

# FORM FOLLOWS NATURE: BUILDING A NET POSITIVE ENVIRONMENT

THURSDAY OCTOBER 5, 2017



TIME	DETAILS
<b>VENUE:</b> Marriott Eaton Centre, 525 Bay Street, Toronto	
7:30 – 8:30	<b>Registration Open; Breakfast Served</b>
8:30 – 8:45	<b>WELCOME &amp; ANNOUNCEMENTS</b> <b>Constantine Eliadis</b> , <i>Chair</i> , Sustainable Buildings Canada
8:45 – 9:00	<b>ENBRIDGE PRESENTATION</b> <b>Achieving the Trifecta of Building Performance – Low-Carbon Sustainability, Affordability and Resiliency</b> <b>Dave Teichroeb</b> , Enbridge
9:00 – 10:00	<b>OPENING KEYNOTE</b> <b>Kevin Flanagan</b> , <i>MRAIC, AIA, Partner</i> , PLP Architecture, London, UK <b>The Edge: The smartest, greenest building in the world is for the birds. And bees. And people.</b> Packed with 28,000 sensors and producing more electricity than it consumes, the Edge received the highest sustainability score ever awarded by BREEAM: 98.4 percent. Landscaping includes birdhouses and bat boxes and is part of a continuous urban path of vegetation for insects. The building is designed to support a working community with comfort, collaboration, creativity and high productivity in mind. With a smartphone, employees are directed to a parking spot, can find colleagues, locate a vacant workspace, adjust the heating, or even manage their gym routine with exercise machines that generate electricity. High-efficiency LED lights are run by a trickle of power from Ethernet cables. The most efficient aquifer thermal energy storage in the world stores summer heat for winter use and the building is naturally ventilated. <b>Kevin Flanagan</b> , <i>MRAIC, AIA, Partner</i> , PLP Architecture, London, UK <b>Oakwood Tower – 80 Storey CLT: Can a city increase the density of existing buildings while minimizing carbon at the same time?</b> PLP Architects are proposing a mixed-use 80 storey wooden tower for London. The project would be the city's 2nd tallest tower and add 1,000,000 square feet and 1000 units to the Barbican Centre. The research is investigating potential benefits of reduced costs and improved construction timescales, increased fire resistance, and significant reduction in the overall weight of buildings. The project won the 2016 RIBA President's Award for Design and Technical Research and was a 2016 Structural Timber Award Finalist.
10:00 – 10:15	<b>Coffee Break</b>
10:15 – 11:50	<b>PLENARY – PREPARING FOR NET ZERO</b> <b>Mark Cichy</b> , <i>RAIC, BES, B.Arch., M.Arch., Director of Computation &amp; Research</i> , Dialog, Toronto, ON <b>Tristan Truyens</b> , <i>P.Eng, B.Eng, BEMP, CEM, Senior Energy Analyst</i> , Dialog, Toronto, ON <b>Leveraging Computational Design for High Performance Building Envelopes</b> Computational Design (or parametric design) represents the building as an algorithm from rules the designer has set. The computer can take on a much larger role in the design process, visualizing multiple parameters and generating options for form based on the desired outcome e.g. net zero carbon. Custom computational modeling considers a wide array of systems beyond mechanical, such as passive energy, glazing type and ratio, water systems and building envelope. Schematic massing can use environmental solar analysis to perform quick optimization of building form based on identified passive strategies. Psychrometric charts can identify design strategies for form such as the effects of shading, natural ventilation, passive solar heating, and conventional heating. <b>Mike Williams</b> , <i>P.Eng., MSc, LEED AP BD+C, RWDI</i> , Toronto, ON <b>Birgit Siber</b> , <i>B.Arch, OAA, RAIC, LEED AP, Principal</i> , Diamond Schmitt Architects, Toronto, ON <b>ecoMetrics – Energy Modeling for the Rest of Us</b> Energy simulation models and their metrics are complex and difficult to understand for most non-engineers. This limits the exploration of deeper energy reductions by all members of the design team. Energy literacy is key to achieving fully integrated design, where architecture and engineered systems are designed in lockstep for high performance and net-zero buildings. ecoMetrics was developed to reveal energy simulation data in accessible graphic terms for the purposes of energy literacy, benchmarking, design and data management. It democratizes the energy-use conversation and decision-making among architects, engineers, consultants and clients.

