MINISTRY OF ENERGY

REGIONAL ENERGY COOPERATION POSSIBILITY FOR MONGOLIA

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MINISTRY OF ENERGY

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- Energy Sector of Mongolia
  - Energy Economic Indices
  - Power Sector
  - Recent Challenges and Policy
- International Cooperation Possibility on Energy
  - Energy Endowments in Mongolia
  - Trade
  - Cooperation Potential

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ENERGY ECONOMIC INDICES

Primary Energy Supply and Economic Indicators

((Unit : 1,000 TOE, %) *

	2000	2005	2010	2012	Жилийн дундаж өсөлт, (%)		
					’00-‘05	’05-’10	’10-’12
Total Primary Energy Supply (1,000 TOE)	2,564	2,800	3,545	8,526	1.8%	4.8%	55.1%
Energy per capita (TOE)	1.06	1.09	1.27	2.97	0.5%	3.1%	52.7%
Population (thousand)	2,408	2,562	2,781	2,868	1.3%	1.6%	1.6%
GDP (billion tog, at 2005 constant price)	2,100	2,780	4,154	5,438	5.8%	8.4%	14.4%
Energy/GDP Intensity (TOE/million Tog)	1.22	1.01	0.85	1.57	-3.8%	-3.3%	35.5%
Import Dependency (%)	19.4%	21.4%	25.6%	15.5%	1.9%	3.7%	-22.2%

Domestic Production, Import and Export

((Unit : 1,000 TOE, %) *

	2000	2005	2010	2012	Жилийн дундаж өсөлт, (%)		
					’00-‘05	’05-’10	’10-’12
Indigenous Production	2,019	3,592	11,591	14,038	12.2%	26.4%	10%
Import	497.1	597.9	908.9	1321.7	3.8%	8.7%	20.6%
Export	3	1,405	9,028	6,227	236%	45.1%	-16.9%
Total Domestic Energy Supply	2,564	2,800	3,545	8,526	1.8%	4.8%	55.1%

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

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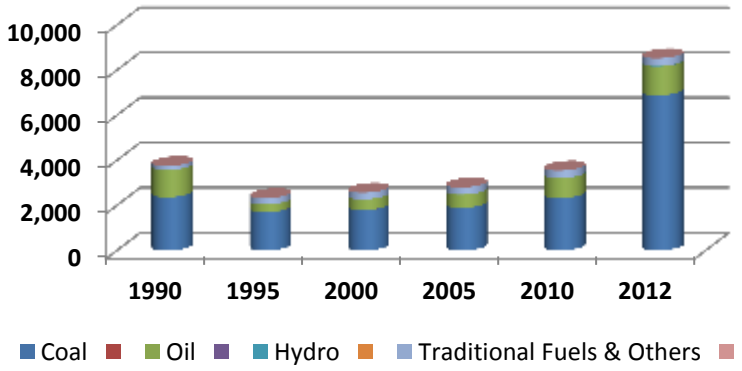
ENERGY ECONOMIC INDICES

Structure of Primary Energy Supply by Source

(Unit : 1,000 TOE, %)*

	2000	2005	2010	2012	Жилийн дундаж өсөлт (%)		
					'00-'05	'05-'10	'10-'12
Coal	1,798	1,895	2,324	6,884	1.0%	4.2%	72.1%
	70.2%	67.7%	65.6%	80.7%			
Oil	472	584	879	1,284	4.3%	8.5%	20.9%
	18.4%	20.9%	24.8%	15.1%			
Hydro	0.25	0.28	4.73	8.96	2.1%	76.0%	37.6%
	0.01%	0.01%	0.13%	0.11%			
Traditional Fuels & Others	293	321	337	348	1.8%	1.0%	1.6%
	11.4%	11.5%	9.5%	4.1%			
Total	2,564	2,800	3,545	8,526	1.8%	4.8%	55.1%
	100.0%	100.0%	100.0%	100.0%			

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



Trend in Supply Share

(2000→2005→2010 →2012, %)

- Coal ↓: 70.2 →67.7 →65.6 ↑ →80.7
- Petroleum Products ↑: 18.4 →20.9 →24.8 →15.1
- Hydro ↑ : 0.01→0.01 →0.13 →0.11
- Traditional Fuels & Others ↓: 11.4 →11.5 →9.5 →4.1

