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Taking Collaborative Action on Mitigating Climate Change

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Promoting energy efficiency in the hotel industry

Le Hoang Viet

ENERTEAM

Energy Conservation Research and Development Center - ENERTEAM

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Country profile: Vietnam

- Located in Indochina Peninsula in the Southeast Asia
- Tropical area with a diversity of climate

Activities & Policy issues

- Started in 1999: Majestic Hotel => reduce 17% energy bill.
- Supports from EC and ADEME (2001-2003): integrating energy management into Environment & Resource Management system (ISO 14001) for 15 hotels/resorts: saving 10% - 20% specific energy consumption (kWh/room.night) – depending on every hotel
- Decree 102/2003/ND-CP, 03/Sept/2003: “Decree of the Government on the EC&E” : ***hotels are considered as commercial buildings and controled by this decree.***
- DSM-EE program (Ministry of Industry)
  - Decision No 40 /2005/QĐ-BXD dated 17/11/ 2005 of the Ministry of Construction to promulgate the ***Energy Efficiency Building Code*** (EEBC) - QCXDVN09: 2005
- Decree 102/2003/ND-CP, 03/Sept/2003: “Decree of the Government on the EC&E”
- VNAT (Viet Nam Adminitration of Tourism) plan to issues Green Hotel Label (Energy issues will take an important role) in 2009.

Energy Efficiency Building Code (EEBC)

Concentrating on:

- Building envelope (except non-air-conditioned storage)
- Equipment and systems in building:
  - *Lighting (indoor & outdoor)*
  - *Ventilation*
  - *Air conditioning*
  - *Water heating*
  - *Equipment for energy management system*
- Applied:
  - Obligatory for building with total floor areas of ≥ 300 m^2
  - As reference for other buildings (≤ 300m^2)
- In practice:
  - Designers are not yet aware on the EEBC
  - No organization for giving approval
  - No agency for supervising/imposing sanctions.

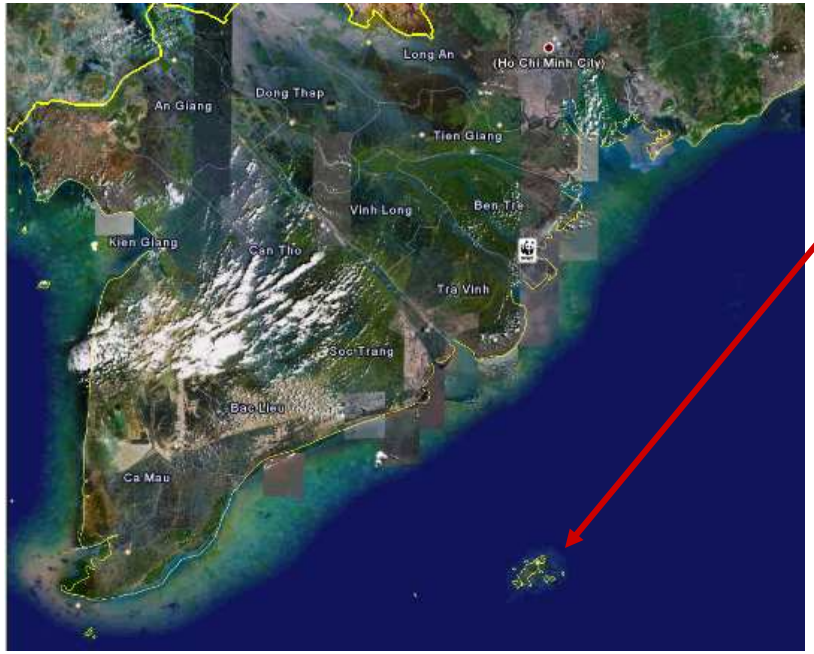
=> *Not yet widely adopted*

CASE STUDY

SAVING ENERGY AT DESIGNING PHASE: CON DAO RESORT

- Investor: **Indochina Capital Group**
- Architectural Design: **AW²**
- Construction & M.E. Design: **CPE (Chan Phuong Engineering)**
- Energy Advisor: **ENERTEAM**

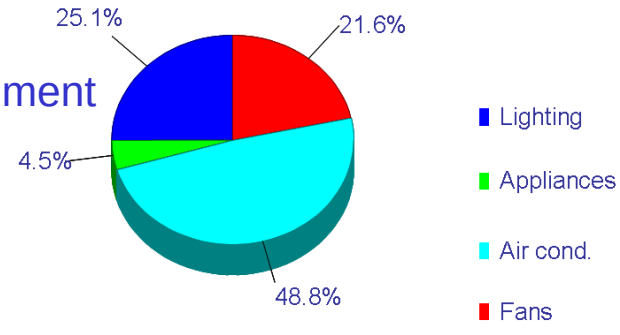
- 29 Hotel villas
- 7 two-bed room residential villas
- 8 three-bed room residential villas
- 1 four-bed room residential villas



Con Dao Resort

Factors have been considered

- Orientation
- Architecture
- Energy generation equipment
- Energy appliances
- Sustainability (water, solid waste, etc.)
- …



Constraint of the site

- Tropical zone: 8º46'N & 106º36'E
- Located in an island
- Main façade must face the sea
- Difficulty of transporting materials
- Difficulties of local construction material
- Located in strict ecological protection area

