GOVERNMENT OF MONGOLIA

# MINISTRY OF ENERGY

# ENERGY SECTOR OF MONGOLIA, COUNTRY REPORT

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- **Current Energy Policy and Measures**
- **Current Situation of Mongolian Energy Sector**
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# 1. General information


- Area: 1.564 million square km
- Population: 3,238,479.0 (2019)
- Government Type: Parliamentary republic
- Capital city: Ulaanbaatar (approx. 1.31 million)
- GDP:11,2 billion USD (2017)
- GDP per capita: 4,017.120 USD
- Real GDP growth: 1 % (2017)
- Unemployment rate: 6.6%
- Inflation: 7
- Exports: 7.4 billion USD
- Imports: 4.8 billion USD

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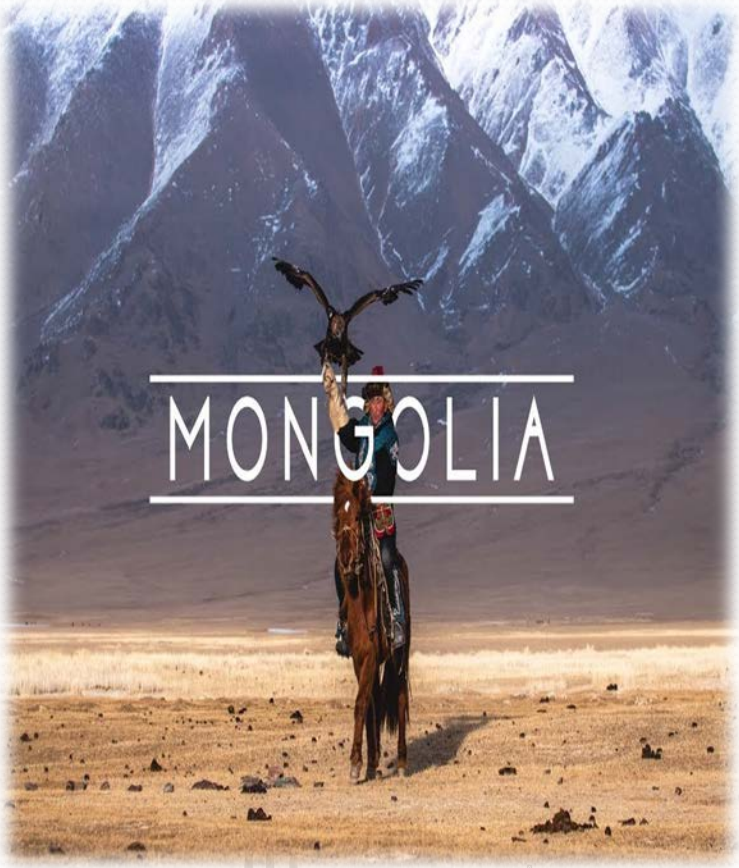


- Number of state households: 859106
- In capital city: 376 419 households
- Official language: Khalkha Mongol 90% (official), Turkic, Russian 10 %
- Official script: Mongolian Cyrillic, Mongolian Script
- Ethnic groups: 96% Mongolians, 4% Khazakhs
- Religions: Buddhist 53%, Muslim 3%, Christian 2.2%, Shamanist 2.9%, other 0.4%, none 38.6% (2010 est.)
- Lowest annual average temperature: -33˚C (-50˚C)
- Highest annual average temperature: +23˚C (+35.8˚C)

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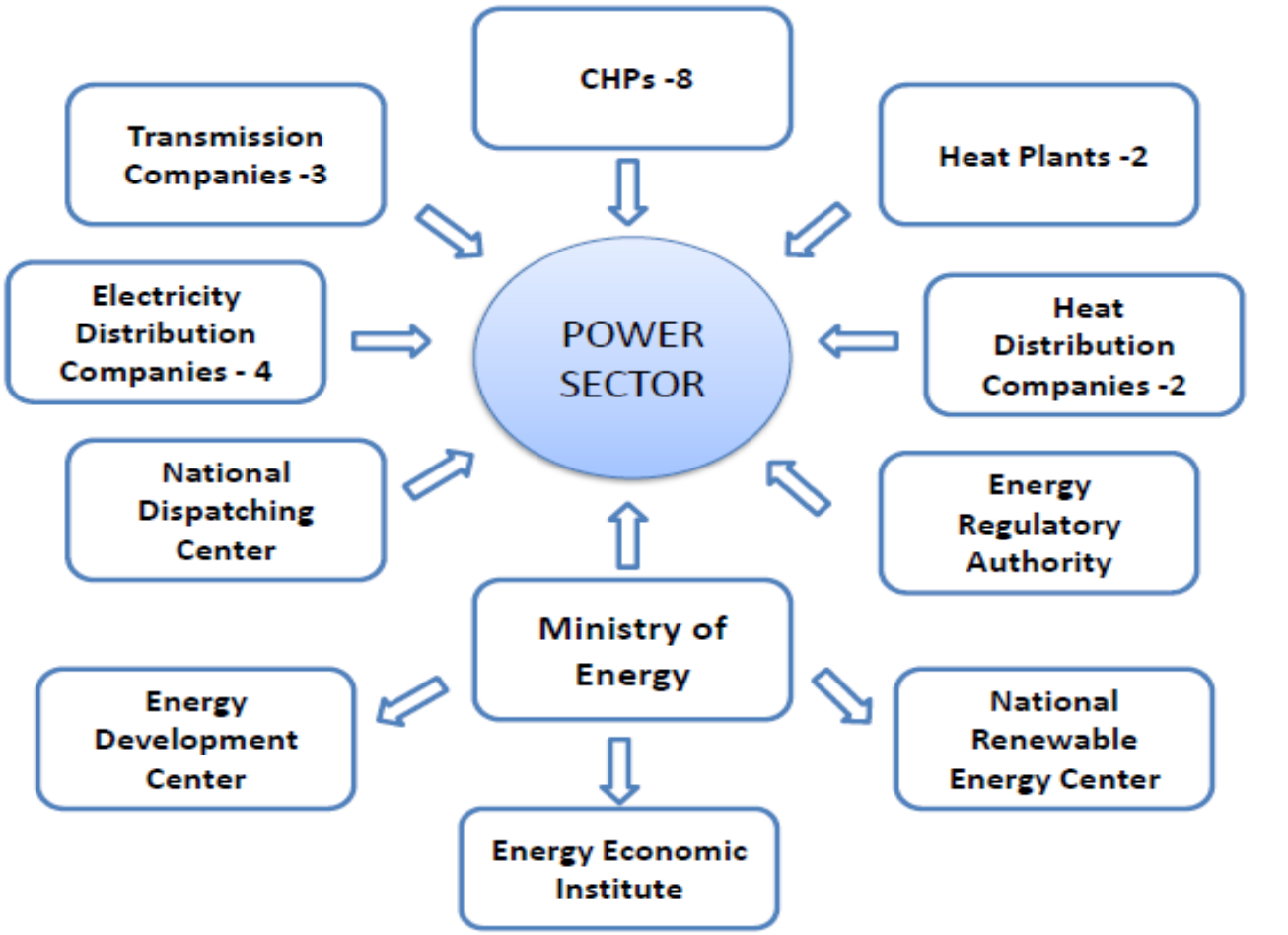