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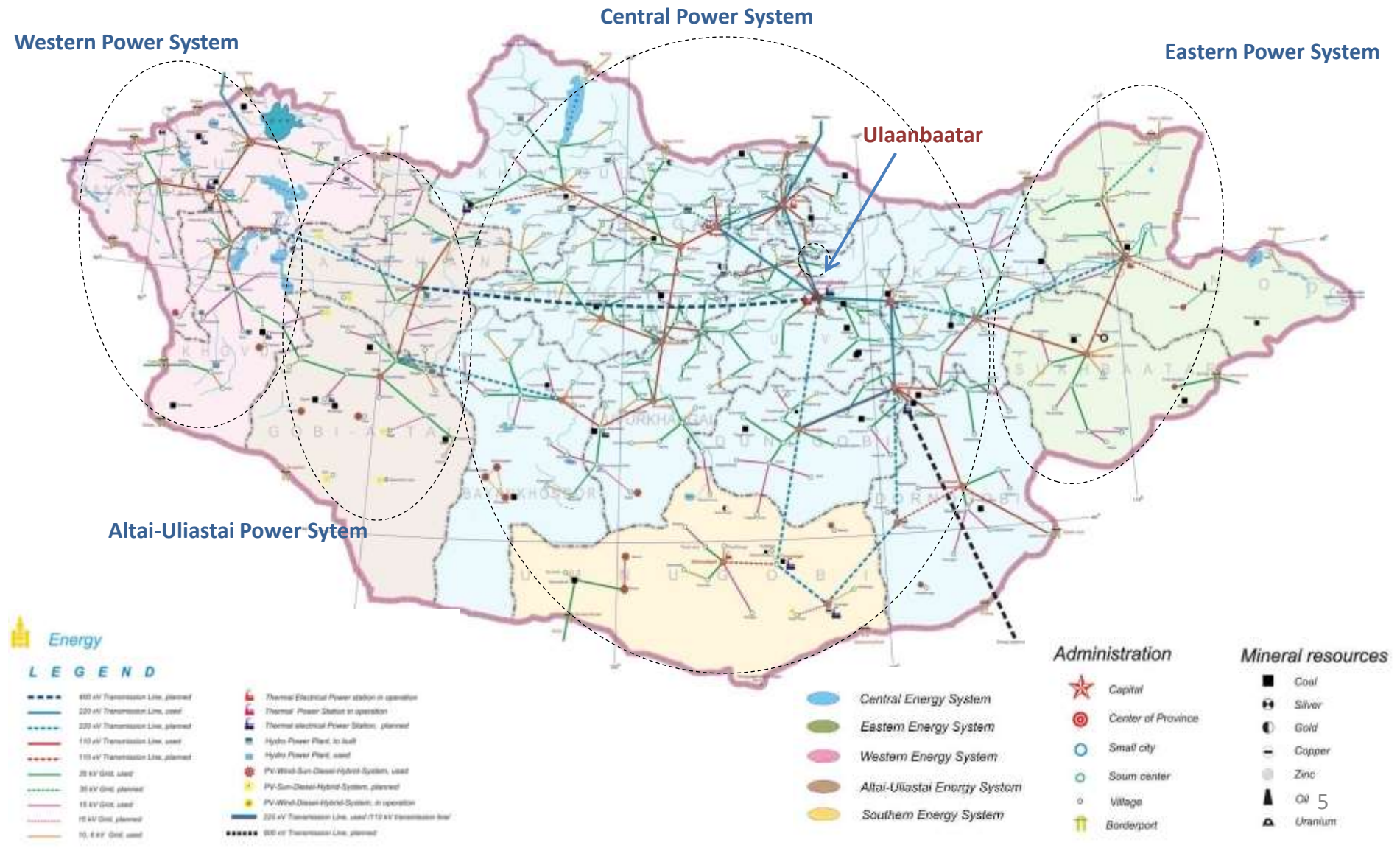
POWER SECTOR OF MONGOLIA



