

TAKING ACTION:

A CONVERSATION
ON CLIMATE ACTION
AND ARCHITECTURE
IN CANADA

OCTOBER 5, 2020

An RAIC 2021 Congress
on Architecture Event

Summary Report

THE ROYAL ARCHITECTURAL INSTITUTE OF CANADA

CONGRESS
ON ARCHITECTURE

CONGRÈS
SUR L'ARCHITECTURE
DE L'INSTITUT ROYAL D'ARCHITECTURE DU CANADA



RAIC | IRAC

Royal Architectural Institute of Canada
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The RAIC would like to thank the following members:

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EXECUTIVE SUMMARY

The RAIC Congress on Architecture brings professionals together to ignite action, strengthen connections and share ideas on a single issue of importance to the profession.

PURPOSE:

- **IGNITE** action and learning to improve architecture
- **CREATE** and strengthen connections and collaborations
- **SHARE** ideas, strategies and leading practices

“Climate change is one of the greatest challenges for humanity”

(Hoegh-Guldberg et al., 2019, p.3).

The RAIC recognizes that the built environment is a significant contributor to climate change, that the continued use of the status quo practice has contributed to the climate emergency, and that architects—through their central role in shaping the built environment—have both the capability and moral duty to directly enable transformational climate solutions (RAIC, 2020). Studies indicate that the building sector and those professions that develop the built environment have significant potential for climate change mitigation (Andrić, Koc, and Al-Ghamdi, 2019; Prior *et al.*, 2018).

As such, the RAIC selected Climate Change and Architecture in Canada as the inaugural topic for the Congress on Architecture.

Over the next year, the RAIC will host a series of virtual events leading into the 2021 Congress on Architecture culminating event taking place on October 4, 2021—World Architecture Day. The events will inform the development of a Climate Action Plan for the RAIC.

The first in the series of activities and events was Taking Action: A Conversation on Climate Action and Architecture in Canada – a virtual event that brought together four presenters to introduce the four 2021 Congress on Architecture topics:

- The Facts / The Context (Facing the Facts)
- Challenges and Opportunities
- Towards the Future: Solutions
- Implementation and Application

INTRODUCTION

Taking Action: A Conversation on Climate Action and Architecture in Canada was presented virtually by the Royal Architectural Institute of Canada (RAIC) on Monday, October 5, 2020, in celebration of World Architecture Day 2020. The event was the first in a series of activities for the Congress on Architecture: Climate Action and Architecture in Canada.

The session began with a welcome as well as a territorial and land acknowledgement from John Brown, President of the RAIC Board of Directors, followed by an introduction by Mona Lemoine, Chair of the RAIC Committee on Regenerative Environments. The opening also detailed the purpose of the 2021 Congress event to “Ignite, Create, and Share” information related to the intersection of architecture and the environment, and the work towards a climate action plan for the RAIC.

Four subject matter experts on climate action and architecture were invited to present their research and experiences related to one of the four Congress topics. The session closed with a discussion and question and answer period, moderated by international environmental journalist, Stephen Leahy.

SPEAKERS (in order of presentation):



Adam Fenech, Ph.D. – *The Facts / The Context (Facing the Facts)*



Alfred V. Waugh, Architect AIBC, MRAIC, LEED AP – *Challenges and Opportunities*



Catherine Dubois, Ph.D. M.Arch. – *Towards Future Solutions*



Ajla Akšamija, Ph.D, LEED AP BD+C, CDT – *Implementation and Application*

GUESTS



Stephen Leahy
(Moderator)



Mona Lemoine
(Host)

SPEAKERS AND GUESTS BIOGRAPHIES

Ajla Akšamija, Ph.D., LEED AP BD+C, CDT

Associate Professor, Department of Architecture,
University of Massachusetts Amherst

