



الهيئة العامة للكهرباء والمياه  
Public Authority for Electricity & Water

# Electricity & Water Sectors in the Sultanate of Oman

BY

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G.M PROJECTS DELIVERY

JUNE 2011

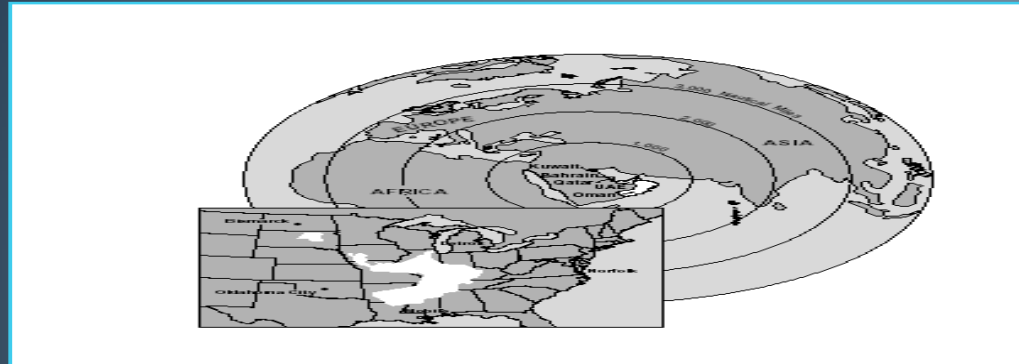


# Agenda

- **Introduction to PAEW**
- **Electricity & Water Sector**
- **Renewable Energy**



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General Facts:

Population : 2.743  
Million

Area :309,500 Sq  
Km



# GEOGRAPHICAL FEATURES

- **Sultanate of Oman lies in the south-eastern part of Arabian peninsula, the total area is about 309.5 square kilometer.**
- **Physical features Oman comprises variable topographical regions.**
- **Hydrological Oman located within arid and semi-arid zones where water resources are very scarce.**
- **Rainfall varies, exceeding 350mm in the mountains, and less than 50mm in the desert in average of 100mm.**
- **Evaporation varies from 1660mm/yr to 2200mm/yr.**



# Water Authorities overview

sector	authority	responsibilities
Water resources	Ministry of regional municipalities & water resources	<ul style="list-style-type: none"><li>•Water resources managements.</li><li>•Water resources development.</li><li>•Water resources monitoring.</li></ul>
Water supply	Public authority of water and electricity	<ul style="list-style-type: none"><li>•Water production.</li><li>• water supply.</li></ul>
Irrigation	Ministry of agriculture	Water irrigation management.
Waste water	<ul style="list-style-type: none"><li>•Oman W.W. Company. HAYA</li><li>•Salalah W.W. Company.</li><li>•Ministry of regional municipalities &amp; water resources</li></ul>	<ul style="list-style-type: none"><li>•Muscat governorate.</li><li>•Dofar governorate.</li><li>•Other regions &amp; governorates.</li></ul>



# Water supply services

- **Drinking water sources:**
- **Desalination.**
- **Ground water (wells).**
- **Supply services by :-**
- **Network distribution.**
- **Tanker points (browsers).**