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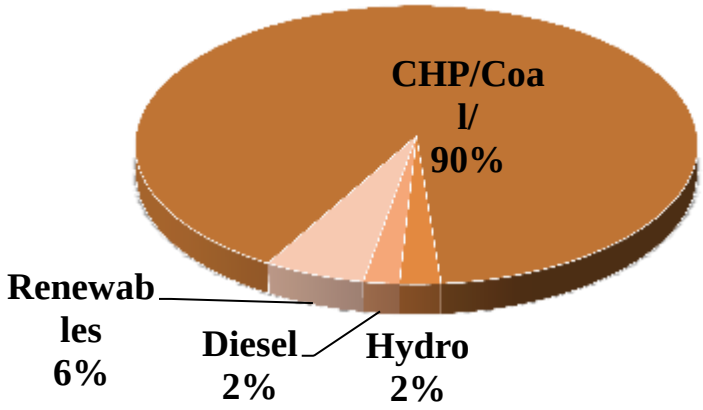
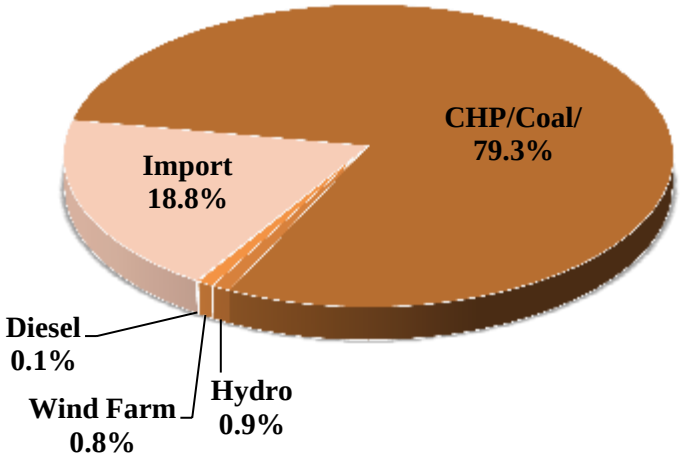
POWER SECTOR OF MONGOLIA

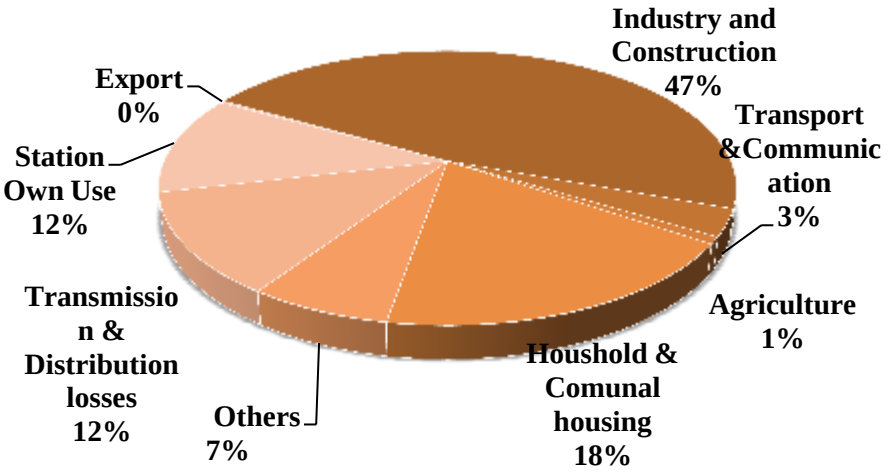
Total Installed Capacity of Power Plants-1090 MW, by type



