



ESCWA

United Nations Economic and Social Commission for Western Asia

International Renewable Energy Jobs Conference

Socio- Economic Benefits of Renewable Energy Deployment in the Gulf Cooperation Council (GCC)

Abu Dhabi, January, 2014

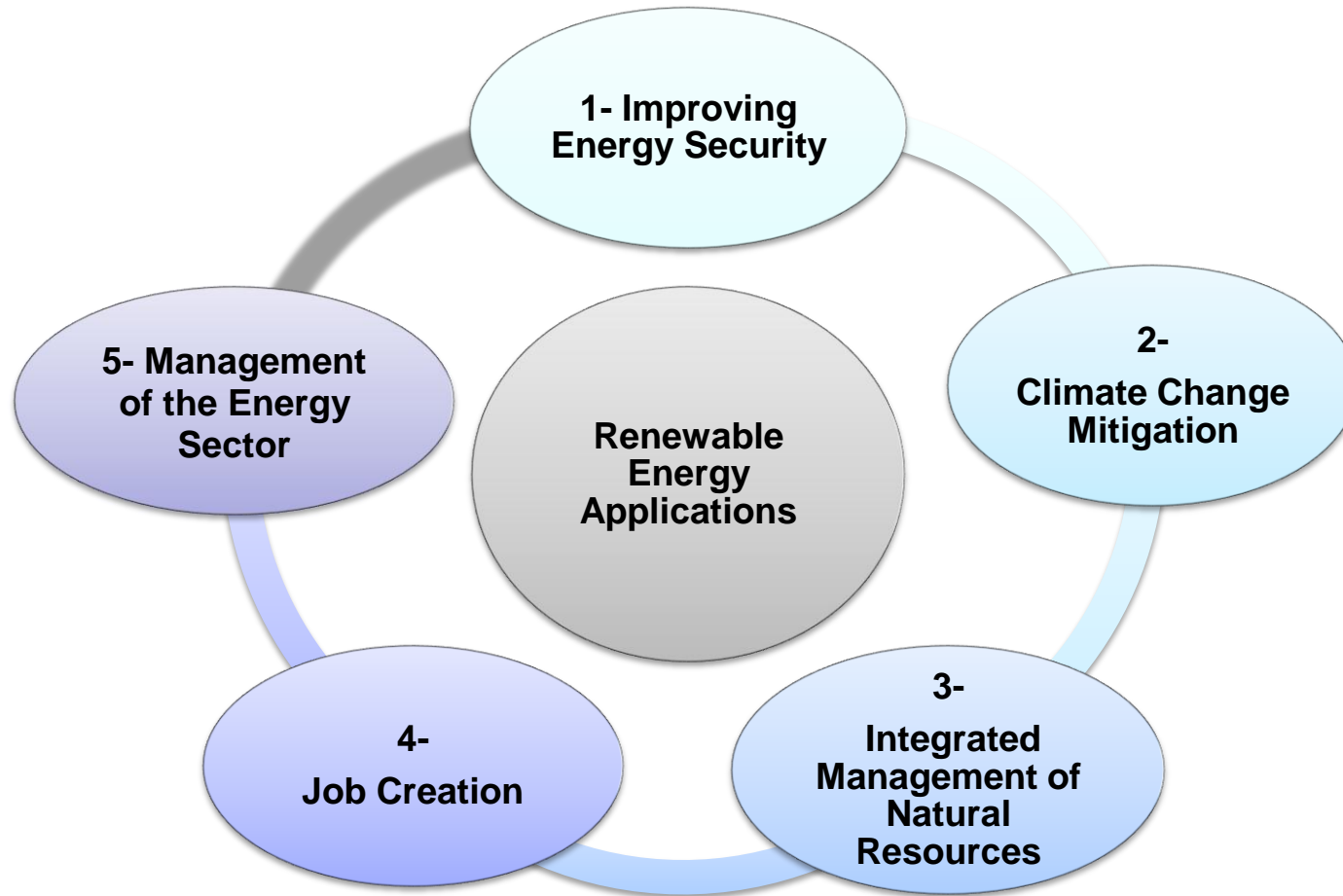
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Introduction



Socio Economic Benefits of RE Applications Deployment in the GCC countries.