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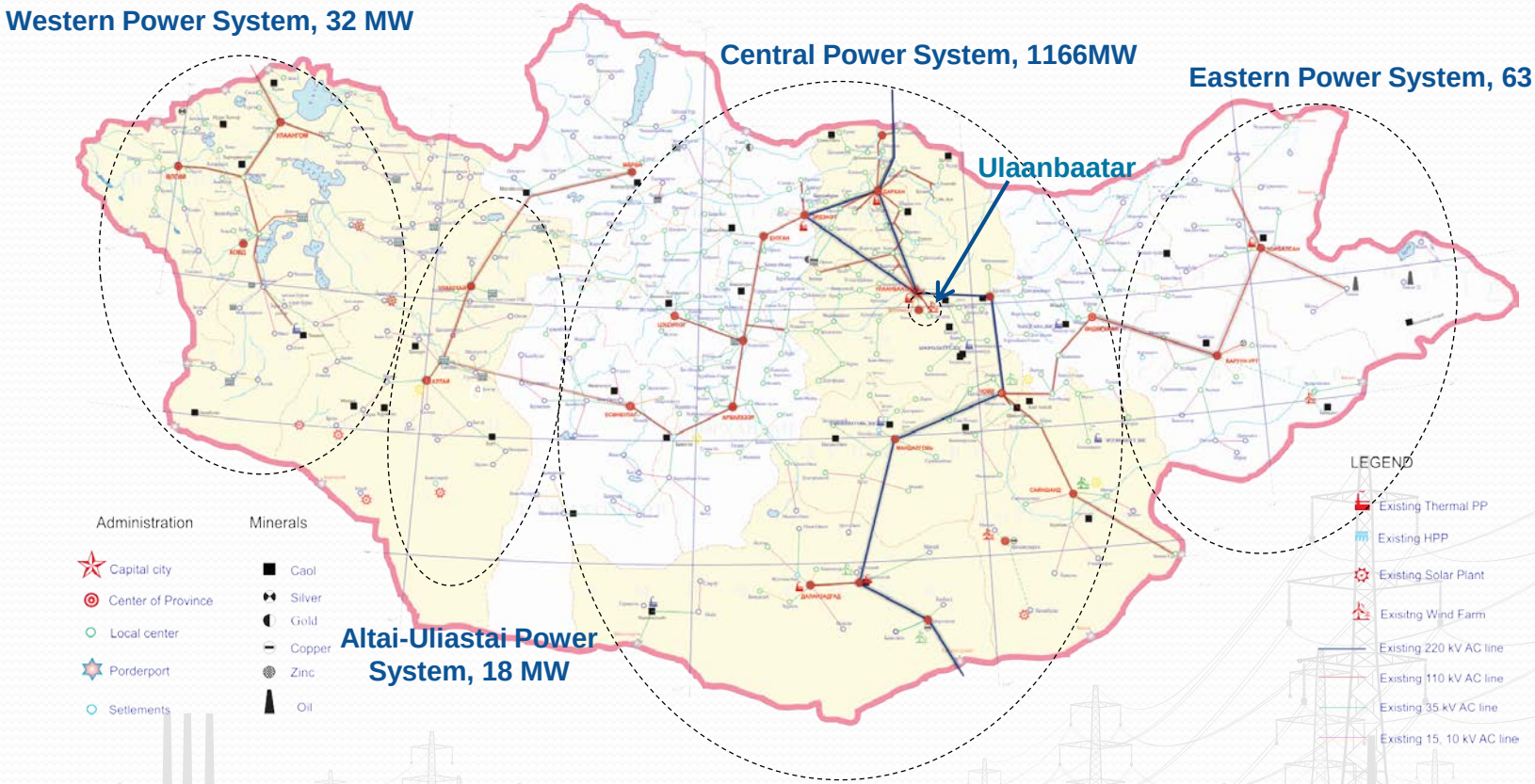

