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University of Maine

What more can Maine do with energy efficiency?
Transcript of remarks by Denis Bergeron
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Transcript:

Thanks. Let me find my slides here. One thing, I am actually a graduate of the University of Maine. And I got my degree here in Parks and Recreation Management. People might ask how does somebody get a Parks and Recreation Management degree at the University of Maine and end up running energy efficiency programs, getting an engineering degree and running energy efficiency programs. Well, I think it actually happened thirty years ago over here at Colvin Hall. I took a course in resource economics, and really that gave me an appreciation for energy issues, probably nowhere else in society is there a worse allocation of natural resource economics than in the energy industry. If you look around you, the financial incentives are perverse. And a couple of speakers this morning talked about energy policy and the need for having a very stable energy policy. Well, that's extremely true. I want to make it clear that this is not a policy speech that I am giving. I just want to put some numbers and some pictures up here for you, and I think the conclusions you can draw are pretty simple from what I'm about to present.

In 2002, the legislature directed the Public Utilities Commission to plan and implement energy efficiency programs. So we started in 2002. What can we do from that time? I've realized that we can do quite a lot with these efficiency programs. We can eliminate electric load growth and the need for new power plants, and we can do it at a half to a third the cost of what it takes to generate power. We can reduce our demand for natural gas, which is a concern right now. We can improve the environment and we can benefit the economy. When we started these programs we created a brand called Efficiency Maine. That's our handle. And the legislation that put us in business told us that we had to provide efficiency programs for all sectors of Maine's economy. So we have programs for residential customers. We have a residential efficient lighting program. We have a low-income program, which is operated with the Maine State House Authority to meet the needs of low-income customers. We're working with businesses. We have three hundred fifty different businesses working to promote our programs in the state, and we've served over two thousand small and large businesses with efficiency incentives and help. We're working with municipalities and a variety of non profits and we're funded through a small charge of about .15 cents per kilowatt hour on people's electric bills, and for the average household that works out to be about nine dollars a year. Our budget right now is about ten million dollars, and we expect it will grow to about fifteen million dollars in 2009 and at that level of funding we've done studies to figure out what you could achieve, actually the public advocate's office did this study, and we're, with this level of funding able to achieve about a sixth of what's economically possible in the state of Maine.

This is a graph that shows our start in 2002. We were told to start right up and get going. That's kind of, looks pretty unimpressive right now, but that's just a half a year's worth of work and we had to do a lot of planning and such to get going. Then you can see what's happening to us as we go, we're in this type of a curve. We are going to bump into our, you know, what we can do with our funding level quite soon. This BOC here is a building operator certification program, which actually trains people how to take care of their buildings. We've been doing it for all of the school systems in Maine, and the average participant, the average school system that engages in this program comes out and saves \$17,000 a year in electricity costs and I think it's about \$9,000 in fuel costs. And that's just through better maintenance practices. It's an issue that's heavily ignored in the energy industry. We're working with virtually every new school that gets constructed, every new publicly funded school that gets constructed in the state of Maine. We're working to develop, you know, innovative designs and high efficient equipment. We're working with businesses on a variety of incentives, and you can look at those at our website, efficiencymaine.com.

Traffic signals. The New England Governor's Conference and the Eastern Canadian Premier's two years ago said that they wanted to convert all the traffic signals in the region from incandescent lighting to LED technology. Well, we did it. Maine's the first state in the country to convert all of the traffic signals to LEDs. I love to go to Boston and say this, just to see how quick somebody picks up the fact that there are more traffic lights in Boston than there are in all of Maine.

We are working with existing schools to help them. It improves their bottom lines and does great things for the local funding. We have a residential lighting program and a state buildings program, and I mentioned the low-income program already. What more can we do? If you look at the blue line that is the forecast of Maine's, what we think Maine's electricity load will grow at if nothing is done. I don't know how to describe that next color. PowerPoint chose it for me. But that is what our current programs are on track to achieve. But if we were actually to fund these programs and really try to achieve all that's economically available to us, we would actually reduce load growth over that period of time.

