



SAUDI – JAPANESE COOPÉRATION IN UTILIZING RENEWABLE ENERGY RESEOURCES

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K.S.A. OBJECTIVES OF RENEWABLE RESOURCES UTILIZATION AND ENERGY CONSERVATION

- ✓ Sensible contribution in fulfilling electricity demand .
- ✓ Securing an energy access for the remote villages and settlements far away from the electricity grid .
- ✓ Saving fossil fuel for more economic attractiveness industries (petrochemical).
- ✓ Save Saudi environment from pollution.



FIRST LARG PV PLANT IN K.S.A

- ✓ The solar potential of Saudi Arabia is one of the highest worldwide, due to very low cloud coverage, vertical sun radiation providing more energy per horizontal surface unit, and a very dry atmosphere.
- ✓ This maximizes viability of integrating solar power into Saudi's energy mix.



K.S.A Power Sector Challenges

Technical

- ⦿ High growth and low reserve margin
- ⦿ Large difference in demand between summer & winter
- ⦿ Need for skilled EC managers, engineers and technicians
- ⦿ Absence of incentives to change to high efficiency equipment
- ⦿ Absence of a central institution to develop, adopt and implement a national energy efficiency plan

Financial

- ⦿ Low tariffs
- ⦿ Large capital needed to meet system expansion

Social

- ⦿ Lack of awareness about energy efficiency



JAPANESE EXPERIENSE IN LARGE PV PLANT PROJECTS

- ✓ Japanese companies made a great breakthrough in advanced manufacturing solar cell technologies which enabled building a demonstrative project on grid – interconnected large PV plant.
- ✓ In December 2009, MOWE signed a Memorandum Of Understanding (MOU) with Japanese consortium to assess the viability of constructing the first large PV plant in different sites across Saudi Arabia.



PRILIMENARY INVESTIGATION RESULTS

- ✓ Two alternatives have been proposed :
 - 20 MW PV For daytime working only .
 - 20 MW PV + 6MW storage battery for day and night working .
- ✓ The project cost is :104 M.US\$ and 126 M.US\$.
- ✓ The generated electricity is (32,740) MWH/YEAR with 25 years project life time.
- ✓ The roughly estimated electricity tariff is US\$ 0.38/KWh and US\$ 0.45/KWh (respectively).



FESIBILITY STUDY OBJECTIVES

- ✓ Assess impacts of Saudi Arabian climate conditions on the PV plant project.
- ✓ Optimize risk management and structure of the PV operating organization.
- ✓ Study of necessary security and government subsidy and legislative support for PV plant operation .
- ✓ Realize the terms and conditions for the (PV – IPP) in Saudi Arabia .
- ✓ Proposal for the investment security rules and government assistance for this project.



UP-TO- DATE ACTIVITIES OF SAUDI- JAPANESE TEAM WORK

- ✓ Selecting a prospective site for installing the small verification plant (2 k.w) in Riyadh Metropolitan area.
- ✓ Base line survey and data collection and analysis including : policy ,regulatory and development matters , meteorological data about solar radiation and sand storms, environmental protection standards , grid codes and construction costs .



Master Plan study for Energy Conservation in Saudi Arabia





Phase 1 – Master Plan Study: Activities

- Visited 100 governmental, industrial, residential and commercial agencies
- Met with officials from 50 ministries and electricity sector agencies
- Surveyed 120 residential and 48 commercial sector customers
- Conducted 25 workshops
- (7) measurements
- Dispatched 18 Saudi experts to Japan



● Phase 2: Master Plan Execution Activities:

- Energy Management System
- Energy Efficiency Levels and Standards
- Time of Use Tariff
- Energy Managers Training
- Energy Audit Service
- Publication Award System
- Load Management (Residential Sector)



CONCLUSIONS AND RECOMMENDATIONS

- ✓ Saudi – Japanese cooperative effort pays great attention to promote utilization of renewable energy resources.
- ✓ Saudi – Japanese have been contributed to Energy Conservation program.



**Thank you
for Attention**

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