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As the industry declines, questions increase

Future may bring dependence on natural gas, resurgence of fossil fuels

By Scott Allen, Globe Staff 10/01/96

PLYMOUTH - The workers at the conference table, employees from all parts of the Pilgrim nuclear power plant, leaned back in the heavy upholstered chairs and shut their eyes, listening quietly to a tape recording of birds chirping.

"I want you to go home. It's 10 years from now. The year is 2006," intoned Kathy Rusley, leader of this self-help session that Boston Edison offers to build morale. "Take a mental inventory of the house. Who's there? Who is no longer there?"

Later, after Rusley had led the group through an entire imagined day, the workers shared their visions of the future: One man drove a luxury car along the coast. One woman bought a log cabin in Maine. Another told how great she looked in jeans.

Nobody talked about working at a nuclear power plant.

These are stressful times for New England's leading electricity source as states move to deregulate. Connecticut Yankee is considering closing for good this fall, and at least four other reactors are so expensive to run they could be forced to close as electric companies begin waging war for customers in the next two years.

But the \$13 billion industry isn't about to give up, and owners are aggressively cutting costs and boosting production. Pilgrim is leading an alliance of 16 reactors that could one day save members a bundle by sharing the cost of services from laundry to office help.

And if most of the nuclear plants do disappear, some of the people who were eager to be rid of them may one day face a hard reality: They may not like the replacement any better.

Smog and acid rain would increase, especially in the first few years, as coal, oil and gas burning plants replaced reactors that release no conventional pollutants. Emissions of carbon dioxide, a compound believed to be a leading cause of global warming, also would soar.

Communities that host nuclear plants would be financially devastated. Pilgrim pays a quarter of Plymouth's taxes.

Others worry that the collapse of nuclear power would open the door dangerously wide for the region's fastest-growing power source, natural gas. Without nuclear power, New England could become as dependent on natural gas

as it once was on oil. That could make the region vulnerable to a 1970s-style energy crisis, where the price of oil quadrupled almost overnight.

Large-scale power blackouts in the West last summer served as a warning of what can happen if New England nuclear plants are replaced by long distance electricity imports from regions such as the Midwest. A tree interfering with a power line in Wyoming caused outages in 15 Western states and Canada because the electric system is so farflung and tightly interconnected.

Finally, renewable energy, the great hope of many anti-nuclear activists, remains just a hope. Plans for the first commercial-scale "wind farm" in New England fell through this year when the developer had serious problems with its wind turbines and went bankrupt; electricity from the sun, meanwhile, remains promising, but too expensive for widespread use.

"Everybody talks about renewables, but nobody is out doing anything about them. It's driving me nuts," said Brian Braginton-Smith, president of the Conservation Consortium, which is trying to develop wind power on Cape Cod.

To be sure, many believe deregulation of the power industry will launch a great leap forward in New England, ending years of artificially high, government-set electric rates that propped up nuclear plants and old coal and oil plants.

"This is really classic economics coming to energy," said Lewis Milford of the Conservation Law Foundation, one of the environmental groups most bullish on competition. With government out of the process, he believes, entrepreneurs will be freed to build low-cost plants that meet tough environmental standards, driving nuclear and fossil fuel plants into retirement.

But the energy future is not yet written, and there are too many variables - from the price of imported oil to the rules of competition in each state - to say who the winners and losers will be. Nuclear plant owners warn simply that New England needs them more than some may think.

"Are some environmental Neros fiddling while Rome burns?" asked Bertram Wolfe, former head of General Electric's nuclear division, in an article calling on environmentalists to defend nuclear power in the magazine *Issues in Science and Technology*. "In a competitive world, we don't think nuclear power can cut it," said Jim Gordon, president of Energy Management Inc., as he led a tour of his 68-megawatt gas-burning power plant deep in the woods of Dartmouth, in southeastern Massachusetts.

Gordon, like other eager-to-go independent power developers, feels the regulatory system has held back technology, allowing outdated plants of all stripes to continue their inefficient ways. Sixty-eight percent of New England's power supply is at least 20 years old, he notes.

"Can you imagine using computer technology or telecommunications technology that is 25 years old?" asked Gordon. His company is proposing gas plants in nearby Dighton and Tiverton, R.I.

Of course, it's easy to be futuristic when analysts believe the future is on

your side. The U.S. Energy Information Administration predicts natural gas will overtake nuclear power as the second-leading electricity source by 2015.

"I don't think anybody is going to order anything beyond a gas turbine over the next 10 years," admitted Marvin Fertel, vice president for economics at the Nuclear Energy Institute, the industry's Washington think tank.

An insignificant power source in New England 15 years ago, natural gas pipelines now run under the region like veins - with more on the way.

