

Old Mills New Lives

Adaptive reuse and whole-building recycling transforms the early American industrial legacy into a green future.

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Developers are finding new life for aging industrial facilities as mixed-use or residential projects, like The Baker Chocolate Factory Apartments in Dorchester, Mass. Photo by Andy Ryan.

Historic mills dot the landscape of the American Northeast and serve as a reminder of manufacturing past. Some were shuttered when companies relocated production facilities, and others simply stopped producing goods that suited our needs.

Though the workers left years ago, many historic mills are again buzzing with activity. The characteristics that hamstrung these factories are often benefits in sustainable adaptive-reuse projects. Vertical transportation can cause unacceptable inefficiencies in modern manufacturing, for example, but has no negative bearing on new uses, particularly those such as office and retail space. Similarly, large windows and turn-of-the-century exteriors scream “maintenance expense” to industrial owners, but speak

the language of opulence and light-filled living space to residential designers. In short, adaptive reuse can turn liabilities into assets for the green-minded.

Larry Curtis, president of WinnDevelopment, offers a simple case in point, saying, “No right-minded manufacturer wants to move materials from floor to floor, but in virtually every residential application, the penthouse commands a premium.” Preserving historic mills, factories and manufacturing campuses are important for historic reasons, too. “Lots of people are attracted to the idea of living, working and shopping in historic spaces,” he adds. “These buildings give people a sense of place, and help them connect with a region and its history in a way that’s hard to do with new construction.”

Environmental Benefits

Adapting facilities for reuse brings a cascade of sustainability benefits from the obvious to the esoteric. The environmental impact of tearing down and disposing of buildings is far from trivial. “Construction and demolition waste disposal triggers a sequence of adverse effects that are not always apparent to building professionals,” says Tom Napier, research architect with the Construction Engineering Research Laboratory, U.S. Army Corps of Engineers. “These include the loss of useful property, wasted materials and embodied energy, greenhouse gas generation and environmental stressors associated with producing new materials instead of using existing ones.”

Napier also points out that tipping fees in the Northeast are on the rise, meaning hauling distances tend to increase, driving up fuel consumption and vehicle emissions. All of these factors can be blunted when whole buildings are recycled instead of razed.

When evaluating the best gains for adaptive reuse, look for simple answers first. In historic mills, insulation offers the biggest benefit at the lowest cost. Masonry buildings can achieve insulation values as high as R-23 when medium-density spray foams (such as BASF Spraytite) are used in combination with cellulose insulation. This was the case at the Oliver Lofts in Boston, an adaptive reuse, mixed-income residential property that was formerly a brewery warehouse. Because all building systems are interdependent, a consulting engineer should offer guidance on how changes to the building envelope will be expressed in other building systems. “Accurately predicting the effects that changes to the building envelope will have on ventilation and moisture is critical,” says Kohta Ueno, senior associate at Building Science Corporation, adding that “errors can cause enormous problems for occupants and building materials.” A failure to understand these relationships can lead to mistakes such as moving the dew point inside a wall, which will quickly create an environment for mold growth and cause damage to the façade.

Putting Infrastructure Back to Work

In many cases, putting electrical or plumbing infrastructure back to work can save resources. Factories that once generated their own power often make good candidates for modern cogeneration. As energy-generating technologies improve and energy costs rise,

some mill projects are reviving their old hydroelectric generation capabilities, using what they need and putting the rest back on the grid.

Others are looking to renewable resources, finding that large, flat roofs make for easy installation of photovoltaic panels or exploring ways to employ geothermal or solar hot water technologies. In cases where advanced cogeneration methods don't make sense, simply working with a property that can be easily reconnected to the grid often presents an opportunity to use existing resources instead of starting from scratch.

A building's past can have a dramatic effect on its future because buildings that are on the historical register qualify for a 20 percent federal tax break and typically receive state tax incentives as well [see sidebar]. These substantial financial benefits come with strict conditions that prohibit changes to the building and promote repair rather than replacement, however. When part of a building's exterior profile, such as its windows, offers no practical option for repair, the requirement states, “the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials.” This sometimes puts the mission of historic preservation at odds with environmental performance, and improvements such as installing low-E glass and related window frame profiles must be fine-tuned to ensure historic accuracy. Even with these strictures, the financial benefits usually provide substantial incentives.

Large-scale adaptive-reuse projects that include residential, retail and office space wake up bedroom communities and restore vitality to these former factory towns. This change stimulates environmental benefits, as citizens are able to find goods, services, work and leisure closer to home, and—when well crafted—master plans for renewal projects include bike trails or riverfront activities, like kayaking, as well as greater opportunities for walking and using public transportation. Such silent benefits are sometimes overlooked, but the community pride that accompanies revitalization projects is palpable.

WinnDevelopment's Curtis sums it up this way: “It's common to hear stories from residents about how 30 or 40 years ago, a family member used to labor in the space where they now live, work or shop.”

The conversion of this 1891 cotton mill in Tiverton, R.I., to the Bourne Mill Apartments earned an award for its use of low-income housing tax credits. Photo by Nat Rea.



Historic Preservation Helps Fund Unique Green Projects

For green building, money matters—and access to the 20 percent federal tax credit associated with rehabilitating historic buildings can often make or break an adaptive-reuse project. Unlike tax deductions, which reduce the amount of income subject to taxation, the tax credit reduces the amount of income tax owed. This means qualifying projects see an actual 20 percent reduction in the amount spent on rehabilitation. To further explain: tax credits are sold by developers to profit-making corporations at a reduced rate (\$0.76 on the dollar). The developer gains that money as equity for the project, and the company benefits from a 10-year tax credit against its tax burden. Add to this state tax credits, often as high as an additional 10 percent, and you'll see financial incentives almost as monumental as the buildings being preserved.

The tax credits come neither easily nor without strings. To qualify, the rehabilitations must be made on structures identified on the U.S. Parks Department's National Register of Historic Places—either as standalone properties or as part of registered districts—and after being registered, projects must adhere to strict rehab guidelines that can require everything from fabricating accurate replicas of original architectural details to mandating the use of original materials.

Currently, new buildings join the register at a rate of about 30,000 per year, with about 1,000,000 buildings currently registered. Many qualify because they are part of registered historic districts while only some 80,000 buildings are individually registered.

Owners of historically significant buildings that are not currently on the register and aren't located in historic districts may work through the State Historic Preservation Office to try to achieve a place on the National Register.

While many think of historic buildings as being architecturally significant (and they typically are), understanding other qualifying criteria also help owners achieve the necessary status. The KBF Lofts in Cambridge, Mass., won its rightful place on the register as a result of being the site of a significant event. The building is located in the heart of University Park near MIT campus which now comprises luxury loft apartments, was once part of the Kennedy Baking Factory, birthplace of the beloved Fig Newton.

A digital brochure featuring further details of the federal tax-credit program can be downloaded at: www.nps.gov/history/hps/tps/tax/download/HPTI_brochure.pdf.

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