Electricity Production + Import, 2013 by type of sources, total 6.3 bln.kWh,



Structure of Electricity Consumption by Sector



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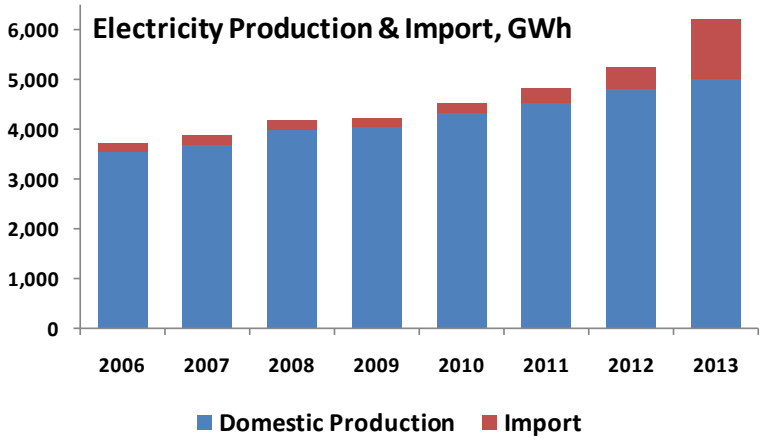
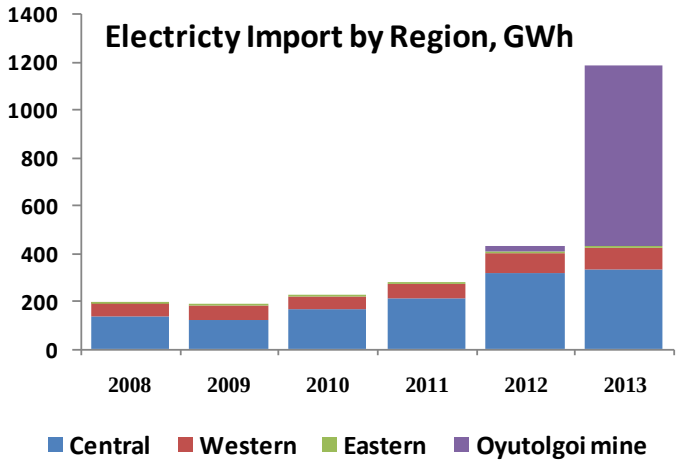
RECENT CHALLENGES AND POLICY

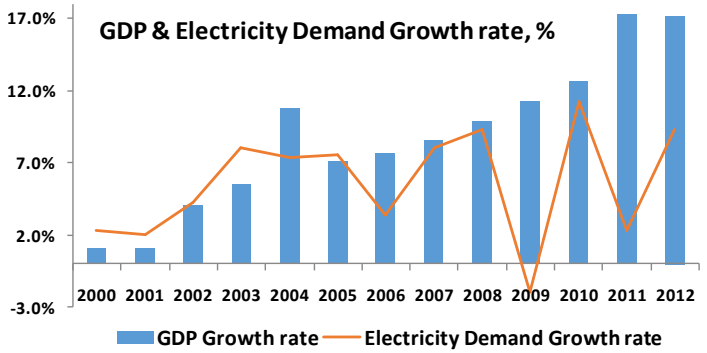
1) **Capacity shortage** on Domestic Power Generation due to:

- Rapid GDP Growth & Intensively Growing demand of Electricity and Heat





- Time Lags of the Power Plant Projects
  - Lack of Investment
    - Low capacity of State Budget
    - Precaution of Investors
      - » Low tariff of Domestic Power System
      - » Uncertainty of Investment Environment



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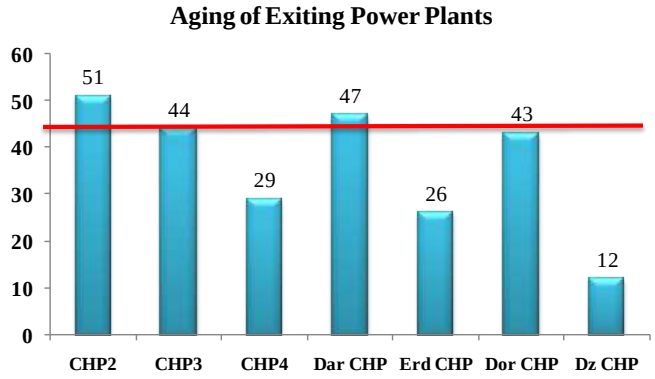
RECENT CHALLENGES AND POLICY

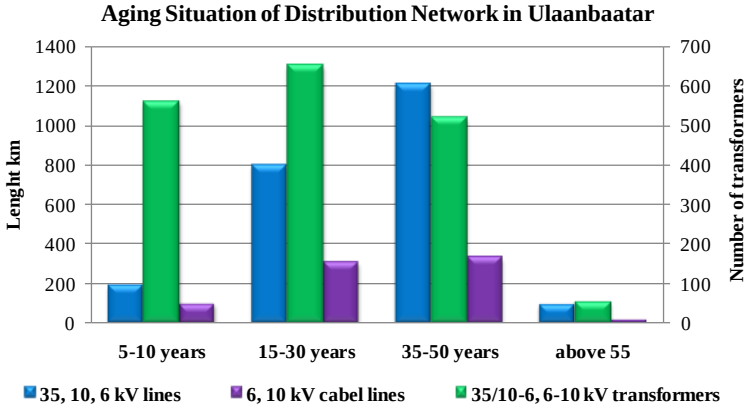
2) Lower Efficiency of Existing Power Plants due to:

- Aging of main equipments
- Insufficient financial capacity for Rehabilitations
  - Tariff
  - Low Capacity of State Budget



3) Higher Loss of Transmission & Distribution Network due to:

- Long transmission & distribution lines to lower demand – lowest population density in the world
  - Social issues for people in remote area
- Overload in distribution network in the cities
  - Time lag on capacity extension on rehabilitation
    - Lack of investment
- Aging of distribution network
  - Time lag on rehabilitation
  - Lack of Investment



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RECENT CHALLENGES AND POLICY

- In the framework for ensuring safety and reliability of power sector

  Commence the planned projects:

  - CHP 5 of Ulaanbaatar Project,
  - Tavan Tolgoi Power Plant Project,
  - Eg Hydro Power Plant Project

- In the framework for improving efficiency:
  - Reduce loss in transmission and distribution network
  - Develop demand side management

- In the framework for developing renewable and environmental protection:
  - Strengthen the renewable energy fund and its activities

- Improve financial capacity of power sector
  - Renew tariff system
  - Increase private sector share in power sector

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INTERNATIONAL COOPERATION POSSIBILITY

Energy Endowments in Mongolia

Mongolia is among the top ten mineral richest countries in the world with only 17 percent of its vast territory properly explored.

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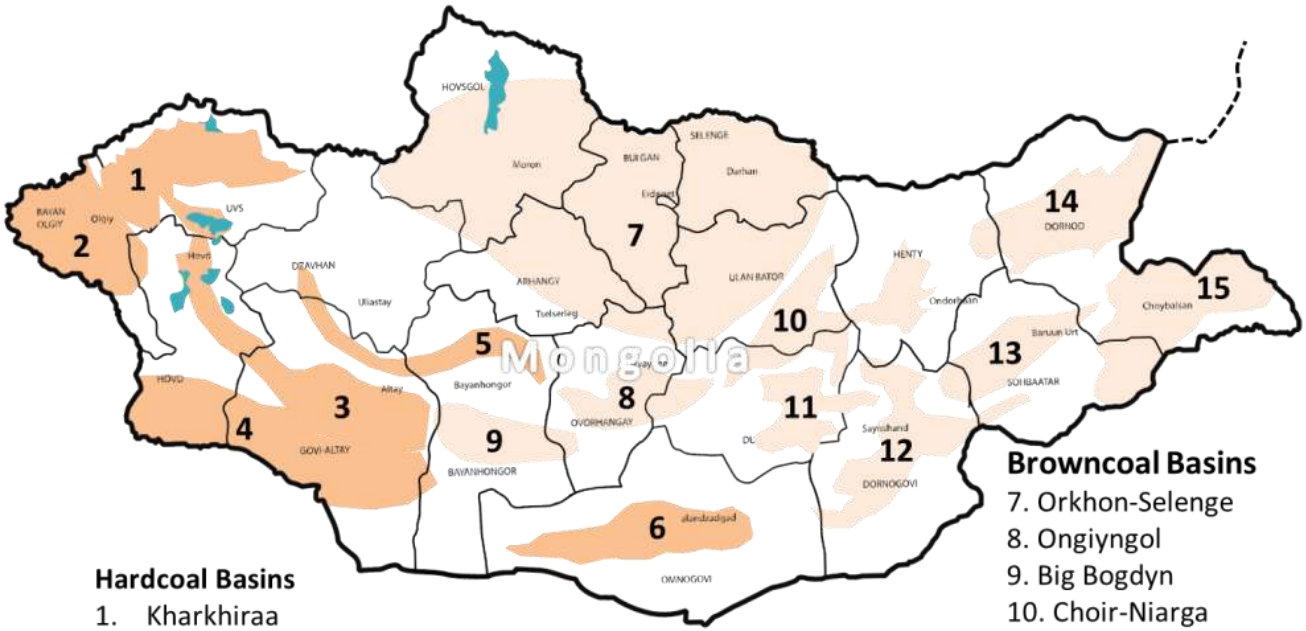
COAL RESOURCE