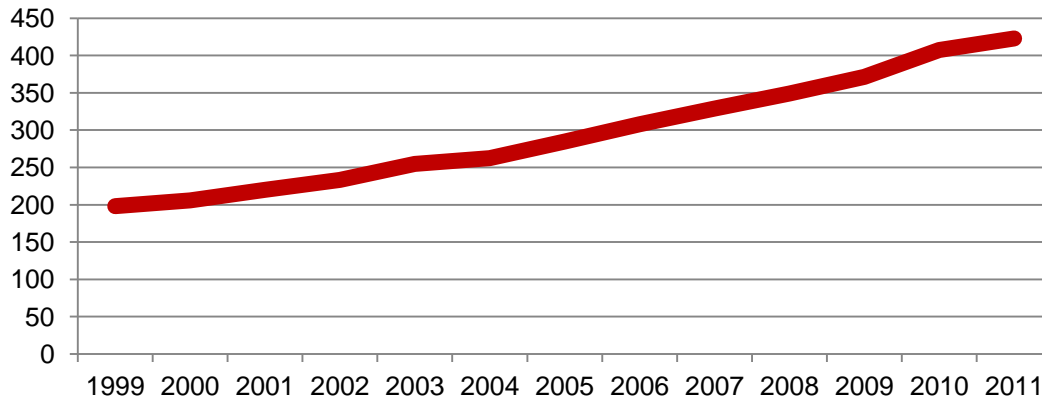
→ ...Provided they are supported by an enabling policy environment.

The Drivers for RE Applications



1. Energy Security:

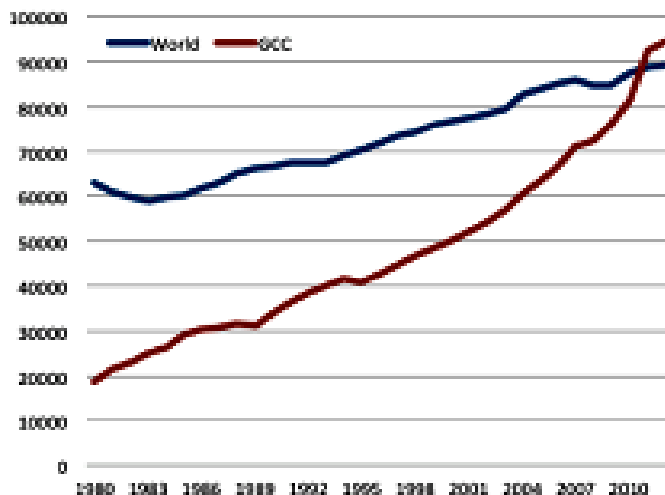
GCC Electricity Consumption (TWh)



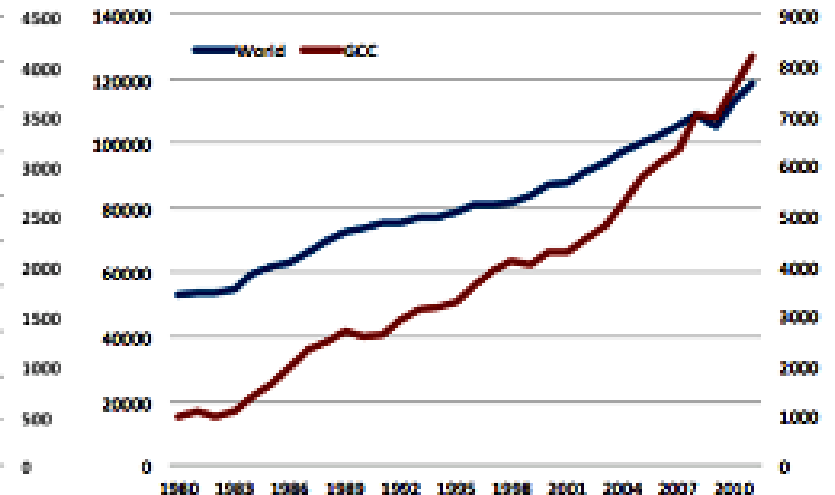
❖ Although the GCC has substantial fossil fuel reserves, but it cannot be complacent about its long-term supply advantage!



World vs GCC Oil Consumption (thousand bbl/day)



World vs GCC Natural Gas Consumption (bn ft³/day)

