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Buildings and stories: mindset, climate change and mid-century modern

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ABSTRACT

A global attitude adjustment that strongly prioritizes sustainable rehabilitation of our existing resources over new creation, including existing and heritage buildings, is required to meet critical climate change and other environmental targets. This is simply part of the new 'low-carbon economy', like recycling programs, car-sharing and similar behaviors.

Mid-century modern buildings, by the sheer size of their stock, and their current state of maturation, are a major target, as perhaps the single greatest impact on carbon footprint reduction. There is an urgent need for their necessary large-scale sustainable rehabilitation and deep energy retrofit. Therefore, it is argued, the rehabilitation and rejuvenation of Modern-era buildings and urban systems will very rapidly become the major focus of architectural endeavor over the next few years. This will be one of the foci of the move toward increasing the generally prescribed valuation of our existing resources.

Preservation professionals have already developed the skills for adaptation and rehabilitation of existing (heritage) resources while protecting (heritage) value. Therefore, they have the opportunity to be leaders of this coming tidal wave of broader architectural conservation work on Modern-era buildings.

KEYWORDS

Mid-century modern; low-carbon economy; value of the existing; attitude adjustment

Prologue

An implicit and almost universal assumption ... is that the (environmental) problem ... has a technical solution. A technical solution may be defined as one that requires a change only in the techniques of the natural sciences, demanding little or nothing in the way of change in human values.

-Garrett Hardin, *'The Tragedy of the Commons'*, in *Science*, December, 1968

... what has not occurred is a change in public attitude towards stewardship over the Earth ...

-Graeme Wynn to Mirko Zardini, 'Has Environmentalism Failed?' in the exhibit, *Its All Happening So Fast*,

Canadian Centre for Architecture, 2016

A global attitude adjustment that strongly prioritizes sustainable rehabilitation of our existing resources over new creation, is required in order to meet critical climate

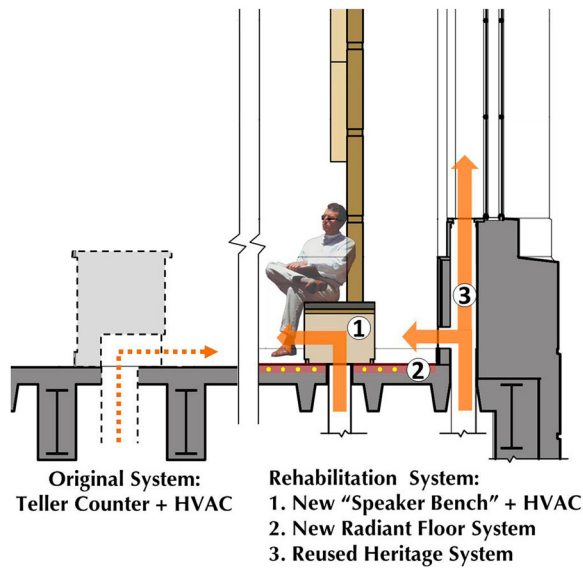


Figure 1. Creative adaptation of modern buildings through sustainable rehabilitation and reuse of existing systems; inspired by the values & design of the existing building. Source: NORR/MTBA Associates.

change and other environmental targets. This attitude adjustment should simply be part of the new ‘*low-carbon economy*’,¹ like attitudes toward household recycling programs, car-sharing and other similar behaviors, and should include reuse and green retrofits of most existing and heritage buildings.

By virtue of its volume and age, Modern architecture has the potential to be targeted for the single greatest impact on carbon footprint reduction. There is an urgent need for its necessary large-scale sustainable rehabilitation and ‘*deep green retrofit*’.² Therefore, it is argued, the rehabilitation and rejuvenation of Modern-era buildings and urban systems will very rapidly become the major focus of architectural endeavor over the next few years. This will be one of the foci of the move toward increasing the generally prescribed valuation of our existing resources.

