hydroelectric production was flat through the 1980s, but about doubled around 1989 and 1990, and increased by another 90 percent in 1999.
    - The earlier increase was from increased production, while the 1999 increase was primarily due to generating units being sold by the utility industry to the industrial sector.
- Natural gas availability has improved with two new pipelines from Canada. While still a small part of the total, its use was more than four times as great in 2000 than in 1980.

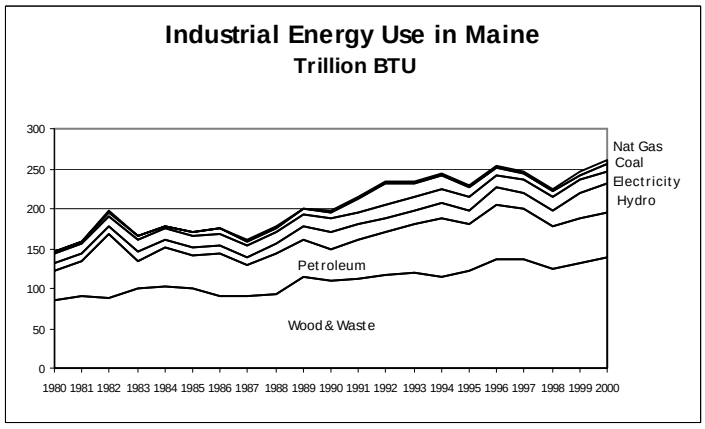


Figure III.C.3

4. The Electricity Sector in Maine

a. Energy Mix

The electricity sector in Maine has undergone significant changes over the past decade, both in structure and fuel mix. See Figure III.C.4.a

- The left hand side of Figure III.C.4.a shows the change in fuels in the mix. Most notably, the share represented by natural gas has risen from zero in 1990 to over 50 percent in 2001, as new pipelines from Canada made it possible to site five gas-fired power plants in Maine. Nuclear power, on the other hand, has fallen from about 30 percent of the mix to zero, with the shutdown in 1997 of Maine Yankee.
- The right hand side of Figure III.C.4.a shows the change in plant ownership. Utilities previously accounted for over one half of that ownership; that share has now fallen to zero.

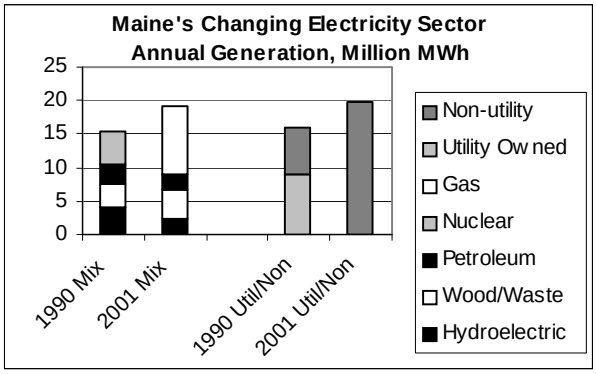


Figure III.C.4.a

b. Capacity Mix – New Natural Gas Units

The total 2003 capacity mix is shown in Figure III.C.4.b.

- The ISO-New England 2003 CELT Report lists 3,640 MW of capacity on line in Maine as of August 2003. About another 138 MW of capacity in Northern Maine is outside of ISO-New England control, bringing total capacity in Maine to about 3,778 MW.
- Of this capacity, 1713 MW, or 45 percent, has come on line burning natural gas since 1999. If natural gas prices stay competitive, this will significantly change the future energy mix for electricity production in Maine.

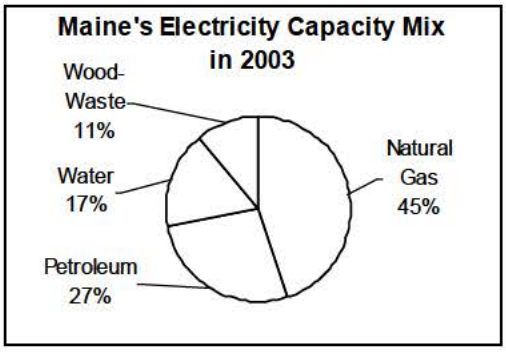


Figure III.C.4.b

c. Electricity Prices

Figure III.C.4.c.shows electricity prices in Maine.

- The price of electricity in Maine is competitive with the rest of New England. However, it is higher priced than in some other states of comparable energy use and about 35 percent higher than the national average for residential and commercial customers.
- Maine's industrial price is over 70 percent higher than the national average.
- End users are free to shop for their energy, but most accept the default standard offer contracts secured through a bid process on their behalf by the Maine Public Utilities Commission.
- Electricity consumed in Maine is not necessarily produced here. Many of the generators in Maine sell their energy out-of-state and, conversely, many of the standard offer suppliers for customers in Maine produce their power out-of-state.
- The actual delivery of the power is still provided by transmission and distribution companies.
- The regulated investor owned companies, Central Maine Power, Bangor Hydro, and Maine Public Service, are the predominant deliverers in the State, but there are also several small municipal companies.

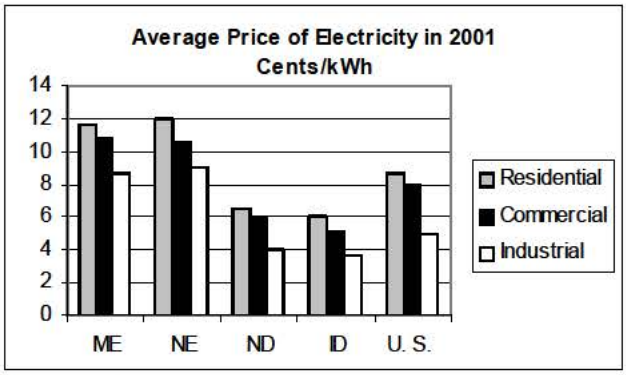


Figure III.C.4.c

d. Customer Usage Patterns

Figure III.C.4.d shows customer usage patterns.

- CMP's average residential customer usage fell by 10 percent, from 7,013 kWh of electricity in 1985 to 6,290 kWh in 2002, probably due mostly to a decrease in electric space and water heating.

- Residential customers have increased their use of electrical appliances (especially personal computers and microwave ovens) since 1980. The use of personal computers has probably caused an increase in the total use of electricity, while microwave ovens may have caused a decrease.

- Increased use of air conditioners, clothes dryers, and dishwashers since 1980 has probably offset some of the decline due to less space heating.

- By 2001, 58 percent of all New England households had air conditioners, 50 percent had dishwashers, 73 percent had microwave ovens, and 61 percent had personal computers. The use of washing machines actually decreased slightly, from 80 to 75 percent of all households, while clothes dryer use increased from 60 to 69 percent.

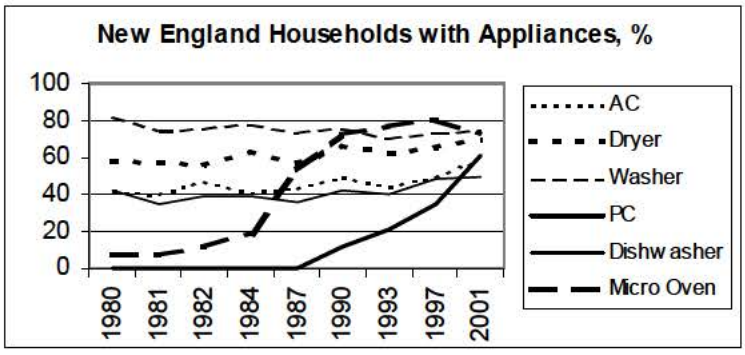


Figure III.C.4.d

e. Electricity Use Forecast

Figure III.C.4.e.1 shows Central Maine Power Company's forecast sales through 2007 from their fall 2002 Load Forecast.

- Cumulative growth is projected at 2 percent for residential customers and 12 percent for commercial customers.
- CMP projects a decline of 15 percent for industrial customers, primarily due to paper industry self-generation (rather than simultaneous purchase and sales agreements with utilities).

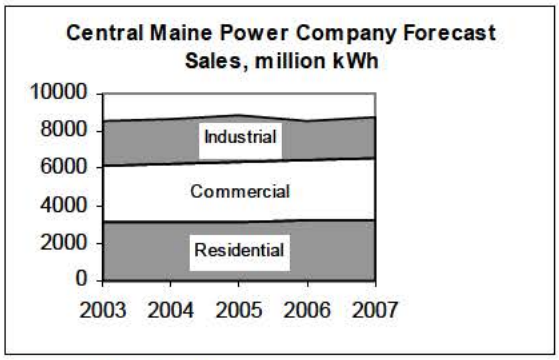


Figure III.C.4.e.1

Figure III.C.4.e.2 shows ISO New England's forecast of Maine energy use and winter peaks through 2012 from its April 2003 CELT Report.

- Both energy use and winter peak load are projected to increase by an average of 1.1 percent per year from 2002 to 2012.

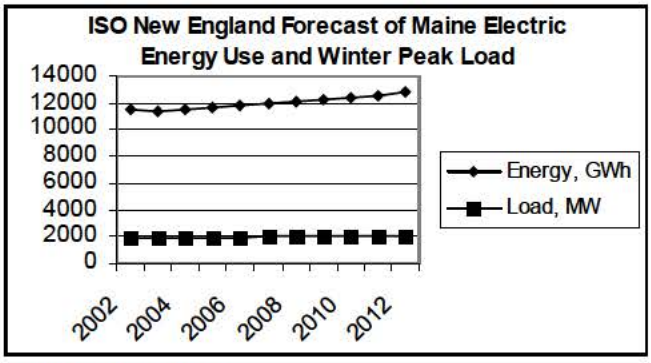


Figure III.C.4.e.2

Figure III.C.4.e.3 shows the forecast of NEPOOL's summer capacity through 2012 from ISO New England's April 2003 CELT Report.

- The forecast average annual growth in summer capacity from 2002 to 2012 is 1.3 percent.
- Natural gas fired and combined oil/natural gas fired capacity provide virtually all of the forecast growth.

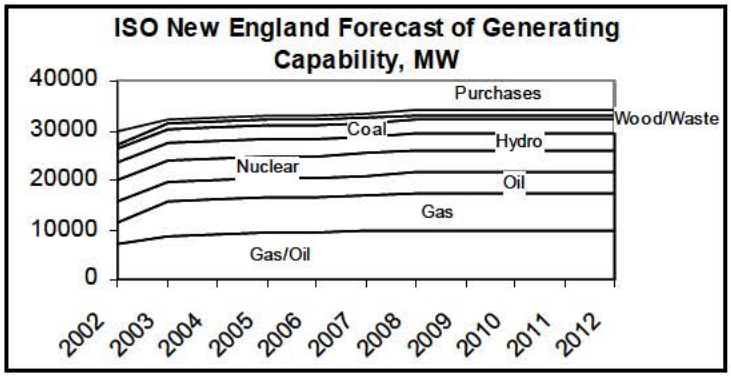


Figure III.C.4.e.3

5. Maine Energy Use in the Transportation Sector

a. Overview

Figure III.C.5.a shows total transportation energy consumption in Maine, including freight and passenger travel.

- Energy consumption increased by 46 percent from 1980 to 2000.
- Most of this increase occurred from 1980 to 1988, a period of significant decrease in the real (inflation adjusted) price of motor fuels and a changing, more dispersed settlement pattern.

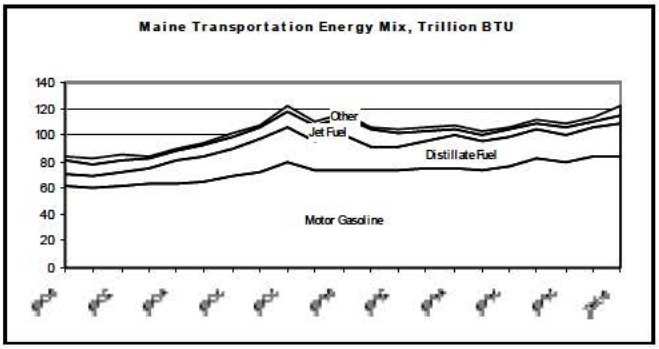


Figure III.C.5.a

b. Highway Transportation

Figure III.C.5.b.1 shows energy consumption for highway transportation.

- The growth in consumption of fuel for highway transportation has outpaced population growth, due largely to more registered vehicles and more vehicle miles traveled.
  - From 1980 to 2000, vehicle miles traveled increased by 88 percent and transportation motor fuel consumption increased by 55 percent, while population increased by only 14 percent.
  - Maine drivers also log a higher average number of miles than either the New England average or national average. In 2002, the average miles driven in Maine were 27,847 per household with the number of registered vehicles at 2.28 per household. In 1994, Maine households averaged 26,361 miles compared to 20,500 miles for New England drivers and 21,100 miles for the U.S. average. Maine's largely rural character may be responsible for much of this difference.

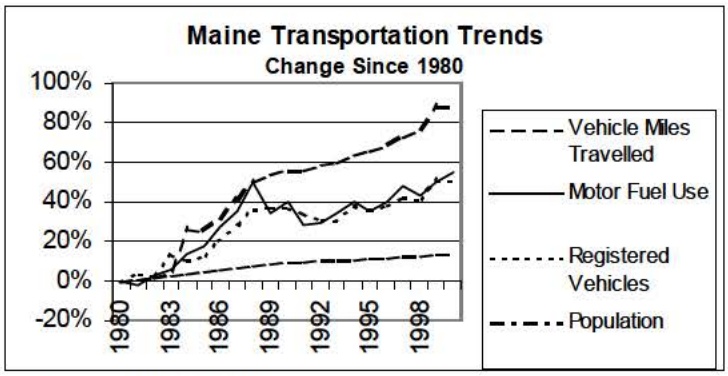


Figure III.C.5.b1

Over the same period, average fuel efficiency increased from about 13.5 miles per gallon of fuel consumed to about 16.5 miles per gallon. Most of this improvement in fuel efficiency occurred between 1980 and 1991, as shown in Figure III.C.5.b.2.

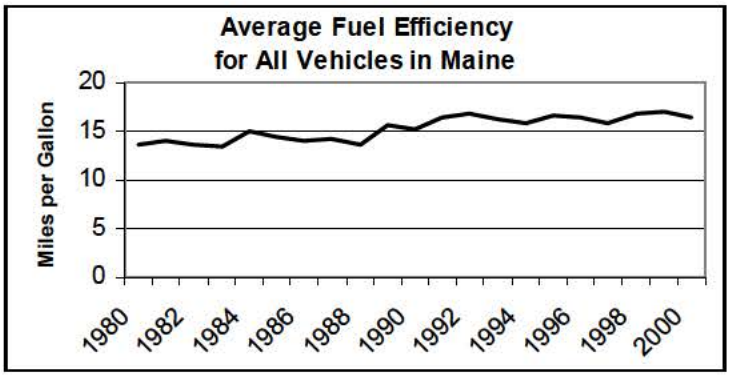


Figure III.C.5.b.2

Figure III.C.5.b.3 shows the trend in fuel prices.

- In 1980 and 1981, gasoline prices, adjusted for general inflation, were at an all time high in Maine. However, as shown in Figure III.C.5.b.3, since that time, the inflation adjusted, or real, price of gasoline has steadily declined.
    - The real price in 2000 was about 40 percent less than the real price in 1980.
    - The decrease is probably somewhat responsible for the approximately 40 percent increase in consumption over the same period.
- The combined effect of increased automobile fuel efficiencies and lower real fuel prices resulted in an expenditure level for motor fuel transportation 23 percent less per person in 2000 than in 1980, in real terms.

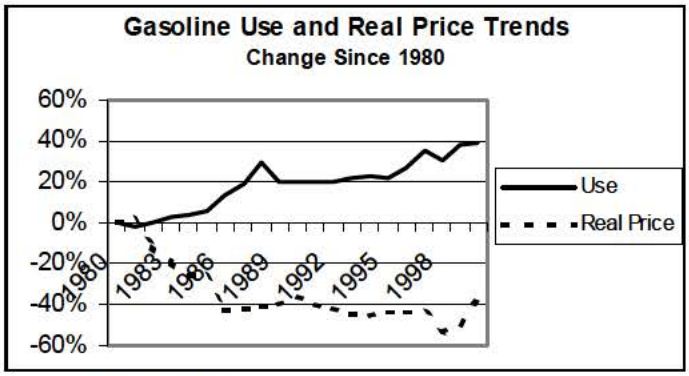


Figure III.C.5.b.3

c. Alternative Modes of Travel

From 1994 to 2000, the use of alternative modes of transportation increased by about 20 percent compared to an increase of about 15 percent for automobiles. However, the overall use of automobiles for travel, estimated at 14 billion miles in 2000, vastly exceeded the estimated 6.5 million miles for fixed-bus routes, ferries, and airplanes. Two recent examples of success at alternative transportation modes include:

- The Island Explorer on Mount Desert Island, which was designed to handle visitors, but is increasingly used by residents. Ridership on the Island Explorer has grown from an eleven week summer service that handled 141,000 passengers in 1999 to a sixteen week service in 2003 that handled 340,000 passengers. The average summer ridership per day has grown from 1,854 in 1999 to 4,145 in 2003.
- Passenger service by both rail and bus between Portland and Boston.

d. Freight Movement

The estimated total amount of freight shipped in Maine in 2000 was 105 million tons.

- Only 10 percent was shipped by rail, water, air or pipeline. This is a significant decrease from about 40 percent in the early 1980s. Contributing factors to this decline include:
  - Deregulation of the trucking industry.
  - The movement of manufacturers to just-in-time inventories.
  - Generally lower costs for truck freight moves.

- 1.5 million tons of dry cargo were handled by Maine ports in 2000, nearly double that of a decade earlier.

- About 8.3 million tons moved by rail in 1999.

e. State Government Transportation Energy Use

Total state motor fuel usage for fiscal year 2003 was 6.57 million gallons. This includes fuel for all gasoline and diesel operated equipment (*e.g.*, vehicles, generators, chainsaws) and an estimate for reimbursed personal vehicle use. Table III.C.5.e shows state large fleet fuel use in 2002. Large fleets are the Department of Transportation fleet, the general fleet managed by the Bureau of General Services, and the State Police fleet. Smaller fleets of the Agriculture, Conservation, Inland Fish and Wildlife, and Marine Resource Departments are not included.

- State vehicles consume about 1 percent of the total highway transportation fuel used in Maine.

- Heavy vehicle use in 2002 was about 500,000 hours, and diesel fuel use was 1,951,394 gallons.

Fleet	# of Vehicles	Vehicle Miles	Gallons of Fuel	Miles/Gallon
DOT	*	7,921,654	1,022,092	7.8
General	1,523	20,870,121	1,282,094	16.3
State Police	522	12,000,000	820,180	14.6
Subtotal		40,791,775	3,124,366	13.1

Table III.C.5.e State Large Fleet Fuel Use in 2002

∗ Use of Department of Transportation heavy vehicles is reported in hours of use rather than miles, and is therefore excluded from the table.

f. New Technology/Biofuels

Table III.C.5.f shows the purchase and fuel costs of a Toyota Prius hybrid compared to the conventional Chevrolet Cavalier and Impala. This comparison is based on state fleet bid data and assumes 100,000 miles of useful life. Other operating costs, such as maintenance costs, excise taxes, and the cost of financing, are ignored in this comparison.

- Hybrid vehicles, which are appearing on the market, are more energy efficient, but also more expensive, than conventional internal combustion vehicles.
- The state has about 24 four-door hybrid automobiles in its general service fleet, and is purchasing four more.

	Purchase Cost	Highway MPG	Breakeven $/gallon	Purch + Fuel @ $1.40/gal	Premium @ $1.40/gal
Prius	$ 19,500	45		$ 22,611	
Cavalier	$ 11,595	30	$ 7.11	$ 16,262	$ 6,349
Impala	$ 15,879	26	$ 2.23	$ 21,264	$ 1,347

Table III.C.5.f Breakeven Analysis for Toyota Prius Hybrid Vehicle

The use of ethanol or biodiesel as transportation fuel alternatives is discussed in Section III.G.

