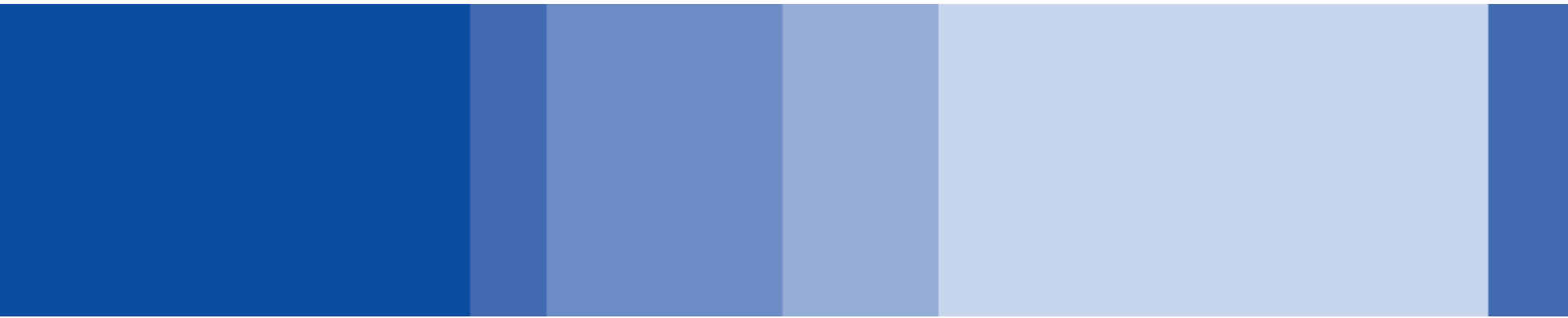


Mongolian power sector:

Background and current policy

Kh.Erdenechuluun
Representing UBEDN , Mongolia





- Territory: 1.564 million km²
- Population: 2.7 million
- Capital city: Ulaanbaatar
- Highest point: Huiten peak (4653 a.s.l.m)
- Lowest point: Khukh nuur depressions (532 a.s.l.m)
- Lowest annual average temperature: -33⁰C (-50⁰C)
- Highest annual average temperature: +23⁰C (+35.8⁰C)



NOMADIC TRADITION





CAPITAL CITY - ULAANBAATAR



❖ Mongolia's energy sector consists of five independent electric power systems:

- Central Energy System (814 MW)
- Western Energy System (12 MW)
- Eastern Energy System (36MW)
- Altai-Uliastai Energy System (15MW)
- Dalanzadgad Energy System (24MW)

TOTAL CAPACITY 901 MW

❖ The Central Energy System, represents 80.2% of total electricity generation in Mongolia

❖ Power generated by thermal power plants using coal accounts 96% of total domestic generation.

❖ Transmission and distribution system

220 kV	=	1044 km
110 kV	=	4240 km
35 kV	=	6921 km
15 kV	=	2112 km
6-10 kV	=	9639 km
0.22-0.4 kV	=	7942 km

❖ Number of consumer

❖ Industrail	20 000
❖ Residential	300 000

1. The most urgent priority for the government concerning the energy sector aims to reach the following characteristics:
 - Financial self-sustainability
 - Efficiency
 - Energy access for rural area
 - Increase of privatization level
2. To fully supply energy and fuel demands by domestic production through the use of coal and other energy sources / *increasing coal production capacities, producing liquefied and gas fuel from coal for local consumers/*
3. Establish Integrated Energy System by interconnecting CES and WES via high-voltage electricity transmission line
4. Increase the share of renewable energy in total energy production by supporting construction of renewable energy power sources
5. To increase the private sector participation into the energy sector