Dr. Ajla Akšamija is an Associate Professor at the University of Massachusetts Amherst and Building Technology Researcher/Associate at Perkins&Will. Her interdisciplinary research approach spans architecture, engineering, material and computer science. She received a Ph.D. in Architecture from the University of Illinois at Urbana-Champaign, with an emphasis on technology and the environment. Her research interests include building science and sustainability, emerging technologies, digital design and representations, information modelling, and knowledge management. She has worked on developing building analysis and modelling applications, implementation of novel materials in architectural design, development of computational models, and has collaborated with researchers from material science, civil and environmental engineering, and computational design. Her professional background includes Perkins&Will, where she directed Building Technology Laboratory (“Tech Lab”), one of the first practice-driven architectural research laboratories, as well as the U.S. Army Corps of Engineers Construction Engineering Research Laboratory and City of Champaign.

Catherine Dubois, Ph.D., M.Arch.

Sustainable Development Advisor,
Société québécoise des infrastructures

Dr. Catherine Dubois is a sustainable development advisor at the Société québécoise des infrastructures. An architect by training, she is currently

developing a method for assessing the vulnerability to climate change in buildings. This mandate is based on research projects she has conducted at Laval University, the National Institute of Applied Sciences in Toulouse, and the University of Toronto as part of her doctoral and post-doctoral studies. The fight and adaptation of built environments to climate change and the transfer of knowledge to design professionals are included in these areas of expertise.

Adam Fenech, Ph.D

Associate Dean (Interim). School of Climate Change and Adaptation, University of Prince Edward Island

Dr. Fenech has worked extensively in the area of climate change since the Intergovernmental Panel on Climate Change First Assessment Report in 1988. He has represented Canada at international climate negotiating sessions, written climate policy speeches for Canadian Environment Ministers, and authored Canadian reports on climate change for the United Nations. Dr. Fenech has taught at the University of Toronto as well as the Smithsonian Institution for over 20 years, and lectures regularly at universities across Canada and around the world.

Dr. Fenech shared in the 2007 Nobel Peace Prize for his work with the Intergovernmental Panel on Climate Change. He is currently the Associate Dean (interim) of the School of Climate Change and Adaptation at the University of Prince Edward Island (UPEI). He is also the director of UPEI's Climate Research Lab, which conducts research on the vulnerability, impacts, and adaptation to climate change —where his virtual reality depiction of sea-level rise has won international awards including one from MIT for communicating coastal science.

SPEAKERS AND GUESTS BIOGRAPHIES (CONTINUED)

Alfred Waugh, Architect AIBC, MRAIC, LEED AP
President, Formline Architecture

Alfred specializes in culturally and environmentally sensitive projects and has extensive experience with First Nations, cultural societies, and educational institutions. Alfred is Status Indian and part of Treaty 8. He was born and raised in Yellowknife, North West Territories, Canada, and was the first Aboriginal person to graduate with honours from the UBC School of Architecture in 1993, becoming a LEED- certified registered architect. In 2005, Alfred established Alfred Waugh Architect, a 100 percent Aboriginal-owned architecture practice. In 2012, Alfred incorporated the firm and changed the name to Formline Architecture. As part of a sustainable design philosophy, Alfred aims to maximize comfort, longevity, functionality, and energy efficiency. The firm has developed a reputation for finely crafted cultural and sustainable buildings including the UBC Indian Residential School History and Dialogue Centre, the Squamish Lil'wat Cultural Centre, and the First Peoples House at the University of Victoria.

Stephen Leahy

International Environmental Journalist

Stephen Leahy is an award-winning journalist and author who has covered international environmental issues for more than 20 years. His work has been featured in publications around the world including *National Geographic*, *The Guardian*, *Vice Motherboard*, *Inter Press Service News Agency (IPS)*, *Ensis*, *Al Jazeera*, *New Scientist*, *The Ecologist*, *Mo Magazine (Brussels)*, *TerraGreen (India)*, *The Toronto Star*, *Maclean's*, *China Dialogue*, *Earth Island Journal*, and *DeSmog Canada*. Based in Uxbridge, outside of

Toronto, Stephen has been the international science and environment correspondent for the Rome-headquartered Inter Press Service News Agency (IPS), the world's 6th largest global news agency. He is a regular international speaker on water, climate, and other environmental issues.