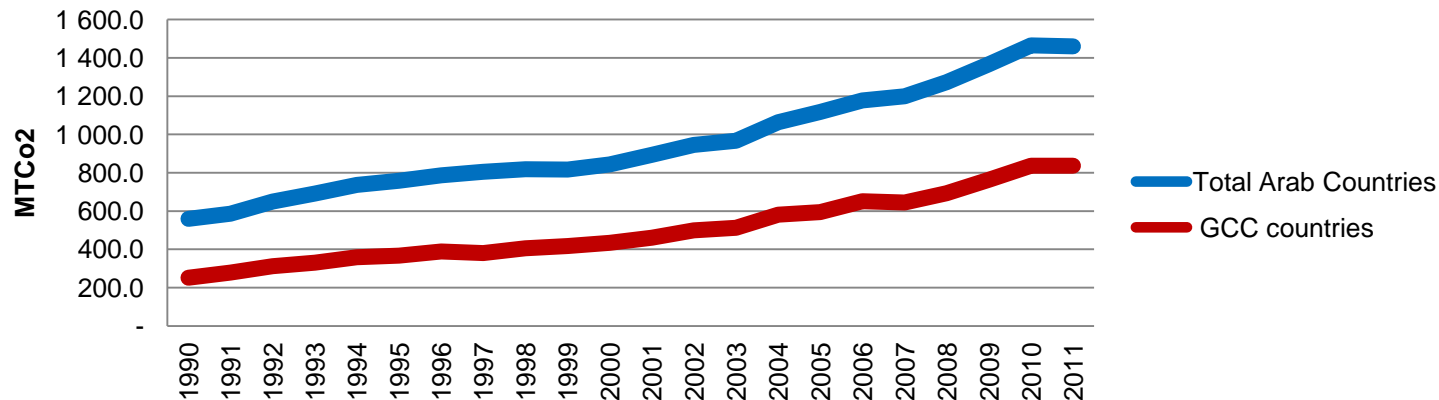


Source: IEA, 2012

2. Climate Change Mitigation:

- Although just 0.6 % of the world population lives in the GCG → 2.4 % of the global GHG emissions (This is due to high-energy needs in the region for air conditioning, refrigeration, desalination, in addition to the lack of energy efficiency).
- GCC countries are among the top 25 countries in terms of CO₂ emissions per capita, with Kuwait and UAE leading (*United Nations Statistical Division, 2007*).
- Growing CO₂ emissions in the GCC countries.

CO₂ Emissions



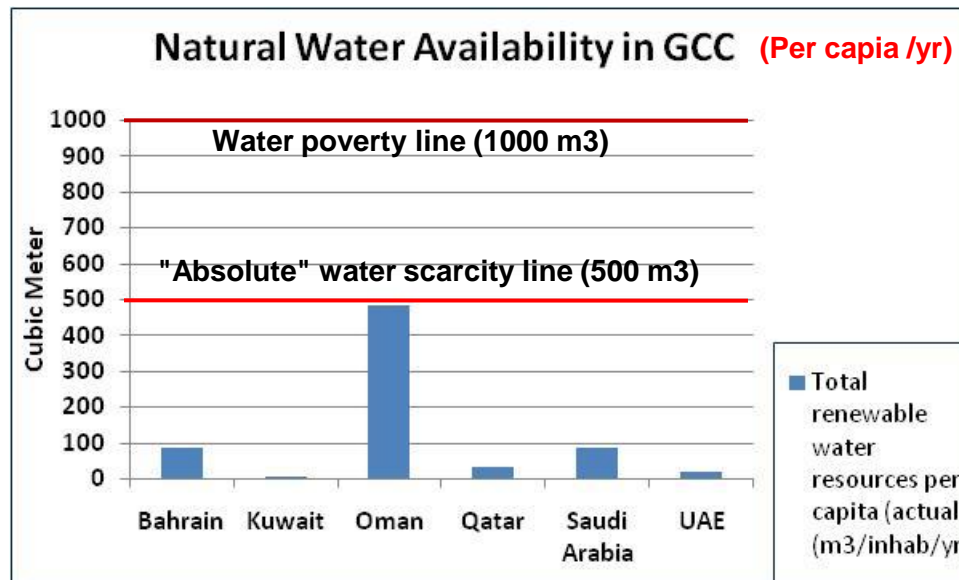
❖ Therefore, it is important for the GCC governments to invest more in RE applications in response to global concerns about carbon emissions.

The Drivers for RE Applications (cont'd)



3. Management of Natural Resources

- Energy needs will increase due to water scarcity
- Water scarcity is a critical challenge facing the region
 - Related to the depletion in fresh water resources and the direct links between water and other developmental components including human health, food, and energy.



Freshwater withdrawal as % of total actual renewable water resources (%)

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
Withdrawal (%)	206	2075	87	381	936	1867

Data source: *FAO - Aquastat*

The Drivers for RE Applications (cont'd)