Here's something that people don't understand. When we talk about how to do these programs, what they cost, we really need to be on a par. We need to measure things carefully. And so we include, if we provide an incentive for say, two dollars, to help somebody buy an energy efficient light bulb, and they pay four dollars for the remaining cost of the other part of that light bulb cost, we include the whole six dollars, because that's what it costs to buy the light bulb, and then we calculate the energy savings. So we're taking the whole cost of buying that, and that's how we figure out, on a levelized basis, what it costs per kilowatt-hour for us to save. We have to do the same thing with power plants. So, when we figure out whether it's economic for us to run a program, we look at what the load forecasts for the region are, and then we try to figure out what's the cheapest thing that's going to be done. You know, what power plant is going to be built to serve that need. In addition to that, you can't just keep growing load and expect that you're going to have the same wires to serve that load. You're going to have to expand your transmission capacity, you're going to have to expand your distribution system, so we count those costs too. And then we count the fuel costs. So then we compare the two on a levelized basis to see that efficiency, how efficiency stacks up. And that's what this

next graph is. The levelized avoided costs of generation, if you were to grow load the way, you know, without any programs or any interference in New England, it would cost you about nine cents a kilowatt hour to generate it and to build the transmission infrastructure to support that. This, this lower graph, is what it actually costs for programs like mine and programs throughout New England that are doing the same thing to save the energy. So it costs you three cents a kilowatt-hour to save the energy, it costs you nine cents an hour to build the supply.

People have already talked about how well New England works as a region, and that's critical, because one of the things that we do is we band together, talk to people like Phillips, people like Whirlpool and Maytag, people who build products. And we tell them that if they will build more efficient products we will help them promote them in the region. So we flood the market with efficient products. This graph, which is a little busy, actually shows you what New England can do if we work together. And the top, the red line, again, is the forecast of what will happen if we don't do anything. The green dots, at three cents a kilowatt hour is what our program is doing and what other New England efficiency program administrators are doing. At 2.9 cents a kilowatt-hour, implementing aggressive building codes and enforcing them reduces your load a little bit further. Appliance efficiency standards at one cent a kilowatt-hour save you still more energy, but then again I said we were only getting one sixth of the potential. If you look at what the other New England states are doing and we put it all together you can see that we can save a huge amount. Now this, here, from where we are today, that represents nine new three hundred megawatt gas fired power plants that will have to be built to serve the load in New England. This difference here is twenty-eight three hundred megawatt gas fired power plants. The implication is, you can eliminate the need for nineteen existing power plants if you fully fund energy efficiency programs.

The only editorial comment I have is that if you remember Susan Tierney's slide this morning, the Energy Policy, the recent Energy Policy Act, incentives for energy efficiency, a billion dollars. Incentives for power plants? Seven billion. Okay. That's the end of that.

My estimates, and these estimates of programs are conservative. They don't include things like us getting better at doing what we're doing. All of that is based on our current track record and just funding at levels that we think make sense. Doesn't include the effect of better practices, and it doesn't include advances in technology. Just what we know about today. Over ten years technology is going to change a lot, we know that. And then, the practices piece. People still don't think about energy as a really crucial component of their business plan. For most businesses, most commercial businesses, it's still between one and two percent of their operating costs. So it's not something, you know when you have a price spike people focus on it. But they still haven't internalized that decision-making.

We know where the energy efficiency is. Thirty-seven percent of the potential is from residential sector. Sixty-three percent is from the commercial industrial sector. And on the residential side, almost all the potential, half of the potential, is in lighting. And then there's heating, water heating, clothes washers, cooling, etc. On the commercial and industrial side, forty percent of it is lighting, that's mostly, most of your commercial load. Quite a bit of it is HVAC, which is your heating, ventilating, air-conditioning systems. All of that, probably fifty percent of it all really is motors. Okay.