Main concepts

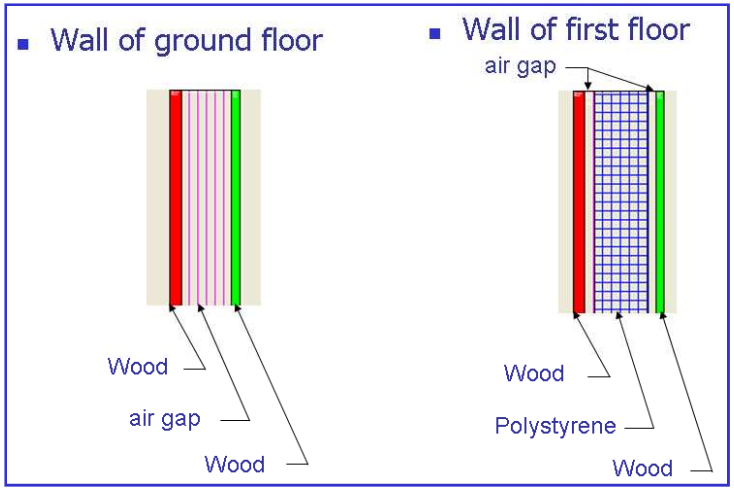
- Low-rise, no concrete color
- Encourrage people to enjoy natural ambience of the sea as much as possible
- Minimize cooling space
- Well thermal insulation
- Heat recovery

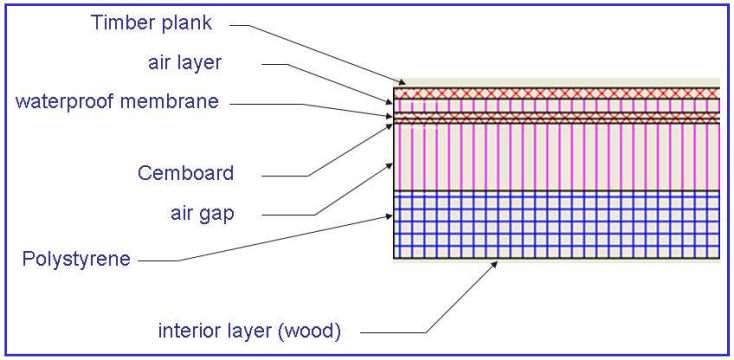
CASE STUDY: Advantages

- Policy of investor: **Environment friendly**
- The beach faces to South-East
  - Main façade, small areas face to the sea (South-East)
  - Auxiliary utilities, non-air conditioned, faces to South West (of villas)
  - Shaded by mountains (in the South-West to North West)

Solutions: Envelop Insulation

- South-Est Façade: **Good shading by extended roof**
  - Visitors can enjoy the sunshine
  - Protect from high solar radiation
- Light construction material, low thermal inertia
- Wall
  - Ground floor: shaded by trees
  - First floor: Better insulated walls
- Roof
  - Receive solar radiation during day time
  - Good insulation





☞ 6% reduction in energy consumption as compared with the normal design (metal roof having well insulated; light precast concrete)

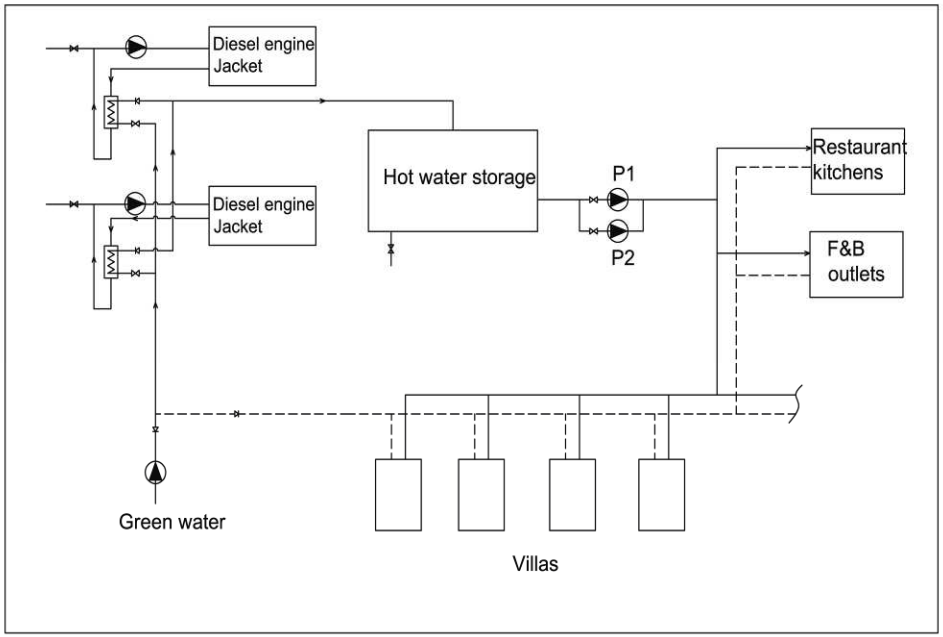
CASE STUDY: Solutions - Minimize cooling space

- Air conditioned areas: only bed room and dining room
- All auxiliary areas are not air conditioned
- Living room benefit from natural ventilation from the sea: a “speciality” of the beach

- Energy consumption reduction due to the lowering of space cooling (whole resort): 35 thousand kWh/year (Equivalent to more than 11,5 thousand liter of D.O/year)
- Only 57% of indoor areas are air conditioned

Solutions – Heat recovery

- Heat recovery fron Diesel power generation unit for hot water supply.
  - Supply capacity: 35 m^3/day
  - Demand: 14m^3/day



- 27 to 84 thousand liter of D.O per year (Depending on room occupany)

  (Fuel for D.O. transtporting from the grand continent to the island is not included)

THE RESORT IS BEING UNDER CONSTRUCTION

Thank You!