Mona Lemoine, Architect AIBC, MRAIC, LEED AP BD+C,
Regenerative Practitioner, RELi AP

Senior Sustainable Design Specialist, Perkins and Will

Mona's raison d'être is to have a positive impact in the world. A community leader, she helped found the first Chapter of the Canada Green Building Council, an experience that formed the basis of her continued advocacy work in sustainability and the built environment. Currently, she chairs the RAIC Committee on Regenerative Environments and is a member of the RAIC Congress Steering Committee. In her advisory role at Perkins&Will, Mona enjoys the opportunity to be a resource on a variety of projects – helping to problem solve and inspire people to incorporate sustainability values in their work. Her unique balance of big picture systems thinking and attention to detail is invaluable in leading and managing teams through the sustainability assessment process. A lifelong learner and adventurer, Mona has lived, studied, and worked abroad in several countries including Venezuela, Japan, and Chile. Being immersed in other cultures and languages has taught her to broaden her perspective and continues to motivate her both personally and professionally.

NEXT STEPS

The RAIC will continue the conversation on Climate Action and Architecture in Canada in the following activities:

RAIC Connects Climate Action Community

The [RAIC Connects Climate Action Community](#) is an online platform for RAIC members to post questions, participate in discussion threads, stay up-to-date with the latest Congress news, and meet other like-minded members.

Interview Series

An interview series centered around Climate Action and Architecture in Canada will be released in April 2021.

RAIC 2021 Congress on Architecture

On October 4, 2021 – World Architecture Day 2021 – the inaugural RAIC Congress on Architecture will address Climate Change and Architecture in Canada. For more information visit: raic.org/congress2021

RAIC Climate Action Plan

Building on the findings of the 2021 Congress and the events preceding it, a Climate Action Plan will be produced by the RAIC as a part of a multi-year climate action strategy. The climate action strategy may include education, practice support, advocacy, and outreach, in addition to the report.



PRESENTATIONS

3.1 The Facts / The Context (Facing the Facts)

The first presentation was given by Dr. Adam Fenech on the topic of The Facts / The Context (Facing the Facts), who began by sharing the sentiment that if climate change is only going to get worse, and there is nothing we can do about it, why should we try to solve it. This is a point 'grabbed onto' by 'climate deniers'— a term for those who do not believe climate change is a fact or of concern. Dr. Fenech agreed that while we cannot do anything to change what has already taken place, we need to adapt and reduce our emissions to change the course as we move forward. This is because in light of the fact that the five hottest years on record for the planet were recorded in the last five years, with that number expected to rise to six by the end of 2020, as the planet is warming slightly every year.

While this change only accounts for a 1 to 1.5-degree difference, Dr. Fenech put this into context by stating that if the planet was to cool by 5.5 degrees, another ice age would occur. This is even more concerning as we are currently in a phase of low solar radiation being received by the earth, due to our distance from the sun, however, this will increase in about 4-5 years, resulting in global warming increasing in speed. This change in global temperatures has already resulted in an increased number of hurricanes and category-5 storms (winds of over 250 km/hour) year over year in those five years. The increased planetary heat has also resulted in more forest fires, with 4% of the state of California affected at a single time this year. Oceans are also taking in the extra heat and CO₂, increasing the volume of these bodies of water and rising sea levels.

Dr. Fenech was unequivocal that humans are adding to the atmospheric carbon dioxide, and that we can only release 565 gigatons more of

CO₂ by 2050, to stay below a change of 2 degrees. However, we are currently expected to reach that volume of emissions in 10 years (2030). Dr. Fenech concluded his presentation on the facts and context of the climate emergency by stating that we need to change the way we are 'doing business' and, in the context of this conversation, practicing architecture.

