

Case Studies of the Greening of Electric Power: Seattle City Light and Public Power

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Seattle City Light and Public Power was founded in 1902, when voters approved a bond measure for a hydroelectric facility on the Cedar River. As a department of the city of Seattle, Seattle City Light is accountable to the voters through the mayor and city council, who govern the appointment of the superintendent as well as approval of the budget and general policies. In the early 2000s, the city council passed resolutions that mandated compliance with the Kyoto Protocol, required that the utility meet any load growth with conservation and renewables, and also required that the utility become climate neutral by the end of 2005 (that is, to have no net emissions of greenhouse gases). Even before that point, Seattle City Light was developing innovative projects around green electricity, but the mandates from the city government have increased the national visibility of this large public power agency. Seattle's mayor also led a national initiative for American cities to adopt the Kyoto Protocol.¹

I interviewed Marya Castellano, director of the Energy Management Services Division (which was in the process of becoming the Conservation Resources Department); Michael Little, energy planning supervisor; and Bob Royer, director of the Communications and Public Affairs Department. Each was able to give a unique perspective on the greening process and sustainability issues as they have emerged at Seattle City Light. Before reviewing the greening process in detail, it is helpful first to get a sense of some general statistics. As of 2003 the utility supplied electric power to 365,000 customers, making it one of the ten largest public power agencies in the U.S. Throughout the twentieth century, Seattle City Light continued to develop hydroelectric power on various rivers, and in 2003 about half of the utility's power supply (or 1900MW of capacity) was from hydroelectric facilities that the utility owned. The utility also purchased power, and almost all of the contracted power supply came from the federal government's Bonneville Power Administration, for which the source was mostly hydroelectric power but included some nuclear energy, coal, and natural gas. The utility had a small contract with a natural gas fired plant in Oregon, but that contract was scheduled to end in 2006. As a result of the mix of city-owned power and purchased power, about 90% of Seattle City Light's total power supply was hydroelectric, making it one of the greenest utilities in the country in terms of greenhouse gas emissions. The remaining sources were 5% natural gas, 3% nuclear, 2% wind, and 1% coal and other. In other words, only a small percentage of the overall power was generated from fossil fuel energy. To offset the small percentage of the portfolio that generates carbon emissions, the utility has three main mechanisms: increased renewable energy, mostly through wind power contracts; funding of carbon offset programs, such as the conversion to biodiesel in public transit, garbage haulers, the city vehicle fleet, and state-run ferries; and energy conservation programs.²

As Mr. Little explained, “Carbon mitigation is the last resort due to its cost and the uncertainty of costs in the future. We would prefer to take actions that truly reduce our greenhouse gas footprint rather than mitigate it. Energy conservation and renewable energy provide the preferred actions for the utility because it results in a smaller footprint. An added benefit to this path is that energy conservation keeps the dollars here in our community and builds a great relationship with our customers.” City Light’s conservation programs are among the most extensive in the country. In 2003 the utility’s conservation programs saved 7.09 average megawatts (aMW, or annual MW hours divided by the number of hours in a year), equal to the power needed for about 5,720 homes. The utility offers a wide range of programs for both residential and commercial-industrial customers. The largest programs (in terms of average annual MW load reduction) for residential customers are multifamily conservation, water savers, and Built Smart (for new multifamily construction). The commercial programs provide larger amounts of savings. One of the leading commercial programs is Energy Smart Services, which provides incentive funding for lighting and energy efficiency technologies. A large portion of the conservation programs are funded by contracts with the Bonneville Power Administration.³

As Ms. Castellano explained, “The conservation programs started in 1977, in response to a citizens’ group and local appointed and city officials. Instead of investing in nuclear energy to meet our needs, we decided to invest in energy conservation. In the last couple of years, our budget has been about \$21 million and our staff has been about seventy-people, making our conservation program one of the largest of its kind in the United States. We look at energy conservation as a resource.”

As Little amplified, Seattle City Light is different from other public utilities because it does not have a problem with peak loads (that is, the total energy consumption at a high point, such as during a heat wave and/or at certain hours during the day). “We’re actually trying to reduce the base load, whereas the conservation programs at other public utilities across the country are typically trying to reduce the peak load due to the cost of generating or purchasing power at peak periods. City Light does not face this situation from a generation perspective. The utility is in a unique setting, surrounded by mountains, with three dams on one river. When we need power for peak purposes, we open the gate at the dams little bit more.”

Because City Light can generate more power than is currently needed, it sells the excess power to the grid and generates revenue for the utility. The utility has a separate charter, so the revenue (other than the utility taxes) does not directly flow into the city government’s general fund. However, the net revenue allows City Light to fund programs in other city departments. As Castellano explained, “For instance, the Office of Housing administers our low-income program, and we give them in excess of \$1 million for low-income conservation, plus an administrative overhead charge. We also have what is probably the most aggressive municipal building code in the nation, certainly in the northwest, and we pay for positions in the Department of Planning and Development to do building and safety inspection, including for the energy code.”

