

Tapping the Potential of Energy Efficiency to Create Greater Economic Security for Maine

by Dylan Voorhees

The summer of 2008 provided a preview of future energy prices. Although oil prices have since dropped, we now have a sense of the economic impact—and personal panic—that such high prices can cause. This was felt most distinctly in relation to home heating costs. The reprise on oil and gas prices may last six months or three years; but it won't last.

The question for Maine people and their leaders is: Will we take advantage of this moment to get better prepared for future high energy prices? We must not lose our sense of urgency—even as oil prices temporarily decline—if we want to enjoy long-term economic and energy security. In addition, the economic recession we are experiencing should provide further motivation to invest in energy efficiency and weatherization that will put people back to work now.

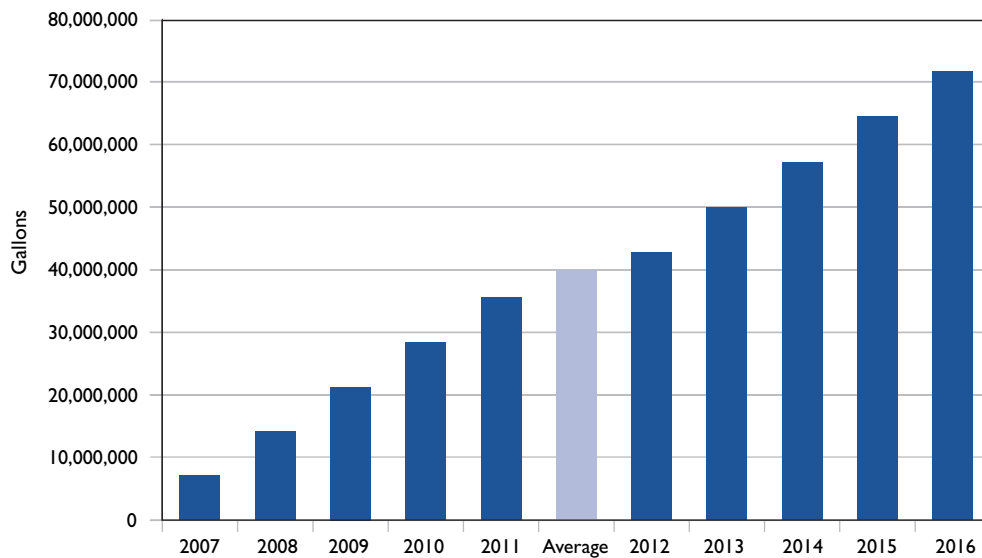
This article describes the potential for energy efficiency in Maine and the barriers that prevent us from realizing the full potential of this enormous “source” of energy. Following a brief look at Maine's current energy-efficiency programs, it describes some of the key features of a policy package that could substantially increase the energy efficiency of our homes, businesses, and industry.

Maine is starting to develop important momentum and a record of success in reducing energy costs through energy-efficiency programs, yet we still lag far behind other states in the region and are missing critical opportunities to save money and energy. With energy costs and security emerging as major global concerns, now is a time for Maine to build on existing programs, expand our energy-efficiency efforts, and improve overall management of these initiatives with a more integrated structure. By embarking on a major effort to capture and eliminate wasted energy of all forms—including electricity, heating oil and propane—we will reduce our dependence on fossil fuels, our vulnerability to global price increases, and global warming pollution levels, while saving up to \$500 million annually for Maine consumers. Furthermore, we can redirect these savings back into our economy, foster significant capital investment in Maine's housing and business sectors, and create new jobs in an expanding energy service sector.

MAINE'S ENERGY SAVING POTENTIAL

In conversations about meeting our energy needs, energy efficiency is often overlooked as a resource. It isn't as majestic as towering wind mills or as noticeable as solar panels. Nor is it as controversial as nuclear power plants or liquid natural gas (LNG) terminals. Yet, energy efficiency is cheaper than any source of power or fuel currently available.

Energy efficiency means providing the same service—such as heating a home or running machines—with less energy. We typically achieve energy efficiency with physical investments that recover excess energy or simply use less energy in the first place. Maine currently wastes a vast amount of energy, and we need to address this problem head on.