3.2 Challenges and Opportunities

Alfred Waugh, an Indigenous architect, gave the second presentation on the challenges and opportunities presented by the current conditions surrounding climate action. Waugh spoke about Indigeneity and offered an alternative approach to, and perspective on, practicing architecture while trying to address various issues, including our continued existence and our relationship to Mother Earth. Waugh noted the need to ask how Indigenous knowledge and Western science can be brought together, as Indigenous culture has nature at the centre of its values.

Waugh stated that if we were to shift our systems and ideologies towards nature, we would walk through the world differently. Rather, Waugh believes that something has been lost in the quest to seek knowledge, as science allows us to isolate and manipulate, leading to a loss of awareness of how everything is interconnected. Waugh also explained that the Indigenous way of thinking holds that ideas are embedded in our past and approaches the way we live together on this earth differently.

Highlighting two architectural projects, Waugh showcased a process on how to address these dichotomies. Waugh stressed the importance of focusing on engagement, listening to Elders, learning about the importance of our inter-relationship to the things around us, and giving

meaning and spirit to their projects. This again raised the question of how one brings together Indigenous knowledge with Western science in terms of how one approaches architecture.

The first project, the First Peoples House at the University of Victoria, took the above concepts through the design of stormwater management systems, including a planted roof and aeration pond that overflows into a seasonal wetland. Designed for the Salish people, for whom water is important, energy reduction was also achieved by using the traditional longhouse as an example of a passive strategy for ventilation. Here science and Indigeneity came together through the 'primitive' idea of lifting the boards along the perimeter to allow for natural ventilation — similar to the design of the longhouse —and using a minimal amount of mechanical HVAC while still needing to use high-tech modelling to ensure its result during the design phase.

The second project Waugh presented was the Indigenous House, located at the University of Toronto Scarborough campus. In this example, an exterior ramp rises to the second storey to allow for the programmatic elements of the second- floor gathering space —a project requirement in terms of its location— to still be able to spill out onto the landscape below, as per asper traditional values. Engagement with Elders was also central in the design process, as Elders were invited to walk the site with the architects and give insight into what plant materials should be used in the sunken garden. The traditional wigwam structure was used as a reference for the roof structure, and Passive House concepts were introduced, as well as "earth tubes" that make use of the geothermal properties of the earth. This too was inspired by Indigenous design practices as birch tubes were originally used for this purpose.

For Waugh, the challenges of designing in an environmentally conscious way can be used as an opportunity to invite Indigenous ways of thinking into the design process.

2.3 Implementation and Application

Catherine Dubois presented on the third theme. She shared that climate change is already having an impact on our buildings across the country. This is through ramifications for infrastructure, including property damage and loss, the premature ageing of some components, the malfunctioning of equipment systems, and ripple effects when a building is at the centre of a larger network. Naturally, for owners and managers, the impact is seen in financial losses. Climate change also affects occupants, sometimes compromising their comfort, health, and even safety. Architects are in a position to integrate climate change mitigation and adaptation measures into projects, aimed at reducing greenhouse gas emissions or enhancing carbon sinks. Because mitigation measures work everywhere in the world, the benefits are potentially global.

Dubois noted that it is important to remember that greenhouse gases (GHG) are the main cause of global warming and adaptation responses are measures for adjusting to the current or future climate in order to protect us from potential damage. This is while taking advantage of new opportunities offered by the climate or responding to its effects.

Yet, unlike mitigation measures, Dubois pointed out that adaptation responses have a highly local focus and must be designed to address specific hazards. Examples of adaptation responses to heat waves in urban heat islands include exterior improvements with vegetation, shading, and choosing an appropriate window-to-wall ratio to help preclude creating buildings prone to overheating— while still allowing for natural lighting and ventilation. Dubois also addressed riverine flooding, or flooding caused by rising water levels. In such cases, land slope and drainage, and the ground floor height compared in relation to the potential water level are critical, as is the type of foundation, and whether the basement is developed. Thus for two different climatic hazards, it is building components that are affected, and therefore, different adaptation measures must be taken.