Building preservation professionals have the opportunity to be leaders of this coming tidal wave of broader architectural conservation work on Modern-era buildings. This is simply due to the fact that they have already developed the skills for adaptation and rehabilitation of existing resources while protecting value (Figure 1).

Proliferation of the modern ... will they endure?

In his 2009 book *The Secret Lives of Buildings*, British Architect Edward Hollis tells us that change over time is good for buildings:

Buildings are less portable than stories, but there are significant parallels between their modes of transmission ... Each alteration is a ‘retelling’ of the building as it exists at a particular time – and when the changes are complete, it becomes the existing building for the next retelling. In this way the life of the building is both perpetuated and transformed by the repeated act of alteration and reuse ... For stories and for buildings alike, incremental change has been the paradoxical mechanism of their preservation ... They have endured in a way that they would have never done if no one had ever altered them.³

The mid-century Modern era of architecture (roughly the three decades after 1945) produced an unprecedented explosion of building construction all over the world. This phenomenal growth occurred during an era of inexpensive, accessible energy to build and operate these buildings. It was also a time, post WW II, where there was a craving for the new, a vast need and demand to ‘change the world’ like never before. Many of these buildings perform poorly in energy expenditure and have a high degree of non-repairable and non-replaceable materials and assemblies. Therefore, we have today a very large stock of unsustainable historic modern-era buildings that are coming to the end of their natural lifecycle. Coincidentally, we are also coming to an energy/climate crisis that will produce a sea-change in architecture away from new buildings and a huge evolution toward focusing on adapting and enhancing our massive existing building stock, including our historic resources.

But, as Hollis reminds us, change is good for the endurance of buildings. This is true for ordinary mainstream modern buildings and even iconic modern buildings.

Often during the mid twentieth-century period, there was also movement away from natural materials that are durable and age gracefully, to more technically and materially experimental building design solutions, in keeping with the technological ‘fast-forward expansion’ of the day. Truthfully, some of these ‘experiments’ simply failed. Others diminished over time to the point where they are no longer fabricated or available for replacements.

Even without the factor of the proliferation of these untested assemblies, throughout the ages, buildings have often outlived the purposes for which they were built. This became more common through the twentieth century, as the pace of societal change moved more rapidly.

And so, buildings must change. For Modern buildings, this will mean deep green retrofits and repair/replacement of systems, materials and assemblies, including some which provide heritage value.

Sustainable rehabilitation gains ground

In the National conservation standard for Canada,⁴ ‘Rehabilitation’ is defined as,

... the sensitive adaptation of an historic place or individual component for a continuing or compatible contemporary use, while protecting its heritage value. Rehabilitation can include replacing missing historic features. The replacement may be an accurate replica of the missing feature or it may be a new design compatible with the style, era and character of the historic place.

The character and volume of rehabilitation ahead, as the Modern era building stock hits ‘heritage age’ (considered to be 40 to 50 years old in Canada) will change and grow. There are/will be the iconic building rehabs, setting the bar for heritage preservation, and there are/will be the more ordinary, ‘mainstream’ stock that will also require careful and technologically advanced wholesale rehabilitation while preserving value – not just heritage value, but economic, social, environmental or even intangible value. Doing this well means new interventions will be incorporated while elements of value will be preserved, re-created or have replacements in kind. There has been a marked increase in literature and web-based tools in recent years that help the designer/practitioner achieve these goals, such as APT’s Technical Committee on Sustainable Preservation’s ‘OSCAR: *On-line Sustainable Conservation Assistance Resource*’,⁵ The Guidance Wheel by The

Sustainable Traditional Buildings Alliance (STBA)⁶ and other standards around the world. Many of these, like OSCAR, are starting now to focus specifically on buildings of the Modern era.