D. Trends in Energy Efficiency

1. Automobile Efficiency and Use

Table III.D.1 shows changes in population, fuel use, and prices from 1990 to 2000. Section III.C.5. discussed vehicle use in Maine and showed that from 1980 to 2000 average fuel efficiency increased from about 13.5 miles per gallon of fuel consumed to about 16.5 miles per gallon. Most of this improvement in fuel efficiency occurred between 1980 and 1991, as shown in Figure III.C.5.b.2. The popularity of sport utility vehicles may have been largely responsible for the halt in efficiency improvements during the 1990s. The penetration of new technologies, such as hybrid automobiles with average highway efficiencies of 45 miles per gallon of fuel, could help change the level trend of the last decade.

	2000	1990	Increase
Total Population	1,274,923	1,227,928	3.8 percent
Number of Households	518,200	465,312	11.4 percent
Gasoline Use, Gallons per person	535	476	12.2 percent
Gasoline Use, Gallons per Household	1,315	1,257	4.6 percent
Fuel Price, 2000 Real Price in $/MBTU	$12.71	$12.83	(1.0 percent)

Table III.D.1. Gasoline Use and Price Trends

2. Energy Use in the Home

Figure III.D.2.a shows use of primary energy sources required for the ultimate delivery of energy to the home.

- Home energy use in New England is less than the national average.
- Efficiency improvement initiatives appear to have had little impact on home energy use in New England since 1990.
    - Energy consumption per household member decreased during the 1980s in both New England and the nation, but has been level or increased slightly since then.
    - The use of air conditioners, clothes dryers, dishwashers, and computers, as shown in Figure III.C.4.d above, has increased.
    - Relatively flat oil prices since 1990 have also probably resulted in less concern about thermostat temperature settings.

- Lower efficiency per household member also results from the 7 percent decline in the average number of people per household in New England: 2.39 people per household in 2000, down from 2.56 in 1990.

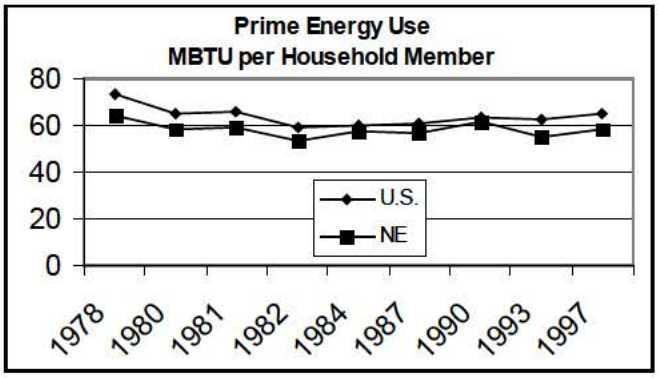


Figure III.D.2.a

Figure III.D.2.b shows diminishing efficiency at delivering energy to the home for both New England and the nation. While New England shows better efficiency than the national average, the downward trend is still troublesome, and the causes are not readily evident.

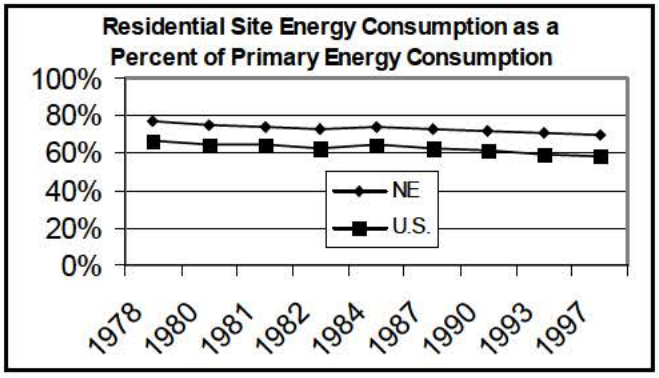


Figure III.D.2.b

3. Commercial Buildings

Commercial sector energy use was discussed in Section III.C.2, but that discussion did not address efficiency trends. There are two primary categories of changes that can increase building efficiency: structural or programmatic. Structural changes include improving weatherization levels, replacing inefficient boilers, installing efficient lighting, and using passive solar construction designs. Programmatic changes include such actions as lowering thermostat settings during the heating season, instituting lights

off policies, and altering building use patterns. Two examples of building efficiency initiatives that have been accomplished are:

- Residential and industrial building upgrades at Brunswick Naval Air Station produced annual savings of over $1,000,000 with a seven-year simple payback.[191]
- The Low Interest Energy Loan Program for Small Businesses administered by the MPUC has achieved annual savings of $160,610.[192]

4. Industrial Processes

Maine has a large, energy intensive pulp and paper industry. This industry has made significant energy efficiency improvements over the past few decades with the installation of cogeneration power plants. These plants allow waste heat from the industrial process to be put to work to generate electricity. In 1990 the electric energy produced by cogeneration power plants in Maine was 5,002 GWh. By 2001, that had increased by 53 percent to 7,642 GWh.[193]

[191] Presentation by Duncan Morrison, Combined Energies, Augusta, Maine, July 23, 2003; telephone conversation with Duncan Morrison, October 24, 2003.
[192] MPUC response to LD 669 survey, summer 2003.
[193] From data in Appendix Table T22 copied from the Department of Energy website at http://www.eia.doe.gov/cneaf/electricity/epa/generation_state.xls.

E. Trends in Renewable Electricity Supply and Use

1. Amount and Type Supplied by Maine Generators

Figure III.E.1. shows electric energy generated from renewable resources.

- Total renewable generation has remained relatively constant over the last decade, but 2001 was a dry year, resulting in lower hydroelectric production.
- The mix should begin to change as wind resources are added.
    - Wind projects announced or under development include Evergreen Wind Power's 50 MW project in Mars Hill (Aroostook County), and Endless Energy's proposed 50 MW project on Redington Pond Range.
    - The estimated energy production from each of these projects is about 150 million kWh per year, or about 3 percent of the total renewable energy production in Maine in 1999.
    - Endless Energy claims that the cost of producing electricity with wind has dropped from 38 cents per kWh in 1980 to about 4 to 6 cents now.
- Individual home solar energy systems are also becoming more cost-effective. For example, the company MrSolar[194] offers 160 watt direct current photovoltaic panels for $655. They also offer kits with solar panels, inverters, and interconnection equipment. A 1200 watt kits costs about $13,000 and is estimated to produce over 100 kWh per month in Maine.
- Solar photovoltaic systems are now being incorporated into commercial building design. Roofing and siding materials are now available with the solar devices integrated into the sheathing material. The savings in building material help to offset the extra cost of the energy system.

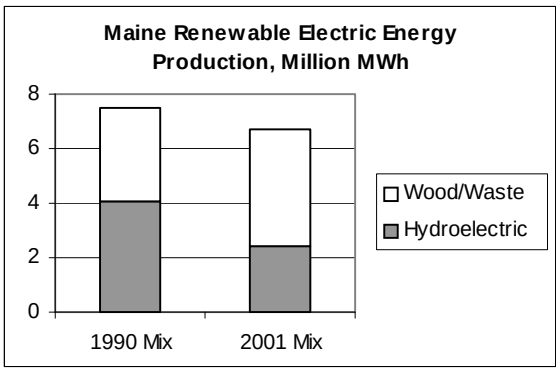


Figure III.E.1

[194] Found at http://www mrsolar.com

2. Amount and Type Used by Maine Consumers

Maine has a standard for at least 30 percent of its electricity supply to come from renewable and efficient resources. The standard offer supplier for Central Maine Power Company's residential customers provided the following breakdown for those supplies for the period July 2002 through June 2003:

Biomass	8.6 percent
Municipal Waste	5.0 percent
Cogeneration	7.4 percent
Hydro	10.6 percent
Subtotal	31.6 percent

"Green" power is available as an option to consumers in Maine.

- Constellation NewEnergy has contracted to supply York Hospital electricity that comes 100 percent from renewable sources, and has begun offering green power products to customers under the Maine Power Options program.
- Interfaith Power and Light provides one million kilowatt-hours of green power per month to about 2,000 customers. Their supplier is Competitive Energy Services.
- Governor Baldacci set a goal for state government facilities to buy at least 50 percent of their electricity from renewable power sources. Maine Renewable Energy sells power to about 750 accounts at state agencies that have committed to purchase renewable power under this goal. When the state went out to bid in the fall of 2003 for the remainder of its electricity accounts, it limited the 30 percent portfolio standard to hydro, biomass and municipal solid waste.

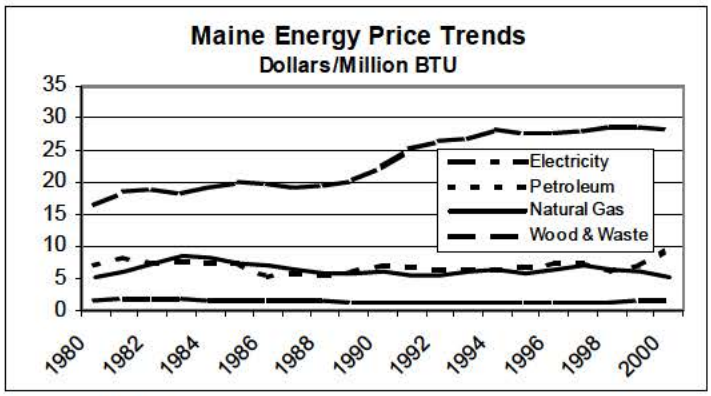
F. Trends in Energy Prices and Factors Affecting Price

1. Nominal Prices

Figure III.F.1 shows trends in the nominal prices of major energy sources from 1980 to 2000.

- Petroleum and natural gas prices are largely driven by regional and national factors, as reflected in the relatively high prices of the early 1980s, but moderating through the late 1980s and staying about level through the 1990s.
- Electricity and wood and waste prices are more strongly influenced by state or regional markets and policies.

- Rising electricity prices in the late 1980s and early 1990s were largely due to high priced purchased power contracts at the major utilities, a slowing of sales growth, and stranded costs from abandoned plants.
- While electricity is much more expensive than other energy sources, many of its uses are more refined. Examples are lighting, refrigeration, air conditioning, and electronics.
- The variation in wood and waste prices was due to changes in supply and demand balances and to changing contracts for sales of electricity to the major utilities.



. Figure III.F.1

2. Real Prices

Figure III.F.2 shows real prices of energy from 1980 to 2000.

- All major energy sources experienced real price decreases over this period.
  - Natural gas and wood and waste prices decreased by about 50 percent.
  - Petroleum decreased by 33 percent
  - Electricity decreased by 17 percent.

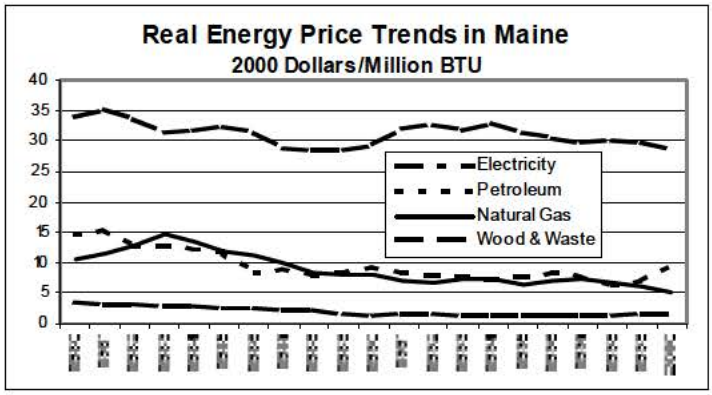


Figure III.F.2

G. Renewable Fuel Use by Maine Consumers

With the exception of wood and waste and hydroelectric power, renewable energy use in Maine is low. The potential growth in wind power has already been discussed. Other energy sources now receiving attention in Maine are renewable fuels, specifically ethanol in gasoline and biodiesel as either a transportation fuel or home heating fuel alternative.

1. Ethanol in Gasoline

- Ethanol comes from the fermentation of biofeedstocks.
- Maine has a variety of potential feedstocks including potato culls and waste, wood residues, and rotation crops such as barley.
- Vehicles are commercially available today that can use E85 (85 percent Ethanol and 15 percent gasoline). These vehicles are called flexible fuel vehicles (or FFVs), and can run on E85, gasoline, or any mixture of the two. FFVs are widely available and include sedans, minivans, sport utility vehicles, and pickup trucks. More than three million FFVs have already been sold in the United States. There are approximately 24,000 E85 flex-fuel vehicles registered in Maine.
- There are approximately 150 E-85 fueling stations across the country, but none in Maine.[195]

[195] For more information about ethanol, see the Alternative Fuels Data Center website at www.afdc nrel.gov.

2. Biodiesel

a. As a Transportation Fuel

- Biodiesel is a domestically produced, renewable fuel that can be manufactured from vegetable oils, animal fats, or recycled restaurant greases.[196]
    - Biodiesel is safe, biodegradable, and reduces serious air pollutants such as particulates, carbon monoxide, hydrocarbons, and air toxics.
    - Blends of 20 percent biodiesel with 80 percent petroleum diesel (B20) can be used in unmodified diesel engines, or biodiesel can be used in its pure form (B100), but may require certain engine modifications to avoid maintenance and performance problems.
- The use of biodiesel has grown dramatically during the last few years.
- The Energy Policy Act was amended in 1998 to include biodiesel fuel use as a way for federal, state, and public utility fleets to meet requirements for using alternative fuels. (Maine is exempt from this requirement, due to low population density.)
- According to the American Biofuels Association, with government incentives comparable to those provided for ethanol, biodiesel sales could reach about 2 billion gallons per year, or about 8 percent of highway diesel consumption.
    - At this level of market penetration, biodiesel would probably be used in bus fleets and heavy-duty trucks (primarily in blends with fossil diesel at the 20 percent level), marine vessels such as ferries, construction and agricultural vehicles, home heating oil systems, and electric generation facilities.
- Feedstock costs account for a large percent of the direct biodiesel production costs, including capital cost and return.
    - It takes about 7.3 pounds of soybean oil (a byproduct of soy used for feed), which costs about 20 cents per pound, to produce a gallon of biodiesel. Feedstock costs alone, therefore, are at least $1.50 per gallon of soy biodiesel.
    - Fats and greases cost less and produce less expensive biodiesel, sometimes as low as $1.00 per gallon. The quality of the fuel is similar to soy biodiesel fuel.
- The Alternative Fuels Data Center lists two biodiesel fueling stations in Maine, both within 50 miles of Augusta.
- The Maine Department of Transportation Freeport facility took delivery of 2,500 gallons of biodiesel in June 2003, and is planning to use greater quantities during the winter months.
- In April 2003 L.L. Bean announced that it would begin testing biodiesel use in its distribution fleet.

[196] For further information on biodiesel, see www.afdc.nrel.gov.

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b. As a Home Heating Oil Alternative

The State is actively exploring use of a biodiesel blend to heat some state buildings during the 2003/04 winter. The State has spoken with its boiler manufacturer and a biodiesel supplier, and tested the fuel in the fall. If the tests prove positive, the State intends to issue an RFP next year for larger volumes of the B20 blend for use in additional Augusta facilities. However, unless the cost of biodiesel declines significantly, the State may be reluctant to undertake a significant conversion of state buildings to biodiesel.

H. Biomass Use

- As discussed in Section III.C.3., biomass is an important energy source for the industrial sector in Maine, particularly for the pulp and paper industry.
    - The National Renewable Energy Laboratory lists 19 timber residue plants in Maine with a total capacity of 646 megawatts and 4 municipal solid waste plants with a total capacity of over 65 megawatts.
    - Biomass can also be used for producing ethanol, as discussed in Section III.G.

- Another important use of wood biomass is for home heating.
    - The State Planning Office estimates that 470,000 cords of firewood were burned in the 1998/99 heating season.
    - This is down somewhat from an estimate of 600,000 cords in 1991 and less than half of the estimated 1.2 million cords burned in 1980. Relatively stable heating oil prices and the inconvenience of operating wood stoves are probably responsible for this decline.
    - An air-dry cord of red maple firewood weighs about 1.6 tons and has the heating equivalent of about 190 gallons of oil.[197]
- Maine has an ample supply of forest biomass, enough to support many times the current level of consumption.
    - A Department of Energy Report estimated that "3.2 billion kWh of electricity could be generated using renewable biomass fuels in Maine. This is enough electricity to fully supply the annual needs of 322,000 average homes, or 88 percent of the residential electricity use in Maine".[198]
    - The table below, taken from that study, shows the estimated availability at various delivered prices.

[197] Jim Philip, "Heating with Wood the 'Lazy' Way: Plan Ahead!", University of Maine Cooperative Extension Bulletin #7116, April 29, 2003.
[198] Marie E. Walsh et.al, "Biomass Feedstock Availability in the U.S." (January 2000).

- It is estimated that there are more than 900 million dry tons of biomass in Maine timberlands. About 45 percent of this is in growing stock, and the remainder is in branches, foliage, stumps, cull trees, salvable dead trees, saplings, seedlings, and shrubs.[199]

	Urban Wastes[200]	Mill Wastes[201]	Forest Residues[202]	Total
Delivered Price	(dry ton/yr)	(dry ton/yr)	(dry ton/yr)	(dry ton/yr)
$20/dt	108,358	43,000	0	151,358
$30/dt	180,597	209,000	806,000	1,195,597
$40/dt	180,597	209,000	1,182,000	1,571,597
$50/dt	180,597	504,000	1,529,100	2,213,697

Table III. H.1 Estimated Annual Cumulative Biomass Resources Available in Maine, 1995$

- To put the data shown in Table III.H.1 into context, a comparison to other fuel sources may be useful. Table III.H.2 shows such a comparison.
  - The 1995 cost of $50 per dry-ton shown in Table III.H.1 adjusted for inflation is about equivalent to $60 per dry-ton in 2003.
  - Costs in Table III.H.1 assume large volumes of biomass are delivered.

Fuel Type	Fuel Unit	Btu/Unit[203]	Assumed Conversion Efficiency	Useful Btu/Unit of Fuel	Per Unit Cost Equivalent to $60/dt
Biomass	Dry ton	16,000,000	70 percent	11,200,000	$ 60.000
Fuel Oil	Gallon	140,000	80 percent	112,000	$ 0.600
Electricity	kWh	3,412	100 percent	3,412	$ 0.018
Natural Gas	Thousand cubic feet	1,025,000	85 percent	871,250	$ 4.667
Firewood	Cord	20,000,000	70 percent	14,000,000	$ 75.000

Table III.H.2 Fuel Prices Equivalent to $60 per dry-ton for Biomass

[199] Eric H. Wharton & Douglas M. Griffith, "Estimating Total Biomass in Maine, 1995", USDA Forest Service Northeastern Research Station Resource Bulletin NE-142 (July 1998).
[200] Urban wastes include chips and grindings of clean, non-hazardous wood from construction activities, woody yard and right-of-way trimmings, and discarded wood products such as waste pallets and crates.
[201] Mill wastes include sawdust, bark, and wood scraps from paper, lumber, and furniture manufacturing operations.

[202] Forest residues include tops, limbs, and thinnings from forestry operations.
[203] Energy Efficiency and Renewable Energy Clearinghouse (EREC) Brief, "Comparing Heating Fuels", Updated January 2003.

IV. OPPORTUNITIES TO IMPROVE STATE ENERGY POLICY

A. Introduction

Preceding sections of this Report have examined existing state energy policies; the tensions and synergies between those and other state policies; and the sources and uses of energy. Broadly speaking, they revealed that Maine has a history of activism in adopting policies and programs to address energy efficiency and renewables issues in numerous contexts; that tensions and synergies between competing policies are complex, and are most usefully examined on a case-by-case basis when considering adoption of new policy measures; and that while Maine has made progress in increasing efficiency and reliance on renewable energy sources, there is room for improvement. Building on those observations, this section seeks to meet the directive of LD 669 of identifying opportunities to improve state energy policy.

To gain a fair assessment of the full range of possible opportunities, we examined the issue from several perspectives. One approach was to determine whether there is a self-evident policy gap in existing policies. A ready example is in building codes: as noted earlier, Maine has state-wide energy efficiency standards for new commercial and industrial construction, but not for owner-built homes. An obvious opportunity lies in bringing owner-built homes within the sweep of energy efficiency standards. Because such a gap exists, however, does not necessarily imply that policymakers should fill it. Gaps tend to exist for a reason—*e.g.*, in the case of residential building codes, policymakers have failed to act in large part out of concern for the interest of individuals to build their homes to their own specifications, without the intrusion of regulation. LD 669 provides an opportunity to revisit that policy decision, but does not in itself overcome the tension that has precluded the gap from being eliminated.