This led Dubois to examine four steps involved in an effective climate change adaptation project. The first step is to determine the extent to which the climate will change in the region where the project is located.

The second step is a diagnosis of the dangers the project will be exposed to, in order to be able to consider adaptation measures and— depending on the dangers— which building components are particularly vulnerable. Dubois is currently developing, as part of the “Vulnerability of Buildings to Climate Change” project, a method for assessing the effect of future climate change on building vulnerability. This method is intended to be comprehensive enough to provide a picture of the risks incurred by each of our buildings while they remain operational. The objective is to encourage the integration of climate issues into architectural practice, so that as many professionals as possible are informed and know what measures to take.

The third step is, once the hazards and vulnerabilities have been determined and diagnosed, one must draw on their expertise and innovation. Dubois believes that architects are often seduced by the idea of pushing the boundaries of practice, exploring new alternatives and ideas, and creating prototypes. This was the case with the example she presented of an amphibious house that was designed by the Morphosis agency a few years ago in the wake of Hurricane Katrina, which devastated New Orleans. This house sits on solid ground most of the time but, in the event of flooding, it simply rises and floats on the water, held in place by columns.

According to Dubois, however, adapting to climate change also means going back to basics and good practices including passive architectural strategies. Dubois, asked, ‘What better way to minimize a building’s dependence on the major power grids than by allowing it to circumvent them with natural heating and lighting?’ It also means going back to the basics of physical and construction principles, so sustainability of the work and envelope, including moisture management. The final step is sharing what the project’s successes and failures were. For Dubois, adapting to climate change is a relatively recent issue and architects will try out alternatives that don’t work and others that will. By sharing this information together, we improve the odds that the adaptation is increasingly successful and minimize the chances of failure.

3.4 Towards Future Solutions

The final presentation, given by Dr. Ajla Akšamija, looked at how climate-positive actions can be implemented and applied through architecture and building science. Dr. Akšamija noted that passive design strategies can be inexpensively included to improve building performance. As such, it is important to first exhaust passive strategies before introducing advanced building science and integrating renewable energy resources. Dr. Akšamija shared that existing building technologies can reduce carbon emissions. The challenge is that the way buildings are designed needs to change. This includes the importance of integrated design and modelling.

As design decisions impact building performance, it is at the design stage that the opportunity to influence the environmental performance of a building is greatest —i.e. the amount of glazing used. Through modelling, architects can quantify the impact of design decisions, as well as optimize performance, from site analysis to HVAC performance. This can be seen in Dr. Akšamija’s research studies over the past five to ten years, which show the impact of building envelope performance and energy consumption, through the modelling for 50,000 examples of energy performance for today’s climate and future predicted climates (i.e. increased cooling loads).

In the case of integrated intelligent facade systems, prototypes tested showed results better than hypothesized, and new systems that can be integrated into new wall types are now being developed. Retrofits of existing buildings can also allow for a 50-60% energy savings to improve building performance, as seen through retrofit models. As such, Dr. Akšamija is expanding the study to include cost- effective retrofit strategies, such as low impact strategies, deep energy retrofit strategies, and cost impacts. This is because architects routinely receive questions about the cost implications of energy-efficient design decisions, so research that shows cost-effective strategies for energy- efficient buildings is an important tool for architects to have. Thus for Dr. Akšamija, a research-based design is essential for practicing architects who want designs with building performance and the environment in mind.

DISCUSSIONS

Question 1: The federal government recently announced new climate emission reduction plans, including increasing the target for 2030, and legislating net-zero by 2050. Please provide a comment.