3. Management of Natural Resources (cont.)

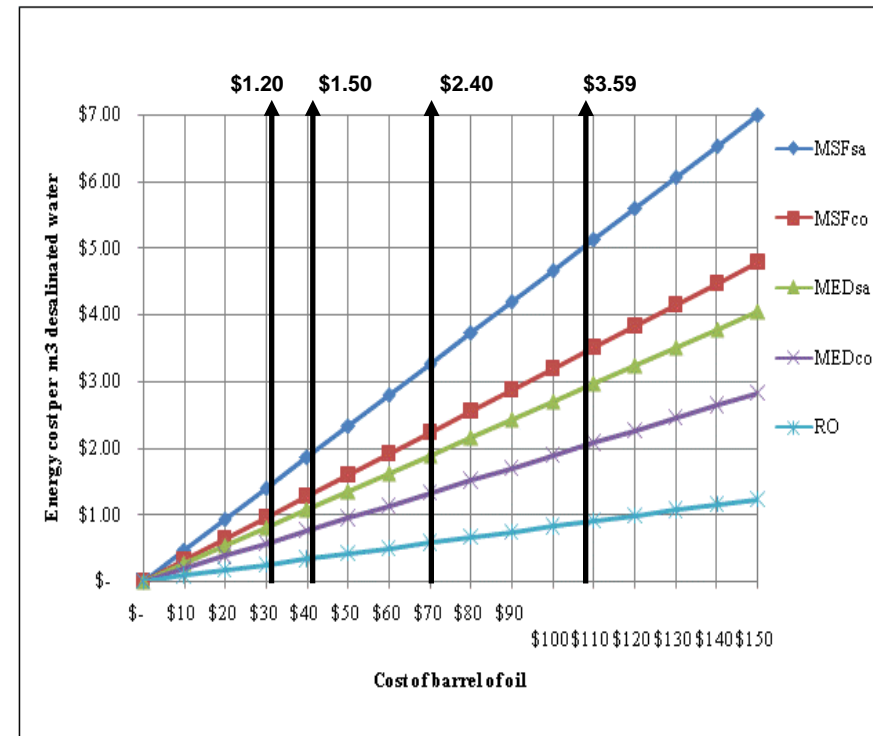
- GCC countries heavily depend on desalination
 - ❖ Desalination plants are costly in terms of the large amount of fuel used and their harmful effect on the environment.
 - Renewable energy such as solar and wind to power desalination plants can be a solution to the environmental and oil-related challenges faced by desalination.

Growth of Desalination Capacity of GCC countries

Countries	Installed capacity (000 m ³ /day)		Capacity Increase
	2000	2008	
Saudi Arabia	5,153	10,598	106%
UAE	2,669	8,743	228%
Kuwait	1,153	2,390	107%
Qatar	511	2,049	301%
Bahrain	409	783	91%
Oman	173	960	455%
Total	10,068	25,523	154%

CO₂ emissions for different desalination technologies

Desalination Technology	kg-CO ₂ /m ³	Total CO ₂ emissions from Desalination (2009 levels)
MSF	20.4 - 25.0	90,000 – 640,000 Tons CO₂ per day
MSF _{cogen.}	13.9 - 15.6	
MED	11.8 - 17.6	
MED _{cogen}	8.2 - 8.9	
RO (sea)	3.4 - 6.0	
RO (brackish)	0.3 - 1.7	

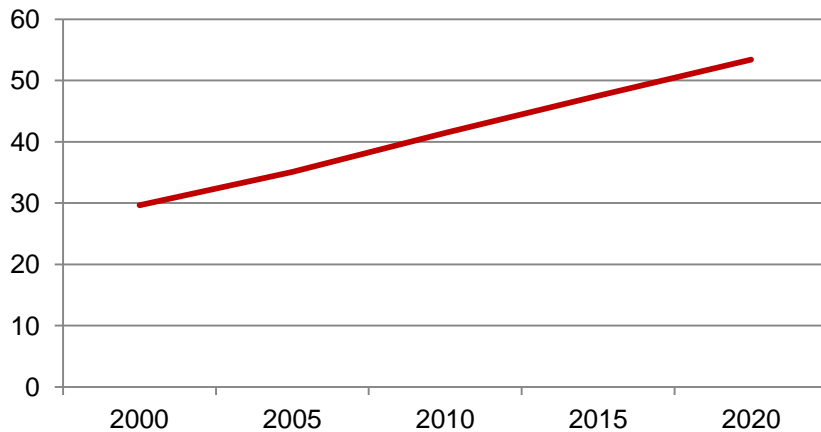


The Drivers for RE Applications (cont'd)



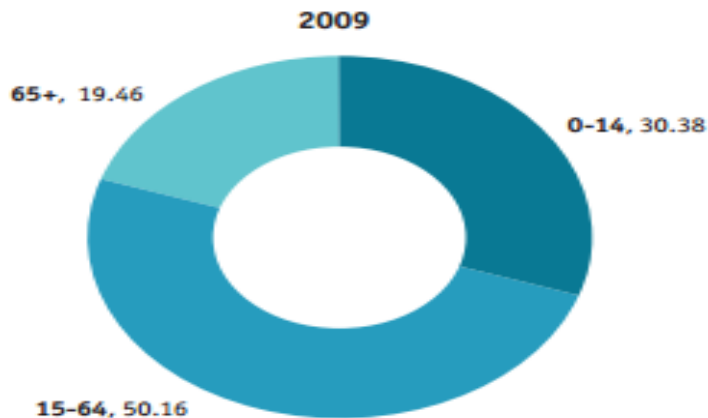
4. Socio-economic & Demographic Dynamics

GCC Population Growth (m)



