

Architecture 2030 – Builders & Designers United to Curb GHG Emissions

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Construction Industry Contribution to Global Warming

By now, majority of the scientific community agrees that human activities have significantly increased carbon dioxide and other greenhouse gas (GHG) into the atmosphere; most scientists also believe that if left unchecked, catastrophic events would occur as a result of melting glaciers, reduced snow reflection back into outer space, and altered ocean currents.

According to an OECD report, building operations accounts for around 40% of global carbon dioxide emissions. If you add in building materials and the construction of buildings, it is nearly half of all GHG emissions. Human migration into the cities is expected to continue to rise; hence there is an urgent need for sustainable urban planning, design and construction.²

A Bold Vision to Curb GHG

A non-profit organization **Architecture 2030** formed in 2005, is trying to take a big chunk out of greenhouse gas emissions. This

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² OECD/IEA Joint Workshop on Sustainable Buildings: Towards Sustainable Use of Building Stock

organization is moving an entire industry across the world to take concrete steps toward reducing greenhouse gas emissions.

The Architecture 2030 °Challenge

The goal of Architecture 2030 is to inspire the world architecture and building community to help keep global warming to approximately one degree centigrade above today's level by adopting the following targets³:

- That all new buildings, developments and major renovations be designed to meet a fossil fuel, greenhouse gas (GHG) emitting, energy consumption performance standard of 50% of the regional (or country) average for that building type.
- That at a minimum, an equal amount of existing building area be renovated annually to meet a fossil-fuel, greenhouse gas (GHG)-emitting, energy-consumption performance standard of 50% of the regional (or country) average for that building type (50% of the regional average through innovative design strategies, the application of renewable technologies and/or the purchase - 20% maximum - of centralized renewable energy).
- That the fossil fuel reduction standard for all new buildings be increased to:
 - 60% in 2010
 - 70% in 2015
 - 80% in 2020
 - 90% in 2025
 - Carbon-neutral by 2030 (using no fossil-fuel GHG-emitting energy to operate)

On 20 February 2007, 250,000 participants across the world attended a live webcast of

³ http://architecture2030.org/open_letter/index.html

the 2010 Imperative Global Emergency Teach-In, produced by Architecture 2030 and hosted by the Academy of Sciences in New York, USA. The goal of the event was to encourage design professionals, design schools and students all over the world to commit to include reducing green house gas emissions as a design criterion in all of their designs. The event featured a panel of three speakers: Dr. James Hansen, director of NASA Goddard Institute for Space Studies; Mr. Edward Mazria, Founder of Architecture 2030, architect, and author of “The Passive Solar Energy Book”; and Mr. Chris Luebke, Director ARUP’s Global Foresight and Innovation Initiative. Participants set in front of their computers or video screens from across Asia, Europe, and Middle East, in addition to North and South America. Many of them from universities expressed their commitment to implementing the 2010 Imperative at the end of the event.

Case studies from
http://architecture2030.org/case_studies/index.html



Tsinghua University Eco-Building, Tsinghua, China



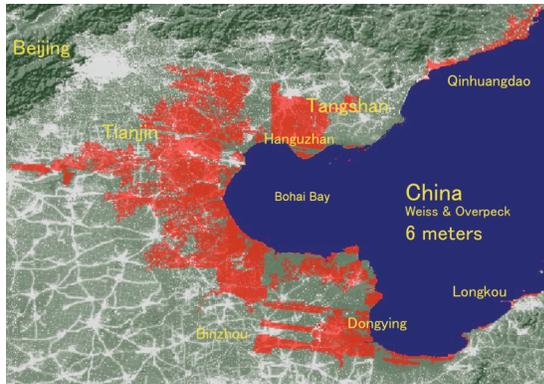
Steinhude sea facility, Steinhude, Germany. Randall Stout Architects.

How does global warming impact you?

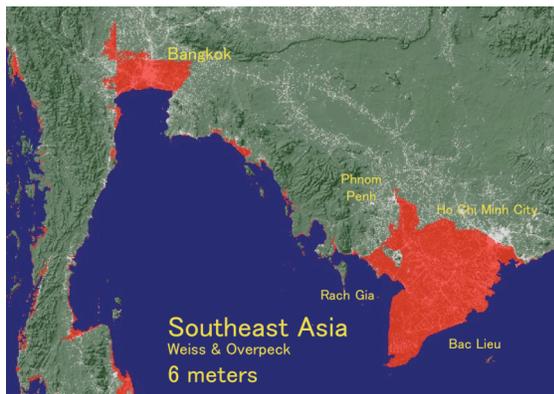
One of the major concerns of global warming is the rise in sea level that could potentially wipe out many economic areas around the globe. In Hong Kong, Chek Lap Kok airport would be completely submerged, as is much of the reclaimed land where Hong Kong’s financial and hotel districts are located.