Another mechanism for achieving net zero emissions has been to amplify purchases of wind power, which are also allowing the utility to replace a contract with a coal-fired plant. In 2002 the utility started receiving power from the Stateline Wind Project, a large commercial facility on the Washington-Oregon border that is owned by

Florida Power and Light. Purchases have increased from 50MW of capacity in 2002 to 100MW in 2003 and 175MW in 2005. As a result of the contracts, the utility could claim to lead all public utilities nationally in the purchase of wind power. As Little explained, “It might be more expensive than other sources, but it matches the values that the city has: politically, culturally, and societally. If you dig deeply in the policies that guide us as a city and utility, you’ll see that those values are reflected by the people who live here.”⁴

Unlike in other utilities, the wind power purchases are not contingent on the city’s green pricing program. Because the main source of power is hydroelectric, Seattle does not have the same level of concern with price volatility that is found in public utilities that are more dependent on fossil fuel energy. As a result, offering long-term lock-in rates on wind energy, similar to the program of Austin Energy, is probably less attractive to Seattle’s commercial customers. Seattle does have a green pricing program, called Seattle Green Power, but the program was relatively small. Statistics from 2003 indicated that only about 1% of the customers were enrolled.⁴ At the time of the interview, the program design was undergoing revision. As Little explained, “The existing green power program is dedicated to putting solar demonstration projects on nonprofit and public service buildings here in the service territory, and to fund local renewable projects that need an infusion of cash to get going. For example, we’re funding a relatively small wind farm and a biogas facility. We are moving to a program design that would allow us to sell green tags from renewable resources. This program design is more in line with other programs, where customers can ‘green up’ a certain percentage of their energy consumption.”

City Light is not investing in new hydro facilities, but it is investing in upgrading existing facilities. Although hydroelectric power is a renewable source of energy that does not generate greenhouse gases, it can become environmentally controversial, especially when it is generated by large facilities that affect aquatic ecosystems. In response to environmental concerns and a federal relicensing process, in 1991 Seattle City Light developed a \$100 million agreement with government, tribal, and NGO groups to mitigate environmental and other damage from three hydroelectric dams on the Skagit River. As a result of the mitigation and the utility’s shift toward a policy of stewardship on the Skagit River, Seattle City Light has won environmental awards for its salmon protection. Likewise, in 2003 Seattle City Light’s Skagit River facilities became the first large hydroelectric facilities to earn certification from the Low Impact Hydropower Institute.⁵

Equity and Sustainability

As in other utilities, City Light faces the trade-off between investing in greening programs and keeping the price per kilowatt hour affordable to customers. The issue of price rates is particularly sensitive in Seattle, because rates went up dramatically in the wake of the electricity crisis of 2000-2001, when the spill-over effects from the California-Enron crises combined with capacity shortage from drought to generate price hikes and debt. Even Bonneville Public Administration raised rates. During that period, Seattle City Light received substantial public criticism for its rate hikes and debt, and the city government responded by appointing a new superintendent and a new advisory board, whose mission was to reestablish the financial health of the utility.⁶

As Mr. Royer explained, “We’re just coming out of the energy crisis. Normally, a MWh is about \$40, but for about fourteen months in 2001-2002 our net cost of energy was \$250 MWh—six times the normal amount. We had to raise the rates by 58%, but even that couldn’t cover the costs, so we had to borrow funds. Yet, even during that period we exempted our low-income customers from about half of the rate increases.” Royer added that the financial picture was much healthier in 2005.

Even with the legacy of the high rate increases in 2001 and 2002, the rates at City Light are lower than those for most of the customer classes served by investor-owned utilities in the region. As Castellano explained, “We used to advertise that we had the lowest rates in urban America, but we can’t say that anymore, because of what happened after the energy crisis. However, the rates are still low in comparison with our neighbors and in comparison with the rest of the country.” Because rates are relatively low, the utility does not experience pressure from low-income groups for the utility to make rate cuts. Instead, public pressure is more toward keeping the momentum going on the greening process.

As Little explained, “Politically, our customers support what we’re doing, so if they have to pay a little bit more, they’re willing to do it. Since 2001 electricity prices have gone up substantially, demand has gone down, and revenues have probably stayed about the same, but people want us to make investments in green energy.” Recently, City Light held focus groups to get a sense of what the public priorities were. They explained that the utility had reduced most of its debt acquired as a result of the energy crisis of 2001, and they asked if the customers wanted the utility to lower the rates. As Little noted, “They said no. They wanted us to keep the rates where they were and to keep on doing what we were doing. Politically, there was an interest in determining whether our customers wanted rates lowered, and the customers said no.”