For an example of national sustainable conservation standards, the Canadian National Conservation Standards cited above now have a companion document, *Building Resilience: Practical Guidelines for the Sustainable Rehabilitation of Buildings in Canada*.⁷ The emerging use of this and similar guidelines helps, within the field of historic preservation, to keep focused on the long-term sustainability of heritage properties, but also to set the example for all existing buildings. The United States General Services Administration has a similar, although much leaner, guideline document and it is likely time that these and other global documents like them be updated and universally harmonized to move in lock-step with international environmental agreements, such as the United Nations Framework on Climate Change Twenty-first Conference of the Parties Agreement (COP 21)⁸ and its antecedents.

Elsewhere, organizations like DoCoMoMo and APTi⁹ are developing approaches and principles for addressing the unique challenge of renewing Modern Architecture in ways that are more energy efficient, healthier and less carbon-producing. DoCoMoMo's *2016 Eindhoven-Seoul Statement*¹⁰ modified their original 1990 charter to add the critical sustainability dimension. APT's *Renewing Modernism: Principles for Practice*¹¹ attempts to address objectives through tangible principles that direct practical solutions, simultaneously promoting sustainability & resilience, and protection of value.

Attitude change: greater emphasis on existing resources

The pursuit of instant perfection is not as interesting as the process of gradual renewal ... what renovation is about.

- Tokyo Architect Jo Nagasaka

It is time to make the concentrated shift to greater emphasis on adapting existing buildings and less on constructing more, to improve our overall resilience and sustainability, and to help avoid or delay the inevitable disaster of climate change. This is simply in line with the rise of the sharing economy, the de-evolution of automobile culture, the turn toward smart growth of cities and the efforts at lowering of carbon footprint¹² everywhere: placing greater value on that which we already have. Indeed, Jo Nagasaka and others are making it 'cool' to be creative in adapting structures over creating new ones.

Our existing resources should play greater roles in the full range of accommodation solutions going forward. The buildings sector is one of the key sectors that requires great change in values; comprehensive alterations to the way we approach architecture will help avoid worsening climate change. We know in North America that our existing structures, most of which are mid-century modern buildings, consume more than a third of our energy and half our natural resources (Figure 2).

Many modern office and large commercial buildings have open concept structural organization ('flex forms') that makes them more easily adaptable to renewed uses, prompting the phrase 'loose fit – long life' to describe a desirable quality for long-term usability, and overall resilience. This is a value embodied in many modern structures (particularly 'International Style' modern structures) that has the potential to aid in the search for reuse and reduced consumption. Ultimately, this is value for the planet.