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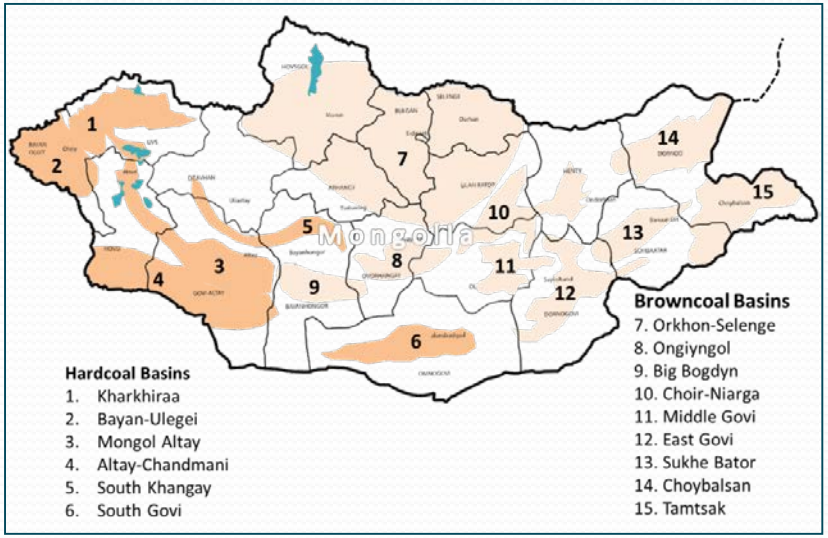
# 2. Reserves of Energy Mineral Resources

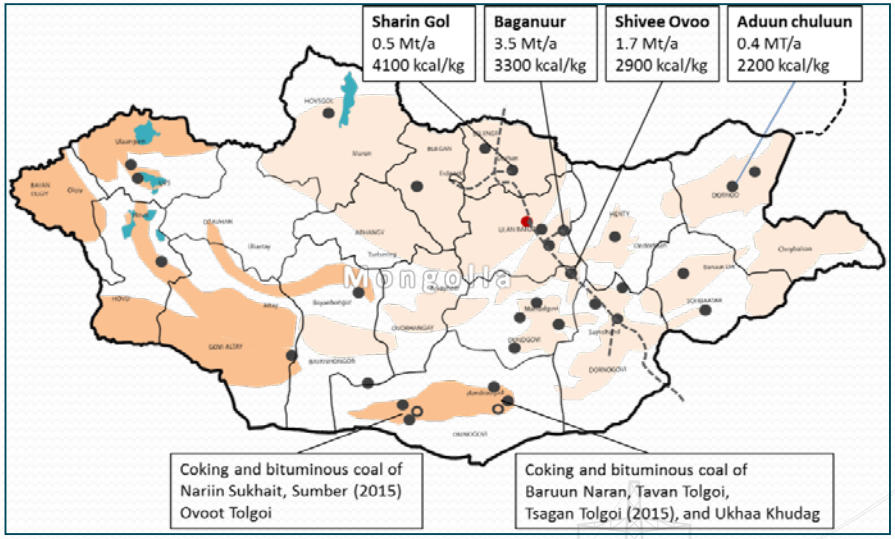
## COAL

### Coal Basins




- Estimated total resources ~ 173 billion ton in 15 coal basins
- Over 370 identified occurrence in 85 deposits
- Proven Reserves 12 billion ton, of which 2 billion is coking coal
- Around 1/3 in Gobi Region
- Around 1/3 in Eastern Region

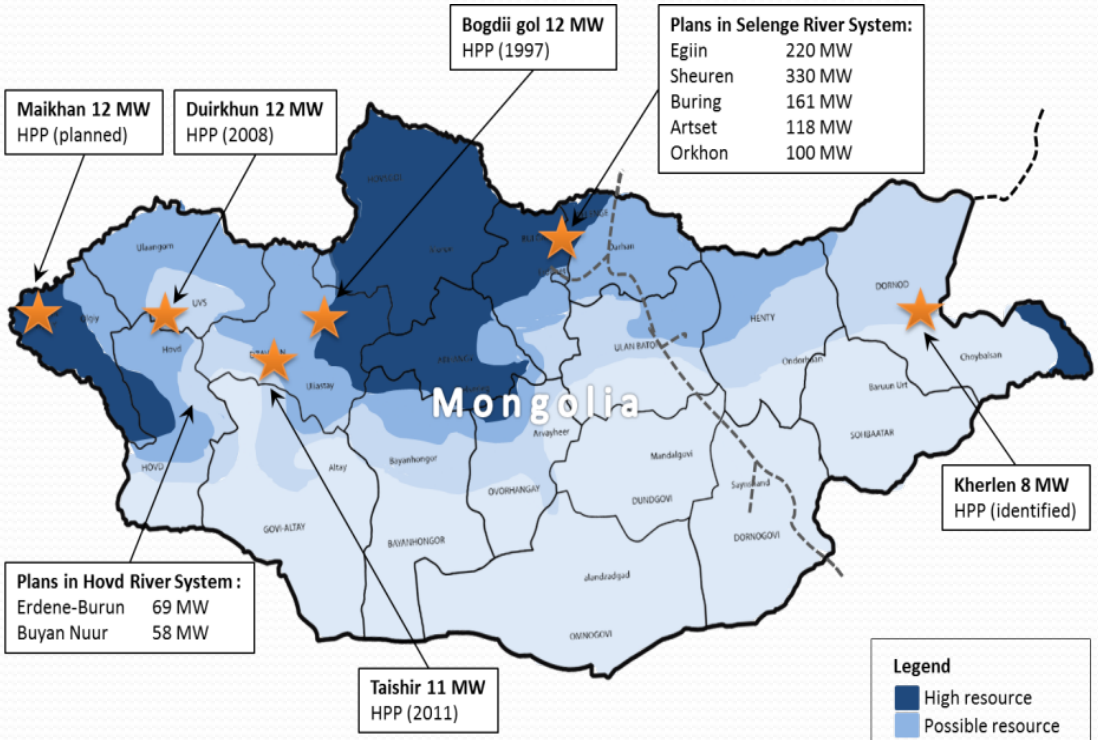
### Key Mines




- Mines in Gobi area are for export /18 million in 2013/
  - Nariin Sulhait
  - Tavan tolgoi
- Mines in other region are for power production and household heating /12 million in 2013/
  - Baganuur, Shivee-Ovoo, Shariin Gol, Aduunchuluun etc.,