A closely related approach is to identify policies that might usefully be expanded through increased funding. Because the State is experiencing severe fiscal constraints, opportunities most likely to have practical value are those for which non-general fund support may be available. An example is the System Benefits Charge on retail electric sales, used to fund energy efficiency programs. Additional funds for such programs can be obtained by increasing the level of the charge on electricity, and by extending it to other fuels. Here again, there are countervailing considerations, most significantly the interest in keeping energy costs down to support economic development and avoid burdening Maine businesses and households. In the discussion below we offer points the legislature may wish to consider in examining whether to pursue these kinds of opportunities.

To identify additional ideas, we solicited comments from interested parties in a number of forums, including public hearings in Augusta and Bangor, through e-mail

contacts, and small group meetings. We also surveyed the energy plans and programs of other states.

These approaches resulted in the identification of a wide variety of opportunities. In an attempt to sort them into meaningful categories, we examined a number of criteria, including the following:

- Do they address a major issue? For example, Section III of the Report noted that relatively little has been done to address motor vehicle fuel use, the largest single component of energy consumption in the State, and one for which the potential for efficiency gains appears large. All of Maine's petroleum is imported, mostly from overseas. Climate change is clearly another major issue. A measure that seeks to have a meaningful impact on vehicle fuel efficiency or climate change would deserve further consideration under this criterion.

- Is there evidence that substantial, measurable benefits will result from pursuing the opportunity? Maine has considerable experience in developing and evaluating energy efficiency programs in the electric sector, and the PUC has recently reviewed a report indicating that sizeable economic benefits would result from additional investments in such programs. In addition to those economic benefits, efficiency programs typically reduce greenhouse gas emissions and contribute to in-state economic development. Under this criterion, increasing the level and breadth of the System Benefits Charge might warrant additional consideration.

- Is the measure likely to win public support, or will public opposition prevent it from being pursued? Applying this criterion, a large increase in the state excise tax on motor vehicle fuel, while having perhaps the greatest potential of any policy initiative to reduce inefficient fuel use, would likely be deemed unworthy of serious consideration based on almost certain public opposition. On the other hand, the likelihood of some public opposition should not foreclose consideration of otherwise worthwhile opportunities. Experience has shown that most energy policy initiatives encounter some degree of public opposition; while the underlying reasons for the opposition should not be ignored, progress in meeting policy goals sometimes requires adopting controversial measures.

- Does the opportunity have symbolic or other value which may make it worthwhile, even if the immediate benefits are likely to be small or difficult to measure? A symbolic or otherwise limited measure may be the first step in gaining support for more far-reaching measures. Some symbolic initiatives are useful as relatively low cost means of focusing public attention on the importance of using energy more wisely. There is an element of symbolic value in many energy policy opportunities in the government sector. The government accounts for a relatively small portion of overall state energy use, but its actions in managing its own energy use can send a valuable message to businesses and individuals throughout the private sector. (Government energy efficiency measures have also been useful in and of themselves in saving the government money.)

While criteria such as these are useful, identifying opportunities deserving serious consideration remains difficult, if only because the "low hanging fruit," *i.e.*, opportunities

that appear attractive under these criteria, tend to have been implemented already. Of those that have not been implemented, as noted below many are the subject of 2003 legislation that has been carried over to the next legislative session. The challenge for policymakers at this juncture is to balance the advantages and disadvantages of remaining opportunities, whose overall net benefits may be impossible to measure objectively.

Using the above criteria, we have sorted opportunities for improvement into four categories:

Category 1. Opportunities with the highest potential to achieve energy savings through efficiency or to increase the use of renewable energy. These tend to be policies and programs for which there is a basis to expect significant, measurable benefits.

Category 2. Opportunities whose potential to achieve energy savings through efficiency or to increase the use of renewable energy is more difficult to predict, but which nonetheless appear worthwhile because they focus on a major energy use and do so on a large scale.

Category 3. Opportunities deserving consideration for symbolic or other value.

Category 4. Minor opportunities, including opportunities to revise or repeal obsolete statutes.

It should be stressed that the category in which an opportunity appears does not reflect a judgment as to the value of seeking to implement it. Opportunities in Categories 3 and 4 may have less immediate potential to achieve significant benefits than Category1 or 2 opportunities, but they may also come at a much lower cost. While the benefits of a Category 2 opportunity may be harder to predict than those of an opportunity under Category 1, the former may deserve support as the best means currently available to tackle a pressing problem.

While categories are not meant to reflect priorities for policymaking, they may be useful in gauging the likely difficulty of successfully pursuing individual opportunities. Just as the size and certainty of potential benefits declines as the category number rises, so too does the level of controversy likely to be associated with the opportunity. This relationship is inherent in the tradeoffs associated with achieving varying levels of benefit. A Category 1 opportunity to conserve energy, for example through raising the System Benefits Charge on electricity or extending it to other energy sources, will generally cost more than a Category 3 symbolic opportunity or a Category 4 minor opportunity. The higher the cost or other impact, the more the parties most affected by that impact (*e.g.*, oil dealers whose prices will rise) will be motivated to oppose the opportunity. Conversely, Category 4 opportunities will ordinarily have less impact, and thus will tend to have the fewest natural adversaries.

In the section below, we identify opportunities within each of these categories.[204] We also note, in bold type, possible quantitative benchmarks to measure progress in meeting goals. Benchmarks have been selected where the data is likely to be readily available, either because the same or similar data is already being collected, or the data is likely to be gathered for other purposes.

B. Opportunities

Category 1: *Opportunities with the highest potential to achieve energy savings through efficiency or to increase the use of renewable energy.*

1a. *Fund Weatherization and Other Non-electric Efficiency Measures in Low and Moderate Income Households through a System Benefits Charge on Oil and a Weatherization Bond.* The focus on efficiency in electricity use has not been matched for other energy sources. In the residential sector, the principal energy source used for space heat is oil. While weatherization programs funded by LIHEAP and other sources have reached a portion of the residential market, the combination of funding limitations and eligibility restrictions has left many of the needs unmet. Those existing programs have saved energy costs of at least $1.83 for each dollar spent, translating to savings of about $200 per year per typical household.[205] Other benefits (*e.g.*, reduced water consumption, economic and environmental benefits) have been estimated to be roughly the same as the direct energy savings, making the overall benefit about $3.70 for every dollar spent.[206] Looking just at the direct energy savings, however, the rate of payback appears relatively slow: at $200 in annual savings, it takes over 12 years to pay back the average per-household weatherization expenditure of $2500.

Maine has resisted imposing special purpose fees on energy sources other than electricity. Because all aspects of rates for electricity have (until recently) been set by the PUC, a convenient mechanism has existed to levy system benefits charges—the charges could simply be included by the PUC as an item of costs in the setting of rates. Even with deregulation of electric energy, distribution rates remain regulated, providing the vehicle for system benefits charge recovery. Because no comparable vehicle exists for other energy sources, fees are more readily perceived as a tax, making political acceptance a greater challenge. On the other hand, the fact that electricity does bear such charges suggests that imposition of similar charges on other energy sources could help 'level the playing field' between electricity and other fuels, *i.e.*, remove a competitive disadvantage to electricity. The fee could be equalized between electricity and other energy sources, by assessing a fee on the latter which is equivalent on some common measure of heating value (such as BTU) as the fee on electricity.

Interestingly, a precedent has already been set for a fee on home heating oil to fund efficiency programs, and it is one to which the Maine Oil Dealers have already agreed. As noted in Section I, federal law provides for a fee of $.002 per gallon on home heating oil, with the proceeds redistributed in the State from which they are derived. Participation by state entities is voluntary. Maine oil dealers, through their trade association, MODA, have opted in to this program, with MODA currently receiving about $800,000 per year from fees assessed in

[204] No significance should be inferred from the ordering of opportunities within each category.
[205] MSHA Fact Sheet, "Maine's Weatherization Assistance Program."
[206] See http://www.eere.energy.gov/weatherization/ne_benefits html.

Maine. While there are some statutory limits on MODA's use of the funds, MODA has discretion to use them for efficiency programs.

The current fee structure of $.002 per gallon, and the associated revenue of $800,000 this year in Maine, indicates that a one cent per gallon fee would yield $4 million that could be used for weatherization, furnace cleaning, and other measures to improve efficiency in oil heating. Even a fee of a few cents would be a small fraction of the typical variability in home heating oil costs. As in electric efficiency and LIHEAP related initiatives, programs could be targeted at those who, due to income limitations, are least able to bear the costs themselves. Either the PUC, with its growing expertise in efficiency programs, or MSHA, with its expertise in low income weatherization and appliance replacement programs, would be a logical home for such a program.

As an alternative or complement to a new fee, the State could seek to enlist its Congressional delegation to have the federal law amended to ensure that some or all of the funds returned to state trade associations such as MODA are used for weatherization or other efficiency related purposes.

Issuance of bonds is another funding mechanism for weatherization that deserves consideration. The State has a strong case to issue bonds for this purpose, given its extensive experience in administering weatherization assistance fund (the State has weatherized over 77,000 homes since 1976); its track record of achieving $1.83 in energy savings for every dollar spent on weatherization; and the large number of low-income households in the State (estimated by the Census Bureau at 93,000), for whom heating costs are a major burden, and who otherwise often lack the means to pay for weatherization measures.[207]

Possible benchmark: number of homes receiving weatherization and other efficiency measures.

1b. *Increase Funding for Cost-Effective Electric Energy Efficiency Programs Consistent with Levels in Other States in the Region.* Funding in electric rates is currently capped at 1.5 mils/kwh, a level that is generating approximately $15 million per year for energy efficiency programs, and is expected to increase to $18 million per year as certain utilities' charges increase to the cap over the next few years. However, a large portion of this funding is needed to pay for prior commitments under the Power Partners Program, leaving relatively little to support new measures. Studies submitted to the PUC indicated that pursuing all cost-effective energy efficiency programs for electricity would have required an additional $17 million in 2003 (for a total of $32 million), rising to a total annual outlay of about $100 million in 2012.[208] Net benefits of fully funding such programs over this period were estimated at $500 million (in 2002 dollars).[209] Another measure of potential need is the SPO's January 2002 Study on reducing household energy consumption, which found that achieving a 25 percent reduction in household energy use by 2011in a cost-effective manner would require additional expenditures of $5 million to $20 million per year over 2001 levels.[210]

[207] *Ibid.*
[208] Docket 2002-162, Commission Staff Report, p. 12 (Feb. 11, 2003).
[209] Id., p. 14.
[210] Hart, P., "Reducing Household Energy Consumption in Maine: What it would take to Achieve a 25% Reduction by 2011," Prepared for the Maine State Planning Office, pp. 36-37 (January 15, 2002).

Table IV.2 below compares Maine's level of funding of efficiency programs to funding in other states in the region.[211]

[211] Source: Memorandum from Julie Michals, Northeast Energy Efficiency Partnership, to Beth Nagusky, August 15, 2003.

Table IV.2 - Summary of Electric Ratepayer Funded Energy Efficiency Activities in the Northeast					
State	**EE Funding Level**	**PUC or Legislative Mandate?**	**Funding Timeframe**	**Regulatory Oversight**	**Administrators of EE Programs**
CT	3 mills per kWh or $86 million in 2002, $89 million budgeted for 2003 - FUNDING UNCERTAIN	Legislative mandate as part of restructuring bill PA 98-28 CGS 16-245M	No sunset	Department of Public Utility Control is regulator, Energy Conservation Management Board (ECMB) advises development of energy efficiency plans	Electric utilities
ME	Not to exceed 1.5 mills/kWh. $12 million spent in 2002, ramping up to $18 million as perf contracts expire	Legislative mandate as part of restructuring bill	No sunset	Public Utilities Commission	Maine PUC ("Efficiency Maine")
MA	2.5 mills per kWh or $100 million/year (electric) in 2002 plus $22 million/year for gas utility programs.	Legislative mandate as part of restructuring bill	2003-2007	Department of Telecom. and Energy oversees cost-effectiveness, Division of Energy Resources oversees program design and budget through collaborative process	Electric utilities and one municipal aggregator (Cape Light Compact)
NH	3 mills/kWh: 1.8 mills for Core EE Programs and 1.2 mills for low income. Total of $32.3 million budgeted June 2002 to Dec 2003	Legislative mandate as part of restructuring bill (HB 489)	No sunset on funding - administrative model to be re-evaluated in 2003	Public Utilities Commission	Electric utilities (statewide programs)
NJ	$109 million (gas and electric) budgeted for 2002 ($80 million for electric), funding level to be reassessed in 2003 for future years	Legislative mandate as part of restructuring bill	2000-2008	Board of Public Utilities	Electric and gas utilities (statewide programs)
NY	$150 million annually	Public Service Commission	2001-2006	Public Service Commission	New York State Energy Research and Development Authority (NYSERDA)
	$132 million	Long Island Power Authority (LIPA) and New York Power Authority (NYPA)		LIPA and NYPA	LIPA and NYPA
RI	2 mills/kWh or $15 million for EE plus other DSM revenues for $22.7 million total budget in 2003	Legislative mandate as part of restructuring bill	initially 2003-2007 but extended to 2012	Public Utilities Commission	Electric utility
VT	$12 million in 2002. Negotiated settlement agreed to funding up to $17.5 million/year, but PSB Order in Docket 6777 sets funding at $14 million for 2003	Public Service Board given legislative authority (S. 137 passed in June 1999) to establish SBC funding and create non-utility entity to administrator programs	2000-2005	Public Service Board	Independent administration: Efficiency Vermont (Department of Public Service performs program evaluation)

Legislation introduced in 2003 to increase those funding levels has been carried over to the next session. Proponents of increased funding point to the large untapped potential, as indicated by the OPA study. They also contend that the competitive dislocation of raising electric rates can be minimized by keeping fees capped at levels comparable to neighboring states, and that any increases in electric rates are typically offset by lower consumption of electricity, resulting in lower overall customer bills. On the other hand, utilities and others stress the unfairness of wealth transfers associated with energy efficiency programs in which not all customers are able to participate, as well as the interference with efforts to meet the widely shared goal of bringing electricity rates closer to national averages. Concerns about the unfairness of assessing charges solely on electricity may be relieved by implementing an opportunity discussed above to fund non-electricity programs through comparable charges on oil and other energy sources.

1c. *Amend the Renewable Portfolio Standard (RPS).* The benefits of renewable power are well recognized: they reduce reliance on imported petroleum; they usually have fewer harmful environmental impacts than non-renewable power sources; and their development and operation generally provides jobs, tax revenue and other economic benefits. Their disadvantages tend to be their direct costs—if they were not more costly, they would not require support through government programs. The extent of their cost disadvantage varies with individual fuel types, locations, project technologies, and plant size. As noted earlier in this Report, Maine has a record of successfully promoting renewable power, but its cost has been controversial. Some argue that it was secured at too high a cost; others contend that it displaced alternatives that would have been even more costly, and that its development and operation has produced significant economic and environmental benefits.

The PUC is currently examining at least three mechanisms to support renewable facilities: changes to the Renewable Portfolio Standard (RPS); System Benefits Charges funding; and changes to the standard offer. Because the PUC study will examine the issues in more depth than this Report, the Legislature will benefit by awaiting the outcome of that analysis before taking action in this area. Based on our more limited assessment, amending the RPS should be considered a Category 1 opportunity, because the terms of the RPS translate directly into requirements on all competitive retail electricity suppliers.

The standard currently requires retail sellers of electricity to secure 30 percent of their supply from eligible sources, which include fossil-fired cogeneration as well as truly renewable forms of energy such as wind and solar. While higher than the standard of any other state, the 30 percent figure is below the proportion of renewable power in Maine's current generation mix. The standard could be amended in a variety of ways to increase its impact on the renewables market: the 30 percent level could be raised; fossil-fired cogeneration could be excluded from the definition of eligible resources; and a portion of the renewable power purchase requirement could be set aside for newly installed generation. However derived, a one percent increase in renewables' contribution to the overall mix, would translate to approximately 22 MW of additional renewable resources.

Possible benchmarks:
-megawatts of renewable energy facilities in operation.
-percentage of Maine generation mix fueled by renewable energy.

1d. *Establish Trigger to Adopt Appliance Efficiency Standards.* Three bills were introduced in this Session to have Maine adopt appliance efficiency standards for ten products not covered by federal standards. Two of these bills were carried over.[212] One estimate puts potential net energy bill savings from adoption of new standards for appliances readily available in Maine at about $5 million per year over the period of 2005 to 2010.[213] While the concept of efficiency standards for appliances not covered by federal standards has support, a common concern is that Maine is a relatively small market for appliance manufacturers, and the adoption of standards may simply lead manufacturers to cease selling in Maine. Supporters of the legislation have sought to address this concern by focusing on appliances which are already available in the marketplace. An additional means of ensuring that Maine is not isolated as a result of new standards, legislation could establish a trigger for adoption of standards linked to adoption of comparable standards in other states in the region. For example, legislation could provide that new standards will become effective in Maine only if two other states in the region, or a single state with a population of at least 5 million, have adopted comparable standards.

Category 2. *Opportunities whose potential to achieve energy savings through efficiency or to increase the use of renewable energy is more difficult to predict, but which nonetheless appear worthwhile because they focus on a major energy use and do so on a large scale.*

2a. *Adopt a State-wide Energy Code that Applies to All New Single-Family Residential Construction, with Voluntary Compliance for Owner-built Homes.* While Maine has enacted legislation that mandates energy efficiency standards in its multi-family residential, commercial and industrial building codes, it has not done so for new single-family residential construction built by an owner (and log homes). (Municipalities are free to adopt more stringent codes.) As a result, only about five percent of the approximately 5,000 single-family homes built each year are subject to energy efficiency code requirements.[214] Legislative initiatives to address this issue have been blocked, principally by the interests of homeowners and builders in freedom from regulation and concerns about the practicality of enforcement. Maine is evidently not alone in that respect: DOE regulations requiring states to adopt building codes that meet minimum efficiency standards (or explain their failure to do so) also do not apply to "low-rise residential buildings."[215] Legislation enacted in 2003 requires a study of the issue by the PUC, in consultation with the Energy Resources Council, and authorizes the Committee on Energy and Utilities to report out legislation on the subject in the 2004 session.[216]

States generally model their building energy efficiency codes on standards developed by ASHRAE, the American Society of Heating, Refrigerating and Air-Conditioning Engineers. Over the years, ASHRAE has updated its model standards as technology has improved, with each successive version providing greater efficiency savings. One study estimated that buildings meeting the current minimum ASHRAE efficiency standard (ASHRAE 90.1-2001) for new construction would be 6 to 9 percent more efficient than buildings meeting the 1989

[212] LD 1157 and LD 1261 were carried over; LD 1158 was not. LD 1157 was voted down in October 2003.
[213] Information supplied to Energy Advisors, LLC by Environment Northeast on October 3, 2003, based on Northeast Energy Efficiency Partnership data.
[214] See http://www.energycodes.gov/implement/state_codes/state_status.cfm?state_AB=ME.
[215] See http://www.ashrae.org/template/AssetDetail?assetid=26428.
[216] PL 2003, c. 497.

standard, and 60 percent more efficient than typical construction in 1975.[217] ASHRAE is currently evaluating standards that would yield savings of 30 to 75 percent over the current standard.[218] While these represent substantial efficiency gains, the actual energy efficiency of new residential construction in Maine is unknown, so we deemed it appropriate to include this as a Category 2 opportunity.

However desirable a mandatory code for all residential construction might be from an energy efficiency standpoint, the issue of public and builder resistance is unlikely to be overcome, at least in the near term. As an intermediate step, the State might consider an optional program, under which individuals and builders choosing to comply with efficiency code standards receive a certification of compliance. While some may be indifferent to certification, or may prefer to avoid the cost, others may see it as a benefit in enhancing the value or marketability of a home.