In China, shown on the map below⁴, an area stretching 100 km inland from the shores of Bohai Bay would be under water, flooding major cities such as Tianjin and displacing millions of people.

⁴ Sea level rise maps courtesy of Jeremy Weiss and Jonathan Overpeck, University of Arizona.



In Vietnam, the entire Mekong Delta, home to 40 million people would be submerged and Bangkok, a city of 9 million people, would disappear.



Sustainable Building and Construction in Hong Kong

According to Mr. K.S. Wong, member of the Hong Kong Institute of Architects Committee on Environment and Sustainable Development, the HKIA established the Committee since 1998 to promote environmental and sustainable designs.

In 2002, HKIA partnered with other building and construction professional organizations in Hong Kong to form the Professional Green Building Council (PBGC). In addition to HKIA, other members include: the Hong Kong Institution of Engineers, Hong Kong Institute of Landscape Architects and Hong Kong

Institute of Surveyors; the Hong Kong Institute of Planners joined in 2005. The PBGC promotes a better sustainable built environment through professional involvement. PBGC, along with local universities, jointly organize seminars and projects to educate and increase sustainable-built awareness among practitioners as well as the students being trained in these industries.

PBGC created the 2006 Green Building Award to further encourage and improve awareness of sustainable designs.

Hong Kong has established a standard for assessing buildings' sustainable design & environmental impact, similar to BREEAM in the United Kingdom & LEED in the United States. The HK-BEAM (Hong Kong Building Environmental Assessment Method) goals are to reduce the environmental impacts of buildings throughout the planning, design, construction, management and demolition life cycle; provide a common set of performance standards for the building industry; improve sustainable design awareness among the building practitioners; and to stimulate demand for sustainable buildings in Hong Kong.

The Hong Kong Electrical and Mechanical Services Department has a very informative website

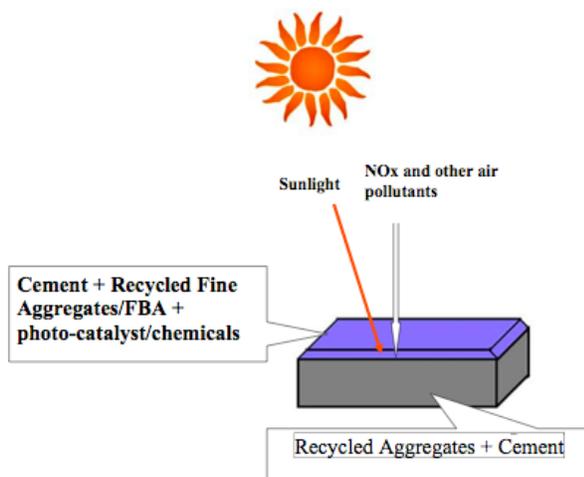
(<http://www.emsd.gov.hk/emsd/eng/pee/index.shtml>) to promote energy efficiency in buildings, including Life Cycle Assessment and Life Cycle Cost Tools for builders and building operators, and computer educational games for children and adults. The Department also sponsors the Hong Kong Energy Efficiency Awards for Commercial & Residential Buildings sector and Schools sector. The goal is to promote energy efficiency and conservation.

All the architectural schools in Hong Kong offer courses in sustainable architecture. In particular, the Department of Architecture at the Chinese University of Hong Kong has a graduate program in Environmental & Sustainable Design.

One very exciting development is the research on recycling of waste materials of Professor C.S. Poon at the HK Polytechnic University,

<http://www.cse.polyu.edu.hk/~cecspon/>.

Professor Poon has successfully developed an air-cleaning paving blocks that would remove low concentration pollutants such as NO_x from the air to be washed away by rain. Other products include paving blocks made from recycled concrete aggregate and terrazzo tiles made from waste glass.



Closing

The global building industry, as one of the biggest green house gas emitters, can make a significant impact as to the future survival of this planet. While the Hong Kong building and construction industry is actively practicing environmental & sustainable design principles, more needs to be done.

Addressing global warming requires the actions of everyone across the globe. By embracing the Architecture 2030 °Challenge, the industry can further achieve its goals for sustainable buildings, enable the citizens to reduce energy costs, help the local economy to be less dependent on fossil fuel, improve the living environment, while taking a step toward preventing global warming.

When Mr. Mazria was asked what motivated him to give up a very successful private architecture practice to devote full-time to Architecture 2030, he said, “I need to answer to my children and grand-children. We can not continue to do business as usual and leave future generations with natural and economic catastrophes when we could have done something about it”.