

Low Carbon Hong Kong: Supporting Business to Set Targets Property & Construction Working Group

12 April 2018 Workshop Highlights

Through *Low Carbon Hong Kong: Supporting Business to Set Targets*, a [BEC Climate Change Business Forum Advisory Group](#) initiative, BEC is working with businesses on a sectoral level to set targets and strategies aligned with the objective of the Paris Agreement – net zero emissions by 2050. Our focus at the moment is the property & construction sector.

This stage of the project involves a series of workshops backed up by research. Our aim is to understand the level of ambition which may be expected of this sector in Hong Kong under the Paris Agreement and to collectively solve problems in setting and achieving ambitious longer term targets.

For more background information, please see [BEC's Low Carbon Hong Kong Report: Supporting Business to Set Targets](#).

The second workshop of the initiative, held on 12 April 2018, focused on new building design. Members and experts recognised that it is vital for new buildings to be designed extremely well to minimise buildings operational energy consumption, as buildings constructed now will remain standing and be in operation throughout this century.

Designing New Ultra-Low Energy Buildings

Two key approaches for ultra-low energy buildings not yet widely used in Hong Kong were discussed: passive house design, and utilising natural ventilation.

Passive house design embodies four fundamental principles: well-insulated building envelopes and windows to minimise heat transfer and avoid thermal bridging, airtight building envelope to avoid infiltration and leakage, managing solar gain, and making use of heat recovery in ventilation and air conditioning systems. Projects that make use of passive design, such as Hamburg House in Shanghai, have shown to reduce as much as 90% of heating and cooling energy demand.

Natural ventilation makes use of the natural forces of wind and buoyancy to ventilate and increase thermal comfort of buildings. Building shape and orientation is critical for maximising natural ventilation. A study across Chinese cities have shown that natural ventilation can reduce cooling energy demand by 8-78% depending on climate zones.

Below are some of the principles of designing ultra-low energy buildings discussed at the workshop.

Insulation minimises heat transfer, and is important in both hot and cold climates (every fridge is insulated to keep the interior cool). Even a thin layer of insulation can make a significant impact in terms of energy as well as comfort and noise. There are innovative ways of implementing insulation, such as spray-on materials and prefabricated buildings components with insulation layers built in. Higher wall-to-window ratio, double glazing are other ways of reducing heat gain or loss.

Natural Ventilation can reduce cooling demand whilst maintaining indoor comfort levels. Approaches such as openable windows allow flexibility for capturing natural ventilation as needed. Chimney type features can also be used to ventilate buildings.

Reducing Solar Gain/Shading reduces incoming solar radiation that heats up buildings, particularly through windows. Incoming heat energy can be minimised through building orientation, using overhangs and balconies for shading, recessed windows, and low-e glass.

Cool Neighbourhoods are important. The hotter the environment, the larger cooling demand for buildings. Trees and vegetation help achieve this as well as light coloured surfaces. Buildings should be designed to capture and utilise waste heat generated, rather than releasing it into the environment which creates a feedback loop of buildings needing more cooling, releasing more heat, and so on.

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