

Net Zero Ready, Set, Go

Rethinking the future of sustainable design strategies

by NATALIE BRUCKNER

Today's high-performance buildings are a direct result of well-implemented sustainable design strategies. While cost is always a consideration for owners and developers, there is an understanding that sometimes spending more upfront can not only provide savings over time, but also positively impact air quality, well-being, and lead to a regenerative future.

"Over the past year, occupants of this planet have become increasingly aware that climate change is challenging our ability to sustain life as we know it on this planet. The UN has indicated that we may only have 12 years to correct the problem or life on the planet will be doomed. The Paris Accord on Climate Change has been signed by all but two countries," says David Driscoll, director, Parkin Architects Limited.

"One aspect of sustainability being stressed is the need for building longevity. This is a function of built-in future proofing. The buildings being built must be easily adapted to new uses as they age. That means the structure should be robust and non-intrusive, the mechanical and electrical infrastructure should be accessible and upgradeable, and the spaces should be open, flexible, and adaptable," he says.

While LEED and Green Globes have proven to be a success, municipalities like Toronto are also doing their part by introducing new regulations that force owners and developers to construct more energy efficient buildings. "These incentives give credit for a wide variety of sustainable initiatives," says Driscoll.

A great example of a Parkin project that showcases not only sustainable design strategies but a client's understanding of its importance is the new York Regional Police, No. 1 District Headquarters in Ontario. "This project was required to be designed for LEED Silver certification, however, when the design began the client asked about the possibility of Passive House certification. We engaged a Passive House consultant to give both the client and our staff a four-day Passive House training course.

"Both the training and the design of this building has been enlightening for us. Access to sunlight and rigid adherence to the five Passive House principles has informed the building's form more than we would have imagined. We are hoping to produce an extremely energy efficient building, if not the first Passive House police facility in Canada."



The Joyce Centre for Partnership & Innovation, Mohawk College, Hamilton, ON.

Mark Bessoudo, manager of research at WSP, says his company is seeing increasing awareness being shown in sustainability by the real estate sector. "There's now an opportunity for these successes to be translated into the infrastructure sector as well," says Bessoudo. "Several infrastructure-scale sustainability benchmarking tools and frameworks have recently entered the market, including Envision, RELi, and GRESB Infrastructure. Large infrastructure projects in Canada that want to receive funding from the federal government will now have to undergo a 'Climate Lens Assessment,' which guides them towards low-carbon and resilient design and operation."

The Canada Green Building Council (CaGBC) is also continuing to push the market towards low-carbon and zero carbon building design, and in 2019 WSP co-authored a report with the CaGBC called Making the Case for Building to Zero Carbon. "It presents the business case for designing new buildings to zero carbon in six different cities across Canada," explains Bessoudo. "The report doesn't just focus on how to get buildings to zero carbon now, but on planning for the future with zero carbon ready buildings – that is, buildings that are designed to make the

switch to all-electric systems and become zero carbon once the electricity grid lowers their emissions to zero. This also requires on-site renewables and high-performance envelopes to lower the thermal energy demand intensity [TEDi]."

Increasing transparency and disclosure of building performance data, of course, is essential to the future of this sector, and Bessoudo says that in 2019 Ontario's Energy and Water Reporting Benchmark (which also requires disclosure of carbon emissions) was expanded to include more commercial, industrial, and multi-unit residential buildings. To encourage transparency, the CaGBC also recently launched their "Disclosure Challenge," which asks participants to disclose the energy, water, and carbon data across their building portfolios.

More commercial property owners are also becoming interested in how to meet or exceed energy targets. Leslie Peer, principal at RJC Engineers, says that these owners are now making triple bottom line decisions and approaching RJC to help them meet BC Energy Step Code 4 standards.

The BC Energy Step Code is a voluntary provincial standard that provides an incremental and consistent

approach to achieving more energy-efficient buildings that go beyond the requirements of the base BC Building Code. Its goal is to make buildings net-zero energy ready by 2032. Step 4 for residential buildings is about equivalent to an R-2000 standard for houses, which means a building is on average 50 percent more energy-efficient than a typical new building.

“There is interest from an increasing number of commercial property owners who are building to own. There’s also an understanding that there are substantial marketing benefits to a sustainable building,” says Peer.

In order to achieve these goals, Peer and his colleagues are being called upon for their knowledge to help owners gain a better understanding and implement these ideas. “We are seeing exterior insulation being adopted more widely to reduce thermal bridging. There is also a re-adjustment of the structure, plumbing, and mechanical systems to achieve high-performance envelopes, and we are also looking closely at window buying decisions,” says Peer.

Indeed, window companies are stepping up to the plate. In B.C., Innotech Windows and Doors is now producing Passive House-certified windows at their Langley plant.

Of course, all of this costs money, however, Peer says that rebates available through utility companies are definitely helping pique developers’ interests.

Lisa Bate, global sustainability lead, principal at B+H Architects and chair of World Green Building Council’s (WorldGBC) board of directors, echoes Peer’s sentiments when she says that clients are now looking at their triple bottom line, which she describes as, people, planet, and profit.

“We are seeing our clients being held more accountable when it comes to these three things, and that includes the environmental, social, and governance issues. It’s not just about financial performance today, but about demonstrating how we are making a positive contribution to the world,” explains Bate. “When we talk about sustainable design strategies today, it’s a very different conversation to the one we were having just 12 months ago.”

Bate adds that she is seeing an increasing number of companies mapping against the 17 United Nations’ Sustainable Development Goals that were created to drive The Paris Agreement. “A lot of companies are now setting science-based targets, with the goal of achieving net zero operational buildings and infrastructure, and net zero embodied carbon by choosing local materials, looking at how they are created, extracted, and transported, for example.”

The World Green Building Council is focussed on a number of initiatives currently, one of which is to promote and support the acceleration of net zero carbon buildings to 100 percent by 2050. And while sustainable design strategies are often thought of on a per building basis, Bate says that there is greater understanding that “the impacts can be far reaching and sustainability is about the ‘we,’ not the ‘I.’”

One project that demonstrates the excellent use of sustainable design strategies and thinking beyond just the building is The Joyce Centre for Partnership & Innovation (JCPI) at Mohawk College; Canada’s largest net zero institutional building, designed by B+H and mcCallumSather (see February 2018 issue of *Award*). However, Bate says that implementing

similar strategies for existing building stock retrofits is a key focus for B+H today, which, while seemingly costly, pays off in operational savings.

To help offset the upfront costs and encourage a more sustainable mindset, many utility companies are providing incentives to owners and developers.

BC Hydro has been working on some exciting programs of late; one of which is the Provincial Government’s CleanBC Initiative, Custom and Custom Lite Programs.

These programs offer energy study funding and capital incentives to support fuel switching and electrification measures in commercial building retrofits. Larger customers eligible for the Custom Program can receive up to \$20,000 towards an energy study, and up to \$200,000 (based on lifetime CO2 emissions savings) to offset capital costs.

The Custom-Lite Program is a streamlined version of the Custom Program, targeting small to medium businesses, and offering up to \$2,000 in energy study funding, and up to \$48,000 in capital incentives.

In addition, CleanBC’s Commercial New Construction Program provides funding for the design and construction of new high-performance buildings that use high-efficiency electricity in place of fossil fuels, in order to reduce greenhouse gas emissions. The program offers up to \$15,000 to support energy studies, and up to \$500,000 to offset capital costs.

The programs are funded by the Province of British Columbia and the Government of Canada, and are administered by BC Hydro ... this is a sure sign that we are heading in the right direction. **A**



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