# RENEWABLES

- Rich resources of Solar, Wind and Hydro in Mongolia:
- **Solar:** 270-300 sunny days in a year, 4.3-4.7 kWh/meter or higher per day
- **Wind:** 10 % of the total land area can be classified as excellent for utility scale applications, Power density 400-600 W/m$^2$, the resource could potentially supply over 1100 GW of installed capacity.
- **Hydro:** Theoretical potential 6.2 GW, more than 1 GW of these ahs been identified




Source: Energy authority, Renewable Energy Department

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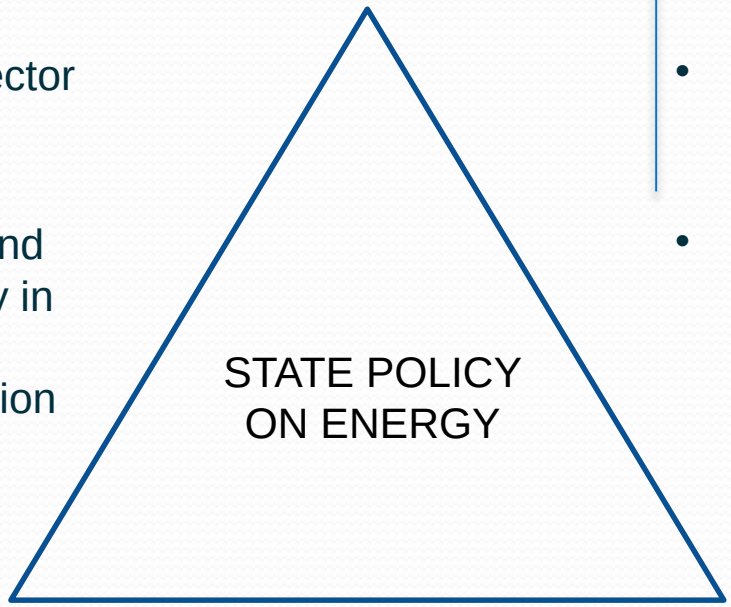
"State Policy on Energy" 2015-2030

# 3. CURRENT ENERGY POLICY AND MEASURES

## PRIORITY AREAS AND STRATEGIC GOALS

### SAFETY

- Ensure energy safety and reliable supply
- Develop mutually beneficial cooperation with regional countries
- Develop a human resource




### EFFICIENCY

- Transfer the state dominated energy sector into private based competitive market
- Support innovation and advanced technology in energy sector, and implement conservation policy

### ENVIRONMENT

- Increase the production share of renewables and reduce negative environmental impact from traditional power generation and greenhouse gas

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# Expected Results

**In the 1st stage 2015-2023:** The stage to develop energy safety resources and backup capacity, establish a foundation for the development of renewable, enhance normal documents and improve legal environment.

- The installed power capacity will be doubled, and start using critical technology with high parameters. Hydro will be taken place at least 10% of the total installed power capacity and it will increase backup capacity to 10%, and create fundament for renewable sector to development intensively, enhance tariff system.

**In the 2nd stage 2024-2030:** The stage to export secondary energy and develop sustainably the renewable sector.

- The backup capacity of power system will be reach at 20% and share of renewables will be reach at 30%. Integrated smart energy system will be created by connecting regions with high capacity transmission lines. State owned Power companies will be become a public company. Distribution and supply service will be privatized and energy sector will be worked as a competitive marked with regulation. Secondary energy will be exported by connecting with North east Asian countries with high capacity DC lines.

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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

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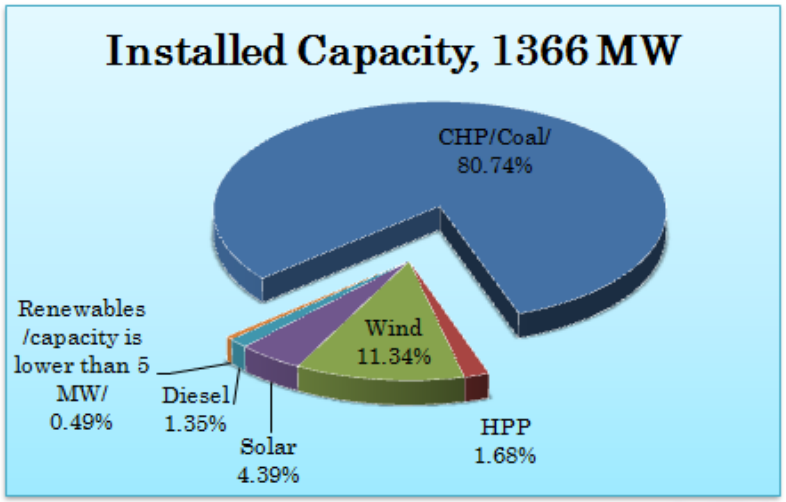
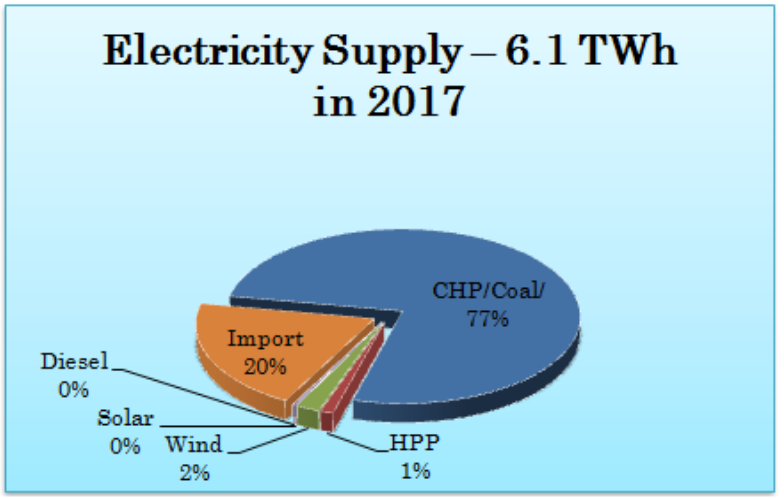
# 4. CURRENT SITUATION OF MONGOLIAN ENERGY SECTOR

The majority of heating and electrical energy is being generated by coal fired thermal power plant and the remaining small amount is from hydro, wind solar and diesel stations. Also we got electricity from Russia, which takes 20 percent of our electricity supply.