Even if compliance is optional, government must be involved to provide for certification. To minimize the cost to the government (and avoid unfunded mandates to local code enforcement officers), certification could be undertaken by engineers licensed by the State. Individuals seeking certification could bear its cost (just as they pay other costs associated with building and selling homes), and engineers could bear the cost of licensing through fees.

Possible benchmarks: number of engineers licensed to certify compliance with residential energy efficiency codes; number of owner built homes certified as compliant.

2b. *Strengthen Enforcement of Other Building Codes.* In contrast to the single-family residential construction market, Maine does maintain building codes with energy efficiency standards for multiple family residential construction, as well as all commercial and industrial construction. However, enforcement of those codes has been lax. The responsibility for enforcement has resided in the DECD, which has viewed rigorous enforcement as conflicting with its mandate of encouraging economic development. Accordingly, opportunities to ensure greater energy efficiency of new construction in those sectors may exist. Lack of data on the efficiency of new construction results in placing this opportunity in Category 2, however.

As noted above, enforcement costs money, and public funding is a major barrier in the current fiscal climate. Private enforcement, using licensed engineers, was identified as a possible means of transferring cost to the private sector in connection with owner-built single family homes. The PUC will examine this and other enforcement options, as well as other costs and benefits of enforcing efficiency standards in existing codes, in its pending study.

2c. *Identify and Address the Energy Implications of Sprawl.* Sprawl is a complex issue that has received little attention in connection with energy policy, even though it is a likely contributor to the large increase in vehicle miles traveled per person in Maine. Sprawl minimization has been a goal of the State Planning Office. In continuing to pursue that goal, the SPO should also examine the energy implications of sprawl, and take them into account in fashioning remedies. A comparative analysis should be undertaken of vehicle trips and trip lengths between densely settled, mixed-use development and sparse or single use development. Attention should be

[217] See http://www.greenbusinesscentre.com/joseph.pdf.
[218] See http://www.ashrae.org/template/AssetDetail?assetid=26428.

given to the benefits of walkable/bikeable communities in lowering vehicle use including school bus transportation. Other states are relating the savings of reduced transportation costs for compact neighborhoods with improved mortgage financing terms. This concept creates an opportunity to advance energy conservation and affordable housing. There presently exist numerous fiscal and regulatory incentives for locating development away from existing service centers and downtowns. Yet, these are the locations which best support the use of transit, reduced vehicle trips and trip lengths and promote walking. These incentives need to be reformed.

Possible benchmark: vehicle miles traveled per person.

2d. *Consider Adoption of the New California Emission Standards.* California recently became the first state to enact legislation (AB 1493, known as "Pavley" for its sponsor) directing its Air Resources Board to adopt standards targeted at reducing automobile emissions of greenhouse gases. Under the federal Clean Air Act, Maine has the authority to adopt regulations modeled on the California standards.[219] While targeted at emissions, those standards are expected to force automobile manufacturers to develop and market more fuel efficient vehicles. Assuming they are implemented in California, the DEP is expected to consider adoption of these regulations in 2004.

2e. *Increase Support for Alternative Passenger Transportation.* While the direct energy efficiency benefits of alternative passenger transportation depend on many variables and are hard to quantify, there is reason to believe they are substantial. One study, based on 1993 data, found that the energy consumed in moving an Amtrak passenger was only 58 percent on average of that required for the average automobile passenger.[220] Maine's financial support for transportation alternatives has been particularly strong over the last four bienniums with regard to capital improvements. This emphasis needs to continue while further attention is given to operating budgets. In this its first year, the Transit Bonus Program which supports operating costs is oversubscribed by participating communities. This program should be funded up to the threshold set in statute. Furthermore, the federal TEA-21 program is now up for reauthorization. The three-year limit on the use of CMAQ funds for operations should be eliminated and Maine should receive its fair share of transit related taxes it sends to Washington. Presently, Maine is shortchanged by an estimated $20 million for transit support. Finally, a study is needed to reconcile existing public policy on operational subsidies. Subsidy policy varies widely by mode and even within modes. Such a study should identify the best returns for public dollar provided. This should correlate well with gauging energy conservation benefits.

2f. *Support Alternative Freight Transportation.* The Federal Railroad Administration estimated in 1991 that trucks used from 1.4 to 5.61 times as much fuel as trains, depending on the route and commodity involved. For routes less than 100 miles, the ratios grew to 4.03 to 9.00.[221] Maine should continue the successful Industrial Rail Access Program under MDOT that is returning freight traffic to rail. Maine should strengthen its role in marketing our seaports now that major cargo facility capacity exists at Eastport, Searsport and Portland. The commitment made to the Montreal, Maine and Atlantic (formerly the bankrupt Bangor and Aroostook Railroad) to provide capital

[219] See http://righg.raabassociates.org/Articles/CLF%20Feebate%20report.DOC.
[220] Federal Railroad Administration, Intercity Freight and Passenger Rail: Energy.
[221] Federal Railroad Administration, "Rail vs. Truck Efficiency," DOT/FRA/RRP-91/2 (April 1991).

support for rail rehabilitation over five years needs to be kept. The Montreal, Maine and Atlantic essentially provides all the rail service to Aroostook County, the only rail connection to the Port of Searsport and it gives Maine direct connections to the Canadian Pacific, Canadian National and Guilford Transportation.

2g. *Redesign the Standard Offer to Include Pure Renewable Options.* As noted earlier, the current standard offer supports renewables through the requirement that the standard offer supplier obtain at least 30 percent of its supply from renewable energy generation. The Legislature should seriously consider providing additional support by amending the RPS statute to give standard offer customers the option to buy power supplied entirely from renewable sources. New York and Massachusetts are among states in which utilities provide this option. This approach would create an expanded market opportunity for renewable energy generators, at least in the short run. A possible downside, according to public hearing comments of competitive energy suppliers, is that pure renewable standard offer products could make it more difficult to develop the non-standard offer retail market for renewables.

2h. *Create a Multi-Year Standard Offer.* By establishing a multi-year standard offer, renewable generators could be provided the opportunity to secure multi-year contracts for a portion of the standard offer supply. This approach would help overcome the difficulties in financing new renewable projects associated with the unavailability of long term sale contracts. By providing for multi-year contracts of varying duration, the PUC could mitigate the current risk that all standard offer supply for any given period will be put out for bid when market prices are spiking. The downside of long term contracts is that they would reduce the flexibility of the PUC to terminate the standard offer in the event that increased availability of competitive offerings for residential consumers made it no longer necessary. It might also require that consumers be prevented from opting out of the standard offer, since reduced standard offer participation could result in stranding of costs of the multi-year renewable generation contracts. In effect, there would be a repetition of the stranding of PURPA contract costs that resulted from electric industry restructuring in 2000.

2i. *Provide Financial Support for Renewable Power from System Benefit Charge Funds.* Maine is currently one of only a handful of states that do not support renewable generation through tax benefits, grants or loan programs.[222] Maine's opportunities to adopt similar measures are limited by its fiscal constraints, and the need to use existing SBC funds for energy efficiency programs. Nonetheless, a modest program targeted at projects or technologies with significant long run potential, such as solar and geothermal energy, could be a meaningful component of a renewable power policy.

2j. *Participate in Additional Northeast Energy Efficiency Partnerships (NEEP) Initiatives to Leverage Regional Cooperation.* Northeast Energy Efficiency Partnerships, Inc. (NEEP) is a nonprofit regional organization founded in 1996. Its mission is to "steadily increase energy efficiency in homes, buildings and industry throughout the Northeast region of the United States." NEEP operates by "recognize[ing] and engage[ing] all concerned and capable organizations in cost-effective regional initiatives that promise greater results than an assortment of sub-regional (state or service territory) efforts could produce. The initiatives promote selected products and practices to address energy end-use in the residential, commercial and industrial sectors." [223]

[222] See http://www.cisolar.com/USA_Incentives.html).
[223] See http://www neep.org/index.html.

NEEP's website lists the following active initiatives:

Residential

Energy Efficient Residential Lighting
High Efficiency Clothes Washers and ENERGY STAR Appliances
Residential HVAC Equipment & Practices (NJ)
Energy Codes
Minimum Efficiency Standards for Available Products

Commercial & Industrial

Resource Efficient Operations and Maintenance (BOC)
High Performance Schools Exchange
Premium Efficiency Motors
Packaged HVAC Equipment and Practices
DesignLights Consortium (Commercial Lighting)
ENERGY STAR® Transformers
Energy Codes
Minimum Efficiency Standards for Available Products

The PUC, the agency responsible for energy efficiency issues relating to NEEP initiatives, selects initiatives to join based on their relevance to Maine needs as well as the availability of PUC staff resources to make participation worthwhile. Currently, the PUC is enrolled in the residential Energy Star Appliance initiative, and the Commercial & Industrial Resource Efficient Operations and Maintenance and Energy Codes initiatives. In addition, the PUC participates in a NEEP project dealing with research, development and evaluation.

Of the current NEEP initiatives in which the PUC does not currently participate, the PUC has identified two, the Commercial & Industrial High Performance Schools Exchange and DesignLights Consortium, that could support efficiency programs in Maine. Direct cost of participation is relatively small—depending on the overall number of initiatives in which Maine enrolls, the registration fee is as little as a few thousand dollars. The larger cost, however, is in the PUC staff time which is needed to make participation meaningful, *i.e.*, the time to attend NEEP workshops and assimilate the information for use in Maine's programs.

As resources permit, participation in additional NEEP initiatives may be an opportunity worth pursuing. The PUC actively monitors NEEP offerings and avails itself of them as its resources permit. Increased funding for energy efficiency programs, which could result from legislative action on the System Benefits Charge funding cap or other options, may address the PUC's resource limitation. Apart from cost considerations, there does not appear to be a significant risk associated with this opportunity.

2k. *Establish a Program through FAME to Finance Commercial and Industrial Energy Efficiency Projects.* System Benefits Charges (and their predecessor funding mechanisms) have been used to assist businesses in financing efficiency projects. An alternative financing approach would be to authorize FAME to issue bonds for that purpose. An advantage of FAME bonds is that they can be readily scaled to meet the financing needs, and the associated costs do not need to be added to utility rates. In addition, unlike projects funded through System Benefits Charges on electricity, efficiency projects funded through FAME need not be limited to measures targeted at a single energy source. As noted in Section I of the Report, there is precedent for FAME involvement in financing efficiency projects and acquisitions of clean fuel vehicles.

Because it is difficult to predict whether the availability of FAME financing would attract significant interest, this opportunity is included in Category 2 rather than Category 1.

Category 3. *Opportunities deserving consideration for symbolic or other value.*

3a. *Provide Increased Flexibility for Energy Education Programs.* As noted in Section I, the PUC has been exploring support for K-12 energy education as a component of its Energy Maine portfolio of programs. One barrier to pursuit of K-12 energy education is the difficulty of measuring program cost-effectiveness. Unlike other programs, where techniques to measure energy savings have been developed, the energy savings associated with educating youth about energy efficiency are long term and difficult to trace. In the absence of a clear mandate from the legislature, the PUC is left with little guidance as to the value placed by the public on K-12 education, and consequently no standards to determine a reasonable allocation of program funds. This can addressed through legislation directing the PUC to support such education without concern for cost-benefit hurdles applicable to other programs. The legislation could identify a percentage of program costs to be directed to such programs (as is currently done for low income and small business programs), or a fixed dollar amount.

Broader public education programs need not be limited to grade schools. The State already promotes public awareness of home energy efficiency issues through the BundleMeUp program. There is clearly an opportunity for increased activities in this area, such as television and print media campaigns. Funding is likely to remain a major obstacle in the short run, however.

3b. *Strengthen the Program to Improve Energy Efficiency in State Buildings.* As noted in Section I, DAFS is in the process of implementing a pilot program under a goal set in statute to improve the efficiency of state buildings by 25 percent over 1998 levels by 2010. While DAFS has reported progress in conducting the pilot program, opportunities may exist to strengthen the program, including the following:

- *Encourage more Liberal Use of Performance Contracting*. Progress in signing performance contracts to undertake efficiency improvements in state facilities has been modest. DAFS has been proceeding with caution, in part because of problems with performance contractors in the past, and also due to difficulties in reaching agreement with contractors over terms which DAFS considers key. Nonetheless, certain policy changes might facilitate more effective use of performance contracting to meet the state's efficiency goals.

  For example, DAFS might be encouraged to pursue performance contracts that bundle energy efficiency measures with other desired objectives, such as meeting space needs or providing improved amenities. There may be increased opportunities to reap the benefits of performance contracting where bundling of energy efficiency and other goals is allowed.

  Performance contractors also frequently provide access to private capital to fund their projects, with interest costs repaid through project cost savings. For example, a project expected to provide annual savings in energy costs might be funded by allowing a portion of those savings to be dedicated to paying off debt used to

finance the project. While private capital may be more expensive than tax-exempt bonds issued by the State, it can be accessed without the delays associated with securing voter approval for issuance of State bonds. In addition, use of private capital avoids depleting the State's bonding capacity.

Possible benchmark: square feet of state facilities under contract for energy efficiency improvements.

• *Allow Affected Departments and Agencies to Retain a Share of the Cost Savings in their Operating Budgets*. Existing law recognizes the incentive benefit of allowing this form of shared savings by authorizing agreements to allow agencies to retain a portion of the first year savings of energy efficiency measures undertaken in their facilities.[224] Because efficiency savings typically continue over several years, the incentive could be strengthened by amending the law to permit sharing to occur longer than one year. The disadvantages are that savings retained by the agency for a longer period become unavailable for other budgetary needs of the State, which may be of a higher priority; and it may be difficult to track the sharing of savings, *i.e.*, the agency with which the savings are nominally shared may suspect that other budgetary constraints are essentially offsetting that sharing, removing the incentive effect.

• *Adopt a Full-scale Program.* While the figure of a 25 percent reduction in state energy use by 2010 exists as a goal, the implementing program currently in progress is a pilot program only. The legislature could strengthen the State's commitment by requiring DAFS to proceed with a full-scale program to meet the efficiency goal, as well as requiring DAFS to develop a timetable of key steps and to provide periodic progress reports. The advantages would be the demonstration of a clearer commitment to achieve energy efficiency and, perhaps, a greater likelihood of meeting the goal. The disadvantage is that the pilot program may demonstrate costs and other risks that should be incorporated into the planning of a broader program. Proceeding without awaiting the outcome of the pilot program could result in mistakes in the broader program design.

[224] 5 M.R.S.A. §1768.

3c. *Increase Percentage of Renewable Power in Electricity Portfolio for State Purchases.* As noted in Section I, Governor Baldacci has set a goal of having the State purchase 50 percent of its electricity supply from renewable power. As a step toward meeting that goal, 750 small State electricity accounts, representing 10 percent of the State's load, have already been switched to a supplier relying exclusively on Maine low-head hydro and biomass. The incremental costs (over electricity supplied from 30 percent renewable sources, as required under the Renewable Portfolio Standard) are offset by efficiency measures. More recently, the State committed to buy electricity for the remainder of its accounts in CMP and Bangor Hydro's service territories with a requirement that the supplier meet the 30 percent RPS requirement with renewable power, with a preference for Maine generators. This brings the overall State purchase of renewable power to 40 percent. As a further step toward meeting the overall 50 percent goal, the State could require suppliers of its accounts in the next procurement cycle to meet a 50 percent renewable power RPS threshold.

Possible benchmark: percentage of state's electric load supplied by renewable power.

3d. *Assign Staff to Oversee and Publicize State Leadership Accomplishments.* To gain maximum effect from State leadership efforts, the State needs mechanisms to ensure accountability in following through on its commitments; it needs to track the costs and benefits of its projects; and it needs to ensure effective communication of its results (including information on costs and benefits) to the public generally, and to specific entities and groups that are most likely to benefit from the information.

The establishment of the position of Director of Energy Independence and Security and Independence may assist in meeting these objectives, given the resources to act effectively.

3e. *Reduce Miles Traveled by State Employees.* As noted in Section III, vehicle use is a major source of energy consumption, and Maine has been experiencing a significant increase in vehicle miles traveled per capita. Opportunities to counter this trend include greater use of telecommuting and mass transit.

The State is already active in this area, as some agencies allow telecommuting, and MDOT supports a number of mass transit programs. However, the State may not be realizing its full potential to exercise leadership. For example, telecommuting initiatives are undertaken by individual departments and agencies; there has been no coordinated, government-wide program endorsing the concept and offering assistance to departments and agencies unfamiliar with the issue. The State could also encourage greater use of mass transit by government employees, for example by sponsoring an electronic bulletin board for ride-sharing opportunities.

As in other areas of State leadership, the advantages are both in the direct savings achieved and the example set for others. The drawbacks are the cost of designing and maintaining programs (which should be relatively small); reduced ability to monitor employee work; the costs of increased remote use of the information infrastructure; and the occasional inconvenience of being unavailable for an in-person meeting (in the case of telecommuting) or having to accommodate mass transit schedules.

A work group has been set up to look at issues associated with increased use of telecommuting and teleconferencing to save fuel. The group is expected to produce its recommendations in December 2003.

3f. *Install Energy Saving Software on State Computers.* The Bureau of Information Services, Office of the Chief Information Officer (CIO), the Information Services Policy Board, and the Information Services Management Group have been examining products to manage energy use in networked equipment, but have not yet determined whether to implement energy management administration at the enterprise level. To ensure that adequate emphasis is placed on this initiative, a reasonable target (*e.g*., three months) could be established to finalize the current assessment and, if warranted, begin implementation of a new software policy.

3g. *Use Federal Energy Program Funds Consistent with Energy Resource Council Priorities.* Maine currently receives annual grant funding from the US Department of Energy Office of Energy Efficiency and Renewable Energy of approximately $300,000, which has been used to pay salaries of DECD staff responsible for administering energy programs. These funds must be used consistently with federal objectives, but the State has considerable discretion so long as they are used for projects related to renewable energy or energy efficiency.

With the state's recent reorganization of energy programs, those programs and the associated positions are now housed at the PUC. Because the PUC has a separate source of revenue (the System Benefits Charge) that can be used to support those positions without tapping into the General Fund, a portion of the federal funds could be reallocated to support energy policy initiatives for which other funding sources do not currently exist.[225]

For example, because there is currently no assessment on sales of heating oil comparable to the System Benefits Charge on electricity sales, oil-related efficiency programs have relatively little funding compared to electric efficiency programs. While the federal grant funding ($300,000 per year) is small relative to the annual revenue from the System Benefits Charge ($15 million per year), being able to fund additional positions focused on efficiency of energy sources other than electricity would be worthwhile.

3h. *Broaden the State's Program of Voluntary Agreements with Businesses to Encompass Energy Efficiency.* In this year's Session, the legislature enacted a law calling for reductions in greenhouse gas emissions, and directing the DEP to use voluntary reduction agreements with businesses as a tool to meet the reduction goals.[226] Because energy efficiency measures and greenhouse gas emission reduction are typically related, that program could be broadened to encompass energy efficiency goals.

A recent report for the American Council for an Energy-Efficient Economy (ACEEE) described the concept of such agreements in the context of federal initiatives, as follows:

[225] Federal funds that support the position of the grant administrator presumably could not be reallocated.
[226] PL 2003, c. 327.

Companies or entire sectors would pledge to reduce their overall energy and carbon emissions intensities (energy and carbon per unit of output) by a significant amount, for example, at least 1% per year over 10 years. Companies that make a more substantial commitment (for example, at least 2% per year) could be given ENERGY STAR or similar recognition. The government could encourage participation and support implementation by: (1) providing technical assistance to participating companies that request assistance; (2) offering to postpone consideration of mandatory emissions reductions or tax measures if a large percentage of industries participate and achieve their goals; and (3) expanding federal R&D and demonstration programs for sectors with high participation.[227]

The advantage of such agreements lies in their voluntariness: the negotiation process allows businesses to participate in the setting of goals and the methods of their accomplishment, increasing the likelihood of their being attained successfully without undue burden on the affected enterprise. The ACEEE report suggested that widespread adoption of voluntary agreements on a national scale could result in industrial energy savings of 8.5 percent by 2010, and 16 percent by 2020, over levels forecasted by the Energy Information Association.[228]

On the other hand, there may be practical issues associated with the effectiveness of such agreements in Maine. Given the substantial efficiency investments in Maine industry over the past two decades, the potential for incremental savings may be proportionately less than the ACEEE report indicated for the national economy. The ACEEE report also noted that 'carrots and sticks' may play an important role in making voluntary agreements work. As quoted above, it cites ENERGY STAR or similar recognition, technical assistance, offering to postpone mandatory emission reductions or tax measures, and government R&D programs as possibly useful inducements. Whether Maine could offer inducements of comparable significance is uncertain.

