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THE SYNERGY OF SCIENCE, FINANCE, & SUSTAINABILITY

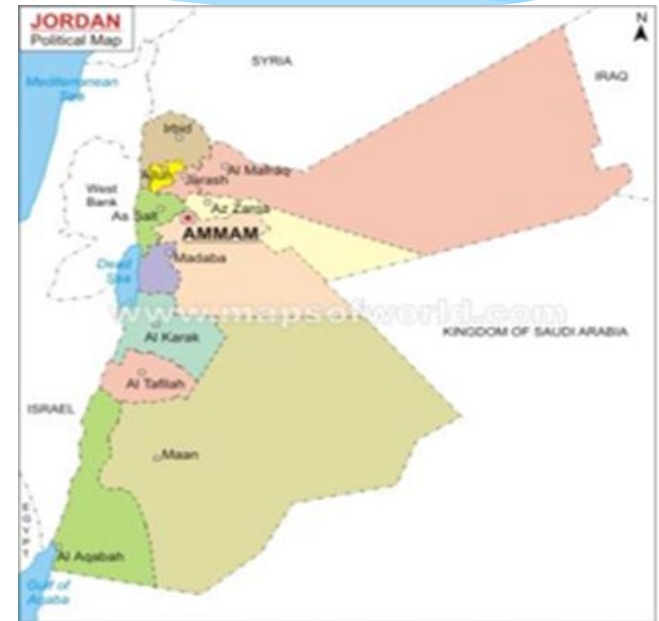
"Energy for Improving Rural Livelihoods - Mainstreaming Appropriate Renewable Technologies Initiatives in Rural Areas of the Arab Region".

21-23 September, 2016 - Beirut, Lebanon

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Facts About Jordan

- * Total Area 89km²
- * Population around 7.6million (+2 million refugees and FW)
- * Rural Population represents 16%
- * GDP around 37.5 USD billion
- * GDP per capita 4,940USD
- * Access to electricity 95%
- * Energy imports 96.5%
- * Fossil fuel represents 97.6% of the total consumption
- * Jordan spent around 14% of its GDP on energy importing

