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Moving Towards Zero Energy Buildings in Chinese Taipei

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Outline



Development of Zero Energy Buildings
Green Building Promotion Program
Examples
Future Prospective

Chinese TAIPEI

Development of Zero Energy Buildings (ZEB)

Status Quo in Chinese Taipei

- No ZEB regulations or standards
- Existing Energy Conservation Program
- Existing Green Building Labeling System

Development of Zero Energy Buildings (ZEB)

Technologies and Strategies Needed

Moving towards ZEB in Chinese Taipei

Building Envelopes

Building Integrated Renewable Energy

Building Insulation Materials

Air Leakage and Reducing Emissions

Air Conditioning and Hot Water

Pumps in Building Systems

Facility Lighting

Automation and Control Systems

ESCO

Energy Performance Certification

Legislation

Chinese TAIPEI

Green Buildings Promotion Program in Chinese Taipei

March 8, 2001

9 indices of Green Building Evaluation System

- (1) Biodiversity
- (2) Greenery
- (3) Soil Water Content
- (4) **Daily Energy Saving**
- (5) **CO₂ Emission Reduction**
- (6) Waste Reduction
- (7) Indoor Environment
- (8) Water Resource
- (9) Sewage and Garbage Improvement



Green Building Label in Chinese Taipei

Green Buildings Promotion Program in Chinese Taipei

Achievements

2000 – 2008

Green buildings & candidate: 1,953 buildings

Energy saving: 647.8 GWh

CO₂ reduction: 426.2 kt



Source: TABC (2009)

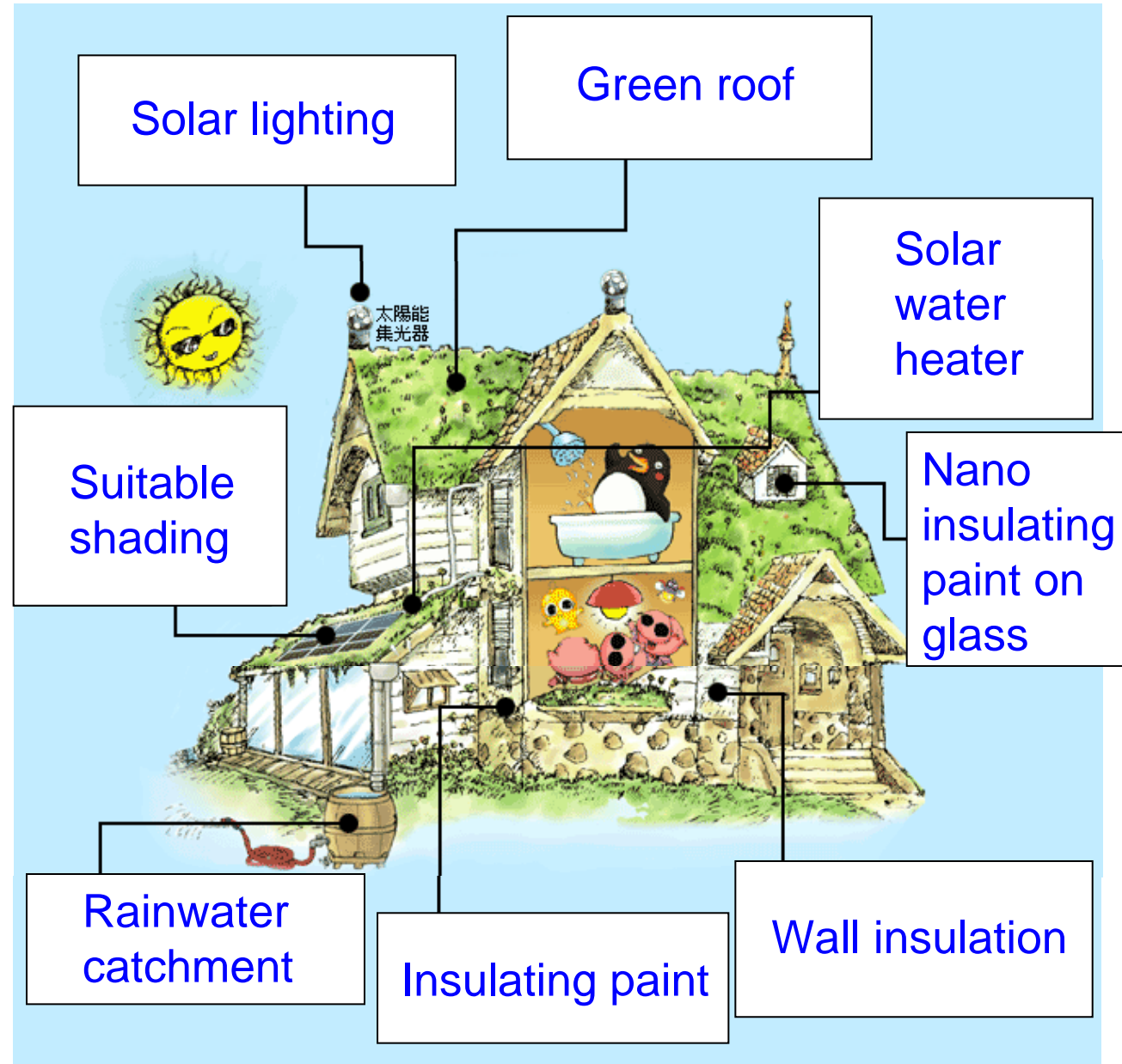
Zero Energy Buildings in Chinese Taipei

Cool Energy Saving House at Taipei Zoo (Demo & Exhib)



