

## Case Studies of the Greening of Local Electricity:

### Austin Energy

By David Hess

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Austin Energy is the tenth largest publicly owned municipal utility in the U.S., with 360,000 customers. As a department of the city of Austin, the utility reports to the city manager and city council rather than to a separate, publicly elected board of directors. The city benefits in many ways from having a publicly owned utility, one of which is the \$1.6 billion in profits that Austin Energy has provided to the city since 1976. Austin Energy has also developed a national reputation in emissions reduction, renewable energy, and energy efficiency. I spoke with Roger Duncan, the Deputy General Manager for Distributed Energy Services for Austin Energy. He served on the Austin city council from 1981 to 1985, when he ran on a platform in support of energy efficiency and renewables and in opposition to nuclear energy. During the early 1980s he helped start many of the green programs in the utility. From 1989 to 1996 he served as the director of the city's environmental department, and he joined Austin Energy in 1998.<sup>1</sup>

The utility owns 2700 MW of generation capacity and has a peak load of about 2100MW. Within the city, the utility operates three natural gas power plants (Holly at 400MW, Decker at 926MW, and Sand Hill at 480MW). When fully operational, the new, high-efficiency, combined-cycle plant at Sand Hill will allow the city to close the older Holly Power Plant in 2007. Outside the city the utility is co-owner of the Fayette coal plant in LaGrange (570MW) and a nuclear plant in South Texas (400MW). The utility has installed emissions reduction equipment at its natural gas plants that go beyond state standards. Retrofitting in the two older plants resulted in NO<sub>x</sub> reductions of about 50%, or 1,000 tons, from 1998 to 2003. The utility is also contributing to pollution reduction retrofits at the coal plant in LaGrange.<sup>2</sup>

I began by asking Mr. Duncan how Austin Energy defines eligible renewables. “My degree is in philosophy, so every time somebody asks me, I have to explain that the term ‘renewable’ is just an arbitrary term relating to the time frame that you’re looking at. Ultimately, everything or nothing is renewable. We define renewables primarily as wind, solar, biomass, and geothermal. Right now biomass is landfill methane, but we’re also looking at other dedicated biomass. We just don’t have access to hydro—we only have about 1MW of hydro in our system—so that’s not a factor.”

Part of the funding for the transition to renewables comes from the utility's green pricing program, which is called “GreenChoice®.” The utility claims that its green pricing program is the most successful in the country.<sup>4</sup> Although the program is relatively new, it has attracted some large contracts from commercial customers. Duncan explained why the green pricing program has grown very quickly: “One of the reasons it’s been successful is that we have a strong environmental community here. For a lot of

reasons we are a green oasis in Texas in terms of environmental support. But in my opinion the primary reason we've been successful is that we hit upon a pricing scheme that made renewables an effective fuel hedge against rising fossil fuel prices. In Austin you have two line items on your utility bill that relate to electricity. One is the base charge and the other is the fuel charge. The fuel charge is a straight pass-through from our utility and is the aggregated price of all the fuel that we use. So the fuel costs (primarily gas and coal) are averaged out, and on an annual basis we set the fuel charge. Obviously, as fossil fuel prices go up, that's going to go up. When we were looking at pricing our renewable energy, I made the decision that since we were signing long-term, ten-year contracts for our renewable energy for a fixed price—and almost all of our renewable energy is coming from West Texas wind—I decided that we were going to pass our fixed price along to our customers. We decided that when customers sign up for GreenChoice®, we would remove the fuel charge from the bill and replace it with a GreenChoice® charge. That price would stay fixed for ten years.

“At the time we did it, I think the fuel charge was 2.79¢ and the green choice price was 2.85¢. We started selling it, and we have a lot of environmentalists, so it was selling well, but then some of the larger businesses started to realize that this was an effective fuel hedge. They started buying really large quantities of green energy. I like to joke that it didn't matter to them if it was green energy or purple energy. From their risk management approach, they decided to lock in the price for ten years, and we started getting very large orders. It's been very successful, and that's why we've led all utilities in the nation for the last three years now in green power sales. I've been mentioning this on the talk circuit for a couple of years, and everyone is excited about it, but we're waiting to see if other utilities follow suit.”