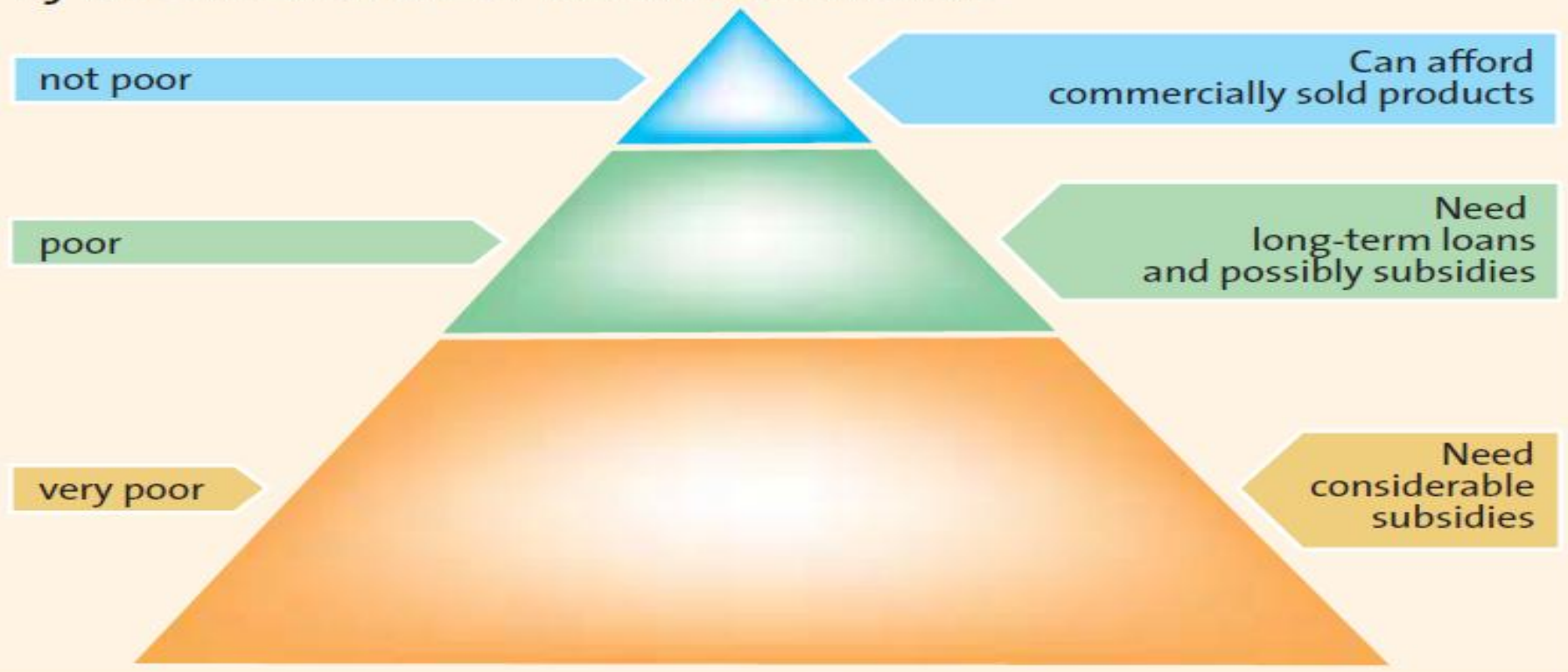


Why Govs Promote for RE In Rural Areas?

- * Should not be its relatively minor contribution towards global climate protection; but rather its contribution to local development and the fight against poverty
- * Increase productivity and improve quality of life, and in which RE technologies are combined with income-raising activities.
- * Overcoming the energy supply gap
- * **In this way, the problem of how to finance RE technologies can also be overcome in the long term???**

Ex. for Financing Mechanism

Financing solutions for photovoltaic systems by income levels of rural households



Current Challenges in Jordan's Rural Areas

*Socio-economic

- Large share of informal economy
- Underdeveloped credit mechanisms to business and households
- Unemployment affects an important share of workforce, especially youth
- Public education system little efficient
- Poverty and inequalities affect a large part of households

Current Challenges in Jordan's Rural Areas

* Energy Sector

- Limited awareness and information on energy and RE technologies
- Lack of qualified HR
- Lack of policy coherence for energy and other related policies
- Subsidized conventional energy sources
- Cost of environmental externalities of fossil fuels is not integrated in energy costs
- Lack of incentives
- Increasing demand due to population and economic activities growth

RE Uses in Jordan

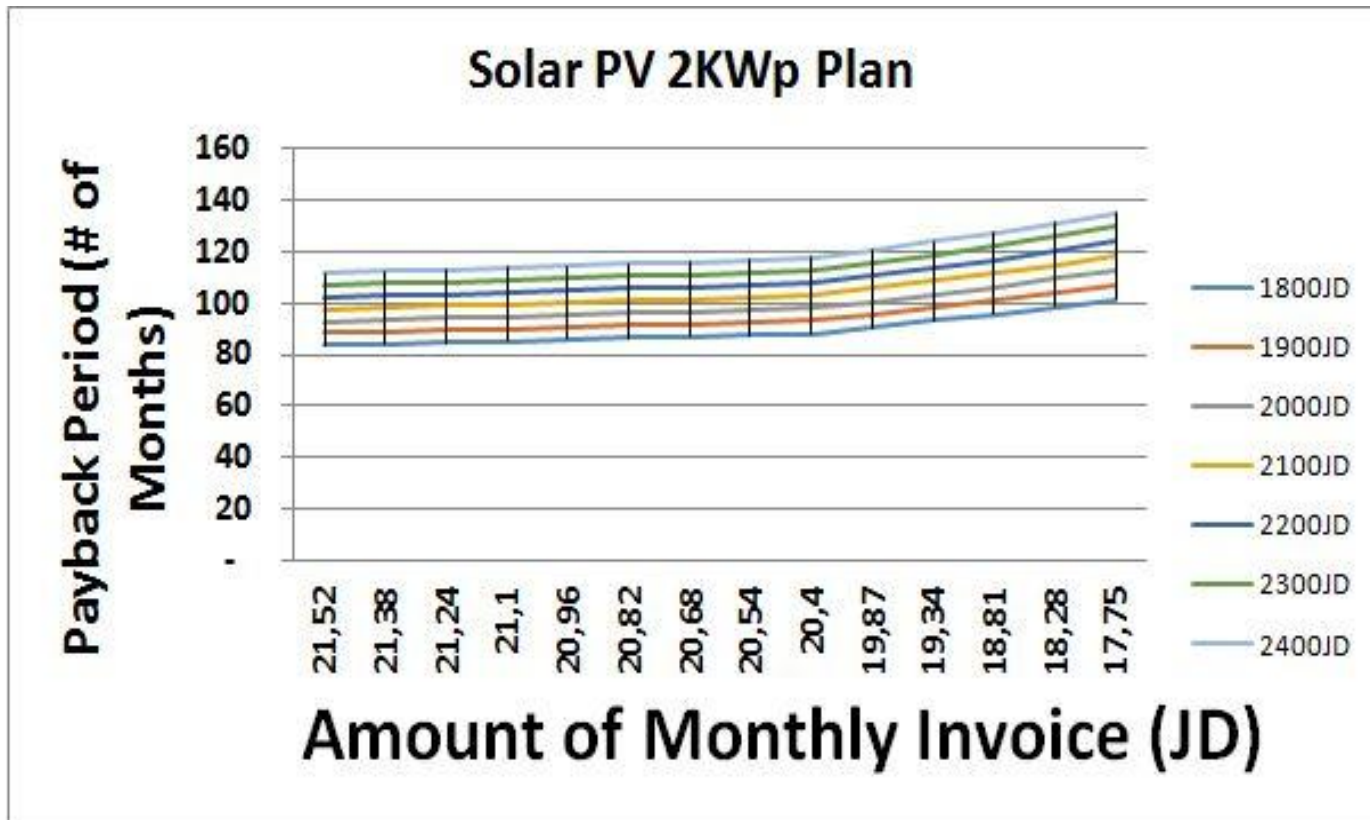
- * **RE share is only 1%** (16.5MW - 60.4% were hydropower, 21.1% biomass, 9.7% PV and 8.8% wind)
- * **Wind Energy**
 - Jordan has a number of regions that enjoy wind speeds suitable for generating electricity (North and South).
 - Three wind farms have been installed:
 - ✓ Ibrahimyya, Hofa – Irbid, with capacity of 320 kW
 - ✓ Ibrahimyya, Hofa – Irbid, with capacity of 1.2 MW
 - ✓ Tafeila wind farm - with capacity of 117MW
 - ✓ Wind park in Maan, with capacity of 66MW