FIGURE 1: **Established Potential Annual Heating Fuel Savings in Maine**

The amount of cost-effective energy-efficiency potential in Maine is large enough to play a significant role in meeting our energy needs, today and in the future. To understand the size of the efficiency opportunity, imagine a bold 10-year strategy to capture energy efficiency. Spurred by programs and policies, each year Maine households and businesses complete thousands of different efficiency projects. Each energy-efficiency measure starts saving energy and money right away and lasts a long time—perhaps five to seven years for some lighting equipment, or as long as 20 to 30 years in the case of building components. As we keep making additional efficiency improvements, the total amount we save each year continues to grow, as shown in Figure 1. Average annual savings amounts are a short-hand for what we could achieve.

There have been 10-year studies about the potential for saving electricity in Maine, completed in 2002 and 2008 (Optimal Energy 2002; GDS Associates 2008), that provide us with specific data. In 2002 it was estimated that Maine had an achievable, cost-effective potential to reduce an average of 160 million kilowatt hours (kWh) of electricity per year. (That achievable potential is a small fraction of what is “technically” achievable in Maine.) That is equivalent to the amount of power used by 26,000 homes. By 2008,

that estimate had grown to 200 million kWh, more than 15 percent of our current annual electricity consumption. Capturing that potential would generate more than \$1.6 billion statewide in net savings over 10 years. These savings are possible even with the estimated cost of the necessary energy-efficiency programs and the labor and capital for building, installing, and retrofitting the efficiency measures (GDS Associates 2008).

Studies across New England suggest that Maine could reduce its consumption of fossil fuels, such as oil, propane, and kerosene, by 15 percent (GDS Associates 2007).

More specific analyses for Maine are forthcoming, but we can make estimates by comparison with some confidence. Maine could achieve an average annual savings of 40 million gallons of heating oil, which means that \$110 million less would leave Maine each year (even at current “low” price of \$2.75). That is as much as 45,000 typical homes consume each year. After subtracting the cost of energy-efficiency measures and programs, the net fossil-fuel savings over 10 years would be approximately \$1 billion.

Putting the electricity and fossil fuel numbers together, Maine could reduce its net annual energy costs by \$260 million just by achieving a healthy portion of the energy-efficiency potential already identified.

BARRIERS WE MUST OVERCOME

Without effective public policies, there are major barriers to energy-efficiency investments that impede Maine’s ability to tap its enormous potential. The “market barriers” that lead us to under-invest in efficiency have been understood for decades. This has not made them go away, but it has helped policy-makers to develop programs and solutions that work. Understanding how these barriers function is essential to developing the next generation energy-efficiency strategy for Maine.

Efficiency is not like energy resources on the “supply side,” such as an oil well or a wind farm. It is dispersed on the “demand side,” and many individual decisions affect how much of the potential can be tapped. On the positive side, most, if not all, homes and businesses can initiate energy-efficiency measures directly. On the negative side, absent good public policies, we will only achieve the benefits of energy efficiency if lots of homes and businesses recognize the potential and act to make it a reality. Here are four important barriers that make it difficult for home and business owners to pursue energy efficiency based on the actual costs and savings.

Split Incentives

One of the most powerful barriers to cost-effective investments is that the person who owns or pays the up-front cost for a building is not always the same person paying the ongoing energy bills. This split incentive exists between a landlord, who owns the building, heating system, and most appliances, and the tenant who pays the bills. If the energy-efficiency investment will not provide the owner with a savings, the landlord will not be motivated to act. Split incentives affect thousands of rental households in Maine. They also affect thousands of business tenants. In fact, businesses renters are often more negatively affected because they are more likely to pay all of the energy bills and to be locked into long-term leases. A split incentive also exists between a developer who wants to minimize construction costs and the eventual owner. The eventual owner can still invest in energy-efficiency measures that save money, but only at a much greater cost than if energy-efficiency measures were part of the original construction.

Information Barriers

Making smart investments in cost-effective energy efficiency may sound straightforward, but thousands of people lack the information they need to make them. Some of this needed information cannot be provided simply through public service announcements and educational outreach.

Imagine the owner of a manufacturing facility, who thinks that there is a better motor available that would save her money. In order to act, she has to first

know her current equipment and related energy costs. Then she needs to know what alternatives exist and how much money they might save, but her regular vendor or maintenance person may not be much help because he sells and works on what he knows: the same old system.

