Energy Sources and Utilization in Iraqi Kurdistan Region

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KRG / Ministry of Electricity
Sulaimani / Iraq
Coat of Arms of Kurdistan

Flag of Kurdistan

Iraqi Kurdistan

Coat of Arms of Iraq
KURDISTAN
About Kurdistan Region

- Area: ≥ 40,643 Sq KM
- Population: 4.7 Million
- Population growth rate: 2.618%
- GDP: 12 Billion US$
- GDP per Capita: 2,550 US$
- Economic Growth rate: ≥ 10%
- Economic Activity: Oil, Natural Gas, Cement, Agriculture and tourism.
Energy Sources and Utilization in Kurdistan -1-

- Kurdistan region is one of the most abundant region for the energy.

- Kurdistan region's economy is dominated by the oil industry, agriculture and tourism. Due to relative peace in the region it has a more developed economy in comparison to other parts of Iraq.

- Available Resources in Kurdistan: Natural gas, oil, long summer sunlight, wind, mountainous and rivers considered to be the main recognized sources for the energy.

- Due to the political background of the region at the last 13 years prior to Iraqi freedom operation the region remained unresponsive to the demand of the energy needs “It cause a very high growth rate: CAGR for 2006-2011 is 14%” and now is higher.

- The Kurdistan Oil and Gas Law were approved on August 6, 2007, by the Kurdistan National Assembly. Kurdistan Region receives 17% of all revenues from all oil production in all of Iraq.
Energy Source and Utilization in Kurdistan -2-

- **KRG oil and gas contracts:**
  - The KRG has signed oil & gas production sharing contracts under the Iraqi Constitution and the Kurdistan Oil and Gas Law.
  - KRG announces 461 million square foot site for Kurdistan Gas City"2008"
  - KRG and Korea National Oil Corporation sign new petroleum contracts"2008"
  - KRG signs petroleum contracts with Talisman Energy"2008"
  - KRG signs five more petroleum contracts "2007"
  - Ministry of Natural Resources announces seven new petroleum contracts for Kurdistan Region, reviews five existing contracts "2007“.
  - KRG signs oil and gas contract with US-based Hunt Oil"2007"
  - Kurdistan Regional Government supports draft Federal Oil Law"2007"
Energy Source and Utilization in Kurdistan -3-

- The shortage of the other energy production like oil and natural gas for heating people adhered to depend on the electrical power as a major energy source. Meanwhile electrical power product partially depends on the availability of such energy sources like natural gas. So the governmental sector of electricity is dealing with the most difficult challenges at the present time.

- The electrical power demand is more than 3,000 MW in Kurdistan region while only 2,100 MW is available in February 2012.
Kurdistan Region - Ministry of Electricity

- Erbil: 29 MW Diesel P.P
- Sulaimani: 500 MW Dohuk PP
- 750 MW Sulaimani PP
- 29 MW Diesel P.P
- 150 MW Baadre PP
- 1000 MW Erbil PP

Northen Governorates of Iraq (Dohuk, Erbil And Suleimaniyah)

- Exist Hydro PP
- Exist diesel PP
- Exist HF. PP
- Exist Gas PP
- PP Under construction

Darbadikhan HPS: 3x83 MW
Dokan HPS: 5x80 MW
51 MW PP
29 MW Diesel P.P
1000 MW Erbil PP
750 MW Sulaimani PP
29 MW Diesel P.P

IRAQ

Strategy

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Imported from Turkey

<table>
<thead>
<tr>
<th>Year</th>
<th>MW</th>
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<tbody>
<tr>
<td>2006</td>
<td>157</td>
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<tr>
<td>2007</td>
<td>145</td>
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<tr>
<td>2008</td>
<td>103</td>
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<tr>
<td>2009</td>
<td>138</td>
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<tr>
<td>2010</td>
<td>146</td>
</tr>
<tr>
<td>2011</td>
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</tbody>
</table>
Imported from Iraqi National Grid

- 2006: 134 MW
- 2007: 193 MW
- 2008: 165 MW
- 2009: 93 MW
- 2010: 13 MW
- 2011: 0 MW
Imported Power from Iran

<table>
<thead>
<tr>
<th>Year</th>
<th>MW</th>
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</thead>
<tbody>
<tr>
<td>2006</td>
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<td>2009</td>
<td>5</td>
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<tr>
<td>2010</td>
<td>5</td>
</tr>
<tr>
<td>2011</td>
<td>5</td>
</tr>
</tbody>
</table>
Electricity Generation in Kurdistan Region

- 2006: 477 MW
- 2007: 474 MW
- 2008: 452 MW
- 2009: 790 MW
- 2010: 1045 MW
- 2011: 1370 MW
Generation by GPPs

<table>
<thead>
<tr>
<th>Year</th>
<th>MW</th>
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</thead>
<tbody>
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<td>2009</td>
<td>507</td>
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<tr>
<td>2010</td>
<td>747</td>
</tr>
<tr>
<td>2011</td>
<td>1238</td>
</tr>
</tbody>
</table>
Max. Demand in Kurdistan

- 2006: 1457 MW
- 2007: 1739 MW
- 2008: 1889 MW
- 2009: 2096 MW
- 2010: 2302 MW
- 2011: 2806 MW
Kurdistan Power Network

- No. Of Power Plants: 6
- No. 132 KV Substation: 30
- Nr. 33 KV Substation: 92
STRATEGIES:

Two strategies are performed for solving the electrical problems in Kurdistan.

One is a short term strategy for production of electricity from the natural gas and oil residues for power generation and establishing a functional transmission line network to connect the newly established generation stations with the center of cities simultaneously installing a control system to the entire region finally improving the distribution network inside the cities to ensure appropriate power delivery for the end users.
STRATEGIES:

Long term strategy:

- Constructing new dams on the rivers.
- Ensuring gas and oil for heating to decrease loads on electrical power by the households.
- Increase natural gas power generation stations.
- To plan and think about the sunlight and wind power utilization.
- To plan a strategy for energy efficiency “House Insulation” and “Demand Side Management”.
- Privatization of electricity sector.
### Large Dams and Hydropower projects feasibility study & re-evaluations

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Installed &amp; Revised Capacity MW</th>
<th>Cost Estimation for 1MW (Million Dollars)</th>
<th>Cost Estimation for Electrical Work (Million Dollars)</th>
<th>Proposed Construction Time in Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bekma dam</td>
<td>1500-650</td>
<td>0.5</td>
<td>750</td>
<td>8</td>
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<tr>
<td>Taq – taq dam</td>
<td>400-270</td>
<td>0.6</td>
<td>162</td>
<td>6</td>
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<td>Bakerman dam</td>
<td>52.5</td>
<td>1</td>
<td>43</td>
<td>5</td>
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<td>Mandawa dam</td>
<td>764</td>
<td>0.5</td>
<td>382</td>
<td>6</td>
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<tr>
<td>21 Small dams</td>
<td>900</td>
<td>1</td>
<td>700</td>
<td>7</td>
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</tbody>
</table>

Kurdistan Region- Ministry of Electricity

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400KV – 132KV Proposed Diagram in Kurdistan
Thanks

ありがとうございました

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