Recent Activities of Solar Energy in Saudi Arabia

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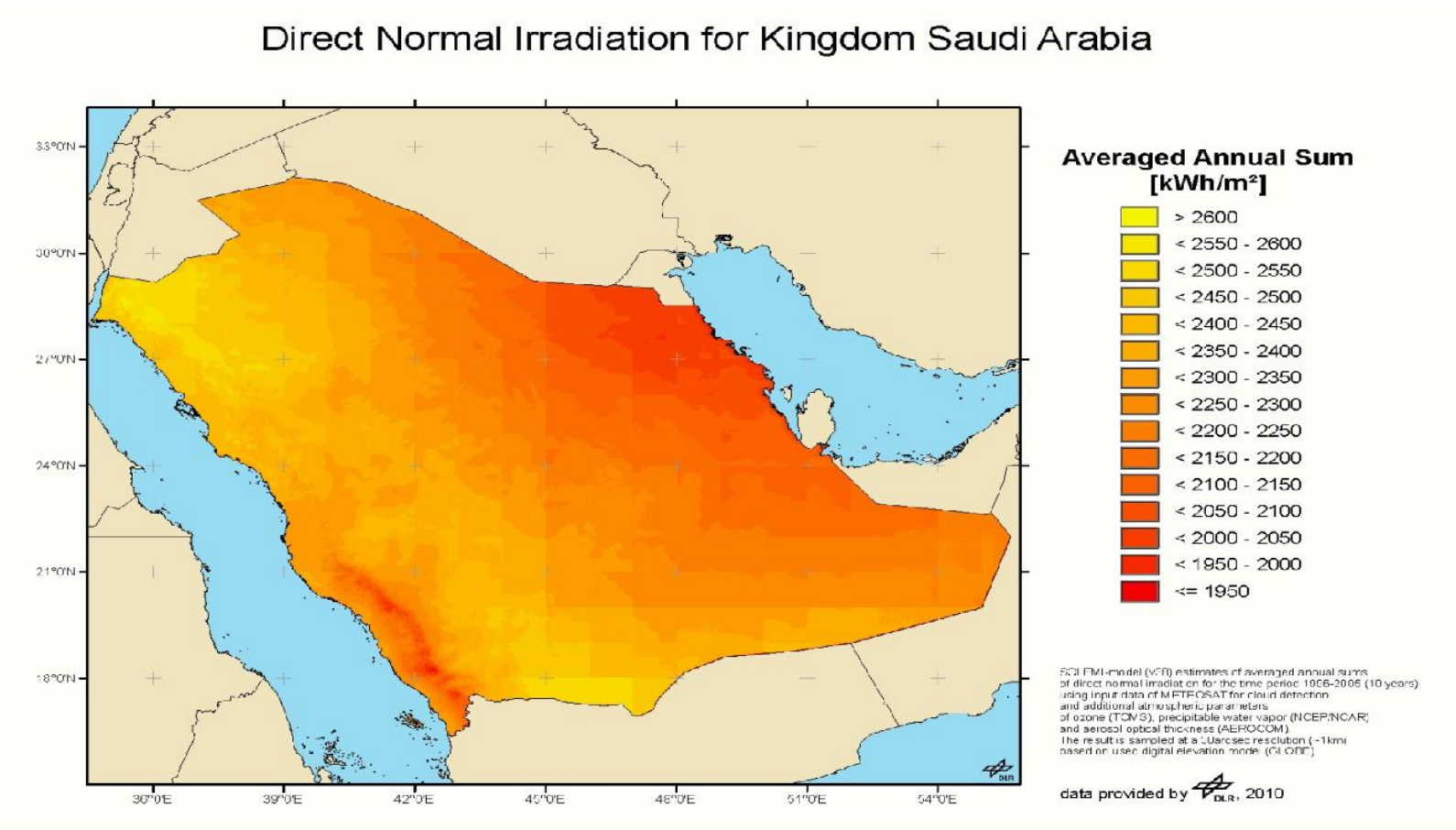
ESCWA Workshop on «Scaling up the use of Renewable Energy in rural areas in ESCWA Member Countries»