RE Uses in Jordan

* Solar Energy

- Direct solar radiation with 5 to 7 kWh/m², which implies a potential of at least 1000 GWh per year annually
- >400 registered installation companies exist in Jordan, only around 10 companies are actively doing business in the field for on-grid markets.
- In late April 2014, around 3 to 4 MW of PV systems had been installed on a decentralized level.
- Around 5 MW under construction, all connected to the distribution grid under the net-metering scheme.
- One totaling 2 MW, financed by Spain in the Azraq area, and another totaling 65 – 75 MWp in Quweirah (Aqaba)
- Maan Solar Power Farm, totaling 24 MW (under construction)
- MEMR is currently processing the tender applications for a new net metering program concerning the installation of 400 household solar PV systems in rural areas. Each system will range from 1 to 4 KW, depending on the households' energy needs.
- The ministry, via the Mercy Corps' management, will give loans to small consumers in the rural areas affected by crises (each with a monthly electricity consumption of less than 600 KWh) in rural communities, who will then be paying for their PV system instead of their electricity bill.

Cost Recovery



RE Uses in Jordan

* **Hydropower**

- Jordan has no notable bodies of flowing water suitable for the construction of hydroelectric power stations
- King Talal dam on the Azarqa River, with a capacity of 5 MW
- Aqaba thermal power station in Aqaba as it flows back to the sea.
- In 2012, these two stations together generated 61 GWh of electricity and were therefore the source of 0.4% of the electricity generated in the country as a whole.

RE Uses in Jordan

* **Biogas**

- Jordan Biogas Company (a joint stock company that is owned by the Central Electricity Generation Company (CEGCO) and the Greater Amman Municipality (GAM)). It generates some 5 GWh of electricity annually through the gases that arise at the MSW landfill.

* **Biomass**

- Small scale- the burning of vegetable biomass serves to a limited extent in rural regions for cooking and heating and is the main source of energy of the Bedouin in the desert

* **Geothermal Energy**

- Geothermal resources in Jordan have been identified mainly in two regions (Ma'een –Madaba and the eastern banks of the Jordan Valley) offer comparatively low temperatures below 100°C. This means they cannot be used to generate electricity and will continue to be used for thermal purposes only, such as for heating swimming pools and greenhouses.



Thank you