NUCLEAR ENERGY POLICY IN MONGOLIA

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Nuclear Energy Agency of The Government of Mongolia
• Total Area - 1.5 million km.sq
• Population - 2.8 million (July, 2012)
• Population growth – 1.43%
• Climate – Continental
• Location – land-locked
• GDP – $8.2 billion (2011)
• Per capita – $2,930 (2011)
• GDP annual growth – 17.3% (2011)
## Explored Main Energy Resources of Mongolia and its Operation

<table>
<thead>
<tr>
<th></th>
<th>COAL</th>
<th>OIL</th>
<th>URANIUM</th>
<th>RENEWABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HYDRO</td>
</tr>
<tr>
<td><strong>Geological Reserves</strong></td>
<td>175 ¹ billion tonne</td>
<td>205 ¹ million tonne</td>
<td>68.5 ² thousand tonne</td>
<td>56.2 ³ billion kWh</td>
</tr>
<tr>
<td><strong>World Ranking by Reserve</strong></td>
<td>15th</td>
<td>-</td>
<td>16th²</td>
<td>-</td>
</tr>
<tr>
<td><strong>Operation in 2010 ⁴</strong></td>
<td>25 million tonne</td>
<td>0.3 million tonne</td>
<td>~ 0.0</td>
<td>27.5 billion kWh</td>
</tr>
</tbody>
</table>

Source: 1 – MMRE, Geology Policy Department  
2 - Europe's Energy Portal, [www.energy.eu](http://www.energy.eu)  
4 – Mongolian Statistical Yearbook, 2010
### Structure of Primary Energy Supply by Source

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>'90-'95 '95-'00 '00-'05 '05-'10</td>
</tr>
<tr>
<td>Coal</td>
<td>2,365</td>
<td>1,695</td>
<td>1,798</td>
<td>1,895</td>
<td>2,324</td>
<td>-6.5% 1.2% 1.0% 4.2%</td>
</tr>
<tr>
<td></td>
<td>63.1%</td>
<td>73.1%</td>
<td>70.2%</td>
<td>67.7%</td>
<td>65.6%</td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td>1,206</td>
<td>345</td>
<td>472</td>
<td>584</td>
<td>879</td>
<td>-22.1% 6.5% 4.3% 8.5%</td>
</tr>
<tr>
<td></td>
<td>32.2%</td>
<td>14.9%</td>
<td>18.4%</td>
<td>20.9%</td>
<td>24.8%</td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td>0.00</td>
<td>0.00</td>
<td>0.25</td>
<td>0.28</td>
<td>4.73</td>
<td>0.0% 0.0% 2.1% 76.0%</td>
</tr>
<tr>
<td></td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.01%</td>
<td>0.01%</td>
<td>0.13%</td>
<td></td>
</tr>
<tr>
<td>Traditional Fuels &amp; Others</td>
<td>175</td>
<td>277</td>
<td>293</td>
<td>321</td>
<td>337</td>
<td>9.6% 1.1% 1.8% 1.0%</td>
</tr>
<tr>
<td></td>
<td>4.7%</td>
<td>12.0%</td>
<td>11.4%</td>
<td>11.5%</td>
<td>9.5%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3,746</td>
<td>2,317</td>
<td>2,564</td>
<td>2,800</td>
<td>3,545</td>
<td>-9.2% 2.0% 1.8% 4.8%</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>


* 1,000 TOE- 1,000 Tonnes of Oil Equivalent

### Trend in Demand Shares

(2000→2005→2010, %)

- **Coal ↓**: 70.2 → 67.7 → 65.6
- **Oil ↑**: 18.4 → 20.9 → 24.8
- **Hydro ↑**: 0.01 → 0.01 → 0.13
- **Traditional Fuels and Others ↓**: 11.4 → 11.5 → 9.5
The overwhelming majority of our heat and electric energy was being generated by coal fired thermo power plants and the remaining small amount by hydro, wind, solar and diesel stations.

### Electricity Generation by Plant Types, 2010

<table>
<thead>
<tr>
<th>Type of PP</th>
<th>Generation, Million. kWh</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined Heat and Power (CHP) Plant</td>
<td>4256.0</td>
<td>98.68%</td>
</tr>
<tr>
<td>Diesel</td>
<td>29.3</td>
<td>0.68%</td>
</tr>
<tr>
<td>Hydro</td>
<td>27.5</td>
<td>0.64%</td>
</tr>
<tr>
<td>Wind and Solar</td>
<td>0.3</td>
<td>0.01%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4313.1</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>

Source: National Statistical Committee
Electricity Demand Forecast of Mongolia, 2011-2030