Answer: Dr. Adam Fenech

Dr. Fenech stated that he was pessimistic and referenced the comment made by Waugh that we, as humanity, need to reinvent our relationship with the natural environment and nature. Dr. Fenech believes that the planet will still be in a crisis state, even once the current climate issue, that being climate change, is resolved. The other serious concerns Dr. Fenech has, and that we are moving quickly towards over the next 20-30 years, includes water and resource scarcity and biodiversity. There is no 'silver bullet', but rather, we need to change our relationship with nature to solve these others growing concerns.

Question 2: Do Indigenous people have the 'silver bullet' to solve all the problems?

Answer: Alfred Waugh

Waugh shared that, in a way, this was already happening in a sense, giving the example of his sons who are more aware that things around them are not right, as he is trying to pass on knowledge to them and spread that message that we have to shift the way we approach our living. For Waugh, this means that we cannot be as material-based as we currently are. Waugh noted that we, as a collective, need to find a new way to live together and on this earth. This is heightened by the fact that by 2040, those over 80 years old will exceed those under five, in our population. More attention must be paid to the existential question of we live on this earth.

Question 3: How would practitioners start to put nature at the centre of their work? How do we decide where development goes based on what the land tells us first, and how do we weave development into existing water and ecological systems?

Answer: Alfred Waugh

Waugh responded that it is important to plan communities around gathering places –to understand and be more aware of the ecology, stormwater retention, and how we treat our waste.

Question 4: What are the barriers to getting to net-zero, and how are they overcome?

Answer: Dr. Ajla Akšamija

Dr. Akšamija explained that the first barrier is cost – a common question received from clients and stakeholders – though there are now technologies available to overcome this. Another common barrier is economics, such as the impact on the life cycle, yet while changing the way we design may cost a little more, there are direct and indirect benefits. Dr. Akšamija recommended that architects talk to their clients about direct benefits, such as improved thermal comfort and reduced energy costs, as well as indirect benefits that include the benefit to society. She stated that, as architects, we need to educate our clients as well. While it might cost more initially, the lifetime cost is lower, not to mention that these are more beautiful and habitual spaces that also have a positive effect on climate change. Dr. Akšamija concluded that saying sustainable design is too expensive is no longer an excuse.

Questions 5: Regarding adaptation and the serious impacts coming, how do we know in a particular location what the weather will be in 2030?

Answer: Dr. Catherine Dubois

Dubois noted that it is important to make bridges with the profession and find data as the information is already available.

Question 6: Is it difficult to convince governments that such benefits will pay-off down the line?

Answer: Dr. Catherine Dubois

Dr. Dubois again noted that architects have to find the data of what the impacts are on your current building stock. This includes asking, what is the climate and what is it expected to be? It is already a struggle maintaining comfortable conditions in office towers in today's climate, with temperatures expected to rise, for example. Building owners need it is important for building owners to use long-term thinking to realize that it is worth investing in solutions now, and to understand what the risks are, in order to choose proper adaptation measures.

Question 7: What are one or two things the profession could do to really tackle climate change

Answer: Dr. Ajla Akšamija

Dr. Akšamija stated that we must move away from aesthetics and other requirements. Instead, we should focus on performance-based design, questioning the impact of every decision based on energy consumption, which we have the tools to do. We need to move towards performance-based design, merging building science and architectural design to make the right design decisions for the climate, location, site, and client.

Question 8: What are things the profession can do to help transform our ways of living?

Answer: Alfred Waugh

According to Waugh, we need to look at what is quantifiable to improve our buildings' performance, as ultimately designers are impacting the quality of life and how people are perceiving their environment. We need to learn how to knit together the quantifiable and the qualitative, and bring these interconnections together together these interconnections. It cannot all be purely science, as being purely science, for Waugh, is what has allowed for the current situation. Instead, a dialogue with nature is needed, and we need to ask how this knowledge can be passed on to younger architects and clients, in terms of the different paths you can take. The quantifiable will eventually be written into the code and be required. For Waugh, the real question is how we live on the earth.