Next she needs to make a decision based on life-time costs—not just the up-front costs—which requires more information than just the purchase price tag. With adequate information she might discover, for example, that the list price of a new industrial motor accounts for about five percent of the total cost of the motor, while the energy needed to run it will make up most of the cost over the long term. A more efficient motor might cost more up front but far less over time because of its energy savings. In fact, the barrier of “up-front costs” often stems from a lack of information rather than a lack of capital. Despite recent financial troubles, homes and businesses with decent credit generally have access to capital for large investments with a clear positive payback. (Financial assistance to pay up-front costs is an important tool, of course, including for those who cannot afford efficiency investments up front.)

Finally, the owner needs information about the reliability and performance of the new system: How expensive will it be to maintain? Will it break down and cost expensive “down time”? In other words, can she trust what appears to be “new” technology?

Supply Chain

Some energy-efficient equipment has been around for quite a while and some of it is constantly evolving and maturing. Vendors who sell and maintain equipment tend to stock and service the common models with which they are already familiar. With all the other barriers suppressing the demand for high-efficiency choices, national chains and local building supply shops have little motivation to put them on the shelf. Absent a strong external change, building contractors build the same way—using the same materials—they have always built. The interdependence of businesses and their vendors or contractors is a fundamental factor in decision making. The relationship can be advantageous when vendors are given a reason and a means to start “selling” energy efficiency, but absent that, they are a powerful force for the status quo.

Transaction Costs

The transaction costs—measured in time and money—of initiating and completing an efficiency project can be daunting. “People are busy” is a truism that is particularly hard hitting in regard to energy-efficiency decision making because it takes time to learn the needed information. Other transaction costs include the time and investment for energy audits to help determine what projects make sense. The installation of a new motor or appliance could be quick and painless, or a project could involve contractors working on your attic or equipment for a week. Transaction costs are especially challenging for smaller projects or smaller customers, including many homeowners. In particular, banks generally do not make many \$3,000 loans because the transaction costs are too high for them, which can make it difficult to get financing for smaller projects. Energy service companies (or ESCOs) might not even consider a job for less than \$100,000.

ECONOMIC BENEFITS FROM ENERGY INVESTMENTS

Major public initiatives and private investments in energy efficiency can create significant, positive overall economic effects, such as increased employment, larger gross domestic product (GDP), greater capital investment in Maine companies, and greater economic security for Maine people. Experience across the nation has demonstrated that energy-efficiency investments generate more jobs than comparative levels of spending in other energy areas (Pollin et al. 2008). Nationally more than 1.6 million jobs are supported by efficiency-related investments (Laitner and Ehrhardt-Martinez 2008). Based on a variety of estimates, there may be as many as 2,500 people currently working in energy-efficiency-related jobs in Maine (Massachusetts Technology Collaborative 2007; E2 Tech Council 2008). Many of these jobs are in the construction or mechanical trades, such as electrical or HVAC technicians. Others are in equipment sales, and still others are in supporting professions, such as accountants, lawyers, and administrators.

There are also jobs in research and engineering, designing and developing energy-efficiency systems and equipment. One national company in Bangor