Possible benchmark: number of voluntary agreements.

Category 4. *Minor opportunities, including opportunities to revise or repeal obsolete statutes.*

4a. *Offer Financial Incentives For Clean, Fuel Efficient Vehicles through Tax and Fee Changes.* As noted in Section I, Maine has a sales tax exemption for clean fuel vehicles. Additional financial incentives might include tax rebates or credits, and local property tax exemptions. Registration fees could also be redesigned to favor such vehicles. The disadvantage of tax and fee-based approaches is the loss of state or local revenue. If tax and fee benefits for clean, fuel-efficient vehicles are offset with higher taxes or fees on other vehicles, general public opposition to tax and fee increases will also be an issue.

Possible benchmark: sales of clean fuel vehicles.

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[227] Nadel, S. and Geller, H., "Smart Energy Policies: Saving Money And Reducing Pollutant Emissions Through Greater Energy Efficiency," Report Number E012 (September 2001), published at http://www.aceee.org/pubs/e012full.pdf.

[228] Id., p. 17.

4b. *Mandate Carbon Dioxide Neutrality of Biomass Generation in Fuel Mix Disclosure Requirements.* Competitive energy suppliers are required to disclose sources of energy, including emissions, and the disclosures are included with electricity bills. As currently written, the regulations reflect the carbon emissions of biomass combustion, but do not recognize certain offsetting considerations. For example, if new trees are planted to replace those that are burned in biomass generators, the new trees may absorb a roughly equivalent amount of carbon from the atmosphere. Another theory holds that biomass removed from the forest for use in generation would otherwise result in the release of an equivalent amount of carbon through natural decay on the forest floor or through use in other products. Revising the regulations to take account of these kinds of offsetting factors would provide a more favorable comparison of biomass energy with fossil fuels. The PUC has been consulting with the DEP to gain a more accurate assessment of the overall emissions associated with use of biomass as an electric generation fuel.

4c. *Encourage Maine's Higher Education Institutions to Provide Instruction in Energy Efficient Technologies.* Comments at the public hearings stressed the value of educating engineers in the latest available energy efficiency technologies, such as embedded energy controls. The University has a strong engineering program, but it is unclear whether adequate emphasis is placed on this issue. The University should be encouraged to examine its engineering curriculum to ensure that it is aligned with the State's objective of ensuring energy efficiency. This issue should be examined at Maine's community colleges and at the Maine Maritimes Academy as well.

4d. *Eliminate Remaining Local Point-to-Point Electric Transmission Charges.* Renewable energy generators are often interconnected to the regional transmission grid at relatively low voltages. Depending on the utility service territory in which the generator is located, the generator may have to pay local point-to-point transmission charges, which raise the cost of selling power into the wholesale market. This places renewable generators at a competitive disadvantage vis-à-vis generators interconnected directly to the high voltage grid, which tend to be the more conventionally fueled facilities.

In response to complaints from generators, Central Maine Power Company revised its transmission tariffs to eliminate the charge for point-to-point service. The PUC should support efforts to make that change permanent, and should work with Bangor Hydro to bring about elimination of its local point-to-point charges as well.

4e. *Eliminate Transmission Constraints.* Under recently adopted New England wholesale market rules, when congestion occurs at the Maine- New Hampshire transmission interface, generators in Maine receive lower spot market prices for their power than generators to the south of the bottleneck. Elimination of the bottleneck would result in increased annual revenue to in-state generators of approximately $60 million in the near term. However, this is a relatively inefficient means of aiding renewable generators, since the benefit would be shared by all generators in Maine (and possibly generators in New Brunswick as well), and consumers of electricity in the State would have to absorb the higher energy prices, as well as at least a portion of the increased transmission costs.[229] In addition, eliminating the bottleneck would require the cooperation of Central Maine Power Company, which owns

[229] Elimination of the bottleneck would require the construction in Maine of new 345 kV transmission lines, as well as facilities on the other side of the State border. The rules governing how the costs of such new facilities are allocated among ratepayers or other parties in the region have not yet been determined.

the rights-of-way, and the construction of transmission facilities would no doubt encounter opposition from local landowners and communities.[230]

Another transmission constraint exists for power sold to New Brunswick. While there is an existing 700 MW transmission interconnection between New Brunswick and Maine, reliability concerns generally preclude use of the line to transmit power from south to north. Bangor Hydro has recently revived a transmission line proposal that would allow south-to-north transfers, and others may be planning transmission additions as well.[231] Eliminating the constraint on transmission from Maine to New Brunswick could also benefit renewable generators in Maine, particularly if New Brunswick retires its Pt. Lepreau nuclear plant in the next few years, as many expect will occur.[232] On the other hand, since the operation of the Pt. Lepreau plant is a major reason for the current limitation on south to north flows, its retirement may itself overcome the transmission barrier to power exports from Maine to New Brunswick.

4f. *Promote Distributed Generation (DG).* DG generally refers to small-scale generation that is located at or near load. The discussion in Section I noted the policy considerations favoring its development.

The PUC has conducted a series of studies of DG, including its market potential and barriers to its increased use, over the past few years. In addition, the PUC has already adopted measures, such as simplified interconnection standards, that facilitate DG installation. Legislation introduced in 2003[233] would have addressed barriers to further DG development identified in the PUC's most recent study. The legislation proposed to raise the renewable DG net-metering threshold from 100 kw to one megawatt; establish a mechanism to pool excess DG energy for sale in the wholesale market; and allow greater utility subsidiary participation in DG. That legislation has been held over, and the PUC has been directed to include DG issues in its current study of issues relating to renewables.

The advantages of measures such as those proposed in the carry-over legislation are that DG powered with renewable energy sources reduce reliance on fossil fuels; and that DG can improve system reliability and lower cost by locating generation in close proximity to load and providing cost-effective alternatives to transmission construction. Any disadvantage depends on the measure used to promote DG. In the case of expanded opportunities for net-metering, the risk is reduced recovery by utilities of stranded costs, leading to the need to shift those costs to other customers.[234] To the extent policies supporting DG allow use of diesel-fueled generation, there may be emission and noise issues as well. Some forms of DG may degrade rather than enhancing grid reliability, particularly if they can not be restarted

[230] Changes in regional market structure currently under consideration may provide a mechanism to compel utilities such as Central Maine Power to build transmission lines needed to eliminate bottlenecks. It is uncertain, however, whether they will be adopted and, if so, when.

[231] "Power Line Proposal Gets Renewed Interest," Portland Press Herald (October 2, 2003).

[232] The New Brunswick Public Utility Board recommended in 2002 that investments needed to keep the plant operational over the longer term not be undertaken. See Energy Advisors, LLC, "A Maine/New Brunswick RTO: Advantages and Disadvantages" (Feb. 24, 2002).

[233] 121st Legislature, First Session, LD 671.

[234] The amount of potential cost shifting depends on a number of assumptions. As a rough approximation, the loss due to net metering of one MW of load with a load factor of 75 percent would translate to cost shifting of about $200,000 per year to remaining customers on the system, assuming that load would otherwise have contributed $.03 per kwh to fixed costs. At that rate, a 10 MW loss would raise Central Maine Power Company's distribution rates by about one half of one percent.

quickly following an outage (*i.e.*, they lack 'blackstart' capability). Utility participation in DG can undermine the goal sought to be achieved by utility generation divestiture, *i.e.*, preventing utilities from distorting the generation market by providing preferential access to the grid by their own generating facilities.

An additional barrier to DG development not addressed in the proposed legislation relates to the environmental benefits that DG may have when its use displaces the use of more polluting forms of generation. Existing law and regulations do not allow entities seeking to site DG to get credit for those benefits (in the form of air emission offsets). The DEP is currently considering a proposal that would overcome this problem.[235] The legislature may wish to encourage this consideration as an additional measure to support DG.

Possible benchmark: number/MW of interconnected DG facilities.

4g. *Reinstate the "Cash for Clunkers" Program.* Until funding was lost in 2002, the DEP promoted purchases of low emission vehicles through a "scrap and buy" program.[236] While low emission vehicles also tend to be highly fuel-efficient, such a program could be directly targeted at fuel efficiency. While this alternative deserves continued consideration, the funding concerns that led to the termination of the existing DEP program have not abated, and therefore represent the principal obstacle to use of this approach in the short term.

4h. *Establish a Utility Incentive to Promote Cost-Effective Energy Efficiency.* It has long been recognized that utilities lack incentives under regulation to promote cost-effective energy efficiency measures, both because the measures cost money, and more efficient use of electricity generally translates to lower sales and reduced profits. Those incentives have caused utilities in Maine to resume promoting the use of electricity in recent years, a trend that may undermine efforts to encourage consumers to conserve.

Recognizing this problem, Maine has experimented with programs to alter utility incentives. Maine has had provisions allowing dollar-for-dollar recovery by utilities of certain efficiency program costs, establishing a rate adjustment program to neutralize the effects on profitability of lost sales, and recognizing utility conservation efforts in setting returns allowed to utility on their investment.

Under legislation introduced in 2003[237], the PUC is studying this subject as well, and is due to release a draft report examining alternatives as well as their advantages and disadvantages for public comment in December.

The advantage of improved incentives is that they would encourage utilities both to support the state's efforts to promote cost-effective energy efficiency, and to avoid activities which undermine those efforts. Whether that would significantly affect the success of those efforts is uncertain. A disadvantage is that designing suitable incentives is complex, and may lead to unintended results, such as rewarding utilities for reduced sales volumes unrelated to conservation efforts. In addition, rate increases necessitated by incentive measures inevitably encounter public resistance.

[235] Telephone conversation with Jeff Crawford, Maine DEP, November 18, 2003.
[236] See http://www.state me.us/dep/air/mobile/scrap.htm.
[237] 121st Legislature, First Session, LD 352.

At the public hearings in connection with this Study, utilities expressed receptivity to addressing this incentive issue. Central Maine Power stated that it would support measures to increase the recovery of its distribution costs through customer or other fixed charges, with lower rates tied to usage. This would diminish the profitability of higher sales volumes. Bangor Hydro also expressed a willingness to meet to explore this issue.

4i. *Support the Production and Use of Renewable Fuels.* Renewable fuels, derived from agricultural products and wastes, include biodiesel, pyrolosis oil, waste cooking oils, ethanol and methanol. Maine has vast biomass resources, which can be used as feedstocks to produce energy bio-products if economically justified. On the other hand, some biofuel crops tend to require use of chemical fertilizers and pesticides. In this Session, the legislature recognized the importance of gaining a greater understanding of the advantages and disadvantages of increased reliance on these fuels when it directed the Energy Resources Council to conduct a study of costs and benefits of state actions to stimulate biofuel use and production, related markets in neighboring states and provinces, and potential synergies between alternative transportation fuels and alternative heating fuels.[238] DOT and the Governor's Office have also instituted pilot programs to evaluate the potential uses of biofuels. While identification of priorities should await the outcome of the study, possible opportunities might include the following:

- *Establish a Renewable Fuels Economic Development Strategy.* To explore in greater detail the opportunities that may exist in Maine, the DECD could be charged with developing a renewable fuels economic development strategy. Others state entities that might usefully contribute include the Departments of Conservation, Agriculture, and Environmental Protection, the SPO, the University, and MTI. (The Department of Agriculture is reportedly planning its own study of renewable fuels production opportunities.) Partnering with industry should also be considered: the DECD could explore working with the Maine Oil Dealers Association (MODA), which has expressed support for further development of biofuels.

- *Involve the Department of Agriculture in ERC Discussions Relating to Biofuels Issues.* The preceding paragraph notes that the Department of Agriculture could assist in developing an economic development strategy relating to renewable fuels. Given the role of agriculture in the State's economy, and the potential for renewable fuels production to create a new revenue source for farms, the ERC should ensure that the Department is represented in discussions relating to biofuels development.

- *Coordinate with Other States to Expand the Biofuel Market.* Stimulating production of biofuels may be aided by building a critical mass of demand. Working with neighboring states is a logical way to build that critical mass, *e.g.,* by coordinating state purchases. There may also be synergies between existing regional programs and coordination on this issue, such as regional climate action and air quality initiatives.

- *Provide Tax Relief for Renewable Fuels Production and Use.* These ideas were put forward in legislation this Session. A proposal to eliminate the excise tax on renewable fuels (LD 441) was amended, and the bill as passed provides no tax relief. Legislation proposing a production tax credit of $.05 per gallon (LD 1492) has been held over to the next session.

[238] 2003 Resolves, c. 50.

The excise tax is currently 24.6 cents per gallon (or less, depending on the BTU content of the fuel). While there is some indication that the current price disparity between the less expensive renewable fuels and petroleum fuels is significantly higher (and the price differential may become clearer with the current study and Baldacci administration initiatives), reducing the disparity might nonetheless stimulate some consumption. The fiscal note to LD 441 indicated that the annual lost tax revenue associated with an exemption to the excise tax for renewable fuels would range from about $4,000 to $6,000 over the next three years.

- *Provide Public Information on the Benefits and Availability of Renewable Fuels.* A barrier to use of renewable fuels is lack of public awareness of their attributes, including their potential environmental benefits. The government can overcome this problem through public education campaigns, just as it has used education to promote energy efficiency. The cost of education campaigns depends on their scope and the media used. As a relatively low cost measure, the government could include renewable fuels information on a website, perhaps linked to existing sites such as BundleMeUp and Clean Cars for Maine.

4j. *Permanently Transfer the Renewables Fund to the Maine Technology Institute.* As noted in Section I, the Renewables Fund is currently administered by MTI under a contract with the SPO. To enhance long term consistency and stability in the program, the administration could be permanently transferred to MTI, with direction to MTI to consult with the SPO, the PUC and DECD in marketing and implementation. In addition, the law could be amended to make clear that costs of administration may be paid from the fund.

4k. *Repeal or Revise Obsolete Energy Policy Related Statutes.*
In reviewing existing statutes that implement energy policy, we identified several that may be obsolete or in need of updating. They are:

- *5 M.R.S.A. § 3305-B,* which requires the State Planning Office to:

Prepar[e] and submit[] to the Governor and the Legislature every 2 years an energy resources plan that includes:

(1) A description of historical energy demand by end-use sector and energy resources used to meet that demand; and

(2) A forecast of energy demand, including electric and gas energy demand, by end-use sector for the next 5 years, 10 years and 20 years…

The requirement of this statute to prepare and submit a "plan" made sense when the State played a more central role in determining the resource mix used to meet energy needs, *e.g.*, when electric utilities were responsible to meet their customers' electric energy requirements. With the advent of deregulation in the retail electric and gas markets and related developments, the mix of resources used to meet the state's energy needs is increasingly determined by individual customers' purchasing decisions rather than state planning. Those decisions are typically made annually, or even more frequently, and are subject to change as prices of alternative resources in the region fluctuate. Accordingly, while it may be useful to continue gathering the kinds of data and forecasts spelled out in this section, development of an energy resources *plan* may no longer be worthwhile.

Amending the language of this section by substituting a word such as "analysis" or "overview" for "plan" would cure this problem.

- *10 M.R.S.A. § 1105,* which prohibits "profiteering in necessities," which are defined to include "gas and electricity for light, heat and power" and "fuel of all kinds. The prohibition is described as follows:

  > Any dealer, trader, manufacturer or warehouseman who with intent to enhance the price or restrict the supply of the necessities of life willfully destroys or permits preventable waste in the production, manufacture, storage or distribution of the same, or, with such intent, prevents, limits, lessens or restricts the manufacture, production, supply or distribution of said necessities, or hoards said necessities, or enters into any contract, combination or conspiracy in restraint of trade or commerce, or exacts or demands any unjust or unreasonable profit in the sale, exchange or handling of the said necessities, or unreasonably discriminates against any person in the sale of said necessities, or in any way aids or abets the doing of any act mentioned, shall be punished by a fine of not more than $1,000 or by imprisonment for not more than 3 years, or by both

  The standard of prohibited conduct in this statute is probably unenforceable due to vagueness. In recognition of this problem, efforts were made in the Second Session of the 120st Legislature to amend it to include a definition of price gouging as "a 15% increase in the price of a necessity, such as electricity, during an "abnormal market disruption," such as an ice storm or terrorist attack." As noted in Section I, however, compromise language worked out between the Attorney General and potentially affected parties was rejected, and no bill passed.[239] In the absence of an acceptable amendment clarifying the meaning of gouging, the statute probably remains unenforceable and should be repealed.

- *5 M.R.S.A. § 1766.* Originally enacted in 1983, this statute authorizes the Bureau of General Services to enter into agreements for private parties to lease public property for the purpose of installing an energy production facility that uses at least 50 percent biomass and/or solid waste as fuel, and sells heat and/or electricity to the state facility. This statute does not appear to have been used, and may be unnecessarily restrictive in light of regulatory changes since its enactment. With the advent of deregulation, the State is free to purchase energy directly from any generator. In conjunction with the target of improving energy efficiency in State facilities, BGS is likely to consider a range of proposals for combined heat and power, of which biomass and solid waste fueled facilities are only one option. Elimination of this statute would be consistent with affording BGS broad discretion to consider all reasonable alternatives.

- *38 M.R.S.A. §631,* which sets forth policy with respect to dams as follows:

  > A. Hydropower is the state's only economically feasible, large-scale energy resource which does not rely on combustion of a fuel, thereby avoiding air pollution, solid waste disposal problems and hazards to human health from emissions, wastes and by-products. Hydropower can be developed at many sites with minimal environmental impacts, especially at sites with existing dams or where current type turbines can be used.
  >
  > B. Like all energy generating facilities, hydropower projects can have adverse effects; in contrast with other energy sources, they may also have positive environmental effects. For

[239] See http://www.iepm.org/annual02 htm.

example, hydropower dams can control floods and augment downstream flow to improve fish and wildlife habitats, water quality and recreational opportunities.

C. Hydropower is presently the state's most significant indigenous resource that can be used to free our citizens from their extreme dependence on foreign oil for peaking power.

While a legislative statement of policy on dams may still be desirable, this statement arguably is not consistent with recent developments. In particular, the statements that hydropower is "the state's only economically feasible, large-scale energy resource which does not rely on combustion of a fuel," does not take account of the progress that has been made in windpower generation. Subsection C may also be obsolete, as gas is replacing foreign oil in meeting peak load requirements.

- *5 M.R.S.A. §1812-E,* a 1991 law which required newly purchased state cars and light duty trucks to meet progressively higher mileage standards by the year 2000. As noted in Section I, the State has not complied with this law due to the unavailability of vehicles meeting the standards. The law has effectively been superseded by the 2003 Executive Order which directs that subcompact and compact sedans be replaced with gasoline-electric hybrid technology vehicles, and that all other passenger vehicles meet a 30 miles per gallon or greater fuel efficiency rating.

- *5 M.R.S.A. §3307(D),* which allows the SPO in certain circumstances to implement a petroleum set-aside program to deal with energy shortages. As noted in Section I, the SPO has never adopted regulations to adopt this authority, and the need for it has been eliminated with the more recent enactment of 37-B M.R.S.A. § 742 conferring far more sweeping emergency power on the Governor. To avoid the implication that the limitations of the earlier statute constrain the Governor's plenary emergency authority under the newer law, the Legislature should repeal 5 M.R.S.A. §3307(D).

- *10 M.R.S.A. § 1023-K,* which authorized FAME to establish and maintain a program to finance projects for the reduction or more efficient use of fossil fuels, including the DEP's High-pollution Vehicle Retirement Program. While the statute's goal remains consistent with state policy, the provisions addressing permissible uses of the fund expired by law on February 13, 2002. Accordingly, there does not appear to be any reason to retain this statute.