Total Demand

Source: GIA Energy Authority, RIED

Development Prospect of Power Sector – Demand Growth

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DEVELOPMENT PROSPECT OF POWER SECTOR – PROJECTS TO BE IMPLEMENTED IN THE NEAR FUTURE

- Telmen TPP 60 MW
- Darkhan, Erdenet CHP 35 MW extension
- Ulaanbaatar CHP#5 830 MW
- CHP#4 100 MW extension
- Oyu Tolgoi TPP 450 MW
- Baganuur TPP 270 MW
- Chandgana TPP 600 MW
- Dornod TPP 100 MW extension
- Choir Wind Farm 50 MW
- Sainshand Wind Farm 52 MW
- Khanbogd Wind Farm 250 MW
- Shuren HPP 300 MW
- Khushuut TPP 12-24 MW
- Salhit Uul Wind Farm 50 MW
- Tavan Tolgoi TPP 300 MW
- Khotgor TPP 36 MW

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WE NEED NUCLEAR ENERGY

- Energy demand
- Necessity of diversification of energy supply options
- Reduction of green gases emission
- Uranium resource /ranking 16th in the world/
  68,500 (1% of the world reverse) tones, confirmed, and 1.5 million tones, hypothetical resource
• “Cogegobi” LCC (the Areva Group, the French Republic)
• “Emeelt Mines” LLC (CNNC, The People’s Republic of China)
• “Gurvan Bulag” LLC (Denison Mines, Canada)
• “Dornod Uran” Joint LLC (with the Russian Federation)
• In total 16 foreign companies in uranium exploration
### HISTORY OF NUCLEAR FRAMEWORK IN MONGOLIA

<table>
<thead>
<tr>
<th>Activities</th>
<th>Organizations</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint Institute for Nuclear Research (JINR)</td>
<td></td>
<td>1956</td>
</tr>
<tr>
<td>Nuclear Energy Commission</td>
<td></td>
<td>1962</td>
</tr>
<tr>
<td>Nuclear Research Laboratory under National University of Mongolia</td>
<td></td>
<td>1965</td>
</tr>
<tr>
<td>International Atomic Energy Agency (IAEA)</td>
<td></td>
<td>1973</td>
</tr>
<tr>
<td>Regional Cooperation Agreement (RCA)</td>
<td></td>
<td>1992</td>
</tr>
<tr>
<td>Nuclear Energy Agency (NEA)</td>
<td></td>
<td>2008</td>
</tr>
<tr>
<td>Forum for Nuclear Cooperation in Asia (FNCA)</td>
<td></td>
<td>2010</td>
</tr>
<tr>
<td>Title</td>
<td>Status</td>
<td>In Force</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency</td>
<td>Signature: 1987 Ratification: 1987</td>
<td>1987</td>
</tr>
<tr>
<td>Title</td>
<td>Status</td>
<td>In Force</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>--------------</td>
<td>----------</td>
</tr>
<tr>
<td>Treaty banning nuclear weapon tests in the atmosphere, in outer space and under water</td>
<td>1963</td>
<td>1963</td>
</tr>
<tr>
<td>Treaty on Non-Proliferation of Nuclear Weapons</td>
<td>1969</td>
<td>1969</td>
</tr>
<tr>
<td>Agreement for the Application of safeguards in connection with the Treaty on Non-Proliferation of Nuclear Weapons</td>
<td>Signature: 1972</td>
<td>1972</td>
</tr>
<tr>
<td>Agreement on the Privileges and Immunities of the IAEA (Charter of IAEA)</td>
<td>Acceptance: 1976</td>
<td>1976</td>
</tr>
<tr>
<td>Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA (RSA)</td>
<td>1980</td>
<td>1980</td>
</tr>
<tr>
<td>Agreement on Nuclear weapon free zone</td>
<td>Signature: 1992</td>
<td>2000</td>
</tr>
<tr>
<td>Protocol Additional to the Agreement between Mongolia and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons</td>
<td>Signature: 2001</td>
<td>2003</td>
</tr>
</tbody>
</table>

  “The peaceful exploitation of the nuclear energy will be an important factor for the sustainable development of Mongolia;”

• **Action Plan of the Government for 2008-2012**

  “...Conduct a comprehensive research for use of nuclear energy, develop technical and economic feasibility study and improve radiation control and safety;”

Resolution No.35/2008 of the State Great Hural (Parliament) of Mongolia.
Legal framework

- **State policy of Mongolia on the exploitation of radioactive minerals and nuclear energy**
  (Parliament resolution No.45, 2009)

- **Nuclear Energy Law**
  (Parliament of Mongolia, 2009)

- **Program for implementation of the state policy and nuclear energy law**
  (Government resolution No.222, 2009)