Question 9: Imagining it's 2040, and we're on our way to net zero, having solved most of these problems. What does that better future look like?

Answer: Dr. Catherine Dubois

There is the hope that, by 2040, climate mitigation will be at the forefront for all architects, as the National Building Code of Canada will enforce some climate action-related regulations that will have to be followed. As that will be a first for Canada, more training and more tools to assist architects will be needed. There is also the hope that it will not be as hard to convince clients of these benefits.

Answer: Dr. Adam Fenech

He has the hope that things will be smaller and that we will be more empowered with the idea that every building should be responsible for its own energy —whether solar, wind, or geothermal— and that we can connect buildings to balance out and share energy. What gets left out of the conversation is thinking about how we have approached things in the past, and the need to redefine our relationship with nature.

Answer: Dr. Ajla Akšamija

Her daughter's artwork summarizes her vision, with the potential for the future to be bright and healthy, but we need to change some things drastically to get there. She hopes that, by 2040, smart development will be more common globally, that there will be more compact developments, that we will see sustainable energy and efficiency at the urban scale, and that new technologies will be developed. She is optimistic that, within the architectural profession, much of this could become a common practice.

Answer: Alfred Waugh

We will be going through an interesting transformation as a species. Artificial Intelligence (AI) will change our world. 40% of jobs will be lost to it, which and this will shift the workforce towards the creatives. Our population will peak in 2060, before it will begin to decline, requiring us to focus on immigration for our workforce. 80% of our energy will come from alternative sources, and we will have better ways to store solar energy. The population will live longer, we will be able to download things into your brains, we will have a colony on mMars, and be able to spread human consciousness throughout the galaxy. We need to maintain a connection to nature, as others will get lost in an AI world.

Question 10: Seth Klein uses “wartime footing” as a metaphor to emphasize thean urgency of the need to respond as quickly as possible. The kKey to this response is the integration of Equity Diversity and Inclusion (EDI). What tools can assist Aarchitects in addressing EDI concerns?

Answer: Alfred Waugh

Architects need to find ways to make inclusive environmentsenvironments that are inclusive, that share culture, and incorporate an ideological approach to how we build our environments. Architects should also employ passive strategies before active strategies whenever possible.

There is an existential layer of a value shift, for which architects need to take the lead and be the ones to educate and learn from clients.

Answer: Dr. Ajla Akšamija

Ideally—yes, we should do everything in our power as architects and creators of the built environment to fight climate change and, specifically, to mitigate the impacts of the built environment on climate change. However, this is a complicated endeavour that requires much more than just architectural solutions, such as policy change, changes in building codes, investments, education, training, improved collaboration, integrated design process, etc. In my humble opinion, we should strive to do as much as we can in our design projects and prioritize our efforts to influence decisions and actions that may not directly fall under our umbrella. Therefore, advocacy, outreach, and education are as important as the design process.

Answer: Stephen Leahy

The science is very clear that urgency is required to meet the climate challenge, and many have called for a WWII-like effort to mobilize climate actions. In fact, a recent study said if a mere 3% of the pandemic-related economic stimulus was invested in low-carbon we'd be well on our way to zero emissions by 2050. I wrote about it here:

Nor is it a problem of not enough money to make this happen. Here's a Need-to-Know based on some new research: If a fraction of the current Covid-19 economic recovery investments by various countries were shifted into low carbon investments we'd be on our way to zero-carbon world before 2050. That would keep global warming under 2 degrees C. How small a fraction of those investments? Less than three percent over the next five years according to an analysis just published last Thursday in the journal Science. That's a very small investment to create the world we want.

— Planetary Emergency vs Business as Usual: Some guiding principles for the world we want.

Shifting urgently to low-carbon ways of living should enhance Equity, Diversity, and Inclusion.