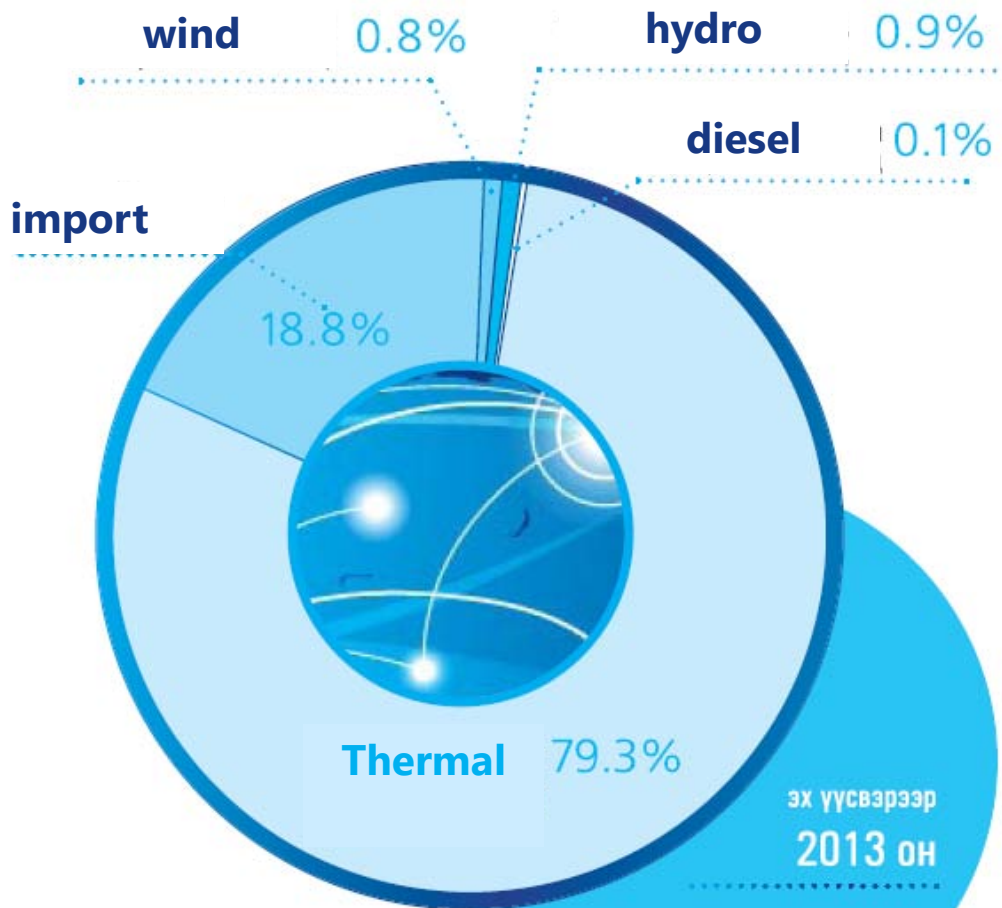
The Government of Mongolia has developed the following policies in the energy sector

1. Energy Law of Mongolia 2001
2. Mongolian Coal Sector Master plan 1995-2014
3. Mongolian Energy Sector Master plan 2000-2020
4. Oil Law of Mongolia 2002
5. Mongolia's Sustainable Energy Strategy 2002-2010
6. National Program of Renewable Energy 2005-2020
7. Mongolian Integrated Power System program 2007-2040
8. Renewable Energy Law 2007
9. Coal Program 2008
9. Energy efficiency law is expected to be approved in 2014

ELECTRICITY PRODUCTION

Эх үүсвэр	2009	2010	2011	2012	2013
Thermal	3989.7	4256	4450	4775.5	5014.0
Diesel	24.2	21.4	20.2	28.7	5.4
Hydro	20	35.3	52.6	52.1	59.9
Wind	0	0	0	0.0	52.9
Total	4033.9	4312.7	4522.8	4856.3	5132.2

