

1st INTERIM REPORT

The Aqaba Residence Energy Efficiency Project (AREE)/ JORDAN



**IN THE FRAMEWORK OF THE
MED-ENEC PROJECT**

**– ENERGY EFFICIENCY IN THE CONSTRUCTION SECTOR
IN THE MEDITERRANEAN –**

Date: 27 July 2007

**Consortium Partners:
Center for the Study of the Built Environment (CSBE)
Emtairah Consulting Corp (ECC)**

I THE PILOT PROJECT

PROJECT INFORMATION

Reference number	JO 01
Country	Jordan
Location/City	Aqaba City, Aqaba Special Economic Zone
Address	9 th District, Plot No 176
Building Type	Residential
Number of Buildings	1
Total Floor Space	420 m ²

CONSORTIUM

Partner number	1
Partner name	Center for the Study of the Built Environment (CSBE)
Role in the Project	Lead partner
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Country	Jordan
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Partner number	2
Partner name	Emtairah Consulting Corp
Role in the Project	Investor / Developer
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II SUMMARY OF THE PROJECT

ABSTRACT

The Aqaba Residence Energy Efficiency (AREE) is a model building for the 9th District in the City of Aqaba, Jordan. The purpose is to show energy efficient design and construction in a dry hot climate, where summer temperatures rise above 40°C and to inspire adoption of best practices in residential buildings for the future. The design approach is to demonstrate the potential of reducing electricity demand for cooling through: 1. design & behavioral elements, 2. building materials, and 3. renewable energy technology. The building should not radically depart from conventional practices to allow for adoption by the future home owners in the region.

THE PILOT PROJECT

Aqaba Residence (AREE) is an energy efficient building designed for hot dry climate. AREE is located in the 9th district of Aqaba city of Jordan. The building, 420 m² in size, is designed for residential purpose with the option of use as guest researcher loggings/study center.

THE ENERGY CONCEPT

The energy concept for AREE is based on an integrated approach incorporating measures for energy conservation, rational use of energy and application of renewable energies. The focus is mainly on reducing electricity usage for cooling. Water conservation measures have also been incorporated into the building concept.

Measures to reduce energy consumption include design & material elements for passive cooling such as compact mass, orientation, shading, evaporation cooling, thermal wall for heat accumulation and sun gain in winter, use of landscaping and plants for shading, improved insulation for roof and walls, and improved construction detailing. Additionally, energy efficient lighting and appliances will be considered based on best available options in the Jordan market. For the remaining cooling/heating needs of AREE, a solar cooling system will be installed using an adsorption chiller technology developed by local entrepreneur.

BENEFITS OF THE PILOT PROJECT

The building will reduce the total net energy demand down to less than 30% of the energy demand of a standard single family home newly built in Jordan. End energy demand is estimated to be at around 21 KWh/m²-a as compared with Aqaba standard of 137 Kwh/m²-a. This translates into energy cost savings of about 5000 Euro annually for a building of the same size. The additional costs to standard buildings is approximately 35 000 Euro and the pay back is expected to be around 7 years, not taking into consideration potential dramatic increases in electricity prices forecasted for Jordan.

STATUS OF THE PILOT PROJECT

The building currently is under construction with 50 % completion.

- **Construction & Installations:** Construction of the skeleton started in Jan. 2007. Skeleton completion is achieved in July 2007. Work on interior started and is proceeding according to plans. Expectations for completion of building is as scheduled for end of Dec. 2007. Contract with the supplier of the solar cooling system was signed on March 07.
- **Monitoring Strategy:** monitoring concept development started March 2007, revised in consultation with STE, Peter Holzer in June 2007. Consultation is underway with Royal Scientific Society (RSS) of Jordan for implementation of monitoring strategy. Installations for monitoring purposes will start in November 2007, and monitoring will commence on Jan 2008.
- **Dissemination Strategy:** The dissemination plan is developed and submitted for review with this report. However activities have already started with the installation of the project sign on site in March 2007, a published article about the project in April 2007, and the production of the project brochure: two editions project in December 2006 and May 2007.