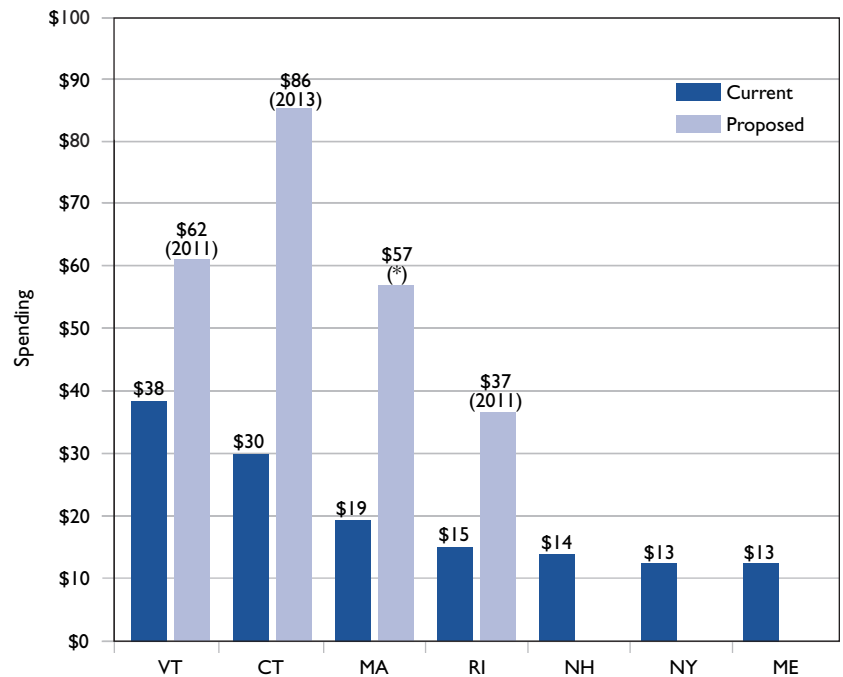
makes a new kind of heat pump that captures latent heat in outside air, even in cold climates like Maine’s, and brings it inside. These heat pumps can save consumers more than 50 percent on their energy bills. This technology is being sold around the country, and the units are stamped “Made in Maine.”

A national *Green Recovery* report recently estimated that \$160 million spent on energy-efficiency retrofits in Maine would create more than 3,000 additional jobs in the state (Pollin et al. 2008). (The report included other clean energy investments also and was linked to a proposed federal economic recovery spending plan.) Such a large expenditure from the federal government, in the form of grants, loans, or tax credits, could become a reality. In the next year or two, Congress and the Obama administration may pass global warming “cap-and-trade” legislation that would generate significant revenues for energy efficiency and clean renewable energy. But Maine lacks the infrastructure to handle that level of investment right now—we do not have enough workers or enough companies to do the work. If we ramp up our energy-efficiency investments now, we will be in a better position to take advantage of potential new large federal investments. (For discussion on labor force investment, see Brown and Ginn, this issue; Cote, this issue, discusses federal energy policy.)

Some of these investments will result in new jobs directly in the energy sector. Others will be created through the “multiplier effect.” Investments in energy efficiency save homeowners and businesses money that they will be more likely to spend in the Maine economy. A 2008 report estimated that the savings on fuel by investing in cost-effective efficiency *just in the commercial and industrial sectors* could increase state GDP by \$260 million and create 2,500 new jobs (Colgan, Merrill and Rubin 2008). These jobs would be additional to the actual energy-efficiency jobs described above.

Are big, new efficiency investments a good idea during an economic recession? Undoubtedly our economic and fiscal situation makes further investments challenging at every level of society. But the need to put Mainers to work and reduce their expenses is greatest right now, so we need to rise to that challenge. The major slowdown in the housing market means many builders and contractors are in need of work.

FIGURE 2: Annual Per-capita Electrical Efficiency Investment



*3x in 3yrs – ENE Proposal

Source: Environment Northeast (2008).

Energy efficiency means using proven, cost-effective measures to save money and put people to work, so it is a reliable choice for policy-makers hoping to stimulate the economy.

Our public policy choices can help to create the environment where markets can respond and grow. For example, a worker who is in transition would be motivated to enter the energy-efficiency field if the state initiated a strategy, with multi-year funding, to quadruple the number of homes being weatherized. An entrepreneur would make similar choices if there was an aggressive program to assist small businesses to do top-to-bottom energy-efficiency retrofits. Even with such investments, this process of economic recovery takes time, but it will happen more quickly if we get on the right course sooner. To date, however, Maine has lacked clear, robust public policies that are based on a long-term commitment to energy efficiency, so other states around us have taken the lead.

MAINE'S EFFICIENCY RESPONSE SO FAR

Fortunately, Maine has not been idle. We have some policies and programs that are successful. The most successful state energy-efficiency initiative to date has been Efficiency Maine. This suite of programs helps residential, business, and institutional consumers to reduce their electricity spending. In 2007 Efficiency Maine used \$13.2 million generated through a small surcharge on all electricity rates to match \$13.1 million in private funds, and achieved energy-efficiency investments that will save Maine people more than \$100 million (Maine Public Utilities Commission 2007). That is a benefit to cost ratio of 3.8 to 1. The annual savings from Efficiency Maine have grown every year. Unfortunately, on a per capita basis, Efficiency Maine's budget lags behind that of similar programs in every other New England state (see Figure 2). The article by Vrabel, this issue, provides a full discussion of Efficiency Maine.