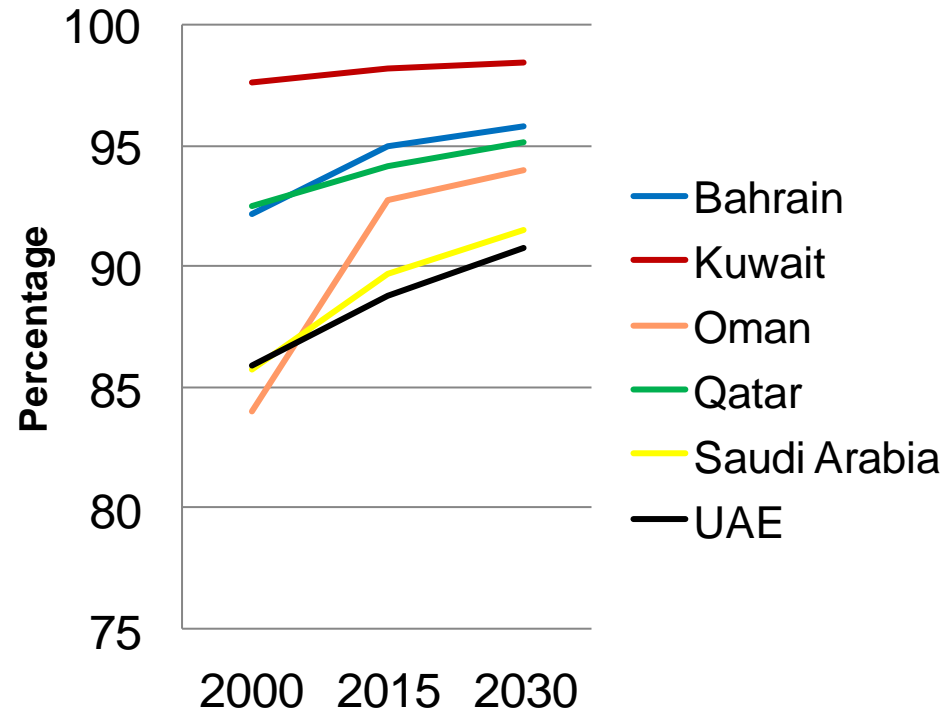
Source: IMF, 2009.

Age breakdown
(% of population)



Source: Economist Intelligence Unit, 2009.

Urbanization

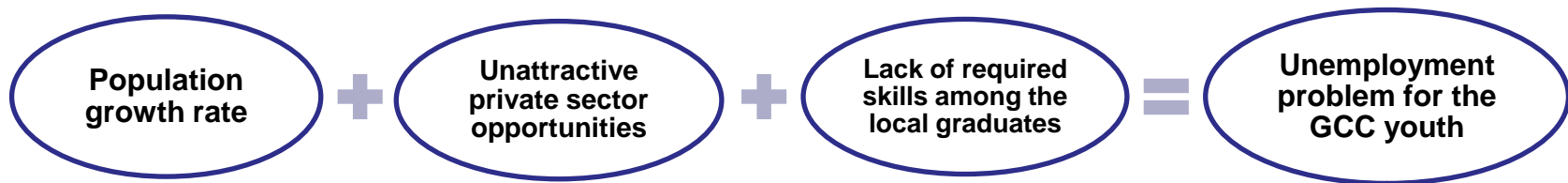


Source: AFED, 2009

➤ Growing population, urbanization and improved standards of living result in increased demand for energy and water in the region.

4. Socio-economic & Demographic Dynamics (Cont'd)

- Estimates of the future number of jobs that must be created in GCC during 2015-2020, is about 1.4 million (*ILO, 2011*)
- The participation of young people in the economic life did not exceed 40% during past decade (53.6% for males and 19.5% for females).
 - More than 30 % of Arab youth are unemployed compared to the global average of 15 %..
 - More than 50 million jobs by 2020 need to be created, mostly for young educated people.

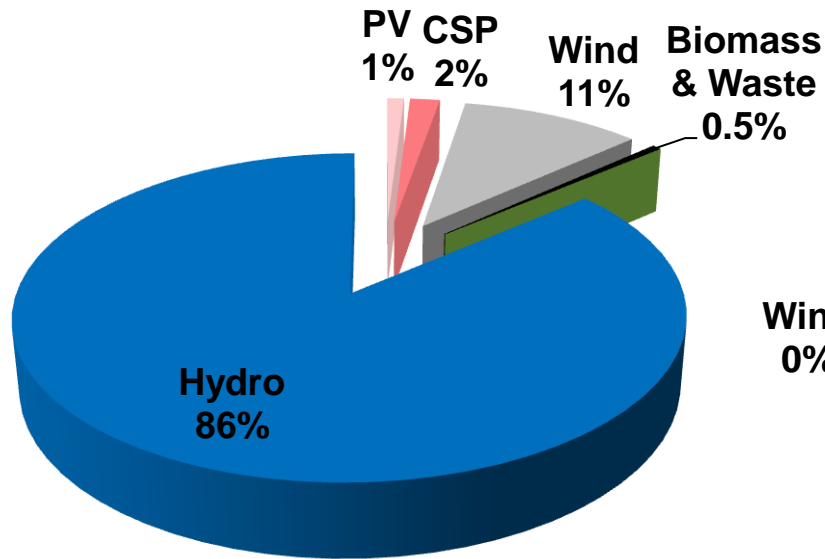


❖ RE has potentials for job creation in the energy sector, particularly for young people