GWh

| Generation set | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|
| Combined heat and power plant | 4,775.5 | ,014.0 | 5,191.3 | 5,415.8 | 5,555.9 | **5,826.9** |
| Diesel station | 28.7 | 5.4 | 8.2 | 6.0 | 3.8 | **3.7** |
| Solar photovoltaic | - | - | 0.6 | 0.5 | 0.3 | **19.7** |
| Hydro power plant | 52.1 | 59.9 | 66.3 | 59.3 | 84.7 | **84.5** |
| Wind power | - | 52.9 | 125.4 | 152.5 | 157.5 | **154.4** |
| **Total generation** | **4,856.3** | **5,132.2** | **5,391.9** | **5,634.2** | **5,802.4** | **6,089.2** |

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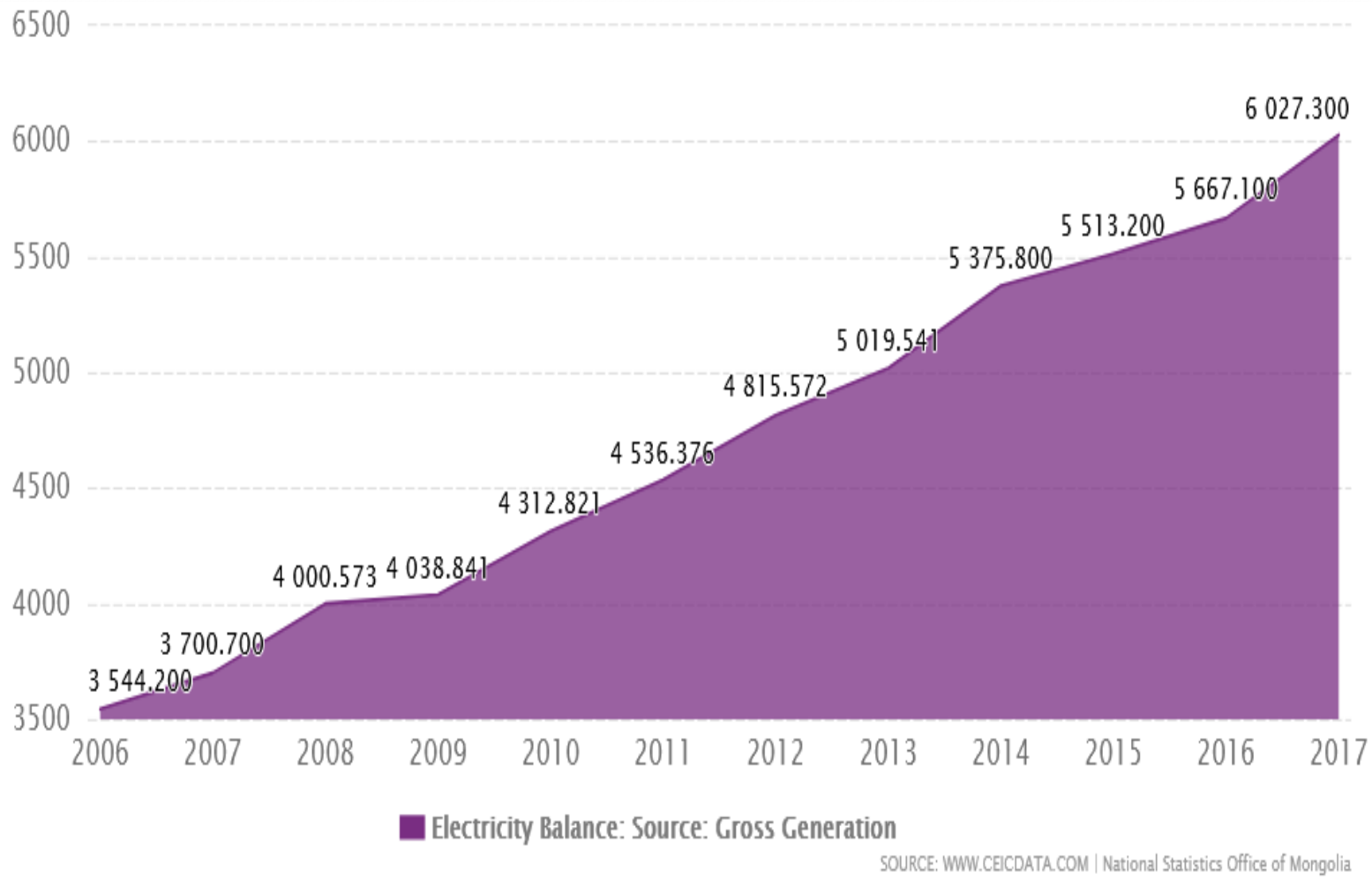

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## Vision

**To fully provide reliable operation of the energy sector, energy security, sustainable development and economic growth of the country and become an energy exporting country with efficient and environmentally friendly technology based on regulated and competitive market dominated by private sector**

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## CO2 EMISSION:

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;

## Electricity tariff for residential

| № | Classification | Unit | Tariff |
|---|---|---|---|
| **1** | ***Simple meter*** | | |
| a | Monthly consumption under 150 kWh | USA $/ kWh | 0.041 |
| b | Monthly consumption over 150 kWh | USA $/ kWh | 0.049 |
| **2** | ***Time use of meter /2 parts/*** | | |
| a | Daytime consumption /06.00 am~21.00 pm/ | USA $/ kWh | 0.043 |
| b | Evening and nighttime consumption / 21.00 pm~ 06.00 am / | USA $/ kWh | 0.032 |
| **3** | ***Monthly base tariff*** | USA $/ kWh | 0.828 |

Remark: Daytime, evening and nighttime tariff will apply duration of the meter hours.