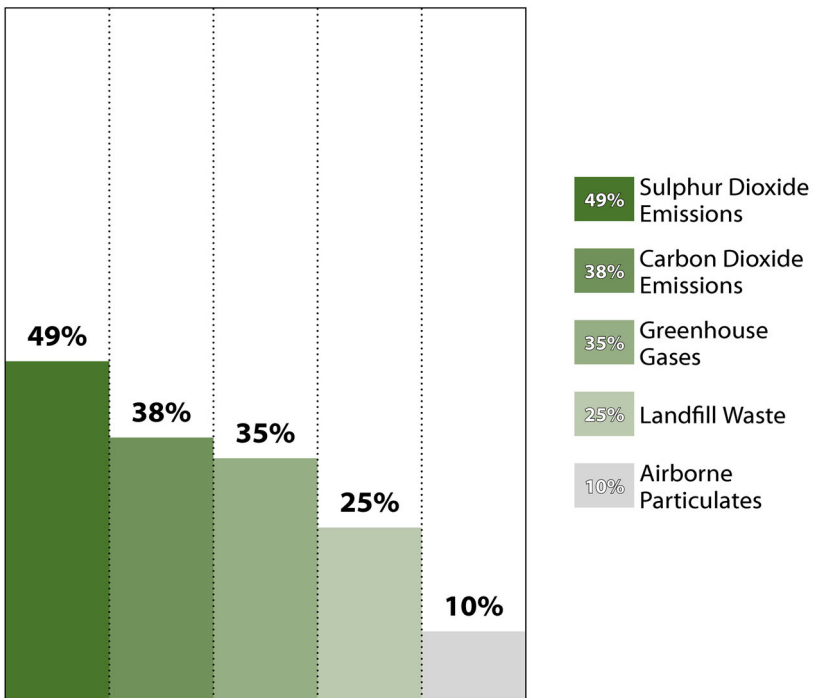
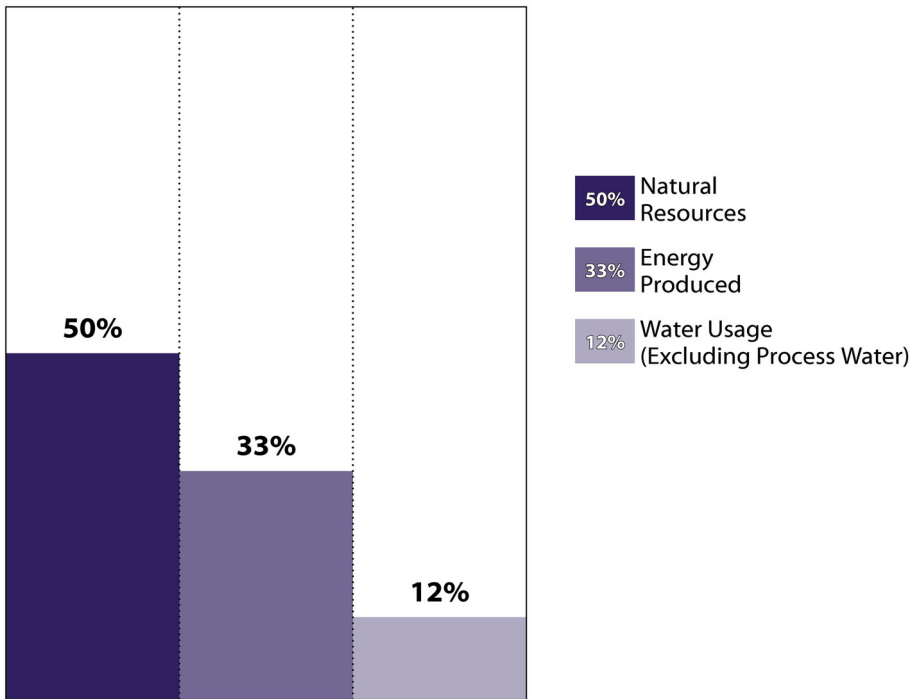


Figure 2. These charts indicate Canadian buildings’ large share in the use of resources and the production of wastes and toxins. Source: The Pembina Institute, Riccones, Brandes and Ferguson.

But we have been slow to move forward on this. The single top international authority on climate change, the IPCC (Intergovernmental Panel on Climate Change) has already told us, several years ago:

Improving energy efficiency in existing buildings encompasses the most diverse, largest and cost-effective mitigation opportunities in buildings ... to combat climate change.¹³

A whole generation after the Brundtland report¹⁴, philosopher and global commentator Thomas Homer-Dixon told us in 2009, regarding the advance of climate change and the end of fossil fuels:

A carbon shift is coming¹⁵

Indeed, it took even another handful of years before there was consensual, quantitative and committed evolution in global attitude toward climate change and its interrelationship with existing buildings: The COP 21 Paris Agreement of November, 2015, signed by 192 countries including those in North America and Western Europe, is a notable landmark, and especially in the Buildings Sector, for several reasons:

- for the first time, a global agreement seriously looked at existing buildings in terms of a defined dimension of fighting carbon emissions;
- it embraces full-embodied lifecycle carbon and starts using zero net carbon as a framework for base lining, monitoring and change;
- for North America, there was strong representation: Canada's new government was leading many commitments and targets and it was acknowledged that the US had maintained building energy levels at flatline, despite building 20 billion square feet (over 1.8 billion square meters) of new construction since 2006.

