

WOLFGANG

KES S S L I N G

SDE4 LECTURE SERIES
2017/2018

Energy and Comfort

Wolfgang Kessling
Physicist and Climate Engineer
Transsolar Energietechnik GmbH

Date and Time——
31 Jan 2018
1800 to 1930

Venue——
Lecture Room
LR423, 4th Floor SDE 3,
School of Design &
Environment,
National University
of Singapore

Contact——
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<https://goo.gl/Z2Aaob>

The New Net Zero Energy Building (NZEB@SDE) is the first purpose-built net zero energy building commissioned by a Singapore tertiary institution. It will make the case that stringent energy targets for Singapore buildings are not only possible, but are necessary and can lead to an architecture of delight.

A net zero energy building consumes only as much energy as it produces within its site boundary. Consumption and production figures are balanced over the course of one year, allowing for periods when consumption is higher than production and vice versa. The building is connected to the city's utilities grid with which it exchanges electrical power when there is a surplus or deficit. To meet demand with on-site energy production, NZEB@SDE relies on an array of solar photovoltaic (PV) panels on its roof.

During the design process, four critical questions were investigated and discussed: how efficiently can energy be consumed? How much energy can be produced on-site? Which environmental conditions can be controlled by users? How do we define thermal comfort? Critical to this was a rethinking of air-conditioning system and its impact on adaptive comfort. The way in which we define thermal comfort, particularly in tropical and subtropical climates, would suggest that higher levels of temperature and humidity are still acceptable, particularly if combined with elevated air speed.

The hybrid system implemented in the NZEB@SDE supplies rooms with cool air – albeit at higher temperatures and humidity levels than a conventional system – and augments this with elevated air speeds from ceiling fans. The cool, moving air creates a comfort mode that is significantly better than the overcooled rooms currently experienced.

The SDE4 lecture on Energy & Comfort is about new ways of defining thermal comfort and rethinking how to do more with less.

About the speaker:

Wolfgang Kessling is a physicist and climate engineer based in Munich, Germany. He is one of the partners and principals of Transsolar and frequently lecturers on sustainable design. Wolfgang's research and development work focuses on high comfort-low energy buildings and design for outdoor comfort in urban settings. In Singapore, he was involved in the climate and energy concepts for the cooled conservatories at the Gardens by the Bay. In 2012, he was invited to give a TED talk on outdoor comfort at the opening ceremony of the first TEDx Summit in Doha, Qatar.

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