- **Program for implementation of international cooperation**
  (Government resolution, 2010)
Chaired by PM
Established in 1962
Members: Ministers of
- Ministry of Finance
- Ministry of Foreign Affairs
- Ministry of Mineral Resources and Energy
- Ministry of Justice and Internal Affairs
Deputy Ministers of
- Ministry of Defense
- Ministry of Education, Science and Technology
- Ministry of Environment and Tourism
- State Secretaries /3/ of Ministries
- Directors of general agencies /4/
- Secretary of the Commission (Deputy director of the NEA)
• The State Administrative Regulatory Authority
• Established in December 2008
• Responsible for
  • The exploitation of nuclear energy and radioactive minerals,
  • Introduction of nuclear technology
  • Implementation of the policy on development of nuclear research
  • Regulatory review and assessment concerning nuclear and radioactive safety and security
Main activities of NEA

- Regulatory review
- Licensing
- Inspections
- Enforcement
- Policy development
- Exploitation of radioactive minerals
- Peaceful use of nuclear energy
- Transfer nuclear innovative technologies

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• Project on The preliminary study of building of the first nuclear power plant-I in 2010

• Project on The preliminary study of building of the first nuclear power plant-II in 2011

• Project on The development of nuclear infrastructure for the nuclear energy programme in 2012
Some local organizations took part in the projects in 2009-2010:

- Nuclear Research Center
- Institute of Physics and Technology
- "ERCHIM" Corporation
- Research Center for Astronomy and Geophysics
- Institute of Geography
- Institute of Geology and Mineral Resources
- Institute of Physics and Technology "ERCHIM"
- Engineering Academy of Mongolia
- Nuclear Energy Agency, Regulatory Agency of the Government of Mongolia
- Technology to Transfer Centre of Mongolia
- ASU Discovery Co., Ltd.
Local organizations taking part in the project in 2012

- Nuclear Energy Agency
- National Emergency Management Agency
- Mongolian Academy of Science
- Nuclear Research Centre of National University of Mongolia
- Mongolian University of Science and Technology
- “Mon-Ame” scientific centre
- “Inter Science” LLC
- “GBD and Partners” Law Firm
- “Association of Energy Development” research team
- Translator team
- Media /National TV, newspapers and magazines/
INTERGOVERNMENTAL AGREEMENT AND MEMORANDUM OF UNDERSTANDING COUNTRIES

The NEA of the Government of Mongolia
**BETWEEN 2009-2011 AGREEMENTS AND MEMONDARUM OF UNDERSTANDING WITH COUNTRIES**

<table>
<thead>
<tr>
<th>No</th>
<th>COUNTRY</th>
<th>AGREEMENT</th>
<th>MEMONDARUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Russia</td>
<td>2 2009, 1 2010</td>
<td>1 2009, 1 2012</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>1 2010</td>
<td>1 2010</td>
</tr>
<tr>
<td>3</td>
<td>India</td>
<td>1 2011</td>
<td>1 2011</td>
</tr>
<tr>
<td>4</td>
<td>China</td>
<td>1 2009</td>
<td>1 2011</td>
</tr>
<tr>
<td>5</td>
<td>France</td>
<td>1 2009</td>
<td>1 2011</td>
</tr>
<tr>
<td>6</td>
<td>USA</td>
<td>1 2009</td>
<td>1 2012</td>
</tr>
<tr>
<td>7</td>
<td>Korea</td>
<td>1 2011, 3 2012</td>
<td>3 2012</td>
</tr>
</tbody>
</table>


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1. **Russia** on Cooperation in the field of peaceful uses of nuclear energy energy (2000)

2. **Rosatom (Russia)** on Cooperation in the field of exploitation of uranium and peaceful uses of nuclear energy (2009)

3. **France** on Cooperation in the field of peaceful uses of nuclear energy (2010)

4. **Russia** on Principal provisions of establishing “Dornod Uran” LLC (2009)
2. Japan
3. India on Cooperation in the field of peaceful uses of radioactive minerals and nuclear energy /2009/
4. Areva Group /2010/
5. China on Cooperation in the field of peaceful uses of radioactive minerals and nuclear energy /2010/
6. The US on Cooperation in the field of peaceful uses of nuclear energy /2010/
MoU with the Republic of Korea

- on Cooperation in the field of human resource development in peaceful uses of nuclear energy and research
  

- on Cooperation in the peaceful use of radioactive minerals and nuclear energy
  
  Ministry of Knowledge Economy /2011-08-22/

- On Cooperation in the field of peaceful uses of nuclear energy
  
  Nuclear Transmutation Energy Research Center /2011-11-28/
THANK YOU FOR YOUR ATTENTION