Hardcoal Basins

1. Kharkhiraa
2. Bayan-Ulegei
3. Mongol Altay
4. Altay-Chandmani
5. South Khangay
6. South Govi

Browncoal Basins

7. Orkhon-Selenge
8. Ongiyngol
9. Big Bogdyn
10. Choir-Niarga
11. Middle Govi
12. East Govi
13. Sukhe Bator
14. Choybalsan
15. Tamtsak

- **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**

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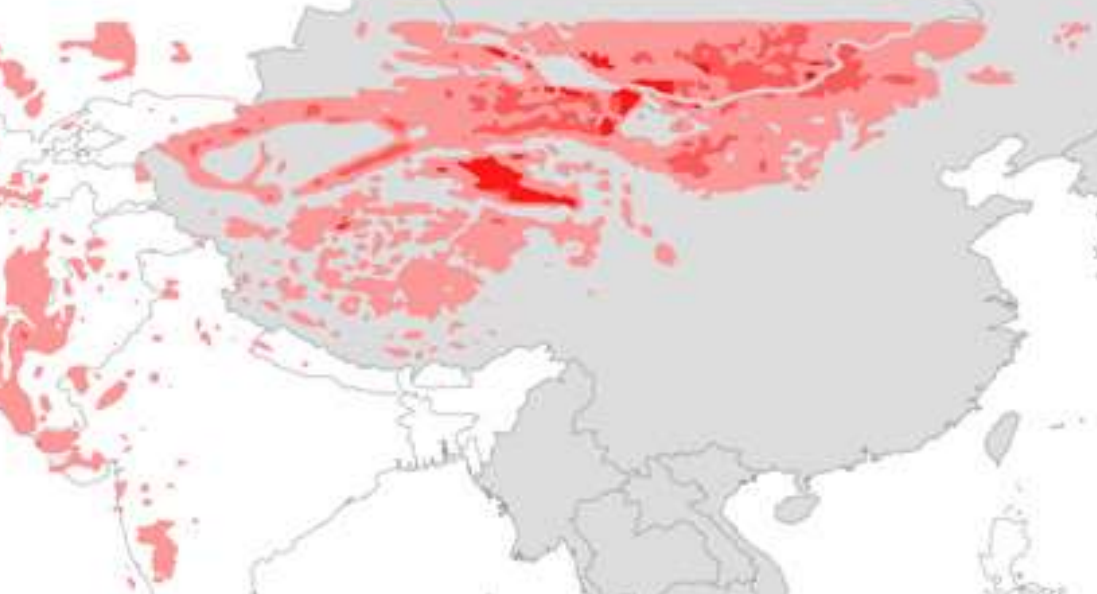
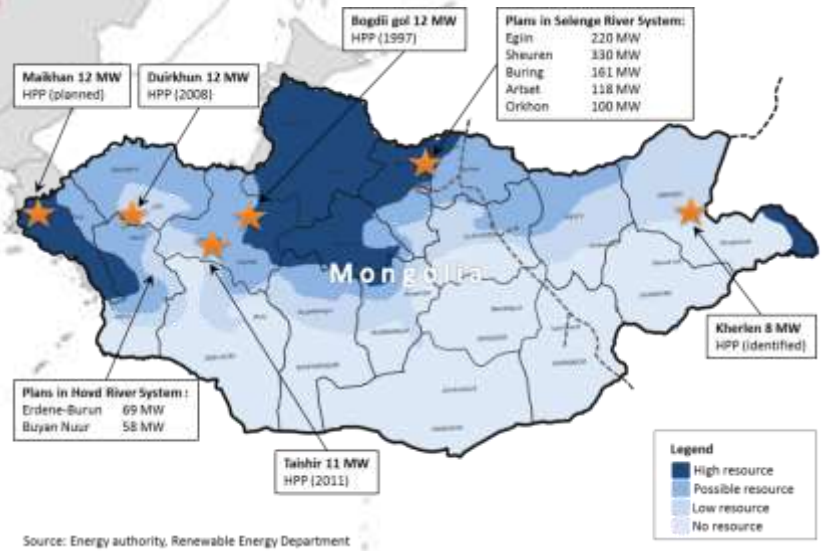
RENEWABLE RESOURCE