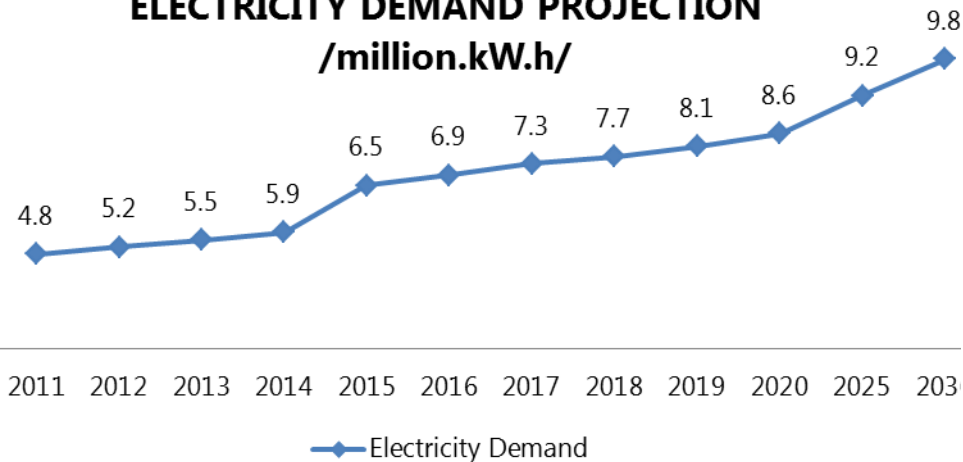
Үзүүлэлт	2009	2010	2011	2012	2013
Heat production	6399.7	6473.9	6567.2	6986.5	6939.4
By water	5979.0	6076.4	6108.2	6472.8	6423.6
By steam	420.7	397.5	459.0	513.6	515.8



Since 2008, Power demand in industry, transportation, agriculture and households has increased by **30%**.

But installed capacity only grew by 6.8%.

ELECTRICITY DEMAND PROJECTION /million.kW.h/

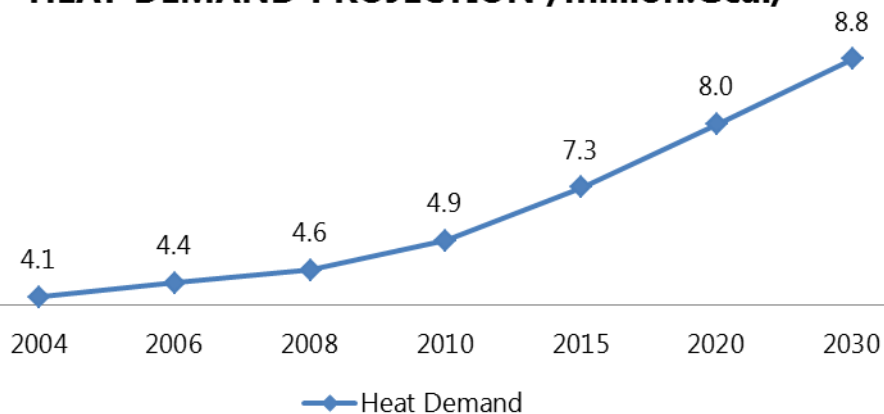


❖ Heat and electricity demand expected to grow due to the economic development

❖ Need to secure reliable energy supply which will ensure other sectors development

❖ Demand increase creates the revenue growth of energy sector

HEAT DEMAND PROJECTION /million.Gcal/



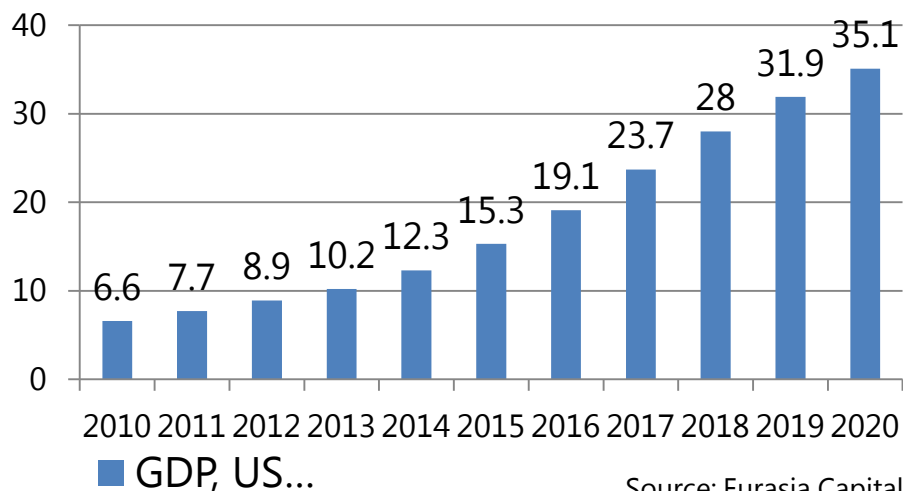
- ❖ Unstable policy /Generally, political parties, taking a power, revising the energy policy during their governance causing barriers in development of energy sector./
- ❖ Current condition, power generation, transmission, distribution systems and supply service owned by state owned companies, promoting monopoly in energy market. Its doesn't meet municipality's and consumers needs.
- ❖ The influence from Government in setting the energy tariff giving the bad impact to financial situation of energy sector
- ❖ State owned companies has opportunities to impelement projects financed by international and local investment. The most projects dedicated to expansion and rehabilitation of technological equipment not for customer service quality improvement.