28.09.17

Agenda subject to change

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10:15 – 11:50	<p><b>Mike Williams</b>, <i>P.Eng., MSc, LEED AP BD+C, RWDI, Toronto, ON</i> <b>Michelle Xuereb</b>, <i>BES, B.Arch., OAA, LEED AP BD+C, Senior Associate, Sustainability Strategist, Quadrangle Architects, Toronto, ON</i> <b>Designing for Future Weather</b></p> <p>56°C with the Humidex. 400 km/hr tornados. Flooding. Blackouts. Are you designing for the coming climate?</p> <p>In 2012, the City of Toronto commissioned a study of future weather and climate drivers. It predicted increased frequency and duration of heat waves, significantly higher temperatures, more freeze-thaw cycles, more intense major rain events and increased intensity of major storms and tornados.</p> <p>For modeling, selecting an appropriate weather file may be the most important input into any energy performance analysis. An RWDI study suggests that using historical weather data in the 2040s will result in 91 days each year of unmet thermal comfort requirements during the hottest part of the day.</p> <p>Learn about more realistic weather data for your energy model, the many common sense passive design decisions that can enhance comfort and how to build-in resilience by anticipating future climate conditions.</p>
11:50 – 12:50	<p><b>Networking Lunch</b> <b>POSTER PRESENTATIONS</b> <b>SBC student bursary winners &amp; outstanding academic project managers answer your questions</b></p>
12:50 – 13:10	<p><b>Lifetime Achievement Awards Presentations</b> <b>Bob Bach</b>, <i>Director SBC, Energy Profiles Ltd.</i></p>
13:10 – 14:10	<p><b>AFTERNOON KEYNOTE</b> <b>Bill Dunster</b>, <i>MA (Hons), RIBA, OBE, Principal, ZEDfactory, London, UK</i> <b>From BedZED to the 'Zero Bills Home': 20 years of architecture &amp; masterplanning designing out fossil fuels</b></p> <p>The London ZEDfactory has asked the same questions for over twenty years: how can most urban development transition towards a zero carbon / zero waste status without nuclear energy and ultimately make no net contribution to accelerating climate change?</p> <p>To meet this challenge and change architecture and urbanism as we know it, it is critical to consider the feedback loop between building physics, environmental impact analysis, human health, energy efficiency, renewable energy, energy storage, zero emissions transport and climate change while working within the constraints of what is affordable and ready for deployment.</p> <p>We have the opportunity to change from being addicted to fossil fuel to a civilization that no longer damages its host environment. ZEDfactory will share some of the more important problems encountered on this journey and discuss a simple ZEDlife toolkit that makes it easier to deliver zero carbon lifestyles and workstyles on new build and retrofit projects on tight budgets.</p> <p>International projects covered will include :</p> <ul style="list-style-type: none"><li>■ BedZED</li><li>■ Nottingham University - Jubilee Campus</li><li>■ Jubilee Wharf Penryn mixed use</li><li>■ London Pavilion - Shanghai Expo</li><li>■ The Zero Energy Bills Home construction system</li><li>■ The ZEDpod low cost volumetric home</li><li>■ Jingdezhen mixed use regeneration</li><li>■ Amersfoort zero carbon refurbishment</li><li>■ Renewables powered personal transport</li><li>■ Designing out organic waste in a circular economy without combustion</li><li>■ Current work on zero carbon farmers homes on the Mongolian plateau</li></ul>
14:10 – 15:45	<p><b>PLENARY – CARBON KILLERS: NET ZERO &amp; NET POSITIVE ENERGY SOLUTIONS</b> <b>Larry Brydon</b>, <i>Director SBC; VP Bus. Dev., Cricket Energy Inc., Toronto, ON</i> <b>Dutch Net-Zero Home Retrofits in a Day: Coming soon to Canada</b></p> <p>The Energiesprong program is a revolutionary Dutch program to accelerate social housing net-zero retrofits using state-of-the-art technology, non-intrusive methods, and innovative financing. It is currently retrofitting more than 100,000 existing homes to net-zero energy performance, some in as little as a day. It uses an energy performance contract that comes with a 30 year guarantee on savings and components.</p> <p>Construction innovations including 3d scanning, BIM, pre-fabrication and modular construction enable whole building retrofits that are faster, higher quality, and less disruptive than traditional approaches. It can also be used for new homes.</p> <p>The process integrates design, engineering, construction, financing, approvals, procurement, supply chains and resident buy-in to ensure success and drive down the cost of the solution. Energiesprong has expanded into the UK, France, Denmark, New York state. Find out how it works and how Sustainable Buildings Canada is bringing it here.</p>