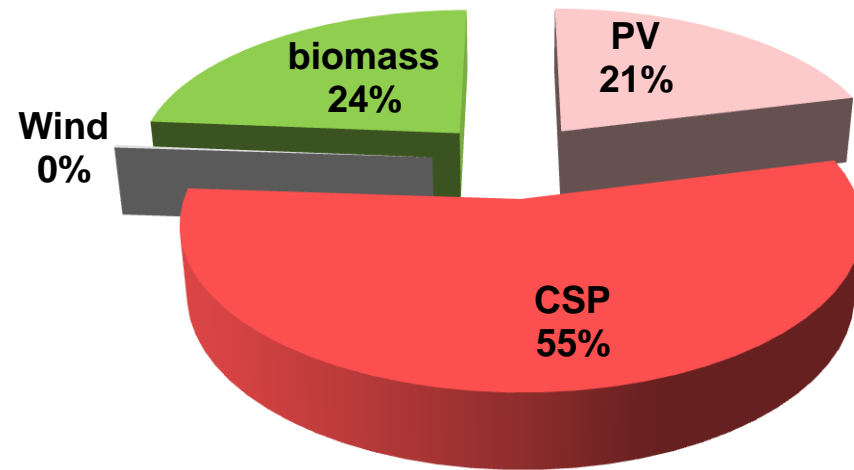
RE Capacities & Existing Policies in GCC Countries



RE Installed Capacity in the **Arab Countries** (2013)



RE Installed Capacity in the **GCC Countries** (2013)

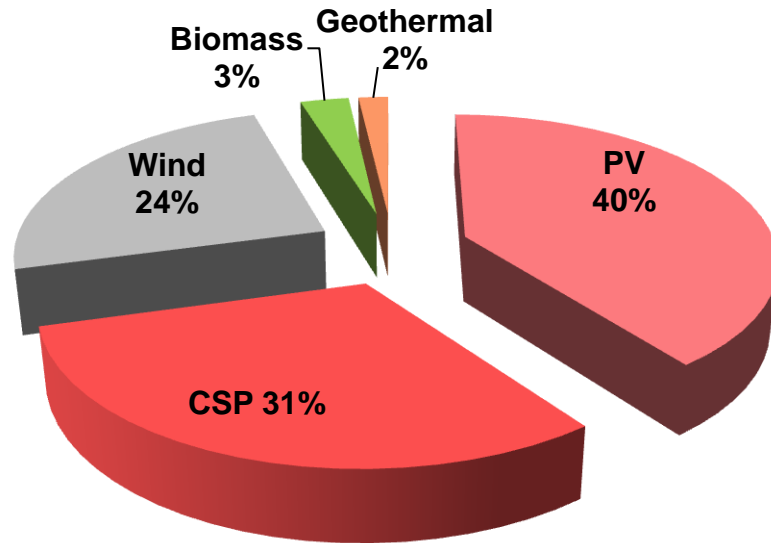


- The RE installed capacity in the GCC countries constitute about 14 % of the total RE installed in the Arab Countries (excluding hydro).
- The total installed RE capacity in the gulf region is about 182 MW (0.15 % of the total installed power capacity) .

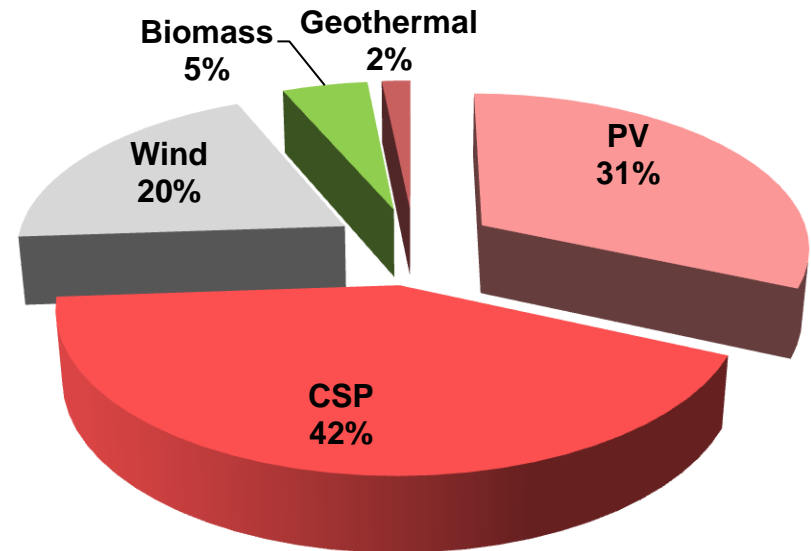
RE Capacities & Existing Policies in GCC Countries



RE Future Targets in the Arab Countries (2020-2032)



RE Future Targets in the GCC Countries (2020-2032)



- The RE future targets in the GCC countries constitute 63% of the total RE capacity targets in the Arab Countries.
- The GCC governments set targets to deploy 62767 MW of RE for 2020-2032 (12% of the total installed power capacity).
 - Gulf countries have considerably invested in developing research and planning for RE projects particularly for Solar and Wind.