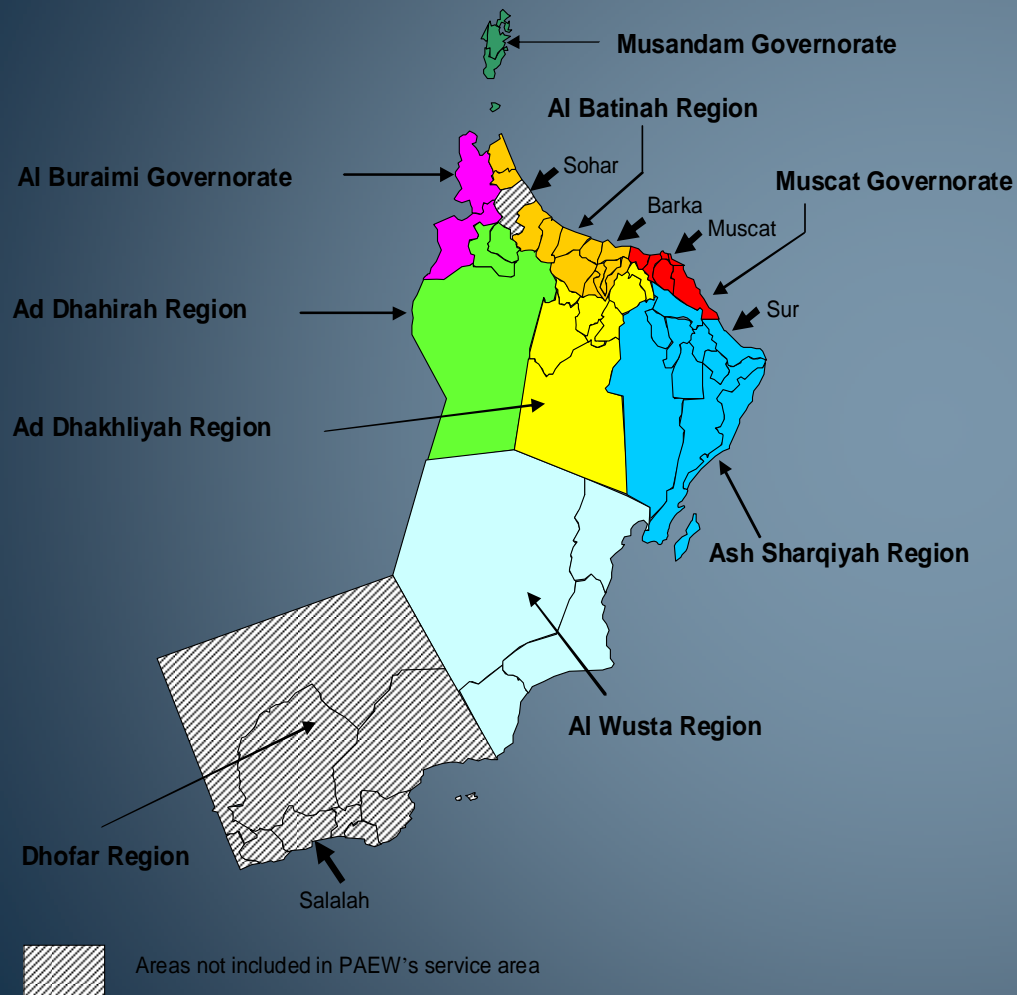
# Desalination plants production

Governate / region	Capacity (MG/DAY)	REMARKES
MUSCAT	41.077	M S F + R O
MUSANDAM	0.385	R O
AL BATINAH	79.40	M S F + RO
AL DHAKHILIYAH	0.264	R O
AL SHARQIYAH	18.502	R O
AL DHHERAH	0.264	R O
AL WUSTA	0.534	R O
TOTAL	140.426	



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# PAEW Water Coverage Area



Population : 2,335,000\*

Transmission: 1,650 km

Distribution : 5,000 km

Consumer Accounts : Approximately 189,000 in 2008

\* Excluding Dhofar & Sohar Governorates



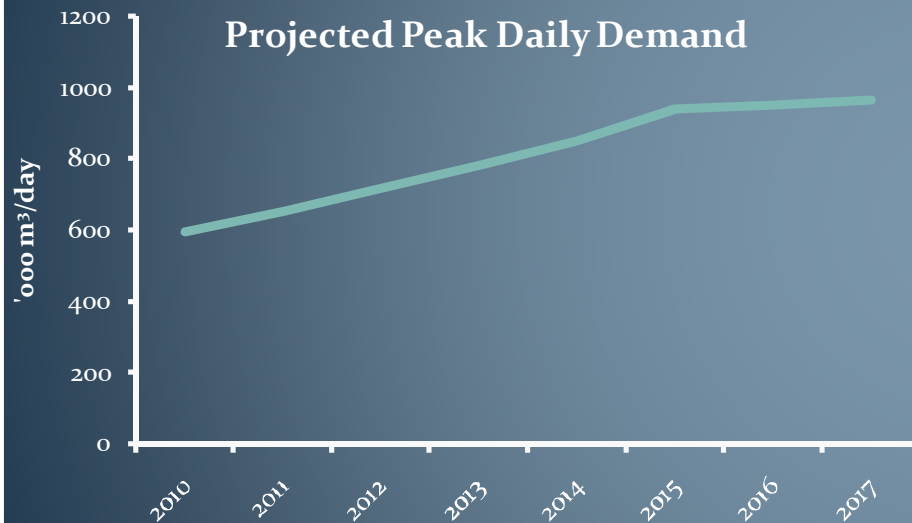


# PAEW Has Dual Roles – Policy & Operational

- **Securing the production of potable water in the “Unrelated Water” Sector**
- **Implementing Government Policy in securing electricity supply**
- **Implementing Government Policy in the development of the electricity and water sectors**
- **Encouraging private sector investment in the electricity and water sectors**
- **Implementing and activating Government Policy in respect of diversification of resources of electric power**