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14:10 – 15:45	<p><b>Paul Savage</b>, <i>BA Philosophy, CEO, Nextek Power Systems, Detroit, MI</i> <b>DC Microgrids and Buildings; Crucial Components of a Net Zero Environment</b></p> <p>DC-producing solar panels and wind turbines can operate a surprising number of DC-native building systems including HVAC, lighting and IT. DC can contribute greatly to achieving net zero buildings and grid-independent resilience.</p> <p>This session covers the advantages of Direct Current as renewables, battery storage, distributed generation and district electrical systems become more popular. The discussion will cover:</p> <ul style="list-style-type: none"><li>■ An introduction to DC and existing DC building components and systems</li><li>■ How DC can move buildings toward net zero and resilience</li><li>■ An overview of DC microgrid technology and its transition from “alternate” to “base bid” in significant projects</li><li>■ How DC power distributed in a building lowers the cost of controls, either wired or wireless</li><li>■ A quick look around the world as to what’s going on with DC topologies and where (Japan, China, India, Africa)</li><li>■ A forecast what’s ahead for DC power standards in the light of the continued falling costs of semiconductors that can negotiate voltages on the fly.</li></ul> <p><b>Neetika Sathe</b>, <i>MSc Physics, MBA, Director, Advanced Planning, Alectra Inc., Vaughan, ON</i> <b>Solar panels + battery storage + software = Canada’s first Virtual Power Plant</b></p> <p>The POWER.HOUSE pilot project in York Region is comprised of 20 rooftop solar arrays plus battery storage systems located at customers’ homes. Intelligent software controls the systems to simulate a single, larger power generating facility. The technology helps to protect against power outages, lowers peak hour electricity demand to significantly reduce energy bills, reduces system-wide impact during peak demand times, and delivers clean power directly to the customer.</p> <p>POWER.HOUSE is an Energy Storage North America (ESNA) Innovation Award winner</p>
15:45 – 16:00	<b>Coffee Break</b>
16:00 – 17:05	<p><b>PLENARY – URBAN FORM &amp; LOW RISE, LOW IMPACT DENSIFICATION</b></p> <p><b>Bryn Davidson</b>, <i>B.Eng., M.Arch, LEED-AP, Co-Owner, Lanefab Design/Build, Vancouver, BC</i> <b>From Laneway Houses to Net Positive Development</b></p> <p>If we want to address climate change, we need to start creating projects that go beyond ‘Net-Zero’ to have a ‘Net Positive’ impact on our communities and their overall GHG emissions. To do that we need to look beyond the nuts and bolts of the buildings themselves and start asking a two other key questions: “Where is your project located?” and “What does it replace?”</p> <p>These questions, which address transportation impacts and site history are often wrapped up in issues of urban and regional planning, as much as architecture, and highlight the need for integrated planning and green building strategies.</p> <p>The City of Vancouver’s infill housing program for creating ‘laneway houses’– in combination with the city’s programs to support Passive House projects - represents this kind of multi layered approach.</p> <p>Bryn’s talk will cover his firm’s experience with building laneway houses and passive house projects in Vancouver, as well as first hand examples of how that city’s policies have helped (or hindered) those efforts.</p> <p><b>Donald Peckover</b>, <i>B.ArchSc, LEED AP, Architectural Designer, SUSTAINABLE.TO Architecture + Building, Toronto ON</i> <b>Net-Positive Development: Improving an Ecosystem</b></p> <p>The Oak Ridges Moraine Conservation Plan was enacted to protect valuable and at-risk land and aquifers around the Golden Horseshoe in Southern Ontario. The area restricts development of greenfield sites for new industrial, commercial, and residential uses. This idea, however, is based under the assumption that all development is inherently negative for the environment. This may have been true 30 years ago, but in the intervening decades development has begun to have positive impacts on the environment.</p> <p>SUSTAINABLE.TO’s proposal for a new residential development near East Gwillimbury aims to have no negative impact on the environment, and in fact aims to be of benefit to the local environment through a series of constructed wetlands, treating sewage waste from homes while also providing wildlife habitat and improved plant diversity; Net-Zero homes which produce as much energy as they consume; improved nature trails for residents and neighbours; and a specialized Sustainability Centre for use by schools and community groups to learn about sustainability and positive-impact development in concert with nature.</p>

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17:05 – 18:05	<b>CLOSING KEYNOTE</b> <b>Russell Acton</b> , <i>Architect AIBC AAA SAA OAA FRAIC, Principal, Acton Ostry Architects Inc., Vancouver, BC</i> <b>The Tallest Timber Residence in the World: Mass Wood for the Masses</b> The 18 storey Brock Commons Tallwood House residence at the University of British Columbia is the tallest contemporary mass wood building in the world. A highly collaborative integrated design process accelerated the project from concept to construction in just ten months. And in less than 70 days, assembly of the prefabricated wood components was completed, four months ahead of schedule. According to the Journal of Sustainable Forestry, substituting wood for steel and concrete could save 14 to 31 percent of global carbon dioxide emissions. Russell Acton will address the positive aspects as well as the challenges faced in creating this pioneering building. Learn how Brock Commons aspires to be a model for a future that features extraordinarily ordinary mass wood buildings for the masses.
18:05 – 18:15	<b>CLOSING REMARKS</b> <b>Constantine Eliadis</b> , <i>Chair, Sustainable Buildings Canada</i>
18:15 – 19:30	<b>Networking Wine &amp; Cheese Reception</b>