

Climate Change Forum cum Workshops –  
GHG Reduction Solutions for a Low Carbon HongKong  
30 Sep 2010 (Thu)



# Zero energy and zero carbon buildings



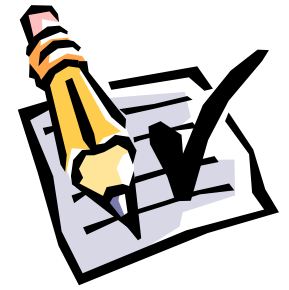
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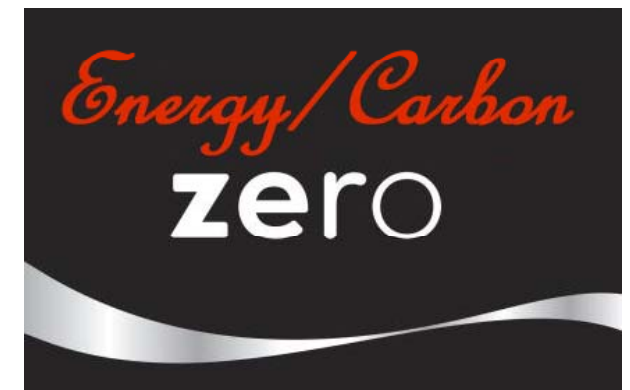
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# Basic Concepts



- Zero energy building (ZEB)
  - A building that produces as much energy on-site as it consumes on an annual basis
  - “Net” zero energy building
- Advantages of ZEB:
  - Reduce energy consumption and costs
  - Reduce carbon emissions
  - Reduce dependence on fossil fuels

"0"



# Comparison of low energy, zero energy/carbon and green buildings [adapted from ECEEE (2009)]

	<b>Pros</b>	<b>Cons</b>
Low energy building (LEB) (e.g. passive house)	Cost optimal; well established principles with thousands of buildings constructed	Does not achieve greatest energy/carbon saving potential
Zero energy building (ZEB)/ Zero carbon building (ZCB)	Greatest energy/carbon saving	More expensive; limited practical experience
Green Building (GB)	Takes account of wider sustainability and resource use issues	May not be realistic across all new buildings

# Initiatives and Pilot Projects



- Major initiatives in the world
  - UK
    - 2016 Zero Carbon Homes and Zero Carbon Schools
    - 2018 Zero Carbon Public Buildings
    - 2019 Zero Carbon Buildings
  - Europe
    - Amending of the 2002 Energy Performance of Buildings Directive (recast)
    - By 2019, ZEB mandatory for new buildings and zero energy to a certain percentage of refurbished buildings

# Initiatives and Pilot Projects



- Major initiatives in the world (cont'd)
  - USA
    - Architecture 2030 ([www.architecture2030.org](http://www.architecture2030.org))
      - AIA 2030 Carbon Neutral Design Commitment ([www.aia.org](http://www.aia.org))
    - ASHRAE Vision 2020
      - Develop the tools by 2020 to enable viable ZEB by 2030
    - U.S. Department of Energy:
      - Net-Zero Energy Commercial Building Initiative
        - Net zero for all U.S. commercial buildings by 2050
      - Zero Energy Homes research initiative

## Examples of ZEB/ZCB projects in the world



Pearl River Tower, Guangdong,  
China [2010]



Self-sufficient solar house, Freiburg,  
Germany [1992]



Pusat Tenaga Malaysia's ZEO  
Building, Malaysia [2007]



BCA Academy, Singapore [2009]