- ❖ **Proposed recommendations:**
 1. Intensivize competition in energy market by privitizing supply service as a international practice */to create retailer companies/*
 2. Give the attention in policy level for raising the funds by enabling stock exchange of companies in energy sector
 3. "Costrecovery" tariif system
 - To set capacity tariff
 - certain rate of return on investment should be considered in setting the energy tariff.

DEVELOPMENT DRIVING DEMAND GROWTH

- ❖ The International Monetary Fund (IMF) forecasts Mongolia's **Gross Domestic Product will grow on average by 14%** per year between 2012 and 2016.
- ❖ Currently, Mongolia's energy demand is driven largely by rapid development of the country's mining sector, especially in the South Gobi region as a result of **mining activities including gold, copper and coal mines**.
- ❖ There is a critical need to modernize the country's **ageing energy infrastructure** and to expand its power and heat distribution systems.

GDP Growth Forecast



Source: Eurasia Capital

Actual GDP growth:

17.3% by 2011,
12.3% by 2012

The trade of mining products depends on economical situation of neighboring countries

ACCESS TO MODERN ENERGY SERVICES

- ❖ The main policy is to connect *soum/administration unit rural area/* centers to the centralized grids step-by-step.
- ❖ Out of total 331 *soum* centers, some 318 have been connected to the CES, EES and WES by 2012
- ❖ “The 100,000 Solar Ger” program was initiated by the Government of Mongolia in 2001 which has been implemented until 2009. Currently, over 104,000 Solar Home Systems are operating throughout the country. This sytem sold to herders at discounted price as the Government subsidy

DECREASING REACH POOR GAP

- ❖ The energy tariff not based on real cost. */The energy tariff setting has a pressure from Government, considering the family income/*
- ❖ Residential consumers payment rate is high due to low energy price and technical solution enabling disconnection from system. */More than 110 thousand ger areas consumer, most of them has low income/*
- ❖ Revenue collection rate was above 100% in last three years for energy sector.

MITIGATION AIR AND WATER POLLUTION

- ❖ Energy sectors CO2 emission rate /portion/ to total emission of Mongolia is too high compared to the other sectors. */Mongolian power generation sectors CO2 emission (6399g) has high volume compared to other sectors as follows, industrial and construction sectors CO2 emission is 356g, agriculture, commercial and domestic CO2 emission 1181g, transport sectors CO2 emission 1887g according to the report ministry of environment and green development, 2012/*
- ❖ Over 160 thousand ger areas residents polluting air by firing 200 thousand tons raw coals and 160 thousand m3 woods annually;

Taking measures from government and local government

- ❖ Expansion power generators electricity and heat production capacity for enabling the households to access to central heating system
- ❖ Promoting electricity heating system in residential area by discounting energy bill by 50% in night time */but this measure causing much peak demand in energy system/*
- ❖ Raw coal firing stoves using in ger area are replacing by clean stoves by 90% government subsidy. */Electricity bills also discounted by 50%/*