# Water Demand Continues To Grow Strongly



Source – PAEW analysis

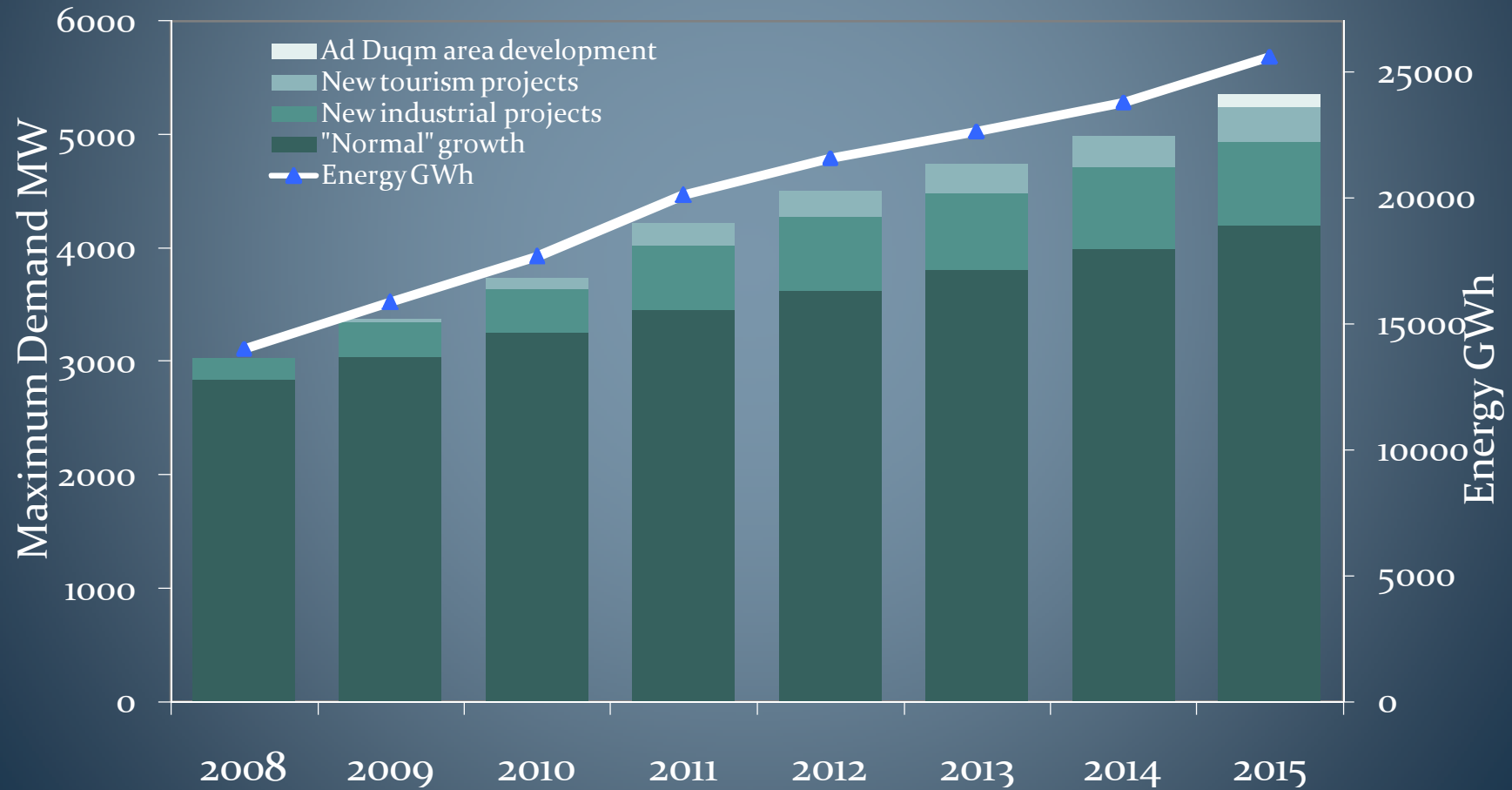


Source – “Demand forecast study for areas served by PAEW”, MM Project no.259030, November 2009