APPENDIX A -Recent Changes in Energy Markets

1. Competition in Wholesale Electricity Markets

The year of Maine's last Comprehensive Energy Plan, 1992, turned out to be a watershed for energy markets. At that time, electric utilities in Maine and elsewhere were mostly vertically integrated, i.e., they owned most of the generating facilities used to serve their retail customers, as well as the transmission and distribution facilities in their service territories. With the enactment of the Public Utilities Regulatory Policy Act of 1978 (PURPA), and the Maine Small Power Production Act of 1979 (SPPA), Maine utilities began to supplement their own generation with purchases from cogenerators and renewable energy producers. Those purchases became significant, making up about third of Maine's electric power sources by 1992. They also significantly diversified Maine's sources of fuel for electric generation, particularly with biomass, but also with municipal solid waste and other renewable fuels. Just the same, Maine's electric energy sources were mostly from within the state, and state regulators could exercise a high degree of control over the utilities' energy resource mix.

The enactment by Congress of the Energy Policy Act of 1992 (EPACT) touched off a series of changes in the structure and operation of electric power markets whose ramifications continue to be felt to this day. As a first step toward introducing competition into wholesale power markets, EPACT authorized the Federal Energy Regulatory Commission (FERC) for the first time to compel utilities to open access to their transmission systems on a non-discriminatory basis to independent generators, marketers and others. In succeeding years, the FERC acted aggressively to remove barriers to wholesale market competition through a series of initiatives, including

- requiring utilities to file non-discriminatory open access tariffs;
- reducing regulatory burdens on new market entrants;
- requiring utilities to transfer control of their transmission grids to independent system operators;
- directing the creation of transparent spot markets for wholesale power;
- requiring standardization of wholesale power market rules between regions; and
- requiring elimination of inter-regional charges and other "seams" which tended to impede the free flow of power between regions.

From the perspective of state energy policy, what is most significant about these developments is that Maine (like other states) has lost much of its ability to control its own electric energy destiny. Increasingly, the cost of power, as well as related issues of how future needs will be met, the diversity of fuel mix, and even decisions over how transmission will be planned and paid for, are being decided either by market forces or in regional or federal forums.

To its credit, Maine has not stood by idly as these changes have occurred. As the discussion below of the state's current initiatives shows, Maine has adjusted to these changes by

reforming its policies, as well as becoming more actively involved in those regional and national policy forums.[1]

2. Competition in Retail Electricity Markets

There have also been significant changes in the retail electric energy market. In 1997, the Legislature adopted the Electric Industry Restructuring Act, which compelled Maine's utilities to divest their generating assets, and directed that retail customers be free to choose their supplier of electric energy as of March 1, 2000. In effect, the Legislature unbundled energy generation from its delivery through transmission and distribution lines. The latter continued to be provided solely by the utilities, on a monopoly basis; the former was to be furnished by non-utility entities (and, with some qualifications, by non-regulated utility affiliates) on a competitive basis. For customers declining to exercise their right of choice, the state would procure energy supplies through an RFP process in the competitive wholesale market.

A discussion of developments relating to deregulation electricity markets of interest to Maine policymakers would not be complete without touching on the California energy crisis of 2000. California was a pioneer in opening its retail electric market to competition, having begun seriously planning for it in 1994. In 1996, the California Legislature, by unanimous vote, adopted a bill calling for the opening of the state's retail electric market in 1999. For a variety of reasons, many of which continue to be the subject of FERC investigations, wholesale electric prices spiked shortly after the market opened, and California's electric utilities were caught in a price squeeze, being forced to sell power at retail at prices well below its wholesale cost. The state's largest utility went bankrupt, and the state was required to finance a major bailout, which has in turn contributed to unprecedented financial difficulties for the state as a whole.[2] While California's experience deterred some states from introducing retail electric competition within their own borders, Maine chose to continue with its retail choice program, albeit with careful

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[1] Departments and agencies actively involved in regional and national policy forums include the Governor's Office, the PUC, the OPA and the SPO. As to the PUC's involvement, See MPUC, Annual Report on Electric Restructuring, Dec. 31, 2001, p. 19:

> Maine PUC Staff regularly participates in the meetings of the NEPOOL committees that formulate the market rules, reliability requirements, and transmission tariffs... If we perceive that the current rules or proposed changes threaten the ISO's independence, the market's competitiveness, or system reliability, we are able to intervene and provide informed comment at FERC consistent...
>
> Although we are not market participants or members of NEPOOL, our participation on NEPOOL working committees helps us understand market issues as they evolve and anticipate how they will affect the markets. During the course of the meetings, we explain to market participants and the ISO any negative effects the proposed rules may have on Maine's ratepayers. When necessary, we request that either NEPOOL itself, or ISO New England, modify the rules to eliminate potential negative consequences for consumers. If our concerns are not addressed at this informal level, we develop formal filings to FERC, the final arbiter of all market rules. We work collaboratively with other New England states as we develop the filings to build a consensus position; whenever possible, our comments are filed jointly with the other state public utility commissions through the New England Conference of Public Utility Commissioners (NECPUC)....

[2] See http://www.pbs.org/wgbh/pages/frontline/shows/blackout/california/.

attention to the lessons of California.[3] Maine has escaped the pitfalls of the California approach to deregulation.[4]

3. Competition in Natural Gas Transportation

1992 was also a pivotal year for national policy with respect to natural gas. In that year, the FERC issued landmark rules unbundling the sale of natural gas at wholesale from its delivery, and ordering pipelines to offer transportation service on a non-discriminatory basis to all market entities (much as the FERC later did for electricity and electric transmission lines). This resulted in increased exploration, pipeline construction, falling prices and increasing producer profits[5]. In succeeding years, the effects were felt in Maine, as development of the Sable Island gas fields off of Nova Scotia took place, and two new major pipelines, one from Nova Scotia, and a second from Quebec, were built in Maine, beginning service in 1999. While Maine still ranks among the states with the lowest household penetration of natural gas, five large natural gas fired generating plants with a combined output of 1700 MW have been built here within the last four years, and start-up local distribution gas companies have begun to expand gas service to Brunswick, Gorham, Bucksport, Sanford, Bangor and elsewhere.[6] As is the case with respect to electric market developments, the State has also adopted policies and programs responding to these changes in the gas market.

4. Technological Change

Technological change has also contributed to the emergence of natural gas as the fuel of choice for new power plants, and that change can be traced in large part to EPACT as well. In response to Section 2112 of EPACT, the United States Department of Energy (DOE) undertook a program to increase the efficiency of gas fired plants, which then stood at 28 percent (i.e., 28 percent of the energy used to fuel the plants was converted to electricity; the rest was lost to heat). Building on lessons learned in the development of PURPA cogeneration facilities, and working closely with industry, DOE's Advanced Turbine Systems Program resulted in combined-cycle technology with efficiency rising to 60 percent – more than double that of only eight years before. Natural Gas combined-cycle plants produce less greenhouse gas emissions that either coal or oil plants, as well as reduced nitrous oxide emissions (from double-digit parts-per-million (ppm) to single-digit ppm levels). DOE estimates that 81% of new generation between now and 2010 will be gas-fired, and that overall 39% of generation will be gas-fired by 2020.[7]

Reliance on natural gas to fuel most new generating plants has policy ramifications for Maine, as well as other jurisdictions. Gas is a much cleaner-burning fuel than coal, the fuel once seen as Maine's principal alternative for large generating plants. Combined-cycle technology also represents a major advance in energy efficiency, an important goal of state policy. Just the same, natural gas remains a non-indigenous, non-renewable fuel, and one whose transportation

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[3] See http://www.state.me.us/meopa/ME-CA%20PROBLEMS.htm.
[4] See http://www.state.me.us/mpuc/Commissioners/RetailElecCompMEWelch.htm.
[5] See http://www.platts.com/features/diversification/gasdereg.shtml.
[6] See http://www.state.me.us/mpuc/annual%20report/2000-annual%20report.pdf.
[7] See http://www.eere.energy.gov/der/industrial_turbines/pdfs/turbine.pdf.

and combustion produce greenhouse gases. In addition, reliance on natural gas for over one third of electric generation nationwide raises important concerns for supply security and price volatility, as reflected in recent statements of the Federal Reserve Board and other officials.

There have been other significant changes relating to generating technology since 1992 as well. As to renewables, perhaps most significant is the dramatic reduction in the cost of producing electricity from wind. According to the United States Department of Energy, windpower can now be generated at a cost in the range of 5 cents/kwh.[8] FPL Energy, the Florida-based company that bought Central Maine Power Company's fossil and hydro generating plants in 1999, is the nation's leader in installing wind turbines, with 30 wind farms in 10 states, producing 1700 MW of power.[9]

While generation from natural gas and wind is expanding, nuclear generation, which in the early 1990s met nearly half of the state's electricity demand, no longer exists in Maine. The 870 MW Maine Yankee Nuclear Plant in Wiscasset, licensed to operate until 2007, was prematurely closed in 1997 due to equipment and safety problems and rising operating costs.[10] Several other nuclear plants in New England have closed for similar reasons. While there are some indications of a possible renewed interest in nuclear technology in the US, and the Bush Administration has declared itself in favor of nuclear generation of electricity, no domestic nuclear plants have been ordered since the Three Mile Island disaster in 1979.[11] The failure of the Department of Energy to resolve controversies and engineering challenges relating to establishment of a repository for high-level nuclear waste is also seen as a major obstacle to further investment in domestic nuclear plants.[12] Thus, one established technology that is capable of producing large amounts of electricity without greenhouse gas emissions is not likely to play a role in Maine energy policy.

5. Environmental Change

Global climate change is another external development with potential policy ramifications for Maine. While identified many years ago as a potential environmental threat, over the past decade there has been a growing consensus in scientific circles that warming is already occurring, and that emissions from human activities, primarily fossil fuel combustion, contribute to that warming. While the relationship of human activity to climate change is not free of controversy, the potential hazards of climate change are sufficiently troublesome to warrant consideration of policies that encourage efficiency and use of energy sources with lower emissions. The Kyoto Protocol was negotiated in 1998 by world leaders. It called for a return to 1990 greenhouse gas emissions levels by 2012.[13] While the Protocol has been rejected by the Bush Administration, many other industrial nations have supported it. Maine was the first state

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[8] See http://www.eia.doe.gov/cneaf/solar.renewables/page/wind/wind.pdf.
[9] See http://www.fplenergy.com/renewable/contents/wind.shtml.
[10] See http://users.rcn.com/agnews/nf/MaineYankeeCloses.htm
[11] See http://www.commondreams.org/headlines01/0424-03.htm.
[12] See http://www.agiweb.org/agi/gap/legis107/yucca.html. Some other countries such as Korea continue to develop nuclear power plants, in part because of their perceived environmental benefits. See http://en.hdec.co.kr/service/service_sub_07.htm.
[13] See http://news.bbc.co.uk/1/hi/sci/tech/1248278.stm.

to endorse it this year (see LD 845, which calls upon the State to meet the Protocol's 2010 target for greenhouse gas emissions, and more stringent targets thereafter). [14]

In addition to global warming concerns, ground level ozone is another environmental issue with implications for Maine's energy policy that has gained prominence in recent years.. Maine, like other northeastern states, experiences unhealthy levels of ozone arising in significant measure from wind-borne nitrous oxide emissions of Midwest coal-fired plants.[15] While reducing nitrous oxide emissions from Maine sources does little to ameliorate Maine's air quality directly, Maine has been active in seeking federal action to curtail those emissions in the Midwest. To lend moral force to Maine's position, Maine's political leaders have considered it important to show that Maine is willing to live by the same standards it would have imposed on other states. [16]

[14] See http://www.pewclimate.org/projects/states_greenhouse_execsumm.cfm.
[15] See http://www.bredl.org/air/epa_facts.htm.
[16] See http://www.bostonphoenix.com/boston/news_features/top/features/documents/01655645.htm: "One of many reasons why the New England states are working to clean up our plants," says Pete Didisheim of the Natural Resources Council, Maine's largest environmental group, "is to strengthen the region's ability to tell upwind states, 'Look, we've done what we can to clean up our plants, and to the extent to which we continue to have dirty air, we need you to do the same thing.'

APPENDIX B - Principal Energy-Related Responsibilities of State Departments and Agencies

Public Utilities Commission	• Electric energy efficiency • Industrial sector energy efficiency • Renewable electric power • Affordable electric and gas rates • Electric and gas competition • Self-generation/distributed generation • Regional Advocacy
MSHA	• Low income household energy efficiency • Low income energy affordability • Energy efficiency public education
DOT	• Renewable/clean transportation fuels • Transportation energy efficiency
DAFS	• Energy efficiency in state facilities • Energy efficiency of state vehicles • Renewable power and fuels use in state buildings
FAME	• Financing energy efficiency projects • Financing renewable/clean fuel projects • Financing clean vehicles
SPO	• Energy policy coordination • Energy reports • Energy security • Regional energy market competition
Governor's Office	• Coordination of state energy policies and activities • Regional energy market competition • Energy efficiency and renewable power and fuels in state facilities • Energy efficiency in state vehicles • Energy security
OPA	• Energy affordability • Energy market competition • Electric and gas energy efficiency
DEP	• Energy efficient vehicles • Clean government
Attorney General	• Energy market competition
DECD	• Building code enforcement • Transportation efficiency (carpooling)

APPENDIX C- INDEX TO SECTION I

APPENDIX D- GOALS, OBJECTIVES AND STRATEGIES ADOPTED BY THE PUC FOR EFFICIENCY MAINE PROGRAMS

I. Goals

A. Improve the efficiency of electric energy use by Maine residential consumers, businesses and other organizations;
B. Increase consumer awareness of cost effective options for conserving energy;
C. Create more favorable, sustainable market conditions for the increased use of efficient products and services;
D. Promote sustainable economic development; and,
E. Reduce environmental damage associated with energy use.

II. Objectives

A. Implement a portfolio of conservation programs pursuant to a Maine energy conservation plan.
B. Implement an organizational model for administration and management of energy conservation programs.
C. Review existing utility programs and implement a transition plan by the end of 2003.
D. Create an awareness of the conservation programs and the value of energy efficiency among the general public.
E. Increase the availability of energy efficient products and services through Maine businesses.
F. Save a pre-defined number of kWhs through program implementation by December 2003

III. Strategies

A. Market Asessment

1. Conduct market assessment studies as needed to expand our knowledge and understanding of the markets for energy efficient products and services in Maine. Coordinate our market assessment efforts with others in the region where possible.
2. Develop market baseline measurements for efficient products and services as needed to support program design and evaluation.

B. Program design and implementation

1. Implement a portfolio of programs that allows all major customer groups a reasonable opportunity to participate in one or more programs.
2. Implement programs targeted at traditionally "hard-to-reach" markets. Target 20% of funds to programs for low-income customers, and 20% of funds to programs for small business customers.
3. Design programs that balance immediate primary results (cost effective kW and kWh savings) with longer-term secondary results (self-sustaining markets, economic development, environmental benefits).
4. Encourage the development of an energy efficiency infrastructure, resources, and skills in Maine. Use existing market channels for program delivery, where possible.
5. Assess current utility programs and their fit with our program plan, phase out those no longer needed, and re-design those to be carried forward.

6. Integrate customer educational efforts into all programs to promote changes in buying habits and energy usage behaviors.
7. Implement an overall marketing effort that develops a clear brand image for our programs, supports program implementation, and increases public awareness of the benefits of energy efficiency.
8. Adopt or adapt regional or national programs or programs from other states, if they will provide benefits to Maine's citizens and are consistent with these goals, objectives, and strategies.

C. Monitoring and evaluation

1. Develop tracking and evaluation criteria and procedures for each program. Coordinate our tracking and evaluation efforts with others in the region where possible.
2. Evaluate programs to a level sufficient for business decision-making.

D. Funding

1. Implement an accounting and reporting system to track revenues by source and expenditures by program and category, in sufficient detail to support evaluation and reporting needs.
2. Leverage ratepayer funds with funds from other sources where possible. Seek additional sources of funding from state, federal, and private sources, where such funding would enhance and support this plan.
3. Set incentive levels at the minimum needed to accomplish program objectives.

E. Communication, coordination, and reporting

1. Implement a process for ongoing public stakeholder communication.
2. Coordinate our efforts with other state agencies with energy-related responsibilities.
3. Monitor national and regional activities and participate in such activities when beneficial.
4. Report to the Legislature by December 1, 2003, describing the Commission's activities, programs implemented or planned, the likely cost effectiveness of programs, the financial condition of the conservation funds, and any recommended changes to the Conservation Act.

APPENDIX E- ENERGY RESOURCES COUNCIL ACTIVITIES AND ACCOMPLISHMENTS

The eight-member Energy Resources Council came into existence at a time of accelerating change in energy markets.[17] The 1999 SPO Plan identified the 1997 Electric Industry Restructuring Act as a major source of change, and by 2002 it had resulted in generation divestiture by utilities, retail choice for electric consumers, the introduction of a renewable resources portfolio standard, and other developments. But there were other important changes as well, such as increased turmoil in the Mid-east; the shutdown of Maine Yankee; the construction in Maine of two major gas pipelines and a half dozen new gas-fired electric generation plants; a dramatic increase in vehicle miles traveled; further scientific evidence of global climate change; and the infrastructure security concerns arising out of the 9/11 terrorist attacks.

The Council's 2003 Work Plan and Report to the Legislature provide a clear view of the priorities of the state agencies with responsibility to develop and implement policies relating to energy. Continued emphasis on energy conservation and renewables is apparent, but there are other priorities as well, reflecting the need to respond to the new challenges of the evolving marketplace. These may be seen in the Council's statement of Shared Principles:

- Energy production, undertaken in an environmentally-sound manner, is needed from a diverse mix of resources.
- Conservation, demand management and distributed resources can be viable and cost effective strategies for meeting energy needs, and are necessary components of a balanced resource portfolio.
- Adequate and reliable energy delivery infrastructure is critical to economic growth and to continued expansion of competitive energy markets.
- Energy and environmental policy are linked, and should be addressed in an integrated manner.
- Maine's energy security depends not only on Maine-specific resources, but on energy resources throughout the region.
- Policies affecting the energy resources on which Maine depends are often developed in regional and national forums; effective representation of Maine's interests in these forums is essential.
- Active interagency coordination on state, regional and federal energy policy offers an opportunity to make more efficient and effective use of State resources.[18]

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[17] The eight members are the Commissioner of Administration and Finance, the Chair of the Public Utilities Commission, the Public Advocate, the Director of the Maine State Housing Authority, the Commissioner of Transportation, the Director of the Department of Environmental Protection, the Director of the State Planning Office, and the Director of Economic and Community Development. The Commissioner of Conservation was added in 2003.

[18] Energy Resources Council, 2003 Work Plan and Report to the Legislature, pp. 5-6.

With these principles as a policy framework, the Council selected five cooperative projects for 2002-2003, summarized as follows:

> 1. **Energy Information.** This project will develop and maintain a shared information base of energy information. Priorities include development of a web-based system with links from a central location to energy data sites, and development of geographic information system (GIS) information on critical energy facilities and infrastructure.
>
> 2. **State Government Energy Efficiency.** The project goal is to aggressively and cost effectively improve State government energy efficiency in buildings and fleets, and develop mechanisms to effectively share information on progress with the public so that State government can lead by example.
>
> 3. **Small Business Energy Assistance.** This project is intended to improve the energy efficiency of Maine small businesses by better coordinating and leveraging agency programs, resources and expertise.
>
> 4. **Regulatory System Evaluation and Improvement.** This project will identify potential gaps, obsolescence or inefficiencies in energy-related regulations and processes, select priority issues for attention and recommend solutions.
>
> 5. **Energy Emergency Preparedness.** Under this project, the Council will produce an updated and workable Maine Energy Emergency Plan, in cooperation with the Maine Emergency Management Agency (MEMA).[19]

The Council also identified several issues that might be addressed as time and resources allow as well as possible matters for attention in each area, as follows:

- Energy efficiency;Additional opportunities for interagency coordination of energy efficiency activities, implementation and possible update of Maine's Energy Efficiency Building Performance Standards, public outreach and education on energy conservation, Electric Energy Conservation Fund priorities, and availability of capital for additional cost-effective energy conservation.
- State government energy use: Clean Government Initiative energy priorities, funding options for state building energy efficiency improvements, and state building conversion to natural gas.
- Alternative transportation and fuels:.Opportunities for alternative fuels and infrastructure, and the role of alternative fuels and transportation efficiency in meeting energy objectives.
- Climate action: Identification and implementation of energy-related climate actions, leveraging of activities throughout the region, and estimating emissions impacts of energy-related programs and activities.
- Renewable energy and renewable fuels: Priorities for the Renewable Resource Fund and economic development opportunities involving renewable energy or fuels.
- Wholesale electricity markets: Regional transmission organizations, market design, resource adequacy, and infrastructure development.
- Federal funding: Priorities for use of State Energy Program (SEP) funds and identification of grant opportunities

[19] Id., p. 7.