RE Activities in the GCC



Kuwait

- Wind turbine (10MW) bids invited
- Solar Thermal (50 MW) bids invited
- PV (10 MW) bids invited

Qatar

- Solar power plant (100MW) Planned
- Mesaieed biomass (W2E) plant (40MW) Completed



Bahrain

- Concentrated solar power plant (500MW) Planned
- Waste to Energy Plant (25MW) Planned
- Two "hybrid" power plants for solar and wind energy (5MW each) Planned



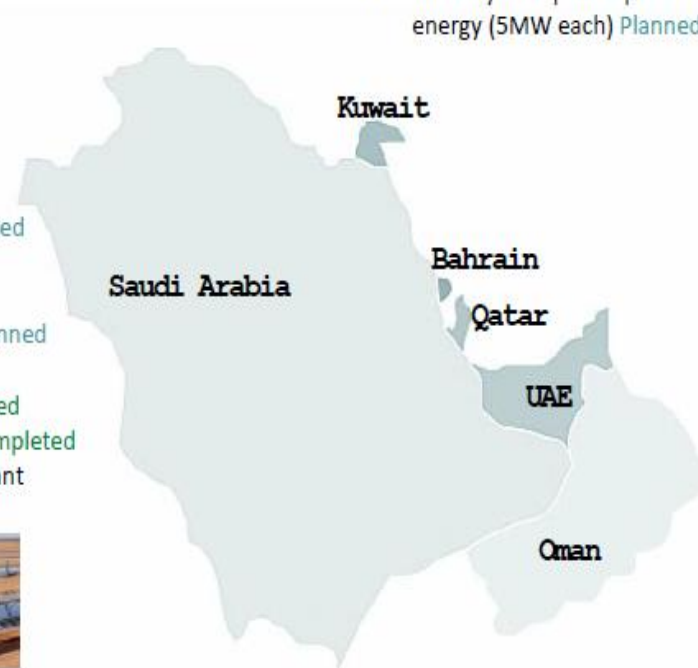
Saudi Arabia

- PV Plant Makkah (100 MW) Planned
- Solar Street Lights Makkah (30,000 lights) Planned
- Solar facility on parking lot (10MW) Planned
- Biodiesel plant Jeddah (141.2 mLpa) Planned
- KAPSARC Riyadh PV Plant Phase 2 (1.8 MW) Planned
- Solar desalination plant Under construction
- KAUST Solar rooftop PV panels (2MW) Completed
- KAPSARC Riyadh PV Plant Phase 1 (3.5 MW) Completed
- Princess Nora University Solar water heating plant (17MW, 36,305 m²) Completed



Oman

- CSP power project (50-200MW) Planned
- Solar-powered desalination plant (6000 litres/hour) Planned
- Biofuel date palm factory (900,000 litres/day) Planned
- Photovoltaic demonstrator (6MW) Completed
- Solar thermal powered oil recovery plant (7MW) Completed