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## TARIFF FOR INDUSRIAL ELECTRICITY CONSUMPTION

The tariff (VAT excluded) for industrial electricity shall be determined depending on the its classification of units of indicators as follows:

| № | Classification | Unit | Tariff |
|---|---|---|---|
| 1 | ***Mining industries*** | | |
| | *These : Coal mining exploration and cultivation* | | |
| | *Oil and gas mining exploration and cultivation* | | |
| | *Iron Mining exploration and cultivation* | | |
| | *Other mining exploration and cultivation* | | |
| **1.1** | Simple meter | USA $/ kWh | 0.065 |
| **1.2** | Time use of meter /3 parts/ | | |
| a | Daytime consumption (06.00 am ~17.00 pm) | USA $/ kWh | 0.065 |
| b | Evining consumption (17.00 pm ~ 22.00 pm) | USA $/ kWh | 0.011 |
| c | Nighttime consumption (22.00 pm~06.00 am) | USA $/ kWh | 0.032 |

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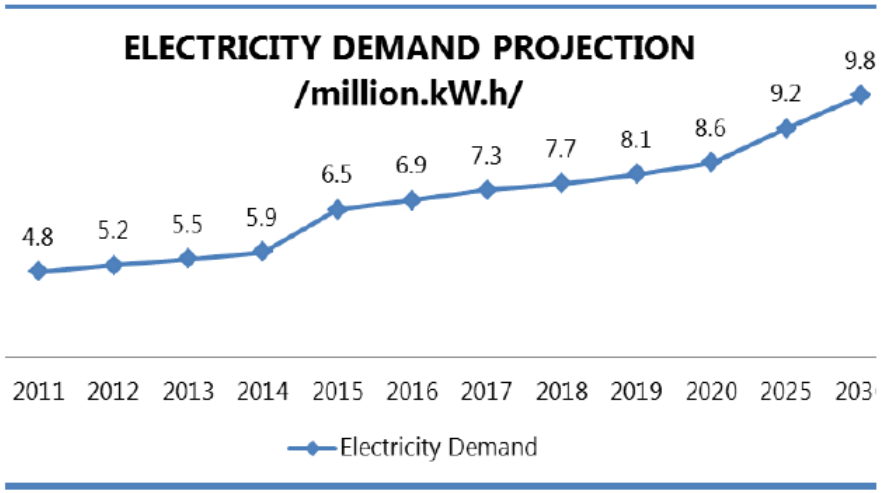
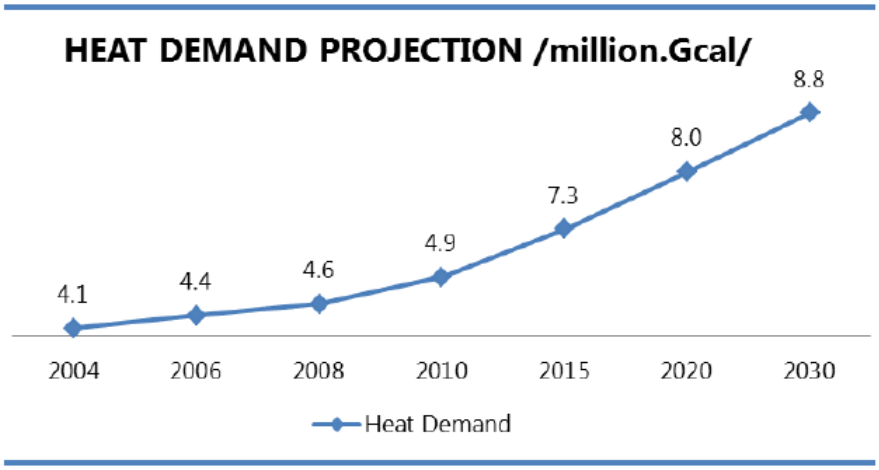
# 5. ELECTRICITY AND HEAT DEMAND INCREASE