Question 11: I don't think that most of those who fund construction care about benefits beyond profit, and they are often not receptive to being "educated". Will it not take political rather than professional persuasion to effect change?

Answer: Dr. Ajla Akšamija

Yes, political, social, and economic factors are very important, but I believe that the architectural profession can initiate some change through our advocacy and outreach efforts.

Answer: Stephen Leahy

As for political versus professional leadership, I'd like to share this experience from the Copenhagen climate conference in 2009: One day, I ran into Germany's leading climate scientist after he'd briefed President Barack Obama's senior staff.

There'd been an intense discussion about how much —, and how fast —, carbon emissions needed to be cut to keep global warming well below 2°C. He told them there was only so much carbon budget left before 2°C was unavoidable. The Obama officials told him to be politically realistic.

"Political reality must be grounded in physical reality, or it's completely useless," he told me with exasperation.

Some years later, that same German scientist told me it would take mass mobilization and marches to make climate action politically realistic. And that is what has happened.

Question 12: In light of the different views and beliefs about the cause(s) of climate change, there seems to be agreement that architects have an important role to play in contributing to lowering carbon emissions as related to building design — either new or retrofit.

What can we do to come together and find common ground so the focus can remain firmly on the future — and what architects can do in practice, at the individual, community, and organizational levels?

Answer: Dr. Ajla Akšamija

I strongly believe in the power of performance-based design, and the use of performance analysis procedures during the design process, to quantify the impacts of design decisions on a building's' energy use, emissions, the occupant's' comfort, etc. This applies on the individual level and for specific architectural projects. On the other hand, community and organizational levels require improved collaboration, community engagement, education and training, as well as sharing of best practices and lessons learned. Additionally, improved integration of research into the architectural profession provides significant opportunities to tackle these extremely challenging problems.

Answer: Stephen Leahy

There will always be "coconutarians"—people who believe things despite overwhelming evidence to the contrary. Ajla makes an important point that performance-based buildings are better buildings to live and work in while reducing their operating costs. At some point, carbon pricing will drive up fossil energy prices dramatically, and those buildings will lose any prestige value. Carbon pollution is beginning to be seen as disagreeable in vehicles, and those vehicles are being banned in California, 14 countries, and a number of cities. Buildings will be next.

Three of four presentations were delivered in English and one in French. English subtitles were provided for the presentation in French.

REFERENCES

Andrić, I., Koc, M., & Al-Ghamdi, S. G. (2019). A review of climate change implications for built environment: Impacts, mitigation measures and associated challenges in developed and developing countries. *Journal of Cleaner Production*, 211, 83-102.

Hoegh-Guldberg, O., Jacob, D., Taylor, M., Bolaños, T. G., Bindi, M., Brown, S., ... & Engelbrecht, F. (2019). The human imperative of stabilizing global climate change at 1.5 C. *Science*, 365(6459).

Prior, J. H., Connon, I. L., McIntyre, E., Adams, J., Capon, A., Kent, J., ... & Westcott, H. (2018). Built environment interventions for human and planetary health: integrating health in climate change adaptation and mitigation. *Public Health Research and Practice*.

Royal Architectural Institute of Canada (2020). Resolution for Urgent and Sustained Action on Climate and Ecological Health. Accessed on December 21, 2020 from <https://raic.org/news/resolution-urgent-and-sustained-action-climate-and-ecological-health>

RESOURCES

TAKING ACTION PRESENTATIONS

The Facts / The Context (Facing the Facts)

Dr. Adam Fenech, [“Climate Change: We’re Screwed, It’s Our Fault, It’s Going to Get Worse, and There’s Nothing We Can Do About It”](#)

Challenges and Opportunities

Alfred Waugh, [“Indigenuity”](#)

Towards Future Solutions

Dr. Catherine Dubois [“Towards a better integration of climate issues in architectural practice”](#) (French)

Implementation and Application

Dr. Ajla Akšamija, [“Towards Future Solutions”](#)



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