It's important to think about how we use energy. If you save energy at home, and I've used a light bulb as an example, a fifteen-watt light bulb, efficient light bulb, replaces a sixty-watt incandescent light bulb. Forty-five watts savings. But outside your house you have distribution wires. Those are leaky pipes. You lose energy through those things. Eight percent distribution loss, all of a sudden when you get to the end of the distribution system its forty-eight watts. Then in the transmission system you lose an additional four, you've got fifty watts. A power plant, the most efficient power plant, is only fifty percent efficient in converting fuel into electricity. So, add that. Now your fifteen-watt light bulb, instead of saving forty-five watts in your home, you're saving seventy-six watts at the generator. And that's important because when you look at natural gas and what's going on in the natural gas industry about fifty percent, forty-five to fifty percent of our energy is generated by natural gas power plants and there's a shortage of natural gas. So when you put all of that together and you impose the curves that we had about energy efficiency for electric programs, you see a very similar affect here. We can actually reduce our natural gas use beyond, here's the forecast, here's where we could be if we implemented the efficiency programs that we're doing right now. Without the technological improvements and practices and such.

We talked about climate change at a couple of points earlier this morning. These are the, just implementing the programs we're talking about by 2010 we could reach sixty-eight percent of the target for what the New England governors had set for themselves, and that's with positive economic benefits at lower costs than building new power plants. Economic benefits. The programs are running now in the region across New England represent 1.2 billion dollars in investment. In the next five years they will create 10,000 jobs. They'll result in 450 million dollars in wages, and that's for people who are doing electrical wiring. Putting in insulation. It's local jobs.

I apologize for this next slide because I did it by myself; I'm not a graphic artist. But one of the reasons why efficiency is good for the economy is because if you take a dollar and you invest it in electricity, you burn fifty percent of it right off the top. That's burnt fuel. It goes to a natural gas company somewhere. You're paying a generator for their return on investment, and then you're paying for the wires. If you had invested that same dollar, well you wouldn't have to invest a dollar in energy efficiency. Efficiency costs a third to a half of what that is. These savings go in the local consumers pockets and get spent locally. So you have a multiplier effect there. The marketing administration that we do for our programs also stays local. All of our marketing administration costs are, that's all spent here in Maine. Some of this is in there, but I don't count it. So all of this money actually goes to the local economy as opposed to this. So there are great economic benefits to efficiency programs.

In conclusion, our programs are achieving less than twenty percent of the achievable potential. Efficiency is a lot cheaper than power supply. We can offset the need and demand growth, deferring a need for twenty-eight three hundred megawatt power plants. It's available in all sectors of the economy, residential through business consumers. We can reduce natural gas demand for electric generation by up to twenty-five percent in 2008 or forty-five percent by 2013. We can help New England meet the climate change goals by up to sixty-eight percent for stationary combustion sources. How do you get there? Well, you integrate energy efficiency into regional system planning. The people at the ISO New England still don't believe that it's a real resource.

You really focus on building energy codes and enforce them. You adopt product efficiency standards. You support adoption of federal product efficiency standards. The US Department of Energy is supposed to be adopting product efficiency standards but they don't do it. Maine is one of the states joined in a lawsuit now to actually force them into compliance. You increase funding for energy efficiency investments. That doesn't mean you have to do it through charges on people's bills. There are other ways, through standard offer procurement service, auction revenues, and the last one is the way we're currently getting our funding, system benefit charges. The state of Maine has done this, other states have not, but now any new building built in the state of Maine has got to be twenty percent more energy efficient than the commercial energy code. We work as a region. When New England works as a region we can really actually force manufacturers to improve their products and give us good service. And then we have to change the way we think about energy. It has to become part of the business model, and it isn't yet. Maine, I'm a professional engineer in Maine, and I'm sad, I'm actually proud to say that Maine has finally adopted a continuing education requirement for engineers in this state. Up until now, we haven't had to do any continuous training, so the engineering community in Maine is pretty stodgy. Sorry to my colleagues, but it's true. We need to work on curriculum development for students, and we need to do marketing. There was this great thing this morning, somebody was talking about, Susan Tierney was talking about fifty-eight percent of the cars in the country are SUVs. You ride in those things. They're expensive to run, they're dangerous, they're loud, and they're uncomfortable. Why are people buying them? It's marketing. So if we can get somebody to buy a Hummer, why can't we get them to buy the right kind of light bulb? But marketing really is education. And then, I said, incorporate it into business practices and then improve our own end practices. And that's the conclusion. Those are my sources, I'll make this paper available to people if they'd like to see it. Thank you very much for your attention.