

VIII. SESSION SUMMARY & CONFERENCE PAPAERS

A. Keynote Sessions

KEYNOTE 1

Matthew CHEUNG Kin-chung, GBS, JP, *Chief Secretary for Administration, The Government of the Hong Kong Special Administrative Region*

KEYNOTE 2

SU Yunshan, *Director-General, Department of Science & Technology and Energy Saving on Buildings, Ministry of Housing and Urban-Rural Development, People's Republic of China*

KEYNOTE 3

Topic: The Paris Agreement Meets the Future Where We Need to Be: in Cities That Are Crowded, Clean and Connected, with Buildings That Are Organic, Efficient and Resilient

Christiana FIGUERES, Vice-Chair, Global Covenant of Mayors for Climate & Energy

ABSTRACT

Does the Paris Agreement solve climate change?

No, it seeks to prevent the worst effects of climate change. Insurance industry deems a temperature rise that goes beyond 2 degrees as systemically uninsurable.

Does it include every country and every sector?

It has been adopted by 195 countries and ratified by 110 countries. It constitutes a global business plan for the decarbonization of the economy. That business plan is now being devolved down to the level of countries, states and cities. It includes most sectors of human endeavor but in particular it points toward a transformation of our physical infrastructure (energy, transportation, buildings) and our natural infrastructure (forests and agriculture).

Will it be implemented?

Yes, the advance in clean energy generation technologies and the drop in prices have taken climate change beyond the sphere of politics into the sphere of the market place. The competitiveness of RE is established and will continue to escalate exponentially based on increasing public and private demand. Smart meters and blockchain technology are just two of the many innovations that will escalate RE. In turn the increasing abundance of cheap and clean electricity is catalyzing electric transportation. And electric vehicles may turn out to be one part of the answer on storage. Coal has no future. Oil and gas are quickly losing ground. Benefits of clean technologies are becoming more visible and more valued. Demand for cleaner technologies is on the rise. Decarbonization of the global economy is unstoppable.

What are the implications for the built environment?

Infrastructure is at the center of the climate challenge for three reasons. First because of direct physical impacts due to increasing extreme weather events. Secondly because the interest in and demand for resilient and environmentally responsible urban planning and building is on the rise. Third because of the unprecedented growth in urbanized population over the next two decades.

Those three trends point to a fundamental transformation in the way we plan, build and inhabit our cities. It points to a fundamental transformation in building design, materials, and operational efficiency. The direction is clear: buildings that are organically designed, using materials that obey cradle to cradle or circular principles, and are energy and water efficient. The integration of innovation is giving the best results. Practices such as integrated project delivery and triple bottom line cost benefit analysis are showing the way forward. Finally, the literature shows that this built environment leads to happier and healthier citizens.

KEYNOTE 4

Topic: Infrastructure, Resilience and Sustainability

Peter GUTHRIE, *Professor, Engineering for Sustainable Development, University of Cambridge*

ABSTRACT

The understanding of sustainability has now matured over thirty years since the Brundtland definition came to world attention. Its success in being accepted has also been its shortcoming, in that there is wide diversity in its interpretations applied to different fields.

In the field of civil infrastructure, the emerging concept of resilience is finding more traction with practitioners. Whilst subject to a similar diversity of meanings as sustainability, resilience can be more readily translated into physical interventions to improve performance. Infrastructure can be made more robust, more adaptable, more amendable, to be better prepared for shocks to the system.

Using case studies from a review of infrastructure delivery, past disasters, and current thinking on resilience, this presentation will draw together lessons learned and put forward proposals for action to improve resilience so as to achieve greater sustainability.

KEYNOTE 5

Topic: Environmental Transformation of the Built Environment

Thomas AUER, *Managing Director, Transsolar, Professor, Building Technology and Climate Responsive Design, Technical University of Munich*

ABSTRACT

The European Union's Roadmap for Moving to a Competitive Low Carbon Economy in 2050 ('carbon roadmap') states that in comparison to 1990, CO₂ emissions of the building sector should be reduced by 90% by 2050. This will have a significant impact on our environment, and the architecture of buildings and cities will change dramatically. But the requirements for energy efficiency and comfort cannot be fulfilled by technology alone. A balance of passive design strategies and active ones is the key to a well-orchestrated system. This requires a thorough understanding of first principles, where climate-responsive design contributes a piece to this complex puzzle.

The goal is for architecture and climate control strategies to become a synergistic unit, where technology is optimised and/or supplemented where needed. The aim of climate responsive design is to develop buildings that offer maximum comfort while minimizing the use of resources and systems. In this regard, building efficiency and user comfort are closely connected with architecture. Besides, vernacular design principles often illustrate the potential of passive design strategies. We recognise that all aspects of design influence environmental conditions. For a sophisticated climate design it is required that form, material and mechanical systems are synergistic components of a finely-tuned climate control system; and conversely, an environmental control strategy is integral to the architectural concept. A full appreciation of all technical aspects of comfort is essential for advanced climate design, both on a building and an urban scale.

It is necessary to approach design holistically. A holistic approach to design, however, also requires expansion of the focus from individual buildings (at district level) to the overall urban context in order to accomplish the goals defined within the EU carbon roadmap. Mixed-use urban districts provide the potential for energy and water supply strategies in which requirements that vary between different program areas enable synergetic service strategies. In this regard it is essential to deploy climate design in on all scales. Aside from an efficient use of resources, outdoor environmental quality becomes another aspect that is directly linked to urban form, materiality and the design of the public realm.

KEYNOTE 6

Topic: Reframing Environmentalism: Shaping a Positive Future

Raymond COLE, *Professor, School of Architecture and Landscape Architecture, University of British Columbia, Canada*

ABSTRACT

Environmentalism has been variously framed as concern about and action aimed at protecting the environment. Critics argue that its message is alarmist, sets environmental issues apart and contextually disconnected from other pressing societal concerns, and situates responsibility and solutions within the domain of a separate movement and its expertise. The current period of increasing climate and political uncertainty creates a qualitatively different context for environmentalism.

In building design, environmentalism has been exercised through strategies directed at reducing non-renewable resource use and pollutant emissions. What is commonly referred to as “green building” design, for example, has been almost exclusively directed at reducing the degenerative consequences of the built environment on the health and integrity of ecological systems rather than emphasizing positive outcomes. While important and necessary, such a response is increasingly recognized as being an insufficient one.

Rather than reducing destructive impacts, the emerging notion and practice of regenerative approaches views buildings as catalysts for positive change, adding value and enabling the full potential of the social and ecological systems to the unique place they are situated. Regenerative approaches are therefore inherently hopeful and full of promise – a marked contrast to the negative messaging of much of the current environmental discourse. While the technical strategies of green design remain valid, the intention, language and more comprehensive framing of regenerative development offers considerable potential to accelerate the development of a shared vision, shared ownership and shared responsibility. The most significant and necessary shift does not therefore reside solely at the strategic level, but in the mind-set of design teams and clients.

Eventually, perhaps, we will come to view the act of building not as destructive of natural systems and depleting the earth’s resources but as contributing to and supporting the creation of a thriving, resilient and abundant world. To achieve such an ambition, we will need to articulate the vision and associated values necessary to affect and guide positive change and, in particular, how these are communicated to a broader public. Buildings, it would seem, can and should form a critical part of this communication process.