COP 21 even had, for the first time in that event, a 'Buildings Day', and that focus was showing a new shift toward existing buildings. Across North America, the realization that the real meat of carbon-fighting is in orchestrated change and deep green retrofits to existing buildings, and a shift away from new 'green gadgets' to an existing buildings strategy, seems to be approaching: both US and Canada Green Building Councils are now finally starting to embrace existing buildings and communities as important agents of change. A new version of LEED™ focused on large-scale rehabilitation of existing buildings, not just their operations and maintenance, has finally seen the light of day. Yet another indicator of this evolution is that there is a whole conference stream devoted to existing buildings for the Canada Green Building Council (CaGBC) 2017 conference in Vancouver, and simultaneously they will be rolling out the new CaGBC Zero Carbon Framework, which includes an 'Embodied Carbon Metric' that builds upon LEED v.4's incentivizing the life cycle assessment of building envelope and structural materials. This will help encourage the industry, which has been focused on new buildings, to better address the sustainable rehabilitation of existing buildings (Figure 3).

Of course, all of this is relevant to 'Renewing Modernism' because mid-century modern buildings are the 'pig in the python' in terms of their volume when viewed within a long-term chronological scale. These buildings are notoriously energy hogs and most could be coming up for widespread deep energy retrofits.

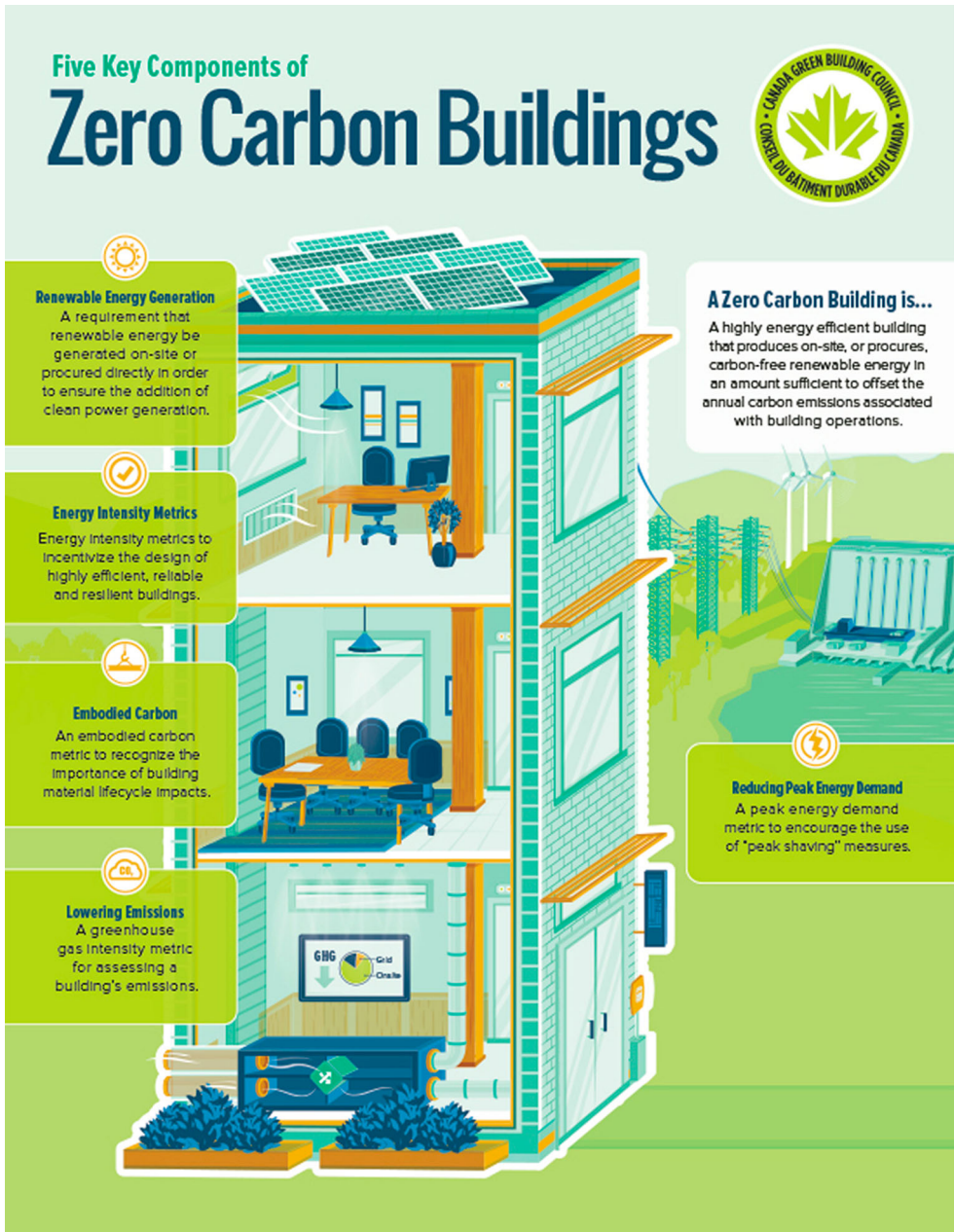


Figure 3. The Canada Green Building Council launched a Zero Carbon Buildings Initiative in 2016 to help advance the move to lower-carbon buildings in support of Canada’s efforts to reduce greenhouse gas (GHG) emissions by 30 per cent by 2030 (as per COP 21 Agreement). The first stage of this work involved development of a Zero Carbon Buildings Framework, whose concept is shown in this graphic. The Framework facilitates broad participation across a range of building types and sizes, provides a clear definition for zero carbon buildings, and establishes five key components for the evaluation of building carbon footprints. Importantly, these include an embodied carbon metric which helps recognize the significance of building material lifecycle impacts, a key indicator for existing buildings. -Source: CaGBC.

Therefore, we need a basic attitude and behavior change: we have now lost the opportunity of automatic raze-and-build. The low-carbon economy will dictate that more and more buildings will be revitalized and rehabilitated throughout the world. More ‘ordinary and everyday’ buildings, especially the huge volume of Modern-era buildings, will remain amongst us, renewed, revitalized and retrofitted to meet the needs of the times, including the