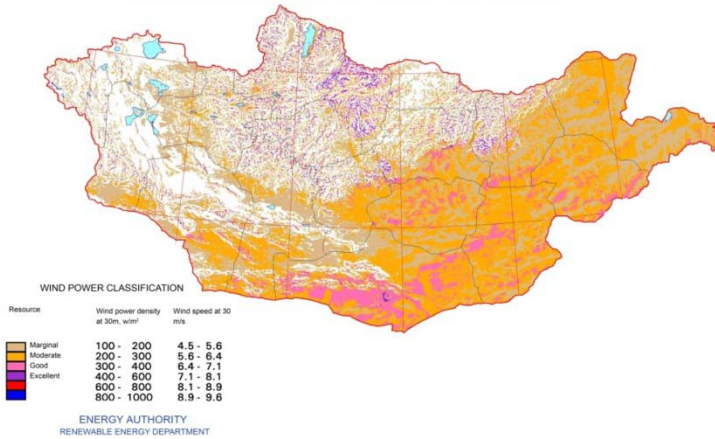
- ❖ Create conditions for extensive use of coal, a main domestic source of energy, for decreasing imports and increasing exports
- ❖ Develop less expensive energy production with less negative environmental impacts so as to fully supply energy and fuel demands by domestic production through the use of coal and other energy sources
- ❖ Produce energy, heat and clean fuel for public utilities through processing raw coal by heating, gasification and fluidization, evaluate environment impacts so as to introduce advanced effective production technology
- ❖ Implement a mechanism requiring polluters to pay for the harm and damage caused to nature, restrict the amount of waste at the pollution sites, prohibit equipment and technology adversely affecting nature and encourage the introduction of advanced technologies that decrease waste.

Opportunities and challenges for future energy policy

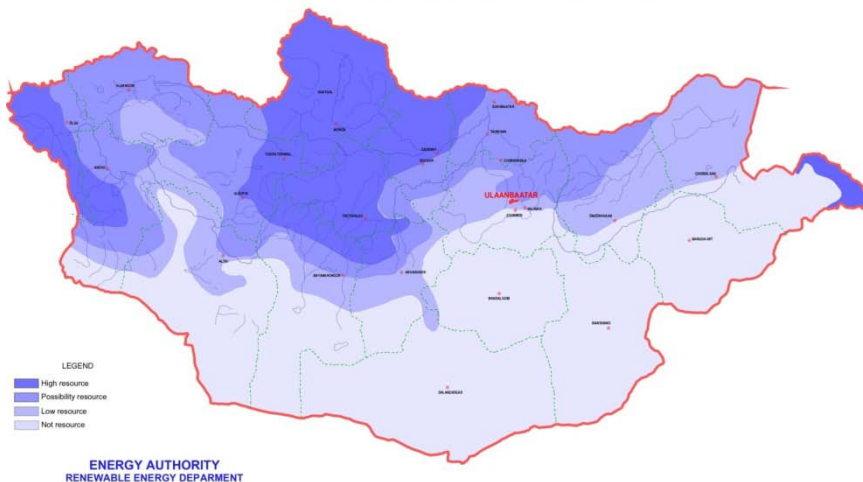
1. Expansion of production capacity
2. Expansion of transmission, distribution lines and heating pipelines
3. Promote renewable energy resources
4. intensifying the process to transfer the energy sector into the market oriented economic principle.
5. attracting foreign and local investments into the energy sector
6. establish favorable conditions for more private sector participation
7. increase the level of privatization of energy enterprises.
8. Energy *conservation* to promote efficiency, consumer choice, and environmental sustainability;

Wind - South Gobi region has the potential for over 300,000 MW.