Driven by “normal demand growth”, industrial projects and tourism development plus ongoing extension of networks to serve more communities



# Expected Power and Energy Demand - MIS





# Opportunities

**New Power & Desalination plants under consideration :**

**Salalh, Ghobrah, Sohar, Barka, Sur, Qurayat**



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# Non Revenue Water situation

Is a very serious issue



# Outline of actions taken on NRW

- **Improve NRW calculation: data availability & quality**
- **Launch renewal of faulty meters**

## Opportunities

**New meter type**

**leakage detection System**



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# INVISMENT ON WATER PROJECT



## INVISMENT ON WATER SUPPLY (2006-2010)

TYPE OF THE WORK	AMOUNTS (MILLION US\$)
<b>DESALINATION PLANTS ,PIPE LINE</b>	<b>1820</b>
<b>NETWORK EXPANSION &amp; DRILLING</b>	<b>26</b>
<b>FEASIBILITY STUDIES</b>	<b>10.4</b>
<b>TOTAL INVISMENT</b>	<b>1856.4</b>





# projects under construction

Number	cost	type
<b>62 projects</b>	<b>236 Million OR = 613.6 Million US \$</b>	<b>transmission main, ground reservoir, pump station and scada system</b>



# projects under engineering

Number of contracts	cost	type
<b>20 PROJECTS</b>	<b>WORTH 300 m. OR = 780 m. us \$</b>	<b>Water main transmission, ground reservoir, pump station and scada system. Desalination plants</b>



# Challenges / Opportunities

- **Consultants**
- **Contractors**
- **Suppliers**



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# PAEW Future Management Contract with Veolia EAU



# Renewable Energy



## Government Position relative to Renewable Energy

- ❑ The Government of Oman has clearly stated its support for the implementation of renewable energy initiatives in Oman
- ❑ A ministerial committee has been established to oversee and coordinate efforts – chaired by Ministry of National Economy
- ❑ A technical committee has been formed chaired by Public Authority for Electricity & Water
- ❑ The Authority for Electricity Regulation (AER) commissioned a study to investigate the potential for renewable energy projects in the electricity sector. The full study is available on AER web site [www.aer-oman.org](http://www.aer-oman.org)
- ❑ The Public Authority for Electricity and Water is taking steps to implement solar and wind energy projects, to coordinate efforts to identify the need for research and development and to identify the need for policy and other support mechanisms



# Study on Renewable Energy Resources - 2008

## Objectives:

- To provide an overview of renewable sources of energy in Oman & the potential use of renewable energy for electricity production
- To provide a platform for developing renewable energy policies for Oman

## Findings:

- Significant potential from: Solar & Wind
- Limited potential from: Biogas, Geothermal & Wave



# Renewable Energy Projects

## Pilot Projects (2009-2012)

- Six projects with total capacity of max. 8 MW
- Conducted in RAECO (Targeting replacement of diesel generation)
- A mix of PV, hybrid wind plus PV technologies
- PAEW is planning to use renewable energy for desalination of water where ever power grid is not available (study on Musandam area).

## Large Scale Solar Project (2011-2014)

- Feasibility Study (Capacity up to 200 MW)
- Selection of optimum location & Capacity
- Review Market structure and regulatory framework
- Competitive Tendering process/award BOO





# Renewable Energy Strategy - way forward

## Policy & Strategy

1. Developing Policy for R.E development
2. Regulatory review

## Project Implementation

1. Pilot Projects (RAECO)
2. 100 – 200 MW Solar Plant (Grid Connected)
3. Wind Monitoring Program then Wind farm
4. Energy Conservation
5. R.E Database

## Capacity Building

### R & D

1. R.E Desalination
2. Hybrid Solutions
3. Solar Cooling
4. Focused research on specific technologies

### Industrial

1. Raw material extractions
2. Manufacturing
3. Added value services

### Human Resources

1. University Programs
2. Engineering and O & M Skills
3. Research & Development
4. Utilities experience

Benchmark/ Monitoring / Feedback



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***THANK YOU FOR YOUR ATTENTION***