urgent environmental needs, and to tell the latest version of their stories. ‘Building Evolution’, the creative art and science of adapting ordinary buildings for recycled uses and improved performance, while preserving their societal value, will soon become a key course topic at architecture schools around the world, just as conservation and sustainability have been slowly working their way into those schools’ curricula in North America over the last several years.

Preserving and leveraging the historic and other values of Mid-century Modern buildings, and becoming proficient and poetic about their transformation and sustainable rehabilitation, is frankly a necessity. We will see an avalanche of change toward this in the next five years.

Ubiquity of modern buildings as agent of change to an existing building focus

The sheer volume of Modern-era buildings approaching the end of their normal life cycle, will dictate that increasingly more ‘mainstream’ architects will be involved in their recycling, revitalization and renewal. Particularly in North America, they will need to face the fact that retrofitting and adapting existing structures is a key element of ‘what they do’. They will have to do so with more creativity and with a healthy respect for preserving the intrinsic value – economic, socio-cultural and environmental – of the existing structure. Heritage conservation architects, engineers and preservationists, having many years of experience in adapting, revitalizing and rehabilitating existing buildings while protecting their value, have the opportunity to lead this fundamental shift in architectural enterprise, through demonstration of best practices in treating existing buildings.

Renewing the Modern, like renewal of all architecture and urban systems, provides us with ‘evolutionary presence’; or, in other words: ‘change as gift’.

This reminds us of another nugget of wisdom from Hollis’s *The Secret Life of Buildings*:

*Architecture is all too often imagined as if buildings do not – and should not – change. But change they do, and have always done. Buildings are gifts and because they are, we must pass them on.*¹⁶

It is time for us to see existing buildings in a new light – one of ‘rich and useful resource’. The Japanese have a concept known as ‘*mitate*’ or ‘*regarding a thing as not what it is supposed to be but as something different and, as a result, gaining something new*’. This puts high value upon existing resources. In the sixteenth century, the Japanese tea master *Sen no Rikyu* altered ordinary items for everyday use rather than creating new items, generating a whole new worldview within that culture. Similarly, we need a new worldview that embraces the reuse and recycling of our massive mainstream existing buildings stock. Developing the technologies and the design sense for this is where we need to put our creative energies now.