1-2 February 2012, Beirut- Lebanon

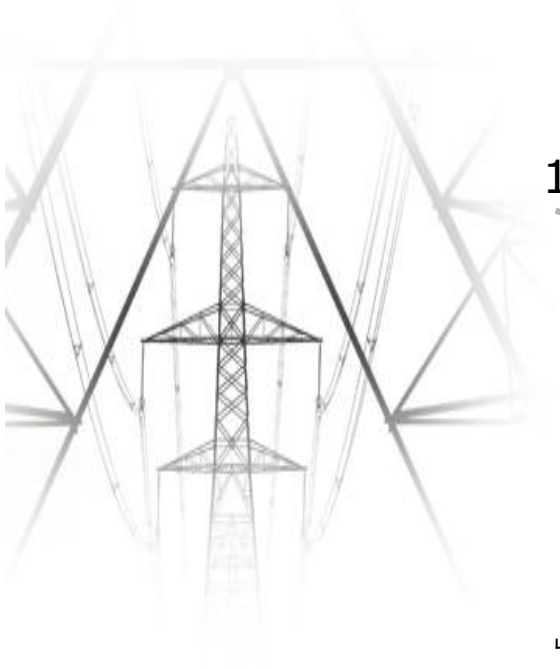
ESCWA

King Saud University 1957

DNI map of Saudi Arabia

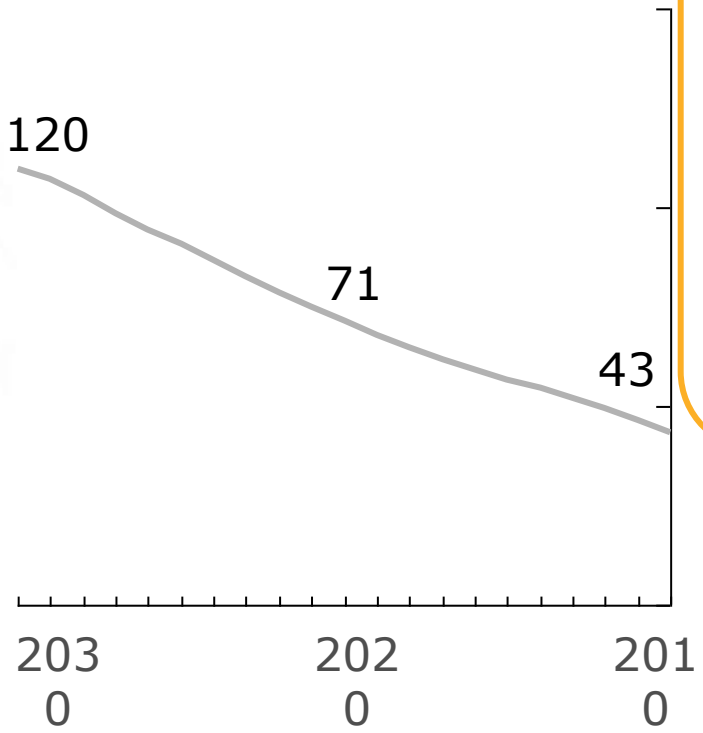


Projected Growth in Domestic Power Demand



Electricity peak demand *

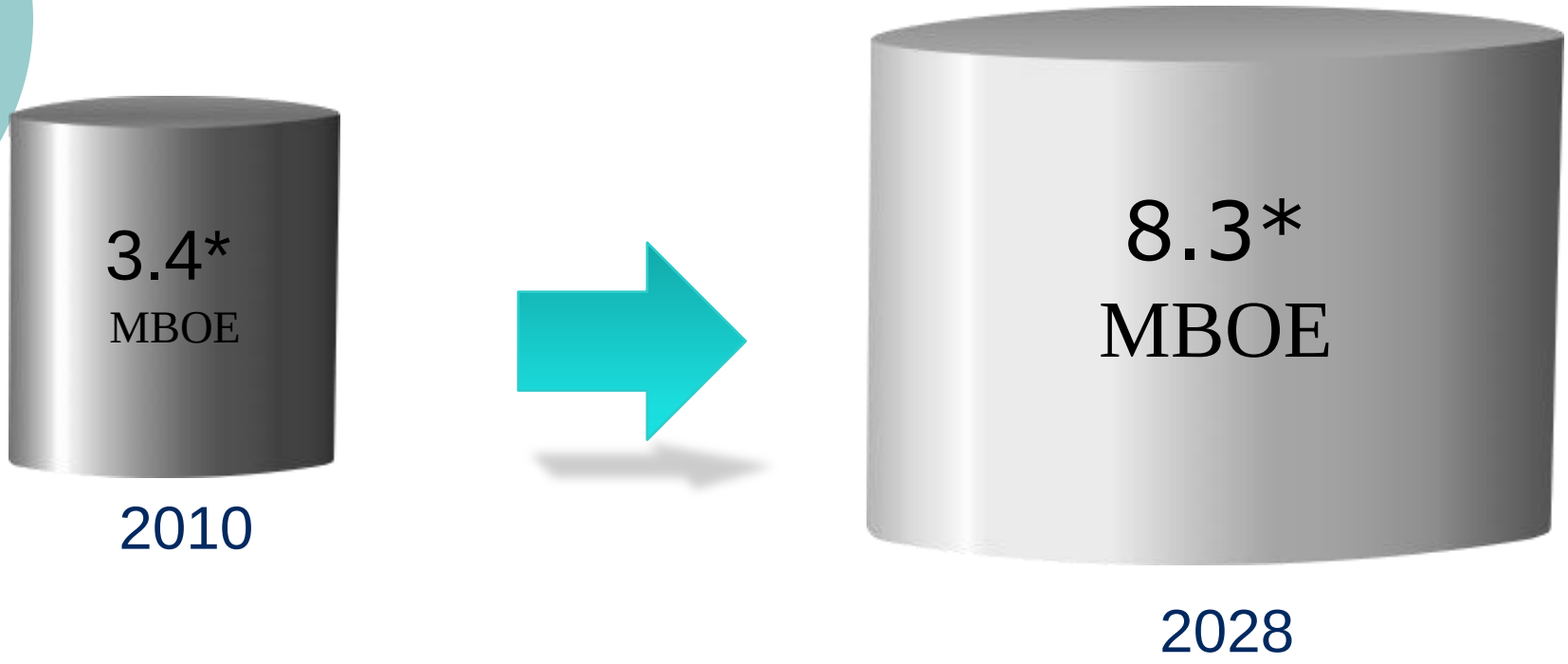
GW



At current pace, domestic demand for power is expected to nearly triple by 2030

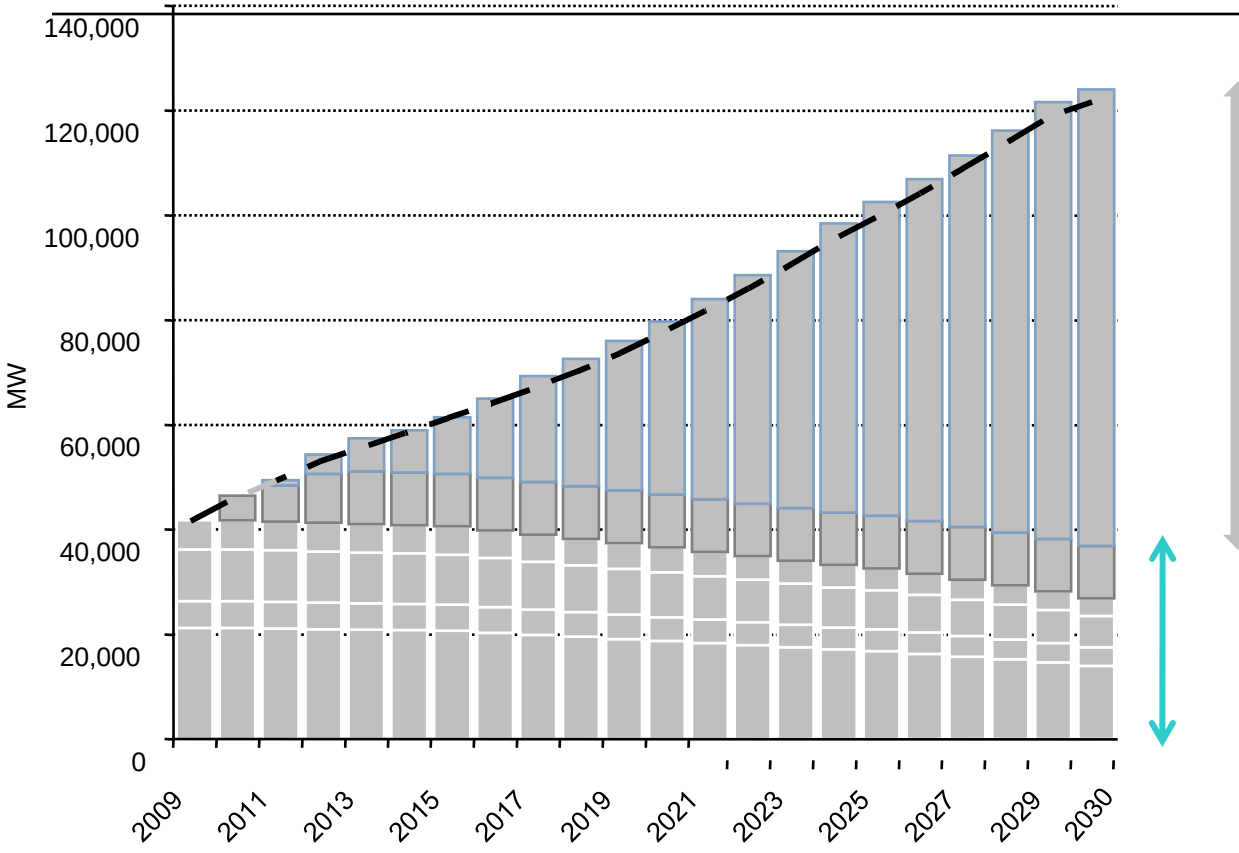
* Source : ECRA