MaineHousing administers Maine's other large efficiency program, a low-income weatherization program run in partnership with the community action programs (CAPs). This program is funded exclusively

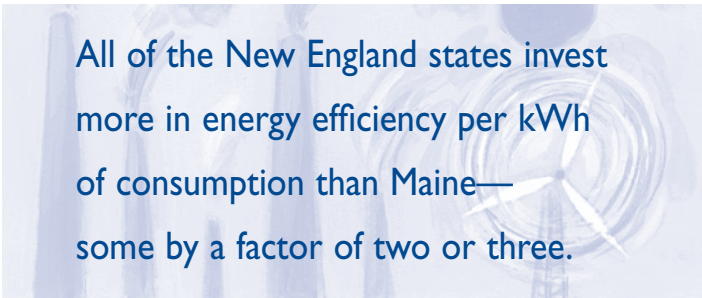
by the federal government and only serves low-income residents (defined as a single person with income of less than \$17,000, or family of four making less than \$36,000). This program works through grants and pays roughly \$4,000 per home to weatherize 1,000 to 1,500 homes per year. These homes realize energy savings of 20 percent on average. Through recently increased federal funding and some one-time state funding, MaineHousing and the CAPs will at least double the number of homes weatherized this coming winter. (See McCormick and Van Hook, this issue.) Even at this rate, however, it could take 40 years to weatherize all of Maine's low-income homes.

Between Efficiency Maine and low-income home weatherization lies an important gap: Maine has no efficiency program to help the other 400,000 households—and most businesses—to reduce oil and propane costs.

Maine has two other strategies that help overcome barriers and increase energy-efficiency investments. One is through state loan programs for both residential customers through MaineHousing and business

customers through Efficiency Maine/Finance Authority of Maine (FAME). The second is through building codes, which mandate a minimum level of energy efficiency in new buildings at the time of construction. Neither of these strategies has provided large benefits yet, although both have the potential to play an expanded role.

The loan programs are not being used fully by the intended audiences for a variety of reasons. It takes significant time and energy to apply for the loans. The rates are slightly more attractive than commercial rates, but that alone is not enough to induce many potential customers to take out a loan. A recent survey of residential financing programs found that they were not particularly applicable for households most in need and had low participation rates (Fuller 2008).



All of the New England states invest more in energy efficiency per kWh of consumption than Maine—some by a factor of two or three.

In many loan programs, lack of rigorous savings assessments and/or loan terms that are too short to guarantee positive cash flow, meant that it was difficult to assure that savings would exceed monthly payments. It is important to note that most loan programs cannot cover their costs internally—loan funds are not successful unless they are connected to other public investments, either to reduce loan rates or to embed loan services in full efficiency programs.

New building codes do not come into effect until 2010 (for new homes, commercial codes are in effect) and will only affect new buildings and major rehabilitation.¹ Building codes do not require the full level of cost-effective energy efficiency, but they do get at some of the major barriers. First, they attack the split incentive problem by injecting some of the interests of the person ultimately paying the energy bill into the construction process. They also help with the information and supply chain problems by forcing all archi-

itects and contractors to learn about and use a minimum set of efficiency measures. When efficiency choices become routine, they become cheaper and easier.

In addition to these programs, many Maine state agencies are involved in promoting or assisting with energy efficiency, including the Department of Community and Economic Development, the Office of Energy Independence and Security, the State Planning Office, and the Department of Administrative and Financial Services.

In 2007, Maine joined the Regional Greenhouse Gas Initiative (RGGI) to reduce global warming pollution from power plants using a cap-and-trade mechanism. The program has begun generating \$10 to \$20 million per year to invest in energy efficiency. Recognizing the value of some independence from state agencies (e.g., flexibility, innovation), and wanting to make greater use of contracting with the private sector, the Legislature established the Energy and Carbon Savings Trust to administer the funds based on performance criteria. The trustees will submit administrative rules to the Legislature for approval in January 2009. Given how energy-efficiency efforts and resources are scattered across state government, the new trust could form the nucleus of an expanded, consolidated, and reinvigorated efficiency strategy for Maine.