The coming tsunami of sustainable rehabilitation for Mainstream Modern buildings is depending on this – and so is Planet Earth. Conservation professionals should be leading this charge.

Notes

1. A *low-carbon economy* (LCE), (also known as a low-fossil-fuel economy (LFFE)), is an economy based on low carbon power sources that therefore has a minimal output of greenhouse gas (GHG) emissions into the biosphere, but specifically refers to the greenhouse gas carbon dioxide.

See also: https://en.wikipedia.org/wiki/Low-carbon_economy

2. A *deep green retrofit* is an analysis, design and construction process that addresses whole-building systems in an integrated manner, to achieve much larger sustainability and energy savings than conventional energy retrofits. Deep green retrofits can be applied to both residential and non-residential (institutional, commercial, industrial) buildings.

See also: https://en.wikipedia.org/wiki/Deep_energy_retrofit

3. Hollis, Edward, *The Secret Lives of Buildings: From the ruins of the Parthenon to the Vegas Strip in thirteen stories*, 2009, Portobello, 2010, Picador
4. Parks Canada, *The Standards & Guidelines for the Conservation of Historic Places in Canada*, 2010, Second Edition
5. <http://oscar-apti.org/>
6. <http://responsible-retrofit.org/wheel/>
7. http://www.historicplaces.ca/media/49493/resilience_en_june%202016.pdf or <http://mtbarc.com/wp-content/uploads/2017/02/2017Building-Resilience-lowres.pdf>

8. The international political response to climate change began at the Rio Earth Summit in 1992, where the 'Rio Convention' included the adoption of the UN Framework on Climate Change (UNFCCC). This convention set out a framework for action aimed at stabilizing atmospheric concentrations of greenhouse gases (GHGs) to avoid 'dangerous anthropogenic interference with the climate system.' The UNFCCC, which entered into force on 21 March 1994, now has a near-universal membership of 195 parties.

The main objective of the annual Conference of Parties (COP) is to review the Convention's implementation. The first COP took place in Berlin in 1995 and significant meetings since then have included COP3 where the Kyoto Protocol was adopted, COP11 where the Montreal Action Plan was produced, COP15 in Copenhagen where an agreement to succeed the Kyoto Protocol was unfortunately not realized and COP17 in Durban where the Green Climate Fund was created.

In 2015, COP21, also known as the *2015 Paris Climate Conference*, for the first time in over 20 years of UN negotiations, achieved the foundation of a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C, and over 190 countries signing on.

9. *DoCoMoMo*: Society for the DOcumentation and COnservation of buildings, sites and neighborhoods of the MODernMOVement
APTi: Association for Preservation Technology International
APT: Short form, i.e. Association for Preservation Technology
10. During the recent International Conference in Seoul, South Korea, DoCoMoMo International updated the founding manifesto *Eindhoven Statement* for the first time since the organization's inception in 1990. The new name of the Statement is the *Eindhoven-Seoul Statement* and it is included below:
 1. Bring the significance of the architecture of the Modern Movement to the attention of the public, the authorities, the professionals and the educational community.
 2. Identify and promote the surveying of the works of the Modern Movement.
 3. Promote the conservation **and (re)use** of buildings and sites of the Modern Movement.

4. Oppose destruction and disfigurement of significant works.
5. Foster and disseminate the development of appropriate techniques and methods of conservation **and adaptive (re)use**.
6. Attract funding for documentation conservation **and (re)use**.
7. Explore and develop new ideas for the future of a **sustainable** built environment based on the past experiences of the Modern Movement.

The changes to the statement are highlighted in bold text above and focus on sustainability and adaptive reuse of modern buildings.