Projected Demand for Petroleum Products In The Next Two Decades



* Source : Saudi Aramco

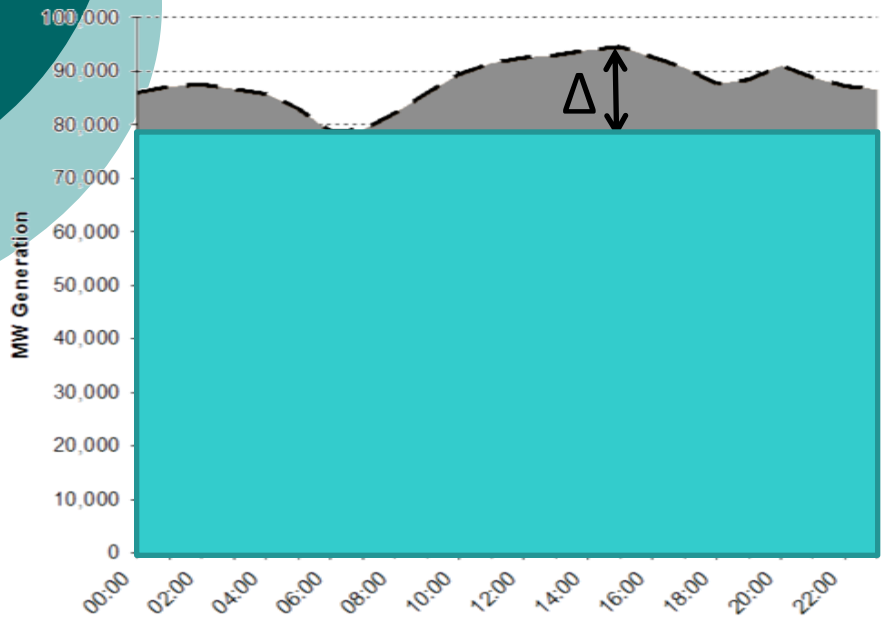
Projected Required Installed Capacity



The Gap By 2030 = Fossil Fuel Needed For BAU Scenario

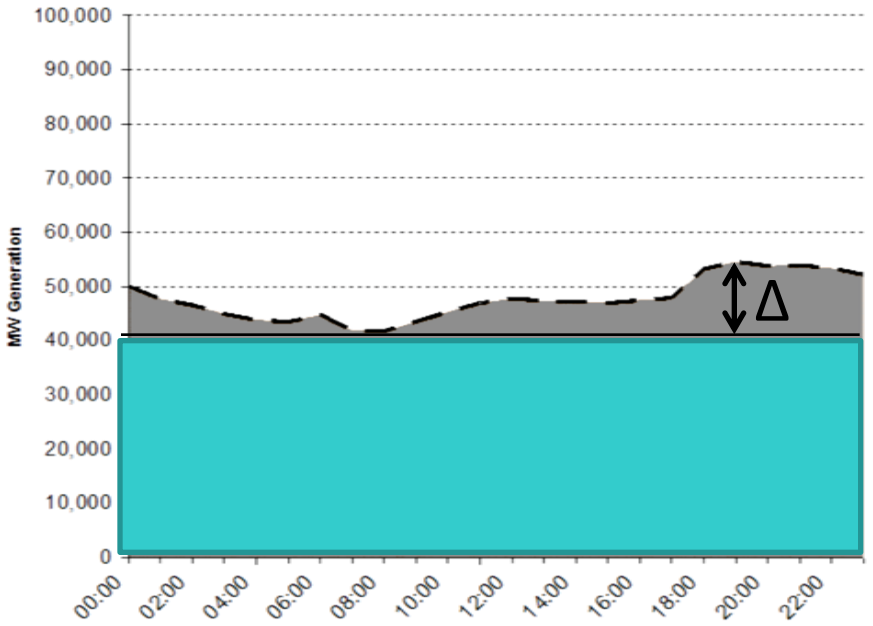
Today's Fuel Mix Extended to 2030

Forecasted daily electricity demand pattern in Saudi Arabia By 2030



Average Daily load in

August 2030



Average Daily load in

January 2030

