MONGOLIA

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The views expressed in this presentation are those of the presenter and do not necessarily represent those of the Asian Development Bank.
MONGOLIA: RICHLY ENDOWED WITH NATURAL RESOURCES

- **Area**: 1.56 mln sq.km
- **Population**: 2.7 mln
- **Language**: Mongolian
- **Currency**: Tugrug (MNT)
  - 1 USD = 1200 MNT
- **GDP**: $5.8 bln (2010)
- **Rating**:
  - B1 (Moody’s)
  - B (Fitch)
  - BB- (S&P)

**Dornod/Dornogobi**
- Uranium Deposit
  - 150,000 t = $18 bln

**Oyu Tolgoi**
- Copper/Gold
  - 16 mln.t = $132 bln

**Tavan Tolgoi**
- Coking Coal Deposit
  - 4.3 bln.t = $387 bln

**Tumurtei/Others**
- Iron Ore
  - 1 bln.t = $100 bln

**Asgat**
- Silver
  - 2300 t = $1.7 bln

**Growth Story Unfolds**

- Location advantage: next to the largest commodity consumer in the world
- Recent massive investment flow into Northern China
- 15 Strategic Deposits with estimated resources valued at over $1.2 trn
- Primary growth driver will be the development of world-class mineral deposits
- Sustained double-digit GDP growth expected in coming years
- Mining sector CAGR over the last 5 years is 27.8%
- Oyu Tolgoi copper/gold mine is to generate $51 bln over 27 years
- **Tavan Tolgoi coal mine is to operate for +200 years with an annual turnover of $1.6 bln for the first 29 years**
GDP Growth: Mining will drive the economy – Is Mongolia the next Qatar?

**GDP in USD Billions**

**Source:** IMF

2010 Kazakhstan GDP = $126 bln

2010 Qatar GDP = $110 bln

2025 Mongolia GDP = $100 bln

**Oyu Tolgoi: Copper & Gold**
- Oyu Tolgoi alone will bring in $5 bln in investments by 2013
- Over the next 27 years the mine will generate 51 bln

**Tavan Tolgoi: Coking Coal**
- Estimated to operate for 200+ years
- Over the next 29 years the mine will generate $87 bln

**Other mineral resources:**
- 15 Strategic Deposits with estimated resources valued at over $1.2 trn
- Yet to be tapped resources include Silver, Uranium Gold, Phosphates, Iron ore and Zinc
- Only 30% of the country is prospected

**Infrastructure:**
- Infrastructure investments to further boost GDP
- Pipeline investments needed to build/update infrastructure through 2015: $8.4 bln

**Mongolia 2005 - 2015**

**Qatar 1989 - 1999**

**Kazakhstan 1992 - 2002**
AN INVESTMENT OPPORTUNITY: ELIMINATING BOTTLENECK

Mining Boom  

Investment opportunities

Rapid Economic Growth

Lack of Infrastructure

Transportation

Energy

Processing industry

Town development
Energy Sector Overview

• Population: 2.7 mln
• Electrification Rate: 80%
• Population Connected to Grid: 1.8 mln
• Deficit in electrical energy:
  – Current deficit 0%
  – In two years 5%
  – In five years 20%
  – In ten years 50%
Power Generation

- Total Power Generation
  4.3 bln kWh

- Power Generation Mix
  - Coal 91.5%, Oil 5.1%, RE 3.4%
Renewable Energy

- RE Policy/ies, highlights:
  - RE national program 2005-2020 (RE target)
  - RE Law 2007 (Tariff, PPA, Tariff period)

- RE Target:
  - 3-5% of total domestic production by 2010
  - 20-25% by 2020
Electricity Cost: Subsidies and Incentives

- **RE Subsidies**

<table>
<thead>
<tr>
<th>RE Source</th>
<th>Base Rate ($/kWh)</th>
<th>Subsidy ($/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>0.08 – 0.095</td>
<td>0.0 – 0.015</td>
</tr>
<tr>
<td>Solar</td>
<td>0.15 – 0.18</td>
<td>0.07 – 0.1</td>
</tr>
</tbody>
</table>

- **Fossil Fuel Subsidies**

<table>
<thead>
<tr>
<th>Fossil Fuel</th>
<th>Base Rate ($/kWh)</th>
<th>Subsidy ($/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>0.08</td>
<td>-</td>
</tr>
<tr>
<td>Oil</td>
<td>0.08</td>
<td>0.03</td>
</tr>
</tbody>
</table>
Wind Resource Potential

Mongolia - Wind Resource Map

Wind Power Classification

<table>
<thead>
<tr>
<th>Resource Potential</th>
<th>Wind Power Density at 30 m</th>
<th>Wind Speed at 30 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility</td>
<td>Rural</td>
<td></td>
</tr>
<tr>
<td>Marginal</td>
<td>100 - 200 W/m²</td>
<td>4.5 - 5.6 m/s</td>
</tr>
<tr>
<td>Moderate Good</td>
<td>200 - 300 W/m²</td>
<td>5.6 - 6.4 m/s</td>
</tr>
<tr>
<td>Good</td>
<td>300 - 400 W/m²</td>
<td>6.4 - 7.1 m/s</td>
</tr>
<tr>
<td>Excellent</td>
<td>400 - 600 W/m²</td>
<td>7.1 - 8.1 m/s</td>
</tr>
<tr>
<td></td>
<td>600 - 800 W/m²</td>
<td>8.1 - 8.9 m/s</td>
</tr>
<tr>
<td></td>
<td>800 - 1000 W/m²</td>
<td>8.9 - 9.6 m/s</td>
</tr>
</tbody>
</table>

*Wind speeds are based on an elevation of 1400 m and a Weibull k value of 1.8

The wind resource classification is specific for both utility scale and rural applications and applies to areas with low surface roughness, e.g., grassland.

U.S. Department of Energy
National Renewable Energy Laboratory
# Total Installed Wind Capacity

## as of June 2011

<table>
<thead>
<tr>
<th>Operational Wind Projects</th>
<th>MW</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Erdenetsagaan</td>
<td>0.1</td>
<td>2004</td>
</tr>
<tr>
<td>2. Mandakh, Sevrei, Bogd, Khatanbulag, Tseel, Manlai</td>
<td>0.7</td>
<td>2007</td>
</tr>
<tr>
<td>3. Bayantsagaan, Bayan-Undur, Shinejinst, Matad</td>
<td>0.6</td>
<td>2008</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1.4</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Above mentioned are small scale not grid connected, installed in the soum center*
Photo of Wind Farm
Salkhit wind farm
## Additional Wind Capacity

<table>
<thead>
<tr>
<th>Pipeline of Wind Projects</th>
<th>MW</th>
<th>Estimated Year</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salkhit wind farm (Clean Energy LLC, Newcom Group)</td>
<td>50</td>
<td>2012</td>
<td>80 mln USD</td>
</tr>
<tr>
<td>2. Khanbogd wind farm (Qleantech LLC)</td>
<td>250</td>
<td>2014</td>
<td>-</td>
</tr>
<tr>
<td>3. Sainshand wind farm (Sainshand)</td>
<td>52</td>
<td>2013</td>
<td>80 mln USD</td>
</tr>
<tr>
<td>4. Tsetsii wind farm (Clean Energy LLC, Newcom Group)</td>
<td>200</td>
<td>2015</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>552</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Next Steps

• Wind power needed for
  – Grid
  – Mining power supply
  – Export