WIND ENERGY RESOURCE OF MONGOLIA

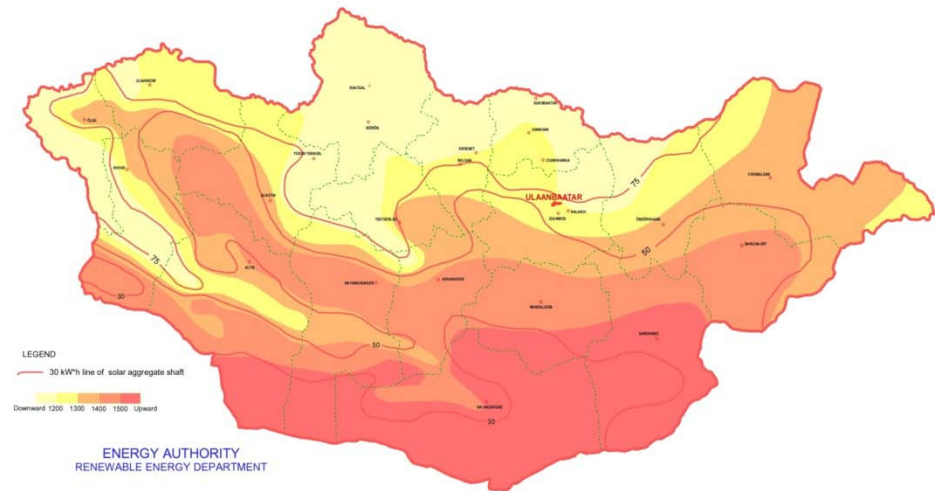


HYDRO ENERGY RESOURCE OF MONGOLIA



Solar - South Gobi region has the potential for over 11,000 MW.

SOLAR ENERGY RESOURCE OF MONGOLIA

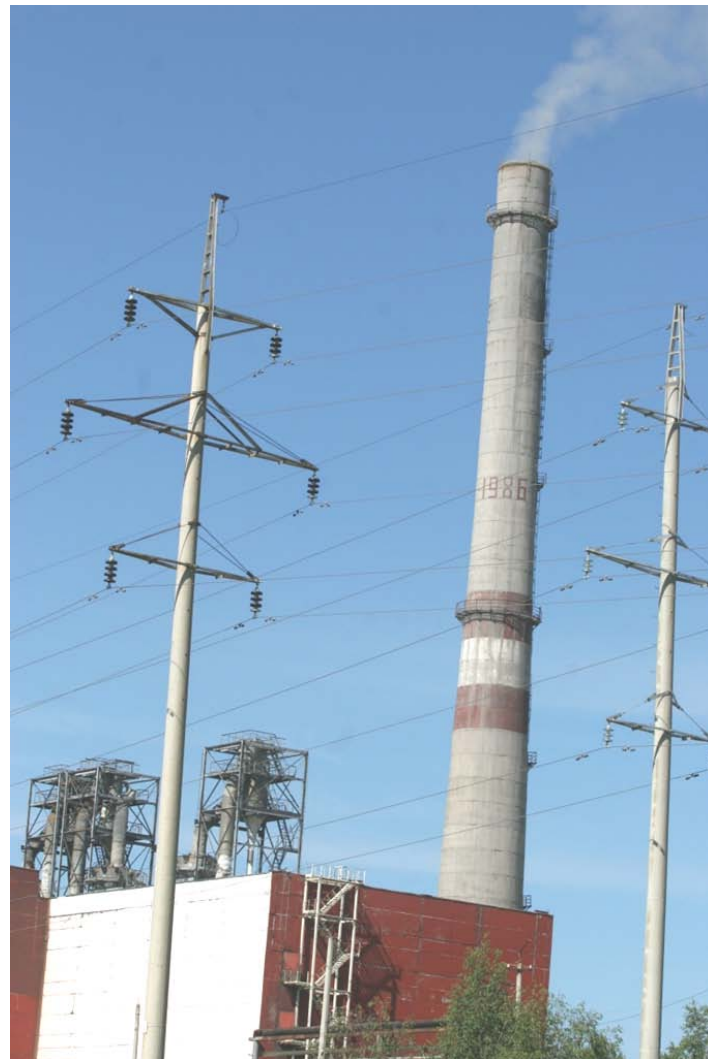


Hydro- The average annual flow of Mongolia's 3,800 big and small rivers estimated at $3,46 \cdot 10^{10}$ m³, providing a potential energy resource of 6,300 MW .

- ❖ Salkhit Wind Farm 50MW–
COD June, 2013
- ❖ Ukhaa Khudag Power
Plant 18MW - in
operation since 2011
- ❖ Combined Heat and
Power Plant 5 450MW-
COD 2018



- To study on technique statistical data collection and forecasting energy demand
- Concepts identifying policy issues based on current situation and analyses made on specific issues.
- Aspects in policy implementation measurement
- liberalization of financial and economical mechanism in energy sector
- To share energy sectors experience of other countries in policy making level, especially in Japan.
- reflect international best practices into Mongolian energy policy by complying current condition and requirement
- To develop draft policy in energy sector of Mongolia in frame of energy regulation by involvement of trained staff.



Thank you

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