Austin Energy derives about 6% of its capacity from renewable energy, and its strategic plan sets a goal of 20% by 2020. As of 2005 the utility purchased 89MW of wind energy capacity from the King Ranch Wind Farm near McCamey, Texas, and it had a generating capacity of 13MW of methane gas from landfills in Austin and San Antonio. In January 2005 the utility signed a contract to add 128MW of generating capacity from the new wind power source in Nolan County. To date Austin Energy's wind capacity is entirely purchased, but the utility is discussing ownership. As Duncan explained, “There's discussion right now. We feel like we need to start moving into owning wind as opposed to purchasing it.”<sup>4</sup>

To encourage distributed generation of solar energy, Austin Energy offers a rebate of about \$5 per watt, which pays for about 50-80% of the installation cost. According to Duncan, the utility has added about 200kw in the past year: “It's starting to pick up with our new solar program. We have a total of about a half MW of solar. It's about half residential or commercial rooftops, and the other half is what we put up earlier on parking garages and other city buildings.” The utility has a goal of 100MW of solar capacity by 2020, and it has partnered with city departments and builders to develop the first “zero-emission” housing subdivision in the country. The 100-home division will be powered by solar energy.<sup>5</sup>

The utility is also known for its energy efficiency programs, and it has a target of 15% reduction by 2020. Its Green Building Program, which provides consulting and educational services to contractors and builders to make residential and commercial buildings more energy efficient, has won national acclaim and awards. Another program,

Home Performance with Energy Star®, provides low-interest loans and rebates so that customers can make energy efficiency improvements to their homes. In 2005 the utility opened the state's first refrigerator recycling center, which will pay customers \$35 per old working refrigerator. The various energy efficiency programs were estimated to reduce peak load by 30-40MW per year.<sup>6</sup>

Finally, Austin Energy is working with the city to develop a plan for the city to convert its fleet of vehicles to plug-in hybrids.<sup>7</sup> Duncan is the primary architect of the new program, and he explained it in more detail as follows: "The city council came to me last year and asked, 'What can we do to crank things up even further in terms of being the clean energy capital of the world?' I responded that we were very progressive in conservation and renewables, but generally we haven't done anything in the transportation sector. Furthermore, I told them that eventually there would be a unification of the transportation and electric sectors. There were two or three fundamental forces out there that were creating a perfect storm: cheap oil was running out, the solution that had been touted in the hydrogen economy was going to be coming even more slowly and at a greater cost than we thought, and there was going to be a gap between that and the oil economy. As a result, we need to look at alternatives to petroleum. When you look at the various alternatives such as biofuels, electricity turns out to be a very attractive alternative in terms of cost, supply, and existing infrastructure. I told them that the hybrids that are already on the road are the first step toward the unification of the sectors, and the next step would be expanding the hybrid's battery capacity and rewiring it so that we could charge it from a wall socket in addition to its gasoline engine.

"Furthermore, where there is true unification of the sectors, there would be a lot of benefits for the city of Austin. First, there would be lower cost to our customers, because we calculated that they would get the equivalent of about 56 cents per gallon from our electric grid from charging. Second, it would clean up air quality; we're an air non-attainment city. Removing emissions from the streets, even if we remove them to a power plant, is helping our ozone situation. Third, it would help us with renewables because we're having problems finding storage capacity for wind and solar, and if we can take in wind at night and in essence store it in automobile batteries, we can take in more wind and have essentially wind-driven cars. Fourth, it would be revenue for the utility, and since we are a public utility, that translates into revenue for parks and libraries. Finally, in the far future when we get the technology worked out, we can use automobile batteries in the transportation sector as storage capacity to avoid future peaking plants. That is, I can wire parking garages, reverse the flow, and on a hot summer afternoon take down a little on all the batteries and avoid a peaking power plant. So for all of those reasons I said this is something we should pursue.

