



Refurbishment of an administrative building

Solar cooling at the Red Sea

Egypt, Sharm el Sheikh

Floor space: 567 m²

South Sinai Governorate Project:
Administrative building with training facilities and accommodation for students

Partners: Egyptian Solar Energy Society (ESES), Egyptian Energy and Environmental Society (EES), Egyptian Environmental Affairs Agency (EEAA)

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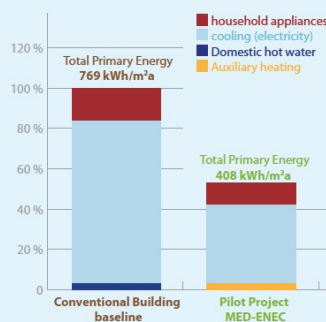
BASIC MEASURES WITH HIGH / MODERATE COST EFFICIENCY

- special Daikin thermal insulation with reflective coating on the roof
- 24 sealed windows to prevent air leakage
- 20 additional shading devices
- 60 energy efficient light bulbs
- Occupancy sensor for lighting control in two corridors

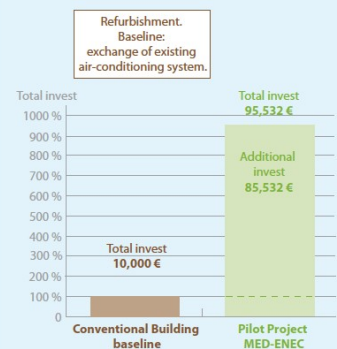
DEMONSTRATION MEASURE: SOLAR COOLING SYSTEM

- 3 lithium-bromide Rotartica absorption chillers with total refrigeration capacity of 24 kW
- 82m² evacuated tube collectors to supply 85°C hot water to the chiller

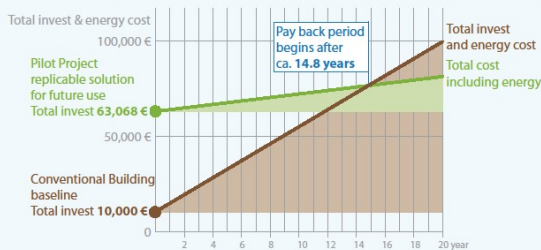
ENERGY CONSUMPTION



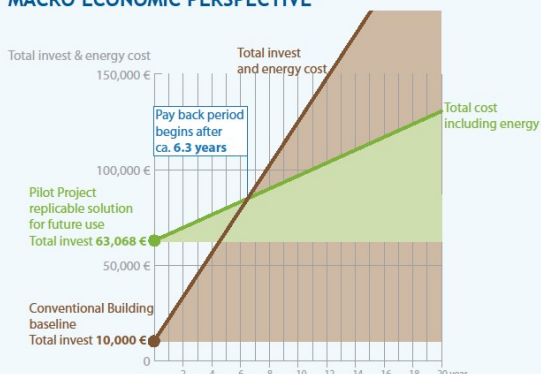
TOTAL INVEST



PILOT PROJECT FOR LARGE DISSEMINATION („REPLICABLE VERSION“)



PILOT PROJECT FOR LARGE DISSEMINATION („REPLICABLE VERSION“) MACRO ECONOMIC PERSPECTIVE



Conclusions:

- (1) The energy consumption of the existing building is reduced by almost 47% through the implemented refurbishment measures, mainly due to the solar cooling and passive measures.
- (2) However, cost-efficiency of the realized pilot project is moderate (30 years) due to high learning cost and difficult access to products and know-how:
 - the roof insulation paint had to be transported from Japan by airplane to meet the timing schedule
 - cutting-edge technologies such as absorption chillers and tube collectors for solar cooling were imported from Europe and China to Egypt for the first time as one off products.
- (3) Taking into consideration a large scale dissemination of the applied measures and thus benefiting from learning and scale effects, the „replicable solution“ becomes an attractive investment as shown in the chart on the left side.
- (4) When realizing this „replicable solution“, significant additional benefits for the country in form of reduced energy subsidies arise. Considering these benefits, the State may have an interest in subsidizing this type of building, reducing thus the pay-back as shown in the graph on the left.