LEADERSHIP IN OTHER STATES

Our neighbors in the Northeast have impressive track records for energy efficiency. All of the New England states invest more in energy efficiency per kWh of consumption than Maine—some by a factor of two or three. They also have benefited from some bold leaders—governors, key legislators, even utility executives—who understand that maximizing energy efficiency is an essential tool in meeting our energy and economic needs. Many states and provinces around us are a step ahead of Maine because they have established funding mechanisms for heating-efficiency programs for most customers, typically through a fuel surcharge that directly funds the programs. Already vulnerable because of our older homes and heavy oil dependency, Maine's people and economy will be increasingly disadvantaged if we continue to let other states outpace us.

In 2006 Governor Spitzer of New York announced that the state would reduce total energy consumption by 15 percent by 2015. State agencies are now developing plans to reach this target. Vermont's legislature had the foresight to establish a dedicated revenue stream to fund weatherization. Their gross receipts tax on heating fuels operates similarly to the surcharge on electricity and natural gas rates that fund Efficiency Maine and efficiency programs elsewhere. Because this ongoing revenue enables greater investment levels, Vermont is weatherizing homes at a faster rate than Maine. New Jersey has established an energy master plan for the state that includes five high-level goals, including reducing energy consumption by 20 percent by 2020. They are re-examining their administrative structure to make programs more performance oriented. The state's Home Performance program is a one-stop home efficiency program that includes home energy audits, a toolbox of financial incentives, and access to certified contractors to complete the work.

AN EXPANDED ENERGY-EFFICIENCY STRATEGY FOR MAINE

An energy-efficiency strategy is the most urgent part of a larger strategy for clean energy and energy independence, which includes renewable energy development, sustainable transportation infrastructure, and support for innovation and workforce growth. Many different energy-efficiency and weatherization solutions will emerge in the 124th legislature. Successful policies will be based on our experience with energy efficiency and directly address market barriers. Our response to Maine's energy crisis should be guided by the following principles.

Plan for the Long-run

Tapping Maine's energy-efficiency potential will not happen overnight. Increasing our workforce capacity, refining strategies and plans, and reaching as many homes and businesses as possible all take time. Reducing our dependence on fossil fuels is a marathon, not a sprint. Maine needs a long-term plan that includes clear, ambitious, and achievable goals, whether measured in gallons of oil, dollars saved, or homes

improved. Planning for the long term, however, does not mean waiting to act. Higher energy prices will come back, and Maine is extremely vulnerable. Increasing investments in energy efficiency now is the most economic way to reduce costs today and in coming years.

Leverage Private Investments

Efficiency Maine and other efficiency programs create incentives for consumers and businesses to invest in energy efficiency. Subsidized or guaranteed loans are one way to induce private investment, but experience has shown that even the most creative financing mechanisms are poor performers on their own (Fuller 2008). Most efficiency programs have found greater results with direct cash incentives that cover between 25 percent and 75 percent of the additional cost of a new efficiency measure, depending on the program type. Especially in an economic recession, fostering private investment is an important strategy. Efficiency incentives in Maine and elsewhere are funded primarily through a dedicated fuel surcharge that goes directly into efficiency budgets, not through general funds. Program managers should have the flexibility to create the most effective ways to foster private investments in efficiency.

Consolidate Overall Planning, Budgeting and Program Evaluation

It makes sense for many private and public agencies to be involved in delivering or marketing energy efficiency. It does not make sense, however, for multiple entities to be setting strategic direction, or using different criteria for designing or evaluating programs. Whatever the model Maine chooses, the highest level planning and administration should emanate from one place, with a common plan to ensure that activities across programs are coordinated.

Take Advantage of the Strengths of the Private Sector

We should rely on each sector for what it does best. We need the public sector to establish goals, plans, and budgets that reflect the needs of the state and different constituencies. This begins with legislative policy making and extends to administrators who set

overall budgets and criteria for how efficiency efforts will work and be evaluated. The private sector is better positioned to offer innovative and competitive ways to deliver those programs. From building contractors or oil dealers to fulltime efficiency companies that submit bids to run efficiency programs, the private sector must play an essential role. Giving complete control over efficiency programs to the energy companies may be appealing, but does not fit the overall public goal of energy-efficiency efforts. Instead, administrators in other states combine basic criteria and goals with performance incentives to fully tap private sector efficiency efforts. Public sector administration need not mean government agencies—several states successfully use an independent authority, trust, or board, which is accountable to, but separate from, government agencies.