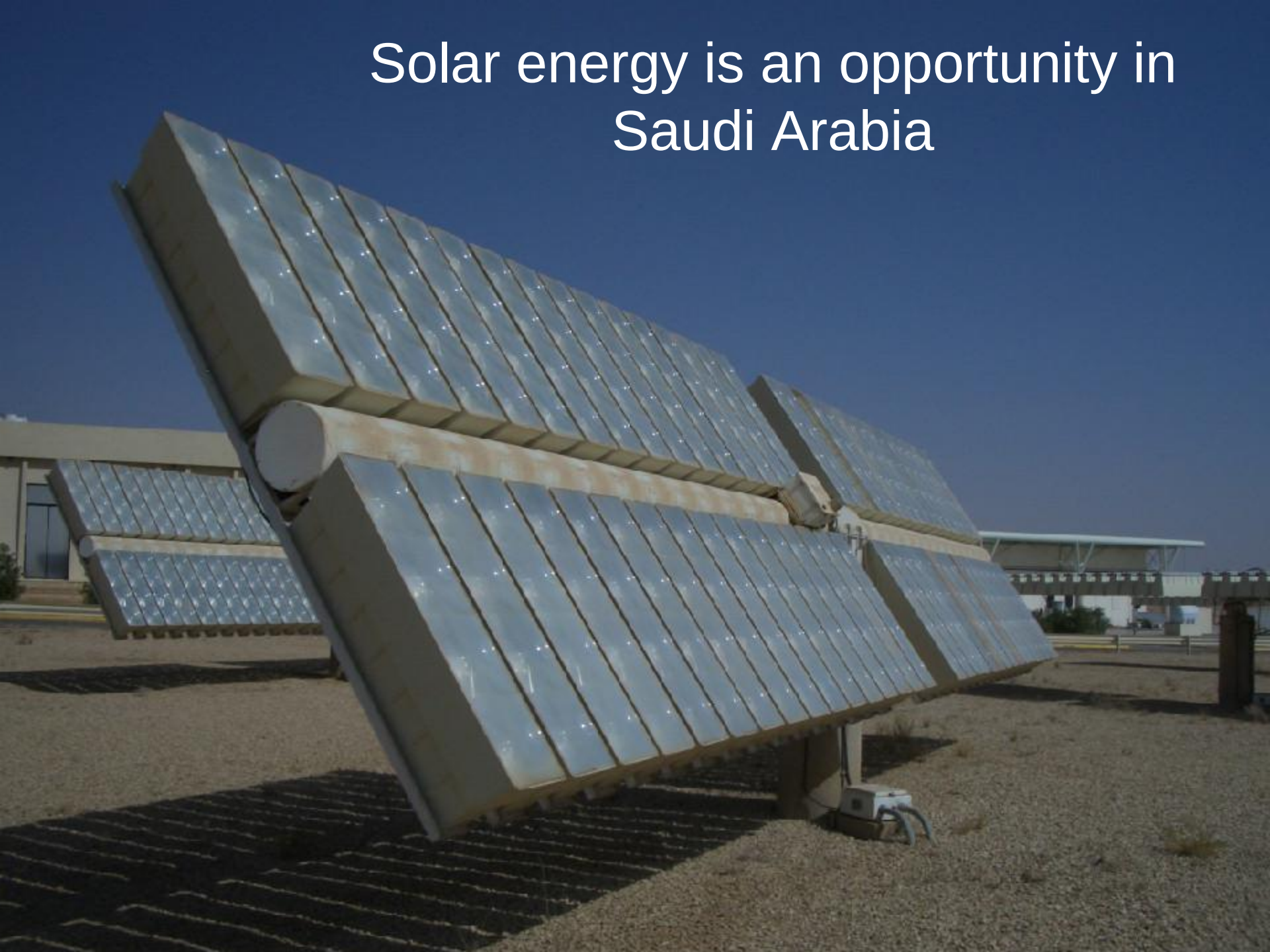
Solar Energy: A solution for many concerns in Saudi Arabia

Economic concerns	Solutions provided by solar energy
• Unemployment (>10%), necessity for Saudization	• Solar manufacturing creates large number of diversely qualified jobs along the value chain, esp. compared with conventional energy sources.
• Limited number of high-tech jobs	• Solar R&D contributes to building globally competitive intellectual capital in KSA
• Dependence on oil (~1/3 of GDP), chemical and petrochemical sectors	• Solar energy helps diversify national economy and generate additional income • Presence of chemical and related industries aides development of solar industry
• Potential for improvement in productivity, export performance (only 10% are non-mineral products), competitiveness	• Solar manufacturing offers potential to export high value-added investment goods • Solar energy allows more profitable and efficient oil use (e.g. for high-growth industries) • Domestic solar energy generation opens path for export of electricity (e.g. Desertec)

Main pillars to introduce solar energy in Saudi Arabia

Supply	Technology	Demand
Domestic solar manufacturing	Domestic solar R&D	Domestic solar market

Solar energy is an opportunity in Saudi Arabia



King Abdullah City for Atomic and Renewable Energy (KA-CARE)