In addition to keeping the prices low, City Light assists low-income residents through various programs. For example, seniors, low-income customers, and persons with disabilities may qualify for rate reductions of 50% for electricity as well as other city services. City Light also offers emergency low-income assistance, and it manages Project Share, a program of low-income support that is funded by customer donations. Furthermore, the utility offers programs through other city departments. For example, the HomeWise Program of the city’s Department of Housing offers weatherization grants to low-income residents.⁷

Policy Issues and Recommendations

State and federal energy policies could have been very helpful, but Seattle City Light has implemented its ambitious greening program mostly on its own. According to Castellano and Little, state-level funding has not significantly assisted the utility’s greening process. Likewise, the State of Washington does not have a renewable portfolio standard. Even if the state did have a renewable portfolio standard, it was not clear to them how helpful it would be, and there was even some concern that a renewable portfolio standard or other state mandates could interfere with the utility’s greening process and conservation programs. As Little explained, “Depending on the structure, we might be challenged in meeting such a mandate. For example, in the State of Oregon, instead of a portfolio standard they require that a percentage of all utility revenues go into

conservation, and there is typically a low-income weatherization component to it. We've been doing low-income weatherization for almost thirty years, and we'll continue to make investments in this market segment whether it's required by the state or not. However, we've already tapped a significant portion of the conservation potential, and it is taking more effort to reach the remaining potential; the existing program offerings are significantly more expensive to operate than our other programs. So, we might be challenged in meeting the targets established in a portfolio standard. There is also an issue of local control. Like many entities, we would prefer to have some parameters, but we don't want the state to tell us that we have to meet our load with a specific mix of renewable sources."

Royer added a similar comment on the risks of a renewable portfolio standard for public utilities in general: "I'm ambivalent about portfolio standards. In some ways they're good, because they lead to more development of renewable resources. However, in other ways they can hit the small utilities in areas where there are high unemployment rates. It's very hard for them to have to develop ten percent of their portfolio with wind. As a consultant, I used to work in rural areas, and I know what it's like."

Regarding federal funding, there was some significant support for the utility from 1979 to 2002, but in recent years the federal programs have been cut. As Castellano explained, "The Department of Energy's Municipal Energy's Management Program provided funding, but the program ended with the energy crisis of 2001. The funding helped cities to develop energy efficiency and conservation programs. They're going to close the entire regional office for the Department of Energy, so it will not have a local presence, not only for energy efficiency programs, but also for smart growth, energy, and other issues."

Royer added another concern: the federal government may require public utilities to divest their generation from their distribution: "We would not do what we do if we had to divest our generation and buy our energy in ten-minute increments off the grid. The FERC—the Federal Energy Regulatory Commission—wants one big market in the U.S., except for Texas. It is tremendously dangerous. We've been very aggressive in fighting it. Our system is different from those of others across the country. For example, we can use our hydroelectric system to store electricity that makes our wind more stable. In the early 1980s we poured money into conservation. We went to communities all over the northwest and convinced them to adopt a building code. We now have the Northwest Building Code for residential customers, and we have commercial building codes in the region. We wouldn't have been able to do that if we had been centrally directed by the federal government."

Although one might expect that the American Public Power Association (APPA) would take a strong stand against the divestiture of generation, Royer explained that the situation is more complicated: "A lot of the public utilities in the Midwest don't have generation, so they have to buy power from private entities. They think they're not getting a fair price from the private utilities, and they're probably right. The large utilities within the APPA are a minority, but there is a group of the largest twenty public utilities, the Large Public Power Council, that is opposed to FERC intervention."

One area where the federal government could help is the problem of transmission congestion. According to Little, "The states of Oregon and Washington have significant wind potential, and developers continue to make investments. The challenge is that the

resource potential is not located where the loads are, and the region has some transmission constraints in getting that wind-generated (and Columbia River hydro) power from eastern Washington and Oregon to the load centers west of the Cascade mountains. And unlike many generating resources that produce predictable output, wind doesn't necessarily blow when you want energy. It fluctuates seasonally and hourly. So, the region could use some assistance in addressing the topic of transmission congestion that would help further the creation of renewable energy projects."

As a result, the utility's future vision—its ideas that would take it beyond net zero emissions—include looking at future investments in distributed resources. During the week that I was visiting, there was a conference on plug-in electric hybrids, the idea that the sister public utility, Austin Energy, has been developing (see the case study on Austin Energy). As Royer explained, "We need to look at cars and buildings. Most of our resources go to large buildings, and in Vancouver they have deep heat exchangers for cooling, so the need for electricity is mostly for lighting and running the pumps."

Finally, a somewhat unique policy issue for Seattle City Light has to do with its high level of dependence on hydroelectric power. The high level of dependence has made the city particularly concerned about the effects that climate change may have on the electricity supply.⁸ Royer explained that the utility has risks on three river systems: the Skagit, Columbia, and the Pend Oreille. "We have water records, and we have a plan based on those water records. If those water records don't mean anything now, or if they mean something different, it adds a huge element of risk. We've had some dry years before—1928 to 1932 were critical water periods—but eight out of ten of the last years were poor water years. It's very unusual. In the North Cascades there are a lot of glaciers, and we've living off those glaciers. Our customers are getting melted glacier water that is two or three thousand years old that we probably don't want to be using up. To me it's getting more and more real, and more and more immediate."

Based on interviews on June 7, 2005, with Marya Castellano, Michael Little, and Bob Royer.

Web site: <http://www.cityofseattle.net/light/>

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