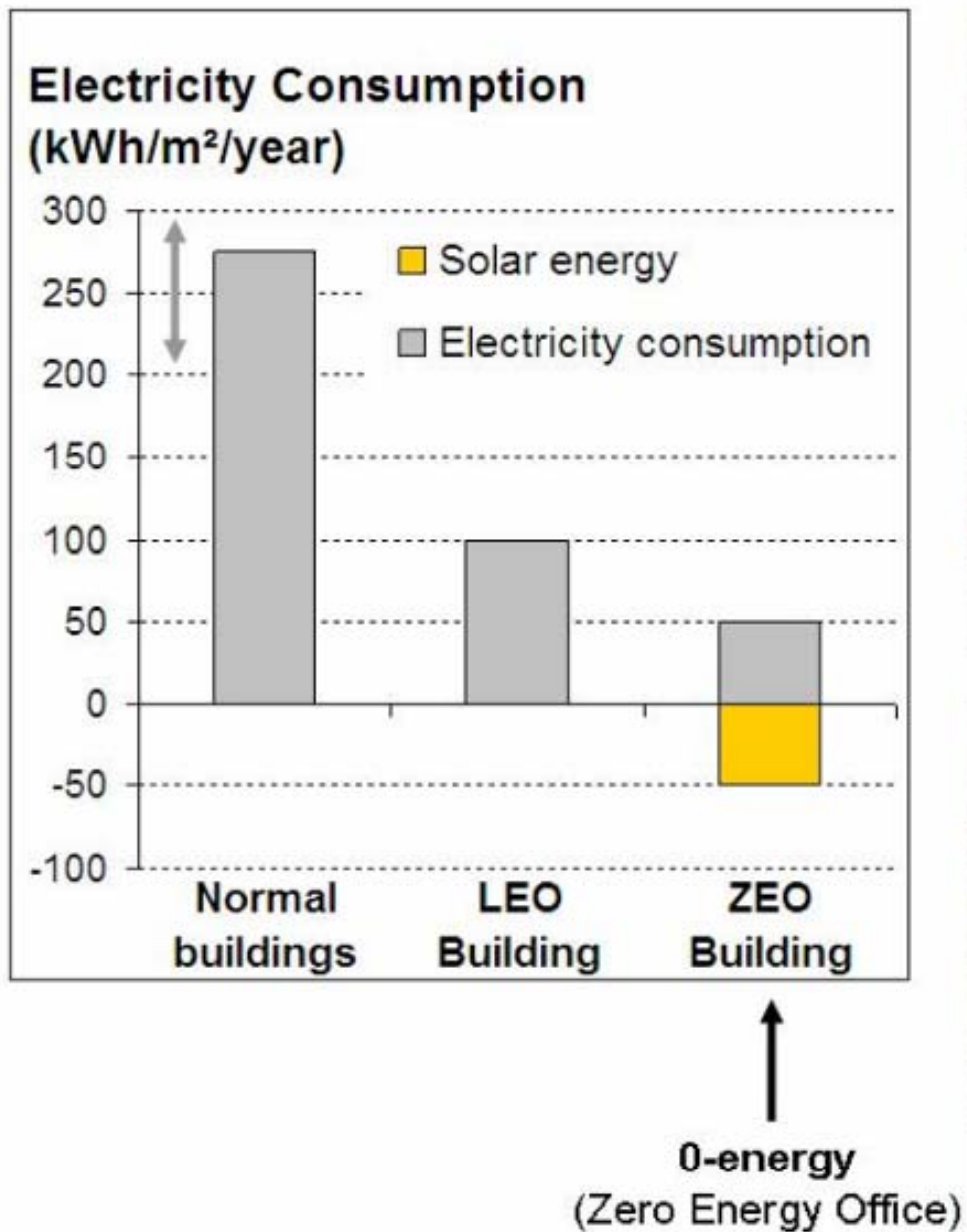


Beddington Zero Energy  
Development (BedZED), London  
[2002]

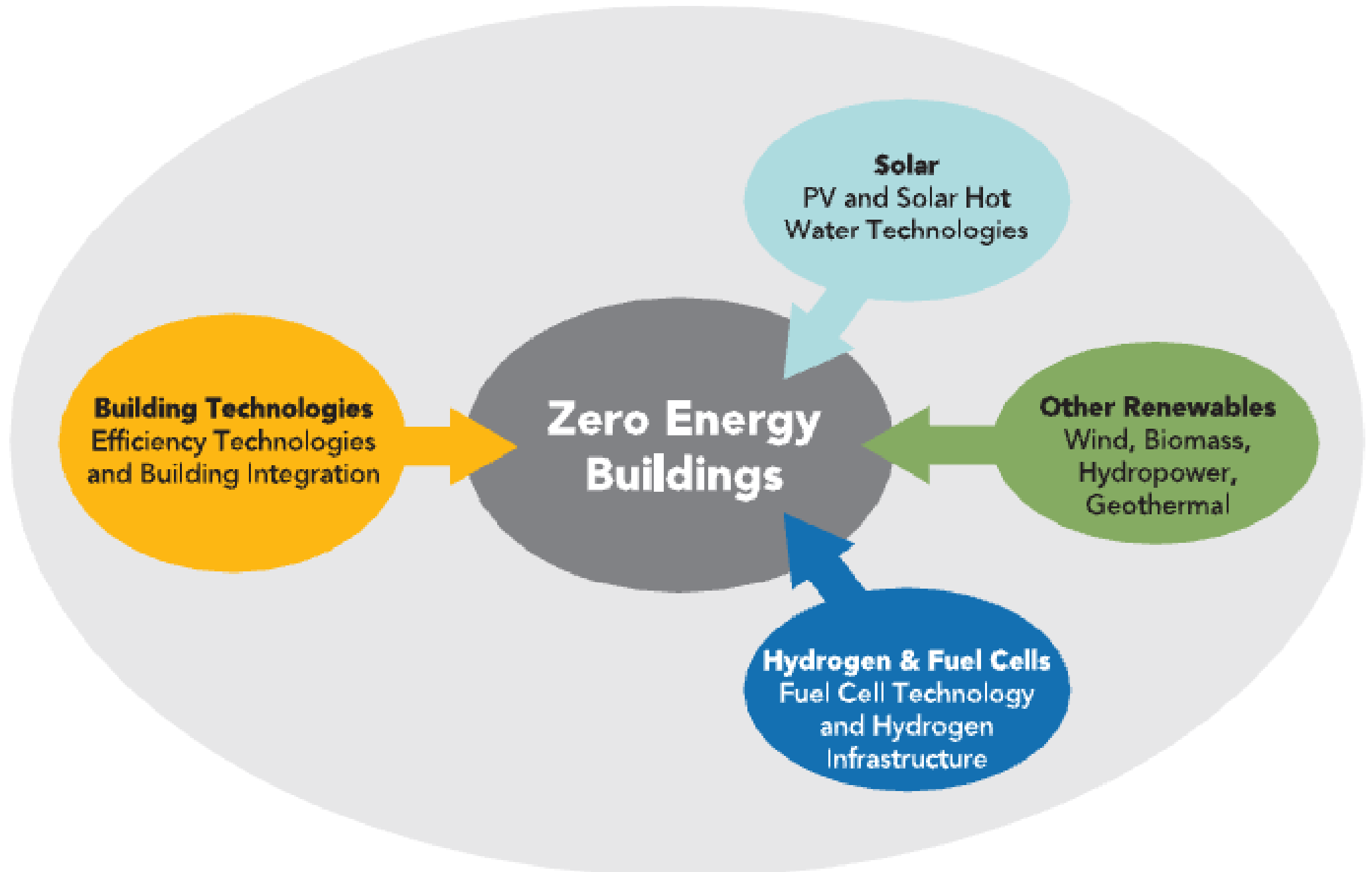


The Barratt Green House in  
Watford, UK [2008]

# Malaysia low energy building and zero energy building



# Strategies for net zero energy building [Source: NSTC (2008)]



THANK YOU