APPENDIX F- AGENCY WORKSHEETS
[TEXT POSTED SEPARATELY ON MAINE STATE PLANNING OFFICE WEBSITE]

APPENDIX G
Maine's Performance in Balancing Policy Objectives

The excerpts the Ninth Report of The Maine Economic Growth Council, 2003 Measures of Growth quoted below show the State's performance in carrying out policies on energy, environment, economic development and transportation.[20] The numbering corresponds to the section numbers in the Report. The full report is needed to place these excerpts into the overall snapshot of Maine presented by the Maine Growth Council, but the selected sections serve to illustrate the issues facing the State.

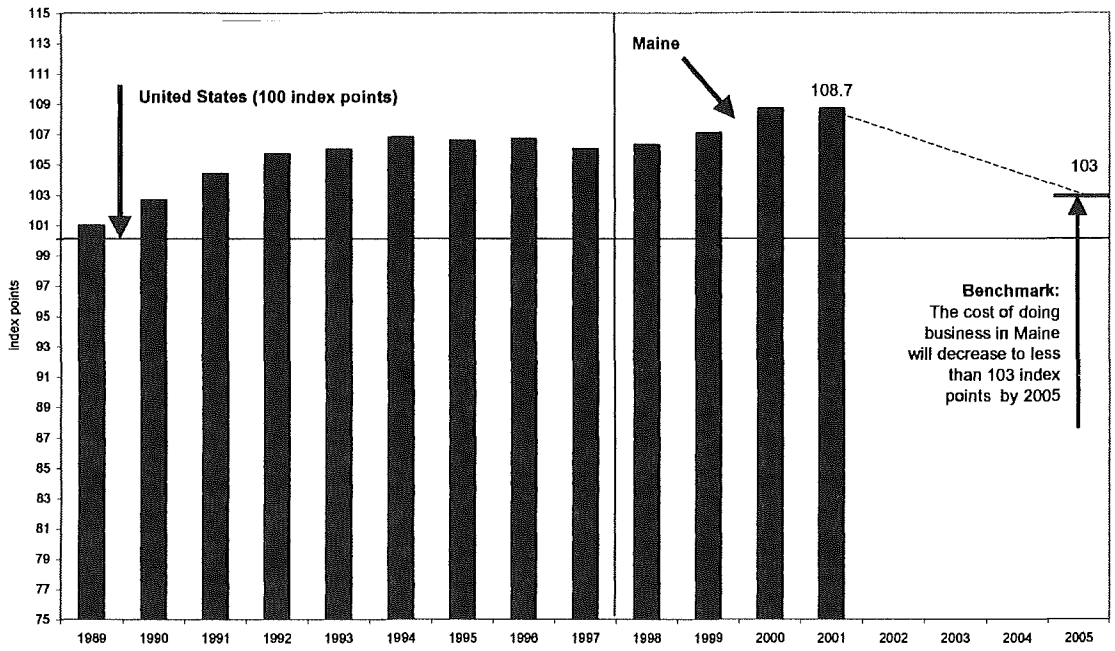
The Economy

14.Cost of Doing Business
Benchmark: The cost of doing business in Maine, 106 index points in 1998, will decrease to less than 103 index points by 2005. Equal
Cost of Doing Business High in Maine Relative to U.S.

Maine's cost of doing business in 2001, according to this index, was 8.7 points higher than the national average cost of doing business and has increased 5% over the past 10 years. This represents a serious competitive disadvantage for Maine-based businesses. This performance measure is an important indicator of the costs of operating a business in the state of Maine relative to other states, and an important consideration for businesses looking to relocate to Maine, expand, or leave the state.
The index includes the unit cost of labor, the energy costs, and the tax burden in each state. Unit labor costs comprise 75 percent of the index, energy costs comprise 15 percent, and the tax burden is 10 percent of the total index. Unit labor costs are defined as the average wages and salaries earned per dollar of output created. The energy cost component of the index compares the average commercial and industrial electricity costs, in cents per kilowatt-hour, to the U.S. average. The tax burden is the total tax burden as a percent of total personal income indexed to the national effective tax rate, which is calculated in the same manner.
Maine was ranked 7th in the nation on this index in 2002. Maine's high rank is attributed to its high state and local tax burden, which placed Maine 3rd highest in the nation on this component of the index. On the energy index Maine was ranked 6th, and on the unit labor cost index, Maine was ranked the 18th most expensive state.

[20] Data Source: Maine Economic Growth Council, Measures of Growth, 2003. Summary and analysis done by the Maine Development Foundation.

Cost of Doing Business, Maine and United States, 1989-2001



Data Source: Economy.com, United States Business Cost Review, 2003.

7. Research and Development Investment

Benchmark: Investments in research and development per Maine worker, $255.44 in 1998, will increase to $1,000 per worker by 2010. Plus
Research and Development Investments on the Increase

In 1999, Maine companies, nonprofits, and education institutions invested over $225 million dollars in research and development activities. In that year, 642,500 people were working in Maine, meaning that Maine invested an average of $349.55 per worker in research and development in 1999. That is an increase of 47% from 1997, when $237.49 per worker was invested in Maine. Although Maine increased the amount of research and development spending per worker from 1997 to 1999, the state has a long way to go to achieve the established benchmark.

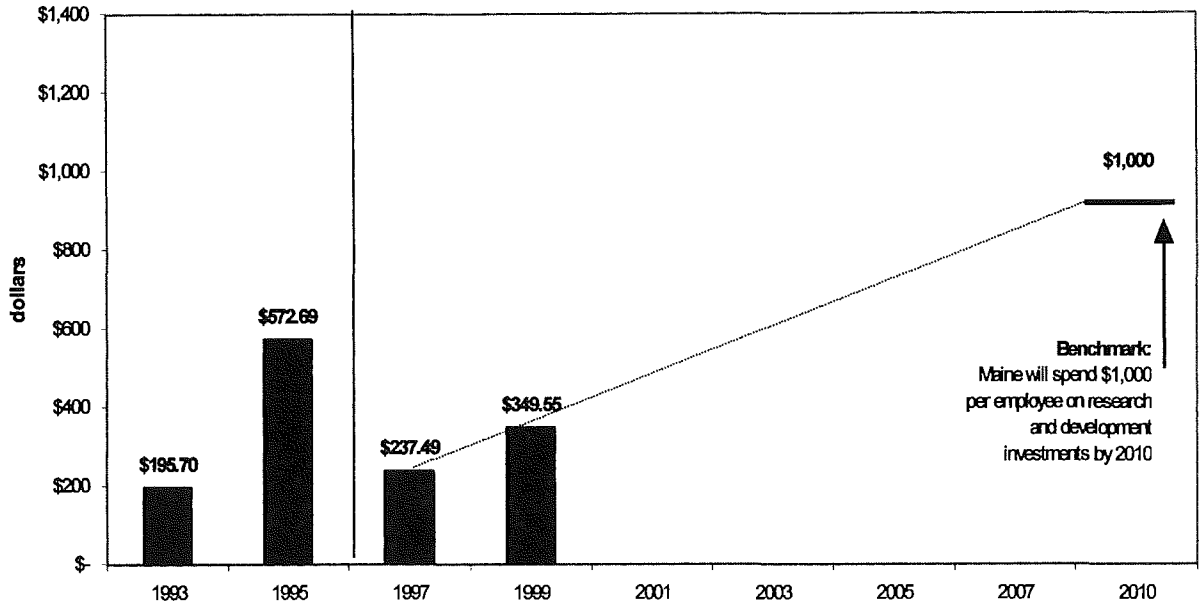
Investment in research and development has been identified as a foundation and significant driver of prosperity and a high quality of life. In Maine, industry consistently invests the most money relative to other sectors in research and development - $140 million in 1999. Still, in order to achieve the stated goal, Maine's industries will need to be even more focused on research and development. That will require continued focus on encouraging innovation and technology, including continued development of industry clusters.

State investment in support of research and development has increased significantly in the last decade in Maine. Between state fiscal years 1999 and 2003, the state appropriated an average of just over $31 million annually in support of research and development. This compares to an average investment of just over $4 million annually during the previous five-year period, 1994-1998.

Analysis by the Maine State Planning Office in 2002 identified research and development and bachelor's degree attainment levels as the key to increasing per-capita income in Maine. The study determined that Maine would need to spend $1,000 (in 2001 dollars) per worker to increase its per-capita income. The benchmark for this indicator is based on this analysis.

Data Source: National Science Foundation, Division of Science Resource Studies, *National Patterns of R&D*

Maine Research and Development Expenditures per Maine Employee, 1993-1999



Resources, and the Maine Science and Technology Foundation, November, 2002.

Energy

16. Cost of Energy

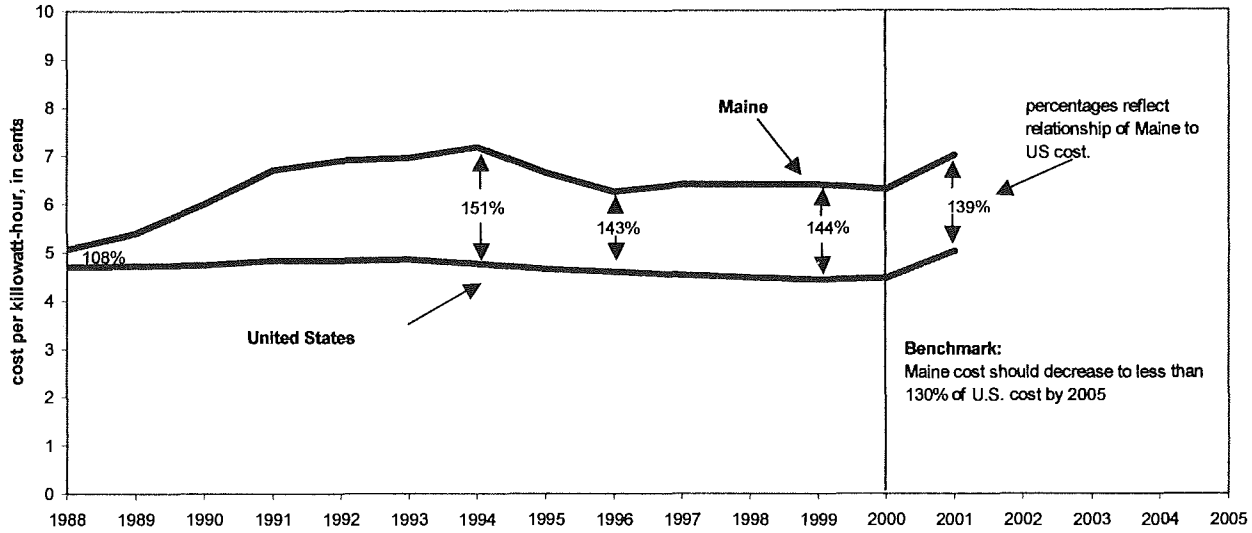
Benchmark: The cost of electricity for the industrial sector in Maine will decrease to less than 130 percent of the average cost of electricity for the industrial sector in the US by 2005. Plus
Maine Industrial Energy Costs Decrease Slightly

In 2001, electricity cost Maine's industrial sector an average of 7 cents per kilowatt-hour. Across the nation as a whole, the industrial sector paid an average of about 5 cents per kilowatt-hour. The graph shows that in 2001, Maine industrial electric consumers paid 39 percent more for electricity than the national average.
Both nationally and in Maine, industrial electricity prices increased from 2000 to 2001, but Maine prices increased at a slightly slower rate. Thus Maine moved closer to achieving the benchmark.
The cost of electricity is a fundamental cost of doing business and its cost reflects and affects other economic conditions. It is important that the cost of energy in Maine be competitively low in order to attract and retain businesses and to help support the vitality of the state's industrial operations. Actual lower costs may reflect lower delivery costs.
Maine's residential consumers paid 11 cents per kilowatt-hour in 2001. Nationally, residential consumers paid an average of 8.5 cents per kilowatt-hour. In 2001, Maine commercial entities paid an average of 11.3 cents per kilowatt-hour.
Electricity costs are now reported disaggregated, with the production costs separated from the transmission and distribution costs. Transmission and distribution costs include stranded costs. Stranded costs reflect net, above-market costs of generation obligations the utilities have incurred since the 1980's, prior to restructuring that occurred in the late 1990's in Maine. These costs are passed on to consumers through utilities' rates. Almost 30% of delivery

costs are attributed to stranded costs, which should be reduced once the existing generation contracts expire within the next decade.

Data Source: Central Maine Power based on US Department of Energy, Energy Information Administration, Annual

Average Cost of Electricty, Industrial Sector, Maine and US, 1989-2001



Electric Utility Reports,1988-2001.

The Environment

52. Air Quality

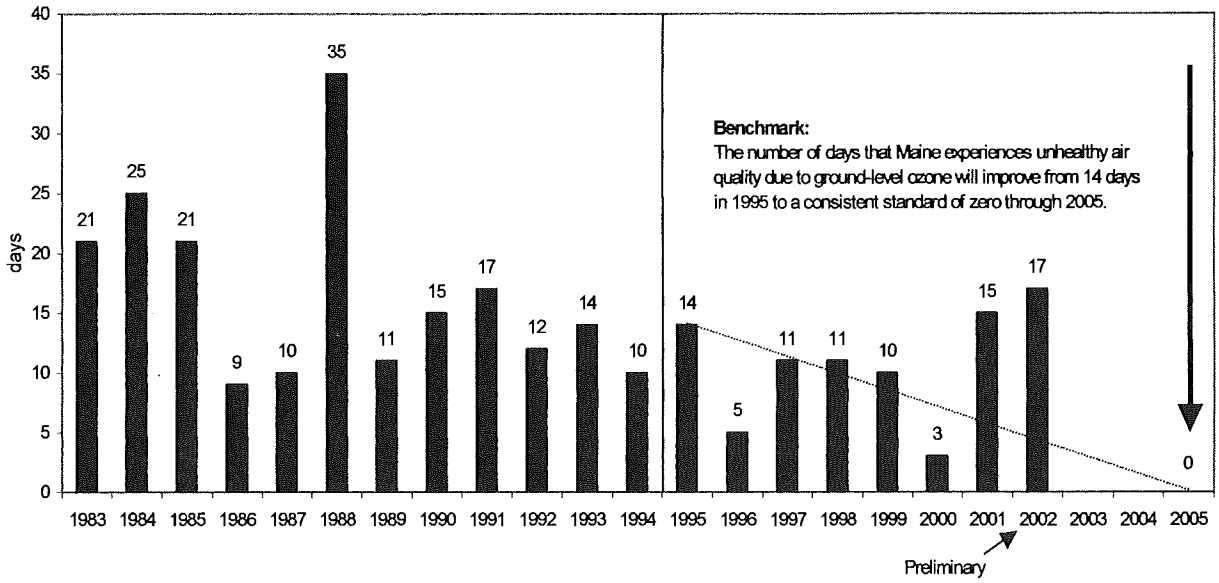
Benchmark: The number of days that Maine experiences unhealthy air quality due to ground-level ozone will improve from 14 days in 1995 to a consistent standard of zero through 2005. Minus Poor Air Quality Reported

In 2002 there were seventeen days that Maine's ground-level ozone was high enough to be deemed unhealthy. This is a slight increase over the summer of 2001 in which there were fifteen such days. The recent increase is mostly attributable to a combination of particularly warm weather and weather patterns that cause pollution from south and west of Maine to come this way.

Air quality is important to long-term economic growth for three reasons. First, high levels of ground-level ozone are unhealthy for Maine people, causing lost work days and other costs associated with ill health. Second, clean air is more valuable than dirty air because the dirtier the air is, the more we must reduce allowable additional pollution, and pollution reduction is costly. Third, Maine benefits economically from its reputation for being pristine. Gaining a reputation for poor air quality, whatever the cause, would work against economic growth.

The report uses the EPA standard of air quality exceedances in which days that have .08 parts per million of ground level ozone, averaged over an 8-hour period, are reported as poor air-quality days. The number of days that are reported as exceeding these levels is a product of poor air quality and the air temperature. Because ground level ozone forms when ozone gas interacts with sunlight and high temperatures, a hot, sunny summer is more likely to produce more ozone days than a cooler year.

Annual Number of Days in Maine with Unhealthy Air Quality, US EPA 8-hour Average Ground-Level Ozone Standard, 1983-2002



Data Source: U.S. Environmental Protection Agency, Air Quality Division, November 2002.

33. Population of Service Center Communities [Author's note: In the MEGC Report, Section 33 was listed under "Community: Civic Assets" and not the Environment section.]

Benchmark: The percentage of Maine people who reside in service center municipalities will improve from 46 percent in 1995 to 50 percent by 2010. Minus

Residential Choices Reflect Increasing Sprawl

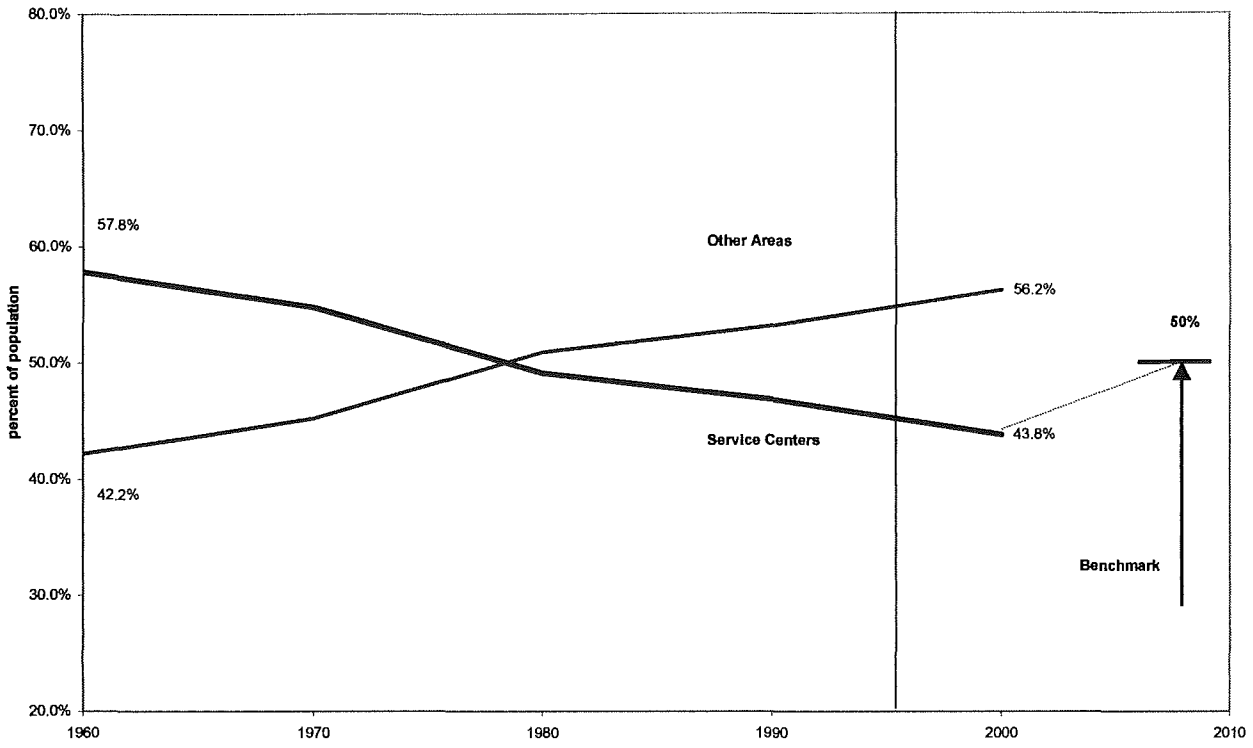
In 2000, about 44 percent of Maine people lived in regional service center communities whereas 40 years ago, about 60 percent lived in these communities. The continuing trend of people moving out of urban centers into the more rural parts of the state increases public costs and impoverishes Maine's central communities.