Source: ITRI/Taipei Zoo (2009)

Cool Energy Saving House at Taipei Zoo



Source: ITRI/Taipei Zoo (2009)

Zero Energy Buildings in Chinese Taipei

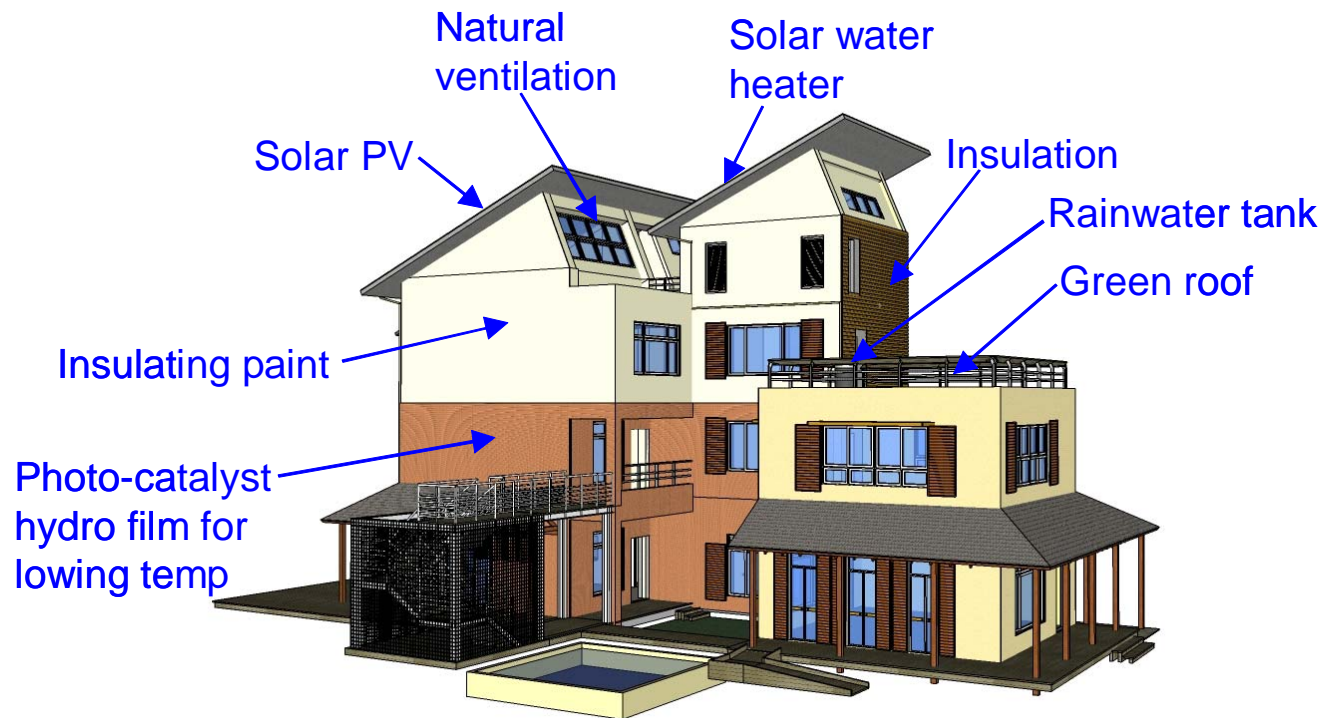
Lohas Energy Conservation House at National Sci & Tech Museum (Demo & Exhib)



Source: ITRI/NSTM (2009)

Lohas Energy Conservation House at National Sci & Tech Museum

- Energy saving: 7,680 kWh/yr (save up to 70% compared with conventional RC building in Taipei) (Applying daylighting, high-efficiency HVAC equipment, natural ventilation, etc.)
- Installed 1 kW Solar PV and 1 kW fuel cell for exhibition



Source: ITRI (2009)

Zero Energy Buildings in Chinese Taipei **Private House in Meinung, Kaohsiung**



Zero Energy building for 4-person family

- All energy supply by 123 pieces of thin Film solar cells
- Total installation cost: NT\$ 1,200,000 (half subsidy by BOE)

Source: UDN (2008)

Low Energy Buildings in Chinese Taipei

Grid Connected Solar PV System

Main Stadium for 2009 World Game, Kaohsiung



Installed Cap.: 1 MWp

Generation: 1,100 MWh/yr



Source: KOC (2009)

Future Prospective

Enhance the Current Implemented Measures

1. Extend the regulation scope of building scale to comply with Building Envelope Energy Efficiency Design (ENVLOAD) .
2. Upgrade the Energy Conservation Index of Green Building Evaluation System to get higher energy saving.
3. Upgrade energy efficiency indexes and setup level rating standards for home appliances, including air conditioner, refrigerator, fluorescent lamp, and electrical motor.

Future Prospective

Energy Audit and Incentives for Energy Conservation Technologies

1. Promote the application of Building Energy Management System
2. Promote the use of renewable energy
3. Promote the auditing and benchmarking system to control the building energy consumption
4. Promote and setup a incentive mechanism for designers implementing energy efficiency design such as tax deduction, low interest rate loan and multiplying the design fee, etc.
5. Promote ESCO



Photo: KOC (2009)

Main Stadium for 2009 World Game, Kaohsiung, Chinese Taipei

Thank you for your attention.