11. This issue of JAC is founded on the results of a Symposium organized by the APT's Technical Committees on Modern Heritage (TC-MH) and on Sustainable Preservation (TC-SP) held at APT's 2015 Annual Conference in Kansas City, MO, entitled, '*Renewing Modernism: Principles for Practice*' and the Statement of the same name that came out of that Symposium, which is currently circulating for final comment. Go to the TC-MH webpage for updates as they become available: http://www.apti.org/clientuploads/Technical%20Committees/2016-2017/TC-MH%20Brochure%20Text_DRAFT_02232017.pdf
12. A *carbon footprint* is defined as: The total amount of greenhouse gases produced to directly and indirectly support human activities, usually expressed in equivalent tons of carbon dioxide (CO₂). For example, when you heat your house with oil, gas or coal, then you also generate CO₂, adding to your carbon footprint. See also: timeforchange.org
13. The *Intergovernmental Panel on Climate Change* (IPCC) is the international body for assessing the science related to climate change. The IPCC was set up in 1988 by the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) to provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. Its main activity is to prepare comprehensive assessment reports about climate change at regular intervals. IPCC assessments provide a scientific basis for governments at all levels to develop climate related policies, and they underlie negotiations at the UN Climate Conference – the United Nations Framework Convention on Climate Change (UNFCCC).
The IPCC Working Group III (WG III) assesses options for mitigating climate change through limiting or preventing greenhouse gas emissions and enhancing activities that remove them from the atmosphere. The main economic sectors are taken into account, both in a near-term and in a long-term perspective. The sectors include energy, transport, buildings, industry, agriculture, forestry, waste management. The WG analyses the costs and benefits of the different approaches to mitigation, considering also the available instruments and policy measures. The approach is more and more solution-oriented. The quote here is from an early assessment by WGIII, whereby greening existing buildings is seen as very important overall to the fight against climate change.
14. The Brundtland Report: Formally known as the World Commission on Environment and Development (WCED), the mission of the Brundtland Commission is to unite countries to pursue sustainable development together. The Chairperson of the Commission, Gro Harlem Brundtland, was appointed by the United Nations in December 1983, in response to therealization that there was a heavy deterioration of the human environment and natural resources. Gro Harlem Brundtland was the former Prime Minister of Norway and was chosen due to her strong background in the sciences and public health. The Brundtland Commission officially dissolved in December 1987 after releasing *Our Common Future*, also known as the Brundtland Report, in October 1987, a document which coined, and defined the meaning of the term 'Sustainable Development'.
15. *Carbon Shift: How the Twin Crises of Oil Depletion and Climate Change Will Define the Future*, is a 2009 book edited by Thomas Homer-Dixon and Nick Garrison that collects six essays that discusses the issues of peak oil and climate change. The book became a national bestseller in Canada.
16. Hollis, *ibid*.

Disclosure statement

No potential conflict of interest was reported by the author.

Notes on contributor

Mark Thompson Brandt is Principal, Senior Conservation Architect & Urbanist, at MTBA Associates Inc., an Ottawa-based Architecture, Urbanism and Conservation practice working at the nexus of natural and cultural conservation. MTBA specializes in opportunities and challenges of where new meets old.

Mark Thompson Brandt is the Co-Chair of the Association for Preservation Technology International's TC-SP Technical Committee on Sustainable Preservation, joining TC-MH to produce the 2015 Kansas City Symposium, '*Renewing the Modern: Principles for Practice*'.

Mark Thompson Brandt is co-author, with Chris Warden of MTBA, of the 2016 National document, '*Building Resilience: Practical Guidelines for the Sustainable Rehabilitation of Buildings in Canada*'. A case study in that document is the *Sir John A. Macdonald Building Rehabilitation*, an adaptive reuse, preservation and new addition to the 1932 former Bank of Montreal, in Ottawa's Parliamentary Precinct, for the House of Commons. This project, by NORR in association with MTBA, earned Green Globes' highest sustainability rating, 5 Globes.