Within the boundaries of 62 specifically identified regional service center municipalities are almost three-quarters of all Maine jobs, services (hospitals, social services, education institutions, cultural activities, and government services), and the state's consumer retail sales. For the most part, these are the places in which Maine people work, shop, and visit for a wide variety of services. To the extent that people live close to or actually within these service centers, economic growth is enhanced because services are delivered more efficiently, people are not traveling as far to work and to shop, and environmental impacts of residential development are lessened in rural areas.

This year, the Maine State Planning Office revised its methodology for identifying regional service centers according to recent rule changes prescribed by the Legislature. However, the changes do not significantly affect the conclusions or the benchmark established by the Growth Council when it began tracking this performance measure in 1999.

Data Source: Maine State Planning Office, November, 2002.

Percent of Population Living in Regional Service Centers (Compared to Other Municipalities) 1960 - 2000



Transportation

18. Transportation Infrastructure

Benchmark: The percentage of all manufacturing freight shipped in Maine that goes by rail, water, or air (11 percent in 1997) will improve relative to the amount shipped by truck, through 2005. Minus Percent of Freight Shipped by Alternative Modes Decreases

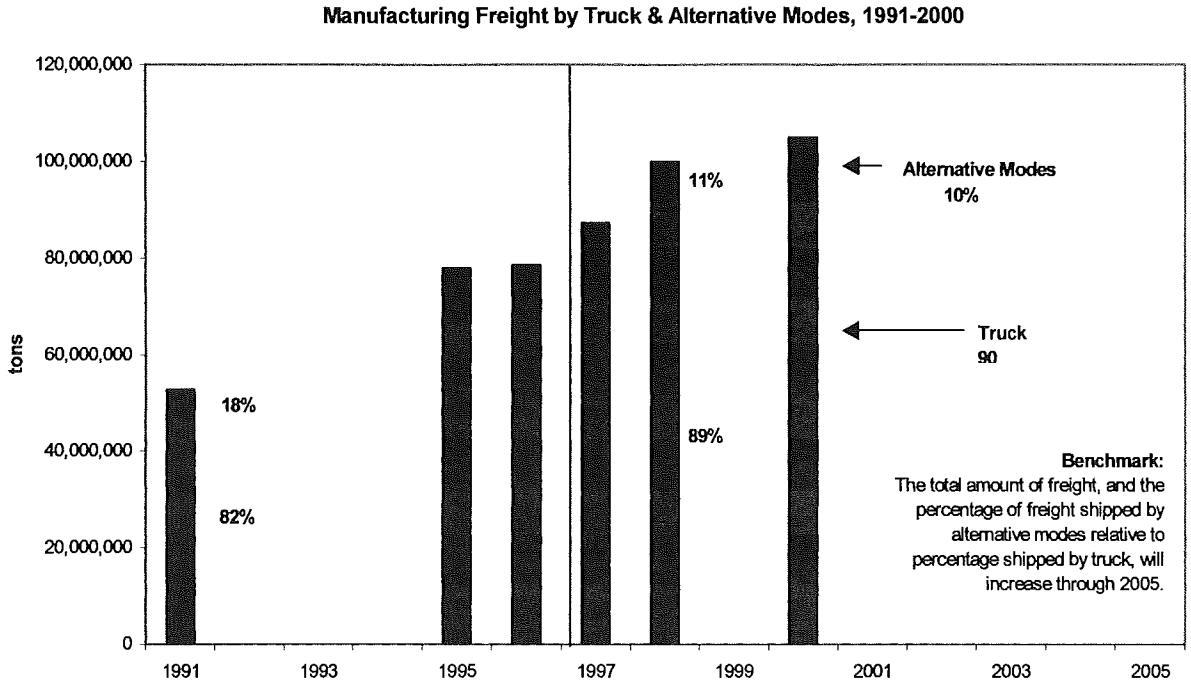
In 2000, approximately 90 percent of all manufacturing freight tonnage transported in Maine was done by truck, while 10 percent was shipped by rail, water, and air. This represents movement away from the benchmark since 1998 when 89 percent of shipping was done by truck and 11 percent by other means.

In total, an estimated 105 million tons of freight were shipped in Maine in 2000. Overall, the amount of manufacturing freight shipped in Maine increased 17 percent from 1998 to 2000.

A good business climate requires an efficient transportation system. While trucks serve as an important means of transport in Maine, it is often more efficient to use other modes to carry large amounts of cargo. The increase in heavy truck traffic has increased traffic congestion and the rate of pavement loss and bridge stress, particularly on older local and secondary highway systems, all of which reduce the speed of travel. The situation also can translate into increased highway and bridge funding needs.

Improving the balance among transport modes will result in increased modal choice and competition, which will increase the efficiency of Maine's transportation system. Maine has a number of underutilized transport modes - railroads, airports, and seaports - that can efficiently transport large amounts of cargo. Greater utilization of rail in particular, as well as air and seaports, would increase competition and relieve the dependency on the traditional road system.

No new data is available for this performance measure since *Measures of Growth 2002*, but the Council has decided to include it in *Measures of Growth 2003* due to the significance of this issue.



Data Source: Maine Department of Transportation, November 2001.

60. Alternative Modes of Travel

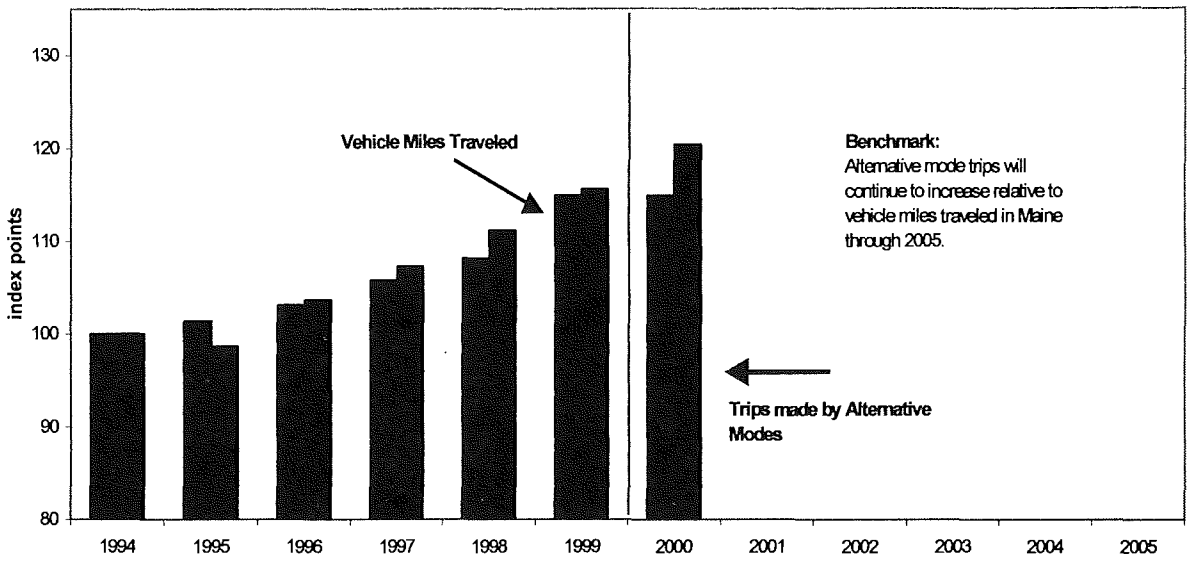
Benchmark: Trips made by Maine people using alternative modes of travel will continue to increase relative to vehicle miles traveled in Maine through 2005. **Plus**

Travel Using Alternative Modes Slowly Increasing

In 2000, the number of trips made by fixed-route buses, ferries, and airplanes (collectively known as alternative modes) increased 4.2 percent from trips made using the same modes in 1999. The number of vehicle miles traveled by automobiles declined by .03 percent during the same time period. These figures were indexed for ease of comparison. In raw numbers there are a great many more miles traveled by automobile than all other alternative modes combined. In 2000, fixed-bus routes, ferries, and airplanes made an estimated 6.45 million miles of trips in Maine, up from 6.19 in 1999. Maine people traveled 14.15 billion miles in their cars in 2000. This is a slight decrease from 1999, when cars were used to travel 14.16 billion miles. Traveling by any mode generally has a positive impact on the economy because it represents the movement of goods and services. However, alternative means of transport provide a more environmentally beneficial means of travel than vehicular transit, which is generally low occupancy. Increased use of alternative modes of transit is also part of a vibrant and sustainable economy because it increases the competitive choices for travel and movement of people and goods. The graph shows vehicle miles traveled and alternative mode trips indexed to 1994, whereby 1994 values were equalized to 100. No new data is available for this performance measure since *Measures of Growth 2002*, but the Council has decided to include it in *Measures of Growth 2003* due to the significance of this issue.

Data Source: Maine Department of Transportation's Strategic Plan, Strategic Passenger Transportation Plan,

Vehicle Miles Traveled and Alternate Mode Trips (indexed from 1994), 1994-2000



Biennial Operating Plans, Transportation Service Providers, November 2001.

APPENDIX H
AGENCY PROGRAM INTERRELATIONSHIPS

				Related Policy or Program Impacts S = Synergy T = Tension I = Impact(both)											
			"P" indicates Primary Objective	Promotes energy security	Encourage use of Maine Renewable energy	Promote energy affordability	Assist low-income consumers	Promote energy efficiency	Develop competitive energy markets	Trans-portation	Economic Develop-ment	Protect the Environ-ment	Leadership by governmen t action or example	Provide public infor-mation	Control Sprawl
Program Number	**Agncy**	**Program/Initiative**	**Primary Objective**	E-SEC	E-RENEW	E-PRICE	E-L/I	E-EFF	E-COMP	TRAN	EcDEV	ENVIRON	LEADERSHIP	EDUCATE	SPRAWL
AG01	AG	Market Monitoring and Anti-Trust	OTHER	S		S	S		S		S				
AG02	AG	Mediation Services	OTHER												
DAFS01	DAFS	Clean Government Program(2)	ENVIRON					S				P	S		
DAFS02	DAFS	Recycling State Waste	ENVIRON					S				P	S		
DAFS03	DAFS	State Building Energy Use	E-EFF	S		I		P				S	S		
DAFS04	DAFS	Energy Savings Pilot Program	E-EFF	S		I		P				S	S		
DAFS05	DAFS	State Purchasing	E-EFF	S		I		P				S	S		
DAFS06	DAFS	State Vehicles	E-EFF	S		I		P				S	S		
DECD01	DECD	Small Business Energy Audit Program	E-EFF	S		I		P			S				
DECD02	DECD	Energy Conservation Loan Program	E-EFF			I		P			S				
DECD03	DECD	Building Performance Standards (see DECD for list)	E-EFF	S		I		P			I				
DECD04	DECD	State Energy Program Grants	E-EFF	S	S	I		P		S		S			
DECD05	DECD	Energy Related Publications(2)	E-EFF					P						S	
DEP01	DEP	Clean Government Program (1)	ENVIRON					S				P	S		
DEP02	DEP	Climate Action	ENVIRON	S	S	I		S		S	I	P	S	S	S
DEP03	DEP	Licensing, Permitting, and Siting Processes Applicable to Energy Facilities	ENVIRON	I	I	T			I		I	P			

DEP04	DEP	Smart Production/STEP-UP	ENVIRON	S				S			S	P		S	
DEP05	DEP	Mobile Source Initiative	ENVIRON					S		S		P		S	
DEP06	DEP	Pollution Prevention Program	ENVIRON					S				P		S	
DEP07	DEP	Small Business Technical Assistance Program	ENVIRON					S				P			
DEP08	DEP	Community Sustainability Project	ENVIRON									P		S	
DHS01	DHS	Emergency Assistance Program	E-L/I				P								
DHS02	DHS	General Assistance Program	E-L/I				P								
DHS03	DHS	Heating Utility and Non Heat Utility Allowance	E-L/I				P								

				Related Policy or Program Impacts S = Synergy T = Tension I = Impact(both)											
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Program Number	**Agncy**	**Program/Initiative**	**Primary Objective**	E-SEC	E-RENEW	E-PRICE	E-L/I	E-EFF	E-COMP	TRAN	EcDEV	ENVIR ON	LEADER SHIP	EDUCA TE	SPRAW L
DOT01	DOT	Explore Maine	TRAN	S				S		P	S	S	S	S	
DOT02	DOT	Congestion Mitigation and (CMAQ) Funds	TRAN					S		P		S	S		
DOT03	DOT	Ridesharing and Vanpooling	TRAN					S		P		S		S	
DOT04	DOT	Park and Ride	TRAN					S		P		S			
DOT05	DOT	GO Maine	TRAN					S		P		S		S	
DOT06	DOT	Alternative Transit and Fuels	ENVIRON	S	S			S		S		P			
DOT07	DOT	Alternative Transportation Infrastructure Development	TRAN	S		S		S		P	S	S			
DOT08	DOT	Port System Administration	E-SEC	P						S	S	S			
DOT09	DOT	Motor Carrier Rules	TRAN	S						P					
DOT10	DOT	Fleet Energy Efficiency	ENVIRON					S		S		P	S		
DOT11	DOT	Intelligent Transportation Systems	TRAN					S		P	S	S			
DOT12	DOT	LED Traffic Light Program	E-EFF					P		S		S			
DOT13	DOT	Transportation Improvement Delivery System	TRAN							P	S	S			
DOT14	DOT	Transportation Enhancements	TRAN					S		P	S	S	S	S	
DOT15	DOT	Motor Transport Services Efforts	TRAN		S			S		P		S	S		
DOT16	DOT	Fleet Energy Consumption(Idling)	ENVIRON					S				P			
FAME01	FAME	Electric Rate Stabilization Program (SUNSET 1999)	E-PRICE		S	P									
FAME02	FAME	Underground Oil Storage Facility or Tank Replacement Program	ENVIRON	S								P			
FAME03	FAME	Clean Fuel Vehicle Program (Not currently funded)	ENVIRON							S		P			
FAME04	FAME	High Pollution Vehicle	ENVIRO									P			

		Retirement Pilot Program (frozen, lack of funds)	N												
FAME05	FAME	Waste Oil Furnace Loan Program (frozen, lack of funds)	E-SEC	P											
FAME06	FAME	Agricultural Products Utilization Commission	E-SEC	P	S					S	S	S			
FAME07	FAME	Northern Maine Transmission Corporation	E-SEC	P		S									

				Related Policy or Program Impacts S = Synergy T = Tension I = Impact(both)											
			"P" indicates Primary Objective	Promotes energy security	Encourage use of Maine Renewable energy	Promote energy affordability	Assist low-income consumers	Promote energy efficiency	Develop competitive energy markets	Trans-portation	Economic Develop-ment	Protecting the Environ-ment	Leadership by government action or example	Provide public infor-mation	Control Sprawl
Program Number	**Agncy**	**Program/Initiative**	**Primary Objective**	E-SEC	E-RENEW	E-PRICE	E-L/I	E-EFF	E-COMP	TRAN	EcDEV	ENVIRON	LEADERSHIP	EDUCATE	SPRAWL
LEGIS01	LEGIS	Joint Standing Committee on Appropriations & Financial Affairs	LEGIS												
LEGIS02	LEGIS	Joint Standing Committee on Business and Economic Development	LEGIS												
LEGIS03	LEGIS	Joint Standing Committee on Natural Resources	LEGIS												
LEGIS04	LEGIS	Joint Standing Committee on Transportation	LEGIS												
LEGIS05	LEGIS	Joint Standing Committee on Utilities and Energy	LEGIS												
MEMA01	MEMA	Emergency Management	OTHER	S											
MMBB01	MMBB	Energy Efficiency Partners Program (not currently running)	E-EFF					P			S	S			
MMBB02	MMBB	Maine Health and Higher Education Facilities Authority	E-PRICE			P			S		S				
MMBB03	MMBB	Maine Power Options	E-PRICE			P			S		S				
MSHA01	MSHA	Low Income Home Energy Assistance Program (LIHEAP)	E-L/I				P	S							
MSHA02	MSHA	Low Income Assistance Plan (LIAP)	E-L/I				P								
MSHA03	MSHA	Residential Energy Assistance Challenge Program (REACH)	E-EFF		S		S	P				S		S	
MSHA04	MSHA	Bundle Me Up	E-EFF				S	P						S	
MSHA05	MSHA	Weatherization Program	E-EFF				S	P							
MSHA06	MSHA	Central Heating Improvement Program (CHIP)	E-L/I				P	S				S			
MSHA07	MSHA	Low Income Refrigerator Replacement Program	E-EFF				S	P				S			
MSHA08	MSHA	Home Rehabilitation	E-L/I				P	S				S			

MSHA09	MSHA	Preservation Financng Program	E-L/I				P	S				S				
MSHA10	MSHA	Rental Loan Program	E-EFF				S	P				S				
MSHA11	MSHA	Community Action Agencies	E-L/I				P	S								
MSP01	MSP	Transportation Waivers	OTHER	S						T						

				Related Policy or Program Impacts S = Synergy T = Tension I = Impact(both)											
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Program Number	**Agncy**	**Program/Initiative**	**Primary Objective**	E-SEC	E-RENEW	E-PRICE	E-L/I	E-EFF	E-COMP	TRAN	EcDEV	ENVIRON	LEADERSHIP	EDUCATE	SPRAWL
OOGOV01	OOGOV	Emergency Powers	OTHER	S									S		
OOGOV02	OOGOV	Regional Energy Policy	OTHER	S	I	I		I	I	I	I	I	S	S	
OOGOV03	OOGOV	Energy Resources Council	OTHER	S	S	S	S	S	S	S	S	S	S	S	S
OPA01	OPA	Advocacy for Retail Utility Consumers	OTHER	S		I	S	S	S				S		
OPA02	OPA	Advocacy in Wholesale Markets	OTHER	S	S	S		S	S			S	S		
OPA03	OPA	Energy Related Publications (1)	E-COMP						P					S	
PUC02	PUC	Consumer Assistance	OTHER			S	S								
PUC03	PUC	Electric Energy Conservation Program (Efficiency Maine Portfolio)	E-EFF	S		T	S	P	S		S	S		S	
PUC04	PUC	Energy Related Publications(3)	EDUCATE											P	
PUC05	PUC	Low Income Assistance Plan	E-L/I			T	P								
PUC07	PUC	Electric Restructuring	E-COMP	I	I	I			P					S	
PUC08	PUC	Electricity Generation from Renewables	E-RENEW	S	P	I			I		I				
PUC09	PUC	T&D Utility rates and rate design	E-PRICE			P	I	I	I		I				
PUC10	PUC	Transmission oversight and approval	E-SEC	P		I			I		I	I			
PUC11	PUC	Monitor ISO-NE and Regional Electricity Markets	E-COMP	S					P						
PUC12	PUC	Natural gas LDC economic regulation	E-COMP	S		I			P		I	I			
PUC13	PUC	Electric Utility Line Extension Policy	E-PRICE			P					I				I
SPO01	SPO	Energy Planning and Policy Development	E-SEC	P	I	I		S	S		I	S	S		
SPO02	SPO	Emergency Petroleum Set Aside	OTHER	S		I							S		

SPO03	SPO	Hydropower Relicensing	E-SEC	P	I	I			I			I			
SPO04	SPO	Winter Heating Fuels Survey and Inventory	E-SEC	P										S	
SPO05	SPO	Renewable Resource Fund (MTI Administers)	E-RENEW	S	P	I					S	S	S		

APPENDIX I - DATA SUPPORTING FIGURES AND ANALYSIS IN SECTION III

[TEXT POSTED SEPARATELY ON MAINE STATE PLANNING OFFICE WEBSITE]