



Energy Efficiency Guidelines for Office Buildings in Tropical Climate

Case Study – ENERPOS building

La Réunion (France)



Organization of
American States

- Location and Climate

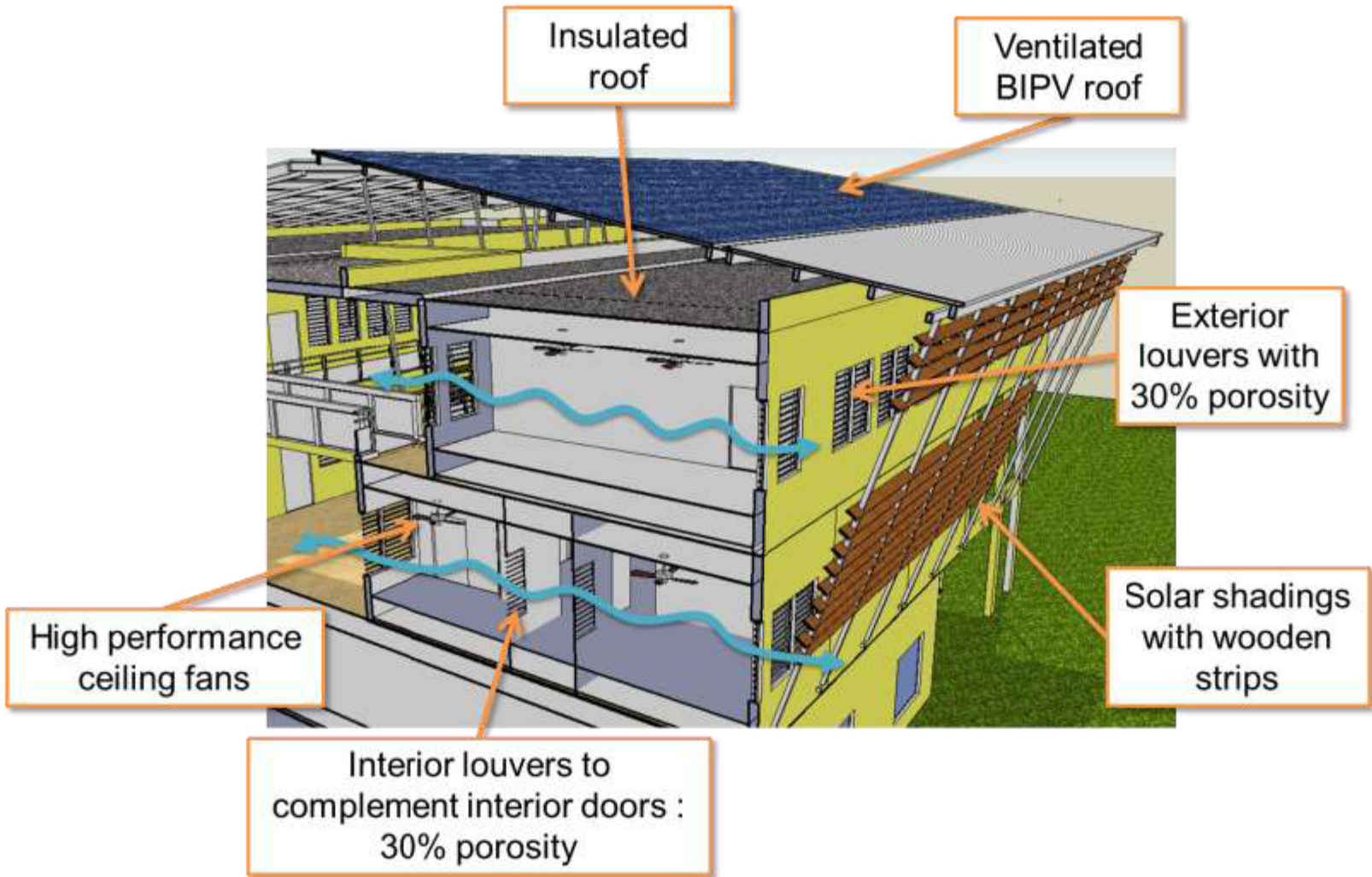


ENERPOS – University of La Réunion

- Funded by
 - IEA SHC Task 40 – ECBSC - Towards Net Zero Energy Solar Buildings
 - French Agency for Environment and Demand Side Management (ADEME)



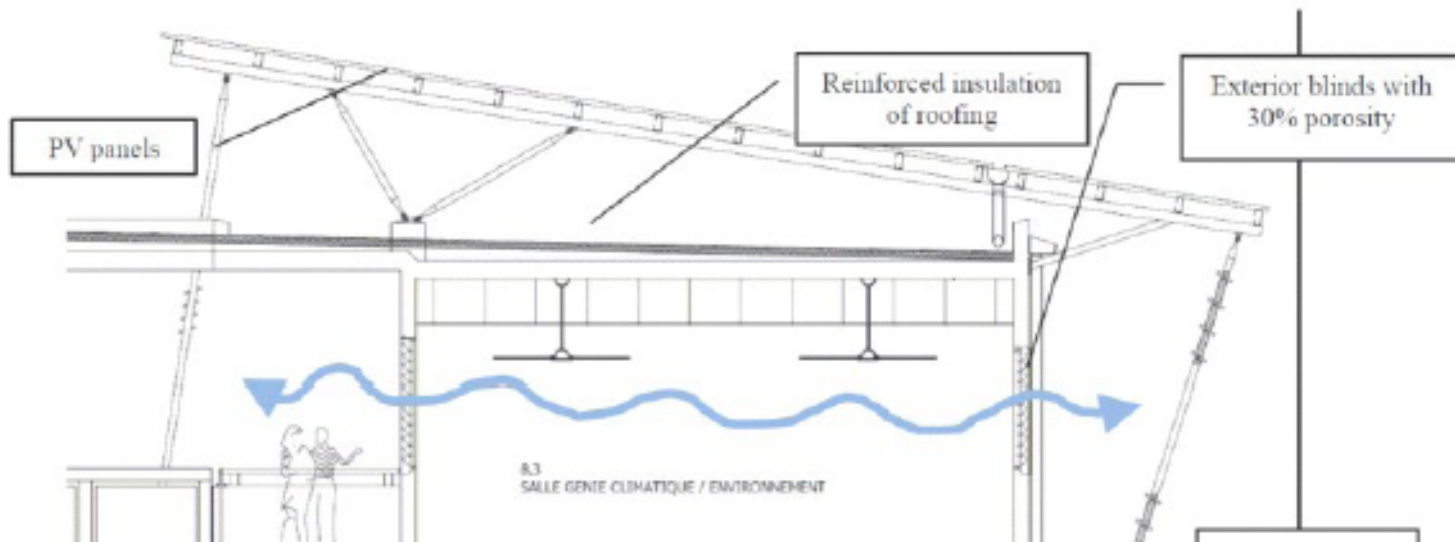
- Classroom and office building
- 1425 m² (gross) – 681 m² (net) floor area



