

## Coloring a “Brown” Legacy “Green”

PATRICIA L. KIRK

**Originally a farming community, Naugatuck, Connecticut, fell victim to the Industrial Revolution, which turned much of the New England village into a brownfield. Now, a developer with a green vision plans to make it a model for sustainable development.**

NAUGATUCK, CONNECTICUT, AN EARLY 20TH-century industrial town best known for the discovery of vulcanized rubber and invention of Naugahyde, is coloring its brown legacy green, by building the nation's first entirely energy-independent green community. The project will redevelop the city's downtown district as a demonstration model for building communities capable of generating all energy required by residents on site, using regionally available alternative energy resources.

The plan calls for integrating new construction with historical landmark buildings and adaptive use of a 400,000-square-foot industrial building to create Renaissance Place, a 60-acre, \$729 million, transit-oriented, mixed-use project built on sustainable development principles. The development will include 3 million square feet of residential and commercial space; open spaces, including a greenbelt and two-mile trail system to provide access to the city's riverfront; and a new intermodal center to enhance access to the MetroNorth commuter train.

The brainchild of Connecticut developer Alex Conroy, president and CEO of Conroy Development Company, the project will combine a variety of currently available technologies and renewable energy resources with green design innovations and energy-efficient systems to attain maximal energy conservation.

The project will serve as a laboratory for studying how the shift from a fossil-fuel energy base to alternative energy resources can affect the American way of life. “Our project will allow companies, developers, and cities to actually visit and talk to people living here, ask them practical questions like: “Do your lights flicker?”” explains Conroy. “We believe we can have a constant level of electricity, but given potential problems, we don't know how the day-to-day might be affected—is there a sacrifice?”

In building Renaissance Place, Conroy says he hopes to generate momentum for a nationwide program of green energy-independent communities to eliminate dependence on foreign oil and fossil fuels. Although energy independence is essential to domestic security, “people will always opt for the cheapest solution,” he says, and, as a result, are unlikely to switch to alternative energy resources unless the cost is comparable with that of mainstream energy sources.



Plans for Naugatuck, Connecticut, include integrating new construction with historical landmark buildings (below) and adaptive use of a 400,000-square-foot industrial building (right) to create a new mixed-use residential and retail project built on sustainable development principles. A nonaccessible riverfront (left) will be converted to a public greenway system of jogging/hiking/biking trails.



When greater demand for alternative energy resources is generated, the cost of green energy technologies will drop, making them attractive to a broader audience, Conroy says. "The key is to create a big enough platform to create a large enough market so that energy-efficient products and technologies can be manufactured cost-effectively."

While environmental scientists and engineers have envisioned the concept of building communities powered by on-site alternative energy resources for some time, this project is the first attempt to demonstrate that it can actually be done.

The mixed-use environment is the best scenario in which to implement a self-contained energy program, comments Daniel Nall, a green-build engineer with the New York City-based engineering firm of Flack Kurtz, because putting different occupancies together makes a cogeneration plant viable.

He explains that in a cogeneration environment, heat created by generating electricity is recycled for other uses. "Instead of having huge generation plants far from users and throwing away waste heat, we would be better off having smaller generators located near users, so waste heat could be redistributed for lower-quality uses, such as heating water and homes," says Nall. "Certain types of buildings that don't need much waste heat like office buildings put together with a hotel, apartments, a hospital, or a laundry that can use the waste heat makes this possible."

Similarly, he says, instead of huge sewer treatment plants, it makes sense to have smaller facilities close to communities where treated effluent can be used for watering lawns, washing cars, and other uses that do not require drinking-quality water.

Nall points out that the most robust ecological systems are complex in that waste from one process fuels another one. "Our hope for survival depends on getting to a complex energy generation grid, he notes, explaining that the nation's energy infrastructure must be reconfigured from a single-grid to a complex-grid system where a variety of energy resources are on line at all times. This grid would operate in a similar fashion to the Internet in the sense that if one source fails—for instance, if solar power is down on a cloudy day—other sources such as wind, geothermal, etc., would pick up the slack to provide a consistent level of electricity and redistribute leftover energy along the grid.