- 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



Asia Solar Radiation



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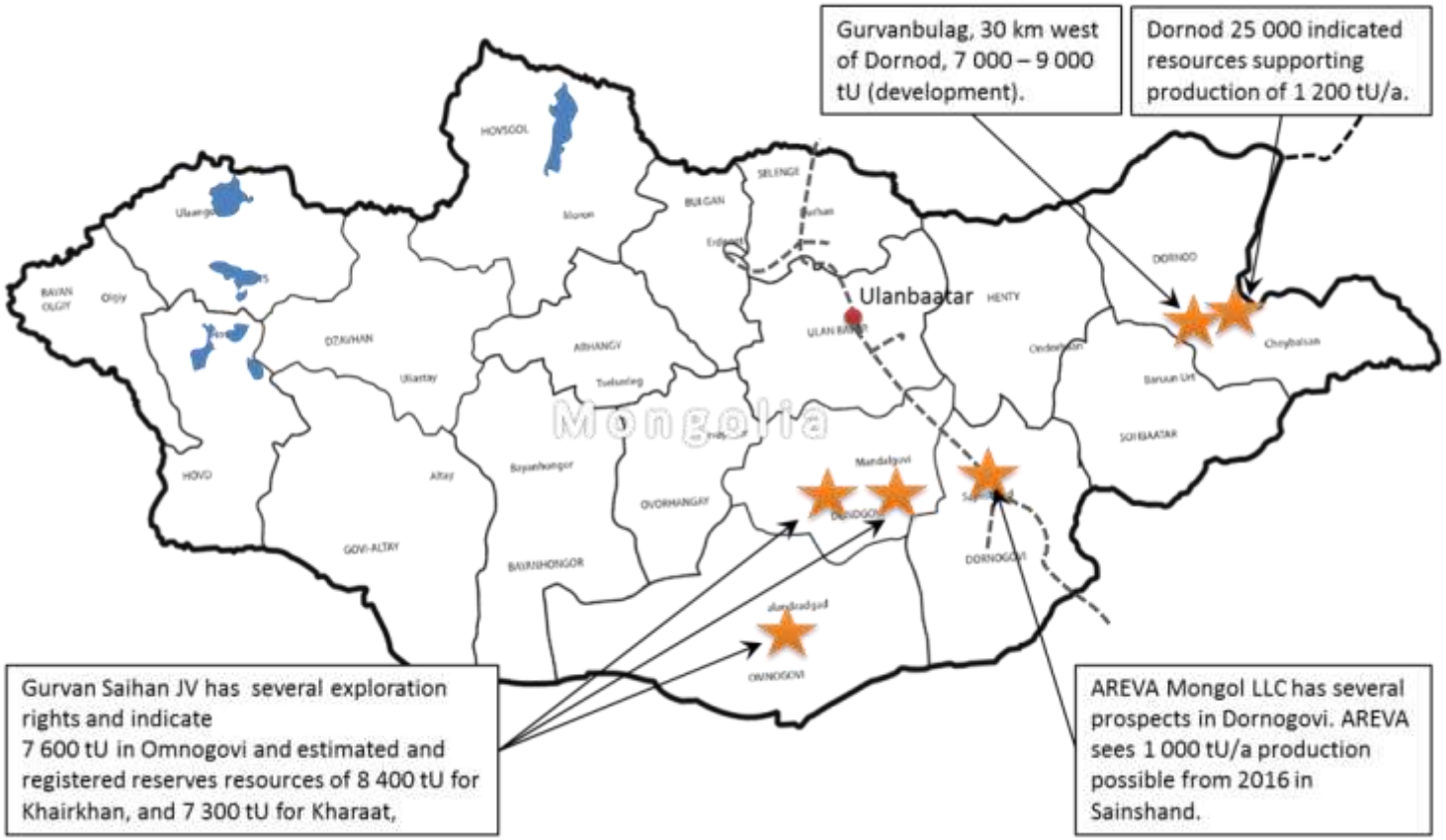
URANIUM



- **Six uranium strata and more than 100 uranium deposits.**
- **Reasonably assured resources - 37,500 tU**
- **Inferred conventional resources - 11,800 tU,**
- **Totally 49,300 tU (IAEA, Uranium Resources 2009)**