Not only is gas abundant, but new "combined cycle" gas plants are 20 to 40 percent more efficient than their predecessors. They produce power two ways: first from burning the fuel much like a jet engine, and then from trapping the waste heat to drive a steam turbine.

Unlike nuclear plants, gas plants have a very small payroll, too. The Dartmouth plant has a staff of 13 - one fifth the staff of a nuclear plant on a per megawatt basis.

As a result, gas is expected to be the cheapest power source around for the next couple of decades, jumping from 18 to 41 percent of the region's energy supply by 2020, according to a preliminary analysis for the New England Governors' Conference.

And if nuclear plants retire early, the federally funded study suggests, gas could claim 53 percent of the power supply.

"You will start to see some real impacts in five years," predicted David O'Connor, the state's Energy Resources director.

But there's no such thing as a controversy-free fuel. A citizens' group in Agawam has gone to court to stop the Berkshire Power natural gas plant, saying the steam from its stack could reduce drivers' visibility or even make roads icy on cold days. Other groups are organizing to fight pipelines.

On the other hand, if natural gas succeeds, New England could one day approach the 70 percent dependence on one fuel that happened in the 1970s with oil. A sudden surge in prices would then ripple through the economy, making everything from electric bills to groceries more expensive.

"I'm troubled by the long-term implications" of nuclear plants closing down, said James Muckerheide, the state nuclear engineer. "The people who end up suffering through this are the people who pay the electric bills."

Other sources that could challenge the rise of gas - Hydro-Quebec of Canada and coal plants in the Midwest - have power to sell, but transmission line capacity severely limits how much they can deliver, at least for now. This summer's nuclear plant shutdowns in Connecticut nearly caused brownouts precisely because it is hard to send power from Ohio and other energy-rich states to the Northeast.

Likewise, Hydro-Quebec's transmission line can carry only about 1,500 megawatts of power, 7 percent of the region's demand. Hydro-Quebec formed a partnership to sell power in New Hampshire's test of utility competition, but

Boston energy consultant Paul Messerschmidt doubts the debt-ridden company can afford a line to expand its presence in New England.

Environmentalists have no love for either Hydro-Quebec, which flooded more than 4,000 square miles to generate power, or Midwestern coal plants, whose smoke drifts on the wind to New England to cause smog and acid rain. Their alternative to over-reliance on natural gas would be to develop clean power sources such as the sun and wind.

Currently, however, neither wind nor sun can match the price of electricity from natural gas (3.9 cents per kilowatt-hour vs. 5 cents for wind and more for solar). But advocates believe both will grow cheaper as the technology improves.

The Union of Concerned Scientists persuaded Massachusetts regulators to include a charge of 50-60 cents a month on household electric bills once competition begins to create a \$40 million-a-year fund for wind and solar projects. A separate deal with New England Electric System would create a similar fund.

But the track record for solar and wind power has been spotty so far, marred by financial and technical problems. Still, Alan Noguee of the Union of Concerned Scientists says there is reason for optimism despite the failure this year of a big wind project in Maine: Green Mountain Power is installing wind turbines in southern Vermont, while the Cape Cod-based Conservation Consortium expects to install its first wind turbine at the Yarmouth landfill soon.

And Massachusetts is the fifth most promising market for electricity from the sun's rays, according to a new study by the National Renewable Energy Lab. The combination of favorable tax laws, high electric rates and a fair amount of sunshine should make photovoltaic panels attractive to a growing number of residents who want to reduce their power bills, the lab found.

If the technologies take off, solar and wind power could account for up to 15 percent of New England's power mix in 2020, according to one assessment, but Noguee admits the energy market is so in flux that projections are "practically worthless."

While others debate the future, the nuclear plants are trying not to become part of the past. Vermont Yankee continues to talk about seeking a 20-year extension of its operating license, which is due to expire in 2012.

But some utilities that own reactors are cooling to the idea of taking nuclear power into competition. New England Electric System would gladly sell its 20 percent share in Vermont Yankee and shares in three other plants - if someone would buy them.

"I can be very reasonable," joked New England Electric System president John Rowe.

Rowe's pessimism is matched by 400 utility executives and independent power officials surveyed by the Washington International Energy Group this year: 39 percent predicted that nuclear power could not compete in an open market, and

80 percent predicted there would be no resurgence of nuclear power.

At Pilgrim, though, owner Boston Edison is continuing to get in shape for competition, setting production records and cutting staff. As a result, some employees in the morale-building class don't know where they'll be in 10 months, let alone 10 years. Jane Norris is a junior clerical worker, one of the job categories the company is cutting deeply. John Waters' maintenance job is to be eliminated at year's end.

"My wife doesn't want to pick up and move again," said Waters, a nuclear journeyman who is nervous about the future.

The worst sign for nuclear power plants? "They aren't building any more," he said.

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