Now is an opportunity for Maine to revitalize its energy efficiency strategy by expanding on our success and filling in some of the missing elements that matter most in terms of energy costs at home and at work. Applying these principles to Maine's specific circumstances, policymakers should tackle four essential tasks:

1. Set clear energy saving targets for five and 10 years. Policymakers should set informed, high-level targets (probably in gallons, kWh, and/or dollars saved) to guide more detailed planning and program work.
2. Invest in *all cost-effective* efficiency in utility fuels—especially electricity. In 2007 Maine's legislature directed the Public Utilities Commission (PUC) to set budget levels according to our energy-efficiency potential. That law must still be implemented—otherwise we are letting energy savings opportunities pass us by.
3. Extend energy-efficiency programs to other fuels—oil, propane, and kerosene—and expand low-income weatherization. Eighty percent of Maine homes are heated by fuel oil, with others dependent on propane and kerosene. Most households and businesses lack access to programs that can help them to reduce spending for all fuels. We must build on the successful Efficiency Maine model and

low-income weatherization to meet that need. Maine must implement a policy to generate the needed revenue for programs that help households and businesses increase their investments in heating efficiency. There are many reasons to avoid Maine's General Fund as a source of ongoing revenue—primarily the large short-term structural gap in Maine's budget, but also because there is a currently successful alternative revenue mechanism known as the system benefit charge. This surcharge on electricity and/or natural gas is used by Maine and more than half of the states to fund energy-efficiency programs on an ongoing basis. It is stable and the programs return direct benefits to the people who pay for those fuels. Extending that surcharge to the other fuels is a natural step, but not without challenges. Fossil fuels are not regulated like electricity and gas, so the charge will not be collected by the PUC. In addition, the surcharge—and the programs it funds—must be designed with particular care for low-income households. Ensuring that significant low-income weatherization is achieved is the best way to do so, when combined with ongoing fuel assistance.

4. Improve overall management by consolidating planning and programs, including streamlined access to information and programs for consumers. When Maine disbanded its Office of Energy Resources, it lost many of its energy planning and programming functions. Consolidation does not need to mean building a new state agency. Maine's Energy and Carbon Savings Trust (or RGGI Trust), guided by its stakeholder advisory group, the Energy Conservation Board, is a likely place to look for a semi-independent entity that could act as an umbrella over multiple coordinated efficiency efforts. In addition to more coordinated management, a consolidated "Maine Energy Trust" would have other advantages: more streamlined access for efficiency customers. This means more than just

the possibility of “one-stop shopping,” where audits, service providers, technical information, and incentives are packaged together. It means an end to a segmented system where one program helps with oil furnace efficiency, another helps with reducing electricity use, and a third with building weatherization. With streamlined, integrated programs, Maine can tap deeper into our efficiency potential.

Most states have moved away from agency-run efficiency programs, and now would be a good time to relocate Efficiency Maine out of the PUC and eliminate its redundancy with RGGI-funded efficiency programs. With its independent trustees, a modest staff and effective contracting authority, the “Maine Energy Trust” could achieve significant results without a lot of bureaucracy. If the trust were given greater authority and funding to tackle the full range of energy-efficiency programs, the programs themselves could be run by a combination of public and private entities, perhaps predominantly determined by a bidding process.

MAKING IT HAPPEN

We have made a significant start in using energy efficiency to reduce costs and electricity usage. The economic and energy challenge before us—to say nothing of the need to reduce global warming emissions from fossil fuels—now demands more ambitious efforts. The untapped efficiency potential in Maine is enormous and extends well beyond the electricity sector where traditional efforts have focused. Public policies that address persistent market barriers are needed to tap the full potential.

States around us have significant experience we can learn from. Those using natural gas for heating have been administering and funding heating-efficiency programs for several years. Those with higher levels of public investment have tackled the “ramping up” challenge. And some have outstanding models for coordinated administration.