United Arab Emirates

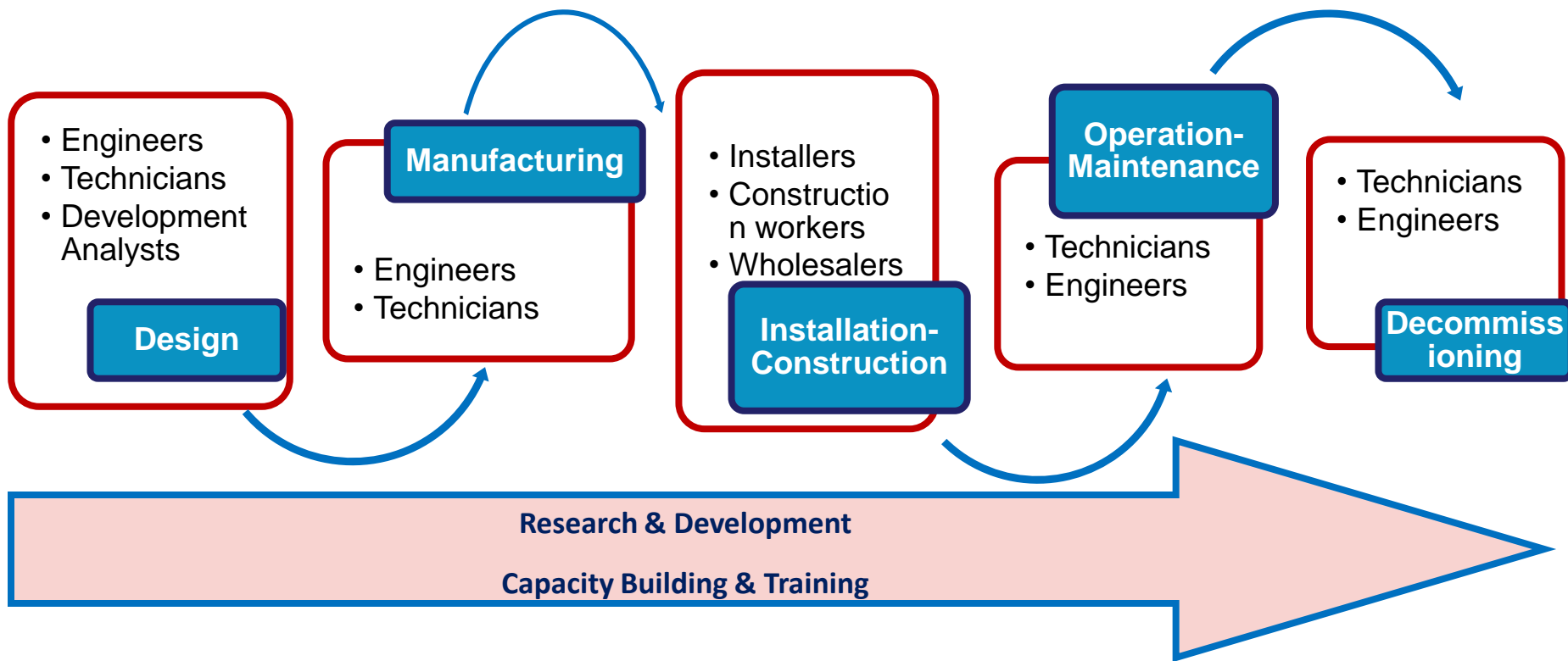
- Sir Bani Yas Wind Energy plant (30 MW) Planned
- Solar power plant (40MW) Planned
- Noor 1 Solar PV plant (100MW) Planned
- Waste to Energy plant, TAQA (100MW) Planned
- Solar rooftop program (500MW) Planned
- Floating solar island project (1MW) Prototype
- Masdar Institute rooftop (1MW) Completed
- Masdar City solar PV park (10MW) Completed
- Shams 1 CSP plant (100MW) Completed
- Dubai solar park (13MW) Completed



Jobs Across the RE Value Chain Cycle



- Economic diversification and job creation is a potential key benefit of investment in RE technologies.
 - Demand for PV or wind power can lead to significant job creation through installation and maintenance activities.



RE Facts and Job Creation Worldwide



Estimated RE Jobs Worldwide (thousands).

Technologies	Global	China	EU	Brazil	United States	Germany	Spain	India
Biomass	753	266	274		152	58	57	39
Bio-fuels	1,379	24	109	804	217	35	23	4
Biogas	266	90	71			85	50	1
Geothermal	180		51		35		14	0.3
Hydropower (small)	109		24		8	12	7	2
Solar PV	1360	300	312		90	112	88	12
CSP	53		36		17		2	34
Solar heating/cooling	892	800	32		12	41	11	1
Wind Power	753	267	270	29	81	48	118	28
Total	5745	1747	1179	833	612	391	370	121.3

IRENA, 2013.

- An estimated 5.7 million people work directly or indirectly in the renewable energy sector based on a wide range of studies from the period 2009-2012.

RE & Estimated Job Creation in the GCC (cont'd)



Source: IRENA, 2013. Based on Rutovitz and Harris, 2012 ratios.

- ❖ **However** RE related jobs expected to be created in the GCC countries will depend on a number of factors, including;
- The local manufacturing and production capacity of RE equipments: are the equipments produced locally or imported?
 - The productivity of the Labor force.
 - The size of domestic local + international markets and the required quantities
 - The scale of production and the potential of the available market (As the quantity of RE technology produced increase, the cost will be reduced)
 - The profile of the labor force that will fill the expected local jobs/ national or foreign labor force ?
 - Pace of advances in technology

- RE deployment can significantly improve the management of the energy sector through:
 - Decentralization will bring improvements in service delivery, transparency, and client orientation .
 - Improved grid management is likely to follow.
 - Smart metering allows for real time monitoring and communication between producers and consumers to optimize grid usage.
 - Public private partnership will be boosted (since the private sector is likely to bear significant financial, technical, and operational risks).
 - National and international cooperation will enhance financing of RE applications.

- Addressing Renewable Energy/ Energy Efficiency Interface
- Addressing Sustainable Energy with an Integrated Lens to Natural Resources Management
- Addressing Energy Policies within a socio-economic and geo-political paradigm

➔ *Need a shift in mind set*

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THANK YOU