- Passive Design
 - Envelope: walls and windows
 - Solar shading
 - Natural ventilation: indoor louvers
- Energy Efficiency
 - Lighting: low energy fluorescent + LED desk lamps + timers
 - Ceiling fans
 - Other: Vegetation / Chairs ventilated back
 - Building management system:
 - Energy and power meters
 - Temperature and humidity
 - Presence sensors
- Energy Performance:
 - Reference: 140 kWh/m²
 - ENERPOS: 14 kWh/m²

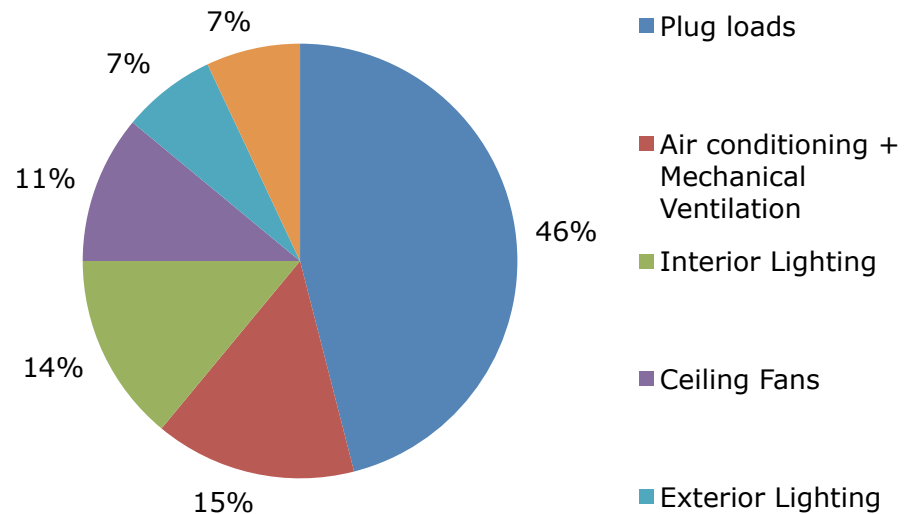
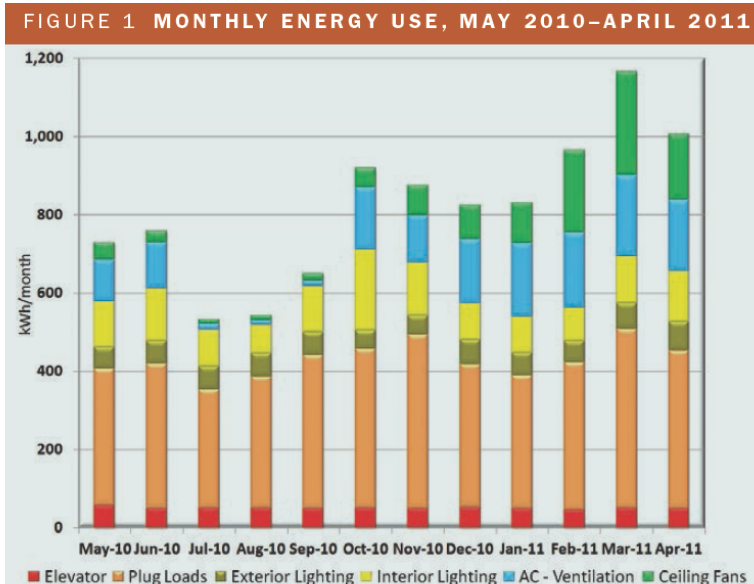


- Roof



- Energy results

- Annual electricity from grid: 14.1 kWh/m²
- Annual on-site renewable energy (PV) exported: 104.4 kWh/m²
 - Balance: - 90 kWh/m² (net exporter)
- PV not in budget – agreement with manufacturer



- Other lessons learned:
 - Elevator energy: highly dependant on lighting – constantly turned on -> standby control: 120 kWh/month to 55 kWh/month
 - From 13% to 7% of energy
 - Using ceiling fans instead of air conditioning reduces energy consumption by a factor of 20
 - Interior lighting:
 - Daylighting optimized
 - Artificial lighting: efficient and optimally controlled

Thank you

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 - Refs: High Performing Buildings magazine (<http://www.hpbmagazine.org/>)
 - http://www.hpbmagazine.org/File%20Library/Case%20Studies/Summer%202012/042-057_ENERPOS.pdf
 - <http://archive.iea-shc.org/task40/objectives.htm>