Leadership on these issues is harder to borrow from others, but is even more important. Maine cannot move forward without leaders who understand where

we need to go and how we must prepare to get there. Three facts are hard to refute: fossil fuel energy will get more expensive; Maine’s dependence is dangerously high; and efficiency is achievable, highly cost-effective, and enormously beneficial to our economy. With additional champions who are willing to lead Maine people toward greater energy efficiency, we can build a more secure future for Maine. 

ENDNOTE

- I. LD 2257, signed by Governor Baldacci in April 2008, establishes a Maine uniform building code for commercial and residential new construction and major rehabilitation. Previously Maine had been one of fewer than 10 states that did not have a statewide energy code for residential buildings. The energy code Maine will use, which is used by the majority of other states, is based on the International Energy Conservation Code (IECC). Maine’s PUC completed analysis at the time LD 2257 was being considered and found that 85 percent of new Maine homes would not meet the minimum standard in the code—they would be illegal if built in New Hampshire (Maine Public Utilities Commission 2008). This failure in new homes illustrates the magnitude of the problematic conditions in older homes.

REFERENCES

- Brown, Robert E. II and Clifford M. Ginn. 2008. “Workforce Investment in Maine’s New Energy Economy.” *Maine Policy Review* 17(2): 80–83.
- Colgan, Charles S., Samuel Merrill and Jonathan Rubin. 2008. *Energy Efficiency, Business Competitiveness, and Untapped Economic Potential in Maine*. Maine Center for Business and Economic Research, Portland.
- Cote, Adam. 2008. “What We Can Expect from the Federal Government to Address Climate Change and Energy Independence.” *Maine Policy Review* 17(2): 46–50.
- Environmental & Energy (E2) Technology Council. 2008. *Industry Profile*. Portland, ME.
- Fuller, Merrian. 2008. *Enabling Investments in Energy Efficiency: A Study of Programs That Eliminate First Cost Barriers for the Residential Sector*. Efficiency Vermont, Burlington.

Please turn the page for more references and author information.

- GDS Associates, Inc. 2007. Vermont Energy Efficiency Potential Study for Oil, Propane, Kerosene and Wood Fuels, Final Report. Marietta, GA.
- GDS Associates, Inc. 2008. Maine Power Reliability Program Electric Energy Efficiency and Demand Response Potential Study, Final Report. Marietta, GA.
- Laitner, John A. and Karen Ehrhardt-Martinez. 2008. The Size of the U.S. Energy Efficiency Market: Generating a More Complete Picture. Report E083. American Council for an Energy Efficiency Economy, Washington, DC.
- Maine Public Utilities Commission. 2007. Efficiency Maine Annual Report. PUC, Augusta.
- Maine Public Utilities Commission. 2008. Report on the Energy Performance of New Homes. PUC, Augusta.
- Massachusetts Technology Collaborative. 2007. Massachusetts Clean Energy Industry Census. Westborough, MA.
- McCormick, Dale and Lucy Van Hook. 2008. "Connecting Residential Energy Efficiency and Carbon Emissions Reductions: MaineHousing's Carbon Market Project." Maine Policy Review 17(2): 120–126.
- Optimal Energy, Inc., and Vermont Energy Investment Corporation. 2002. The Achievable Potential for Electric Efficiency Savings in Maine. Prepared for the Maine Public Advocate. Optimal Energy, Inc., Bristol, VT, Vermont Energy Investment Corporation, Burlington, VT.
- Pollin, Robert, Heidi Garrett-Peltier, James Heintz and Helen Scharber. 2008. Green Recovery: A Program to Create Good Jobs and Start Building a Low-carbon Economy. Political Economy Research Institute, University of Massachusetts, Amherst.
- Vrabel, Tim. 2008. "Efficiency Maine: Investing in Energy Savings and Knowledge." Maine Policy Review 17(2): 95–98.



Dylan Voorhees directs the Clean Energy Project at the Natural Resources Council of Maine. Since 2006, he has led NRCM's involvement in a variety of energy and climate issues, including the Regional Greenhouse Gas Initiative, wind power and renewables policy, and energy efficiency funding and standards. Prior to joining NRCM, he worked on wind power for the Executive Office of Environmental Affairs in Massachusetts, and on sustainable land use development for the Vermont Forum on Sprawl.