"The city council then said to go ahead with it, and I drafted a plan that was an incentive package of utility rebates and fleet orders. We will provide a rebate for gas-optional hybrids that come onto our system, and we will also work to get soft orders from government fleets, businesses, and individuals. We will package the incentives of rebates and fleet orders and see if we can replicate it in the fifty largest cities in the country. Austin by itself isn't going to move the automobile market, but we feel that there is potential to create large consumer demand. I certainly have interest from other cities,

utilities, and organizations, but this is just starting and I'm trying to focus on putting the package together in Austin correctly."

### Equity and Sustainability

As with other greening efforts for electricity, Austin Electric experiences trade-offs between the costs of renewable energy and the goal of developing more renewable energy. As Duncan commented, "What did Thomas Jefferson say? 'Do only as much good as the people can handle or afford.' The way we've handled this is to set up priorities in our strategic plan: energy efficiency first and cost effective renewables second, before we go to gas, coal, and others. Every year we very carefully calculate a break-even point on our energy conservation programs to make sure that the costs of those programs are less than the avoided costs on the supply side. We look at our supply side alternatives and then target under that for our conservation programs. On the renewable side, GreenChoice® is being passed through to the customer to sign up for, but we recognize that for some renewables programs, we're just promoting the technology. For example, we do not expect solar to be cost effective at this time. Recognizing that, we limit the amount of money we invest in it. That's not the same philosophy as just getting supply for our energy load."

In addition to the broad issue of balancing the higher cost of renewables and conservation programs with the customer's need for a low price, Austin Energy has also faced the trade-off between keeping its older, in-city plants and community concern with their health and environmental effects. As a result, Austin Energy has faced some environmental justice concerns, but it is working to solve them. When I asked about this issue, Duncan responded, "We have a problem plant in a low-income neighborhood (the Holly plant). The plant isn't run very much, and we're in the process of closing that plant for neighborhood and community reasons. Other than that, we're not experiencing emissions problems."

For low-income customers, including renters, Austin Energy also offers some model programs. For example, the utility offers free home energy improvements, including attic insulation, sealing and repairing ductwork, caulking, weather stripping, and solar screens on windows. Through the Plus One program, Austin Energy also contributes to the City of Austin Customer Assistance Program to provide a fund to low-income customers who are not able to pay their utility bills.<sup>8</sup>

### Policy Issues and Recommendations

When asked about barriers to renewables and policy issues that the utility is facing in the conversion to renewables, Duncan noted that transmission congestion was a significant problem for wind energy coming from west Texas. "Getting the transmission problem handled out of west Texas is probably our major problem. It's wind now, but if we wanted to tap into the concentrated solar power in west Texas, we'd have even worse transmission problems. That's the main barrier." He added that ERCOT (the Electric Reliability Council of Texas) controls transmission construction, but it takes time to build the infrastructure to meet the new demand for west Texas renewables: "We are pressing

ERCOT, as is everyone else, to build transmission lines. You can put up a wind turbine in six months, but it takes a transmission line about five years to get through the process.”

He described the other major barriers as mostly related to cost and the stage of technology development, such as the cost of solar and the intermittency of wind: “Right now we have a big problem with the intermittency of wind. Sometimes when we get too much wind in the night, we have to close down a coal plant in order to take it all. We’ve looked at compressed air energy storage and other possibilities, and nothing works well economically for us. That’s why we’re looking at the possibility of automobile charging. A second problem is that eventually the utility industry will become hybridized, so that thirty or forty per cent of the utility will be going on site. The major issue to solve is to have a distribution system that can flow two ways intelligently. When you start getting a lot of on-site generation in place, that will be a major problem to solve.”

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