مدينة الملك عبد الله للطاقة الذرية والمتجددة
K•A•CARE

The City shall aim at contribute to the **sustainable development** in the Kingdom through utilization of **science, research, and industries**

The driving force:

- Making atomic and renewable energy an integral part of a national **sustainable energy mix**
- Creating and leveraging the competitive advantages of relevant technologies for **the social and economic development** of the Kingdom of Saudi Arabia

Mandate

Policies & Strategies

- ✓ National Atomic & Renewable Energy Policy
- ✓ National strategy & Implementation Plan

Regulatory

- ✓ National atomic Regulatory Authority

R & D & T

- ✓ National laboratories
- ✓ Joint & Collaborative Initiatives
- ✓ Overseeing & Fostering National R&D Activities

Human Capacity

- ✓ National Programs
- ✓ Educational & Training Institutions
- ✓ Scholarships

Mandate

Execution

- ✓ support execution of nuclear and renewable projects

Investment & Business

- ✓ Investment Initiatives
- ✓ Empowerment of Private Sector
- ✓ Technology Development in Power , Desalination, Manufacturing,…

International Relations

- ✓ National Competent Authority
- ✓ International Conventions & Treaties

Facilities

- ✓ National Laboratories
- ✓ All Necessary facilities

Different research institutes, centers and universities

Aramco North Park - PV

- Largest of its size worldwide: 10 MW
- Number of PV panels: 121,250
- Number of parking spaces: 4,450
- Area: 200,000 square meters
- Technology: Thin Film CIS Photovoltaic

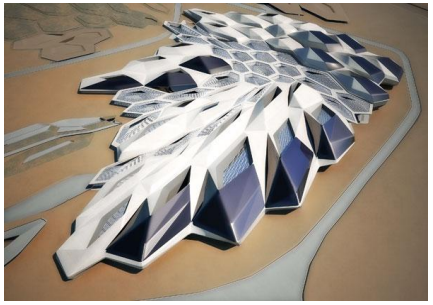
ارامكو السعودية
Saudi Aramco

King Abdullah Petroleum Study and Research Center (KAPSARC) – 3.5 MW

- EPC: Phoenix Solar
- Expected to be completed in September 2012
- KAPSARC is geared toward achieving

  LEED Platinum certification
- KAPSARC is planning to generate
  20% of its energy needs from solar energy

KAPSARC
مركز الملك عبدالله للدراسات والبحوث البترولية
King Abdullah Petroleum Studies and Research Center



PNU Solar district heating

- 17 MW_{th}, winter, 25MW_{th} peak, capacity.
- System is the largest globally with over 35,000 sqm collector area.

جامعة الأميرة نورة بنت عبد الرحمن
Princess Nora Bint Abdul Rahman University

KAUST – 2MW - PV

- 2MWp power generation facility, 3,281 MWh annually (simulated)
- First large scale grid-connected, roof top, solar power plant
- 9,300 modules 215 Wp modules over 11,600 m_2
- Saves 1,700 tonne of carbon emissions annually

Other projects …

1- Farasan island – 480 kW

- 180 W/m2
- CIS think film (Showa Shell + SEC + Aramco)
- Save transferring the equivalent of 28,000 barrels of diesel fuel

2- Rumah – Pilot – 30 kW

Polycrystalline, thin film, thin film(Hyblid), CIGS, HIT(hybrid) types of PV

3- Rural isolated locations (more than 40 Sites – under study)

200 – 500 KW Hybrid solution with DG-study phase

الشركة السعودية للكهرباء
Saudi Electricity Company
طاقة مثمرة

المملكة العربية السعودية
وزارة المياه والكهرباء
MINISTRY OF WATER & ELECTRICITY

Final remarks

- Solar energy is still at the early stages in Saudi Arabia
- Many challenges and promising solutions
- High feasible for rural cites and islands
- Other renewable energies in Saudi Arabia ?

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Thank you ....