"To achieve a zero-energy building will take a change in the attitude of developers and users," says Bill Reed, an environmental architect-engineer who helped launch the U.S. Green Building Council's Leadership in Energy and Environment Design program and serves as president of Arlington, Massachusetts-based Integrative Design Collaborative, explaining that that may mean shifting a building's priority of use, such as orienting it to conserve energy or capture light, wind, breezes, or solar opportunities rather than a great view. "We may have to engage ourselves more intimately with buildings, put in windows that open manually," he adds. "If the user wants everything automatic, then you can't do zero energy."



Conroy's project will leverage technology, products, design, regionally available alternative energy resources, conservation, infrastructure, and education to achieve the project's goals of green and energy independence, according to Michael P. Divney, principal at the New York-based firm of Divney Tung Schwalbe, the engineering and planning consultant on the project.

According to Divney, Conroy chose Naugatuck for this project for a variety of reasons, among them, extremely supportive municipal officials and community leaders, and underused assets. Assets include the town's authentic character, location, and an opportunity for adaptive use of a 400,000-square-foot industrial building with a roof large enough to accommodate solar panels and photovoltaics. In addition, the city is located in a valley, which preliminary studies indicate could generate wind energy, and near a sizable supply of natural gas, which could present a cogeneration opportunity in cooperation with the local utility to heat water and homes by recycling waste heat.

Potentially, ten renewable energy resources will be used to power the project, including solar, wind, fuel cells, geothermal, and possibly hydro, along with conservation. Although hydropower usually is not environmentally friendly, Divney says he is looking at speculatively building a low-head hydropower dam on the Naugatuck River. The project's buildings, designed by architect Mark E. Strauss, a principal at New York-based FXOWLE Architects, will be oriented for optimal interior daylighting, minimal energy use during summer months, maximal solar gain in winter, and natural ventilation. Green roofs will be used throughout the complex to help manage stormwater runoff, cool the environment, and reduce energy use.

# LANDWRITES

Though a relatively small city, with a population of just 30,000, Naugatuck is adjacent to a commuter-rail system and lies at the intersection of two major highways, which might prove attractive to residential and retail developers. The centerpiece of the city's desirability is its traditional community atmosphere, with landmark architecture, a village green, a vibrant arts community, and lots of character, Divney says. "People are spending fortunes to create places that look like this," he adds.

Noting that the project is an extension of what has already been done by nonprofit organizations, governments, and educational institutions, Conroy says, "We're trying to do this from a comprehensive approach, using various sources of energy to bring green energy to a noninstitutional setting. Not everyone will initially accept or understand what we're doing," he adds. "We're not looking to be a village on the frontier, just mainstream," he adds. "Our green ideas are grounded in sensible concepts."

Renaissance Place will be built in four phases over the next ten years, with the first phase, which will include 300 residential units, 60,000 to 80,000 square feet of retail space, and a parking structure, breaking ground this fall. Dave Prendergast, CEO of the Naugatuck Economic Development Corporation, says that Renaissance Place is being developed as a public/private partnership and is part of the city's overall downtown redevelopment plan.

Approximately 20 percent of the project cost involves local, state, and federal funds earmarked for brownfield cleanup, parking facilities, and other public works such as burying utilities and creating new streetscapes. The borough has established a project-specific tax incentive to assist Conroy with infrastructure improvements and site cleanup, and is assisting with land assembly and the transfer of title of borough-owned property to the developer.

In addition, the state is rebuilding two bridges over the Naugatuck River and assisting with funding for improvements along the riverfront, which currently is overgrown and inaccessible. Because it is an exceptionally expensive endeavor, Conroy hopes to offset a portion of the cost for renewable energy technologies and products with public and private grants, and by offering to showcase manufacturers' products in exchange for use. **U**

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