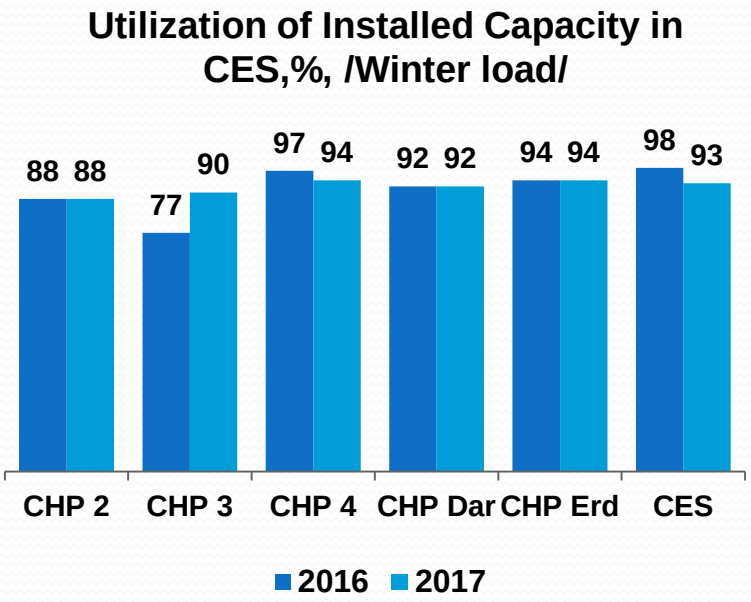


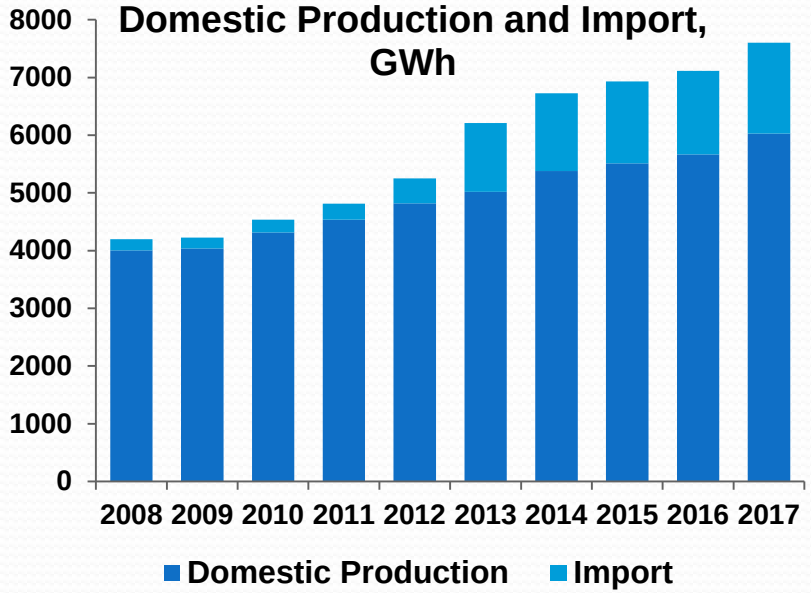




- Heat and electricity demand expected to grow due to the economic development
- Need to secure reliable energy supply which will ensure other sectors development
- Demand increase creates the revenue growth of energy sector

# Recent Challenges:

- Capacity Shortage



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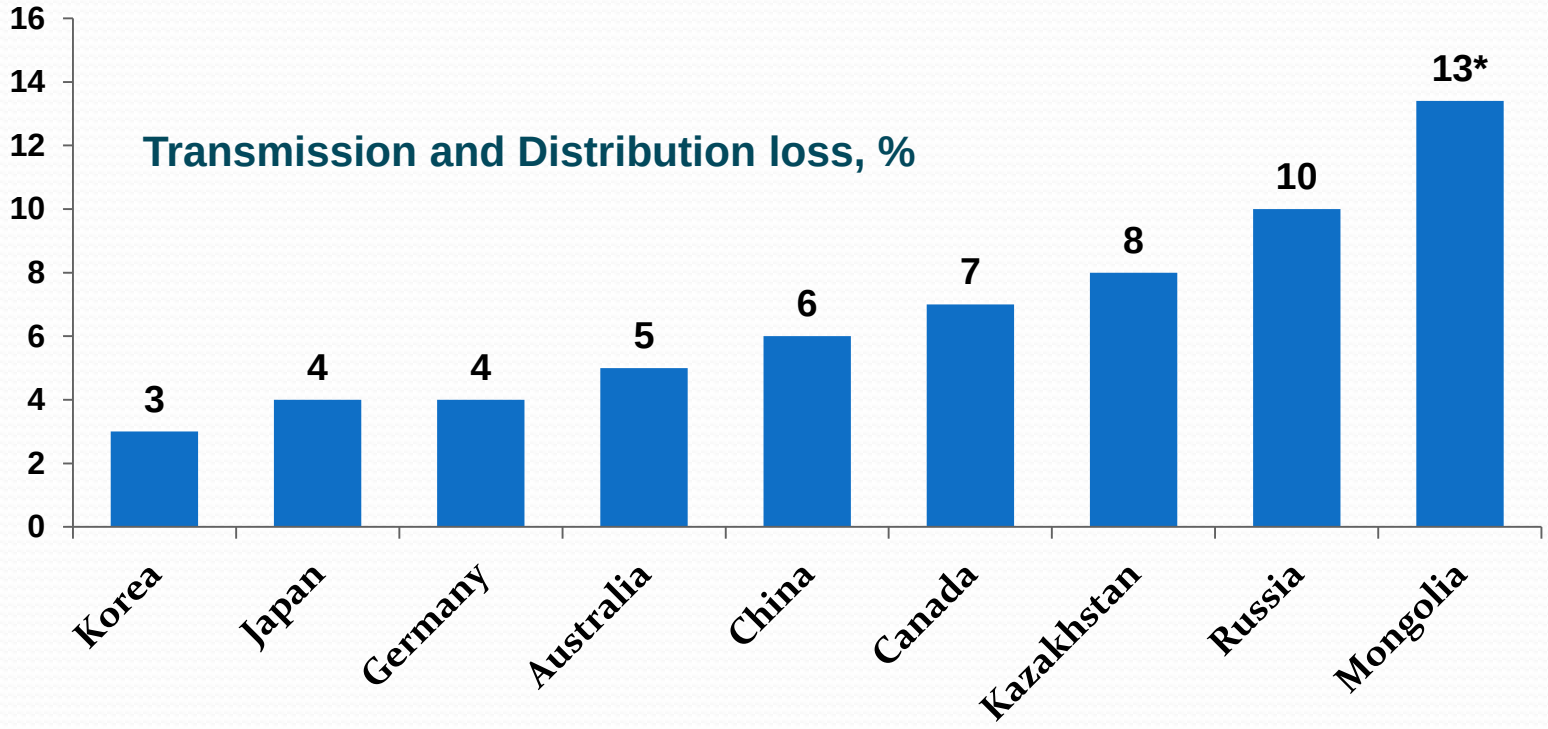
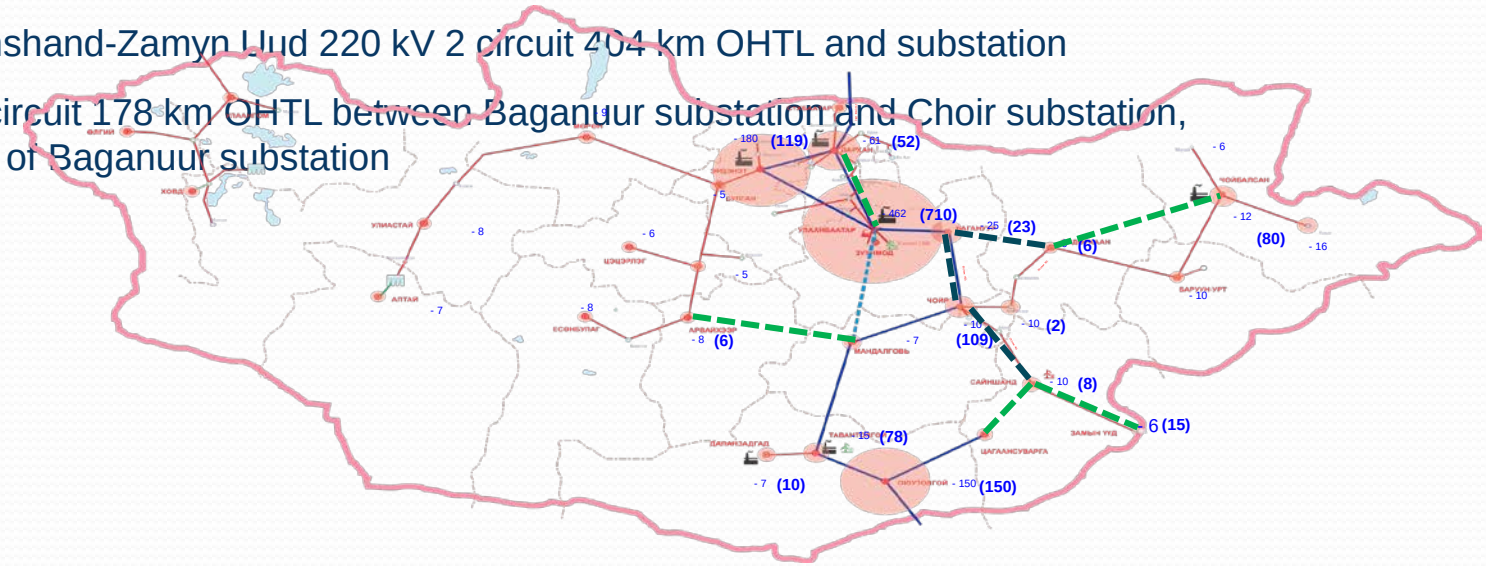
# Recent Challenges:

- Efficiency



# Key projects that need to be implemented in the urgent matter

- Capacity Extension Projects on Existing CHPs in short-term
  - Capacity expansion of CHPP -3's high pressure section 75 MW
  - Expansion of Amgalan heat plant by combined heat and power plant with 50 MW
  - Capacity expansion of CHPP 3 by 250 МВт
  - Capacity expansion of CHPP 2 by 300 MW/ including one block of gas turbine and generator/
- Expansion of regional power transmission networks
  - 220 kV 2 circuit 118 km OHTL between Baganuur substation and Ulaanbaatar substation, and expansion of substations
  - Choir-Sainshand-Zamyn Uud 220 kV 2 circuit 404 km OHTL and substation
  - 220 kV 2 circuit 178 km OHTL between Baganuur substation and Choir substation, expansion of Baganuur substation



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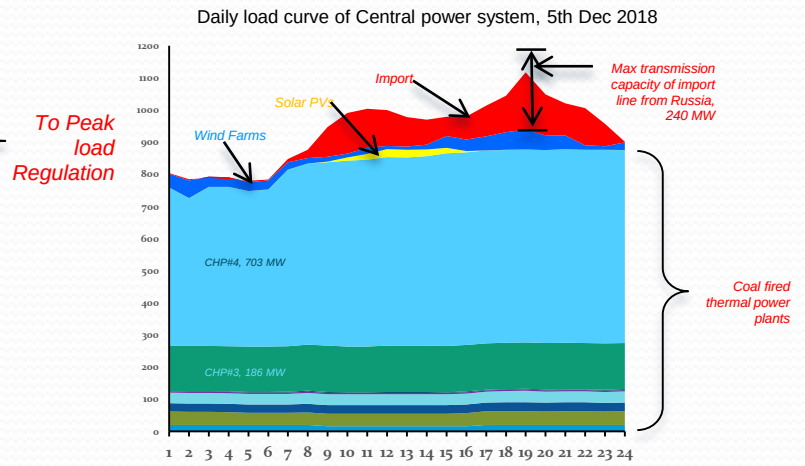
# THE MID-TERM NATIONAL PROGRAM FOR IMPLEMENTATION OF THE STATE POLICY ON ENERGY (2018-2023)

## Key projects that need to be implemented in the urgent matter

Generation recourses to stabilize load fluctuation

- Hydro Power Plants
  - Eg HPP, Erdenburen HPP
- Gas Turbines
  - Create gas turbine units using infrastructure of existing CHP's
- Storages in Central Power System
  - Hydro Pumped storage 100 MW or above
  - Big sized battery storage  100 MW






For planned and potential projects of power plant and transmission lines:

As a financier, Contractor, Equipment supplier, Consulting service

Concession agreement: Built-Operate-Transfer, . . . . . .

Independent Power Producer

For existing power projects:

In the Projects of Operational enhancement and Restructuring:

Operator company

Consultant

In the Projects of Rehabilitation and Capacity Extension:

Investor, Contractor, Equipment supplier, Consulting service

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