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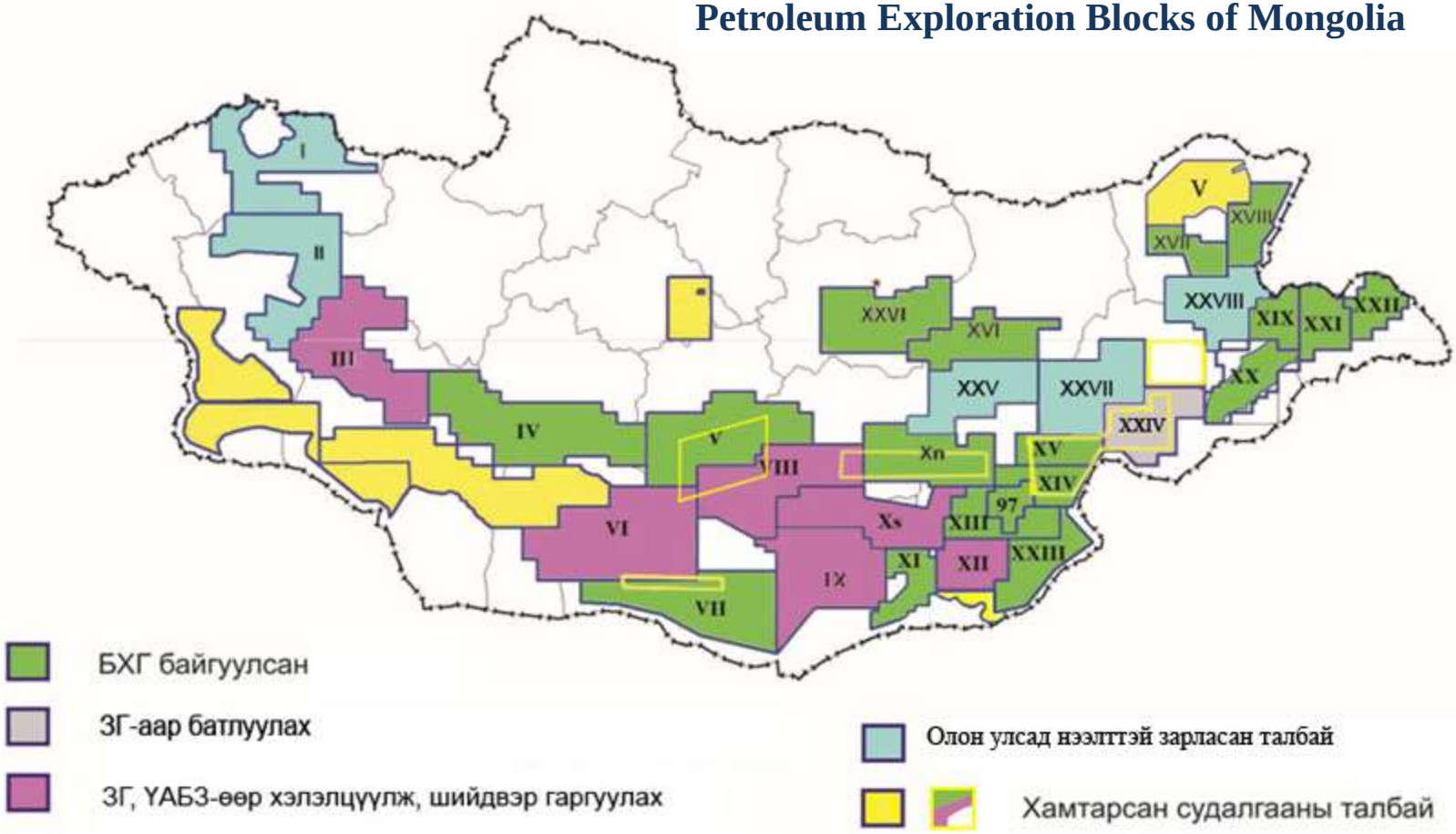
OIL

Petroleum Exploration Blocks of Mongolia



- **Total 31 exploration blocks**
- **Current Proven reserve is 332 million ton**

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ENERGY TRADE

Energy Production and Imports/Exports by Source in 2012, 1,000 TOE

2012	Production	Import	Export	Total Domestic Supply
Coal	10,964	0.0	-8,738	2,324
Oil	479	0.0	-479	0.0
Petroleum Productions	0.0	1,284	0.0	1,284
LNG	0.0	0.0	0.0	0.0
Electricity	415	37	-1.8	450
Heat	932	0.0	0.0	932
Traditional Fuels & Others	337	0.0	0.0	337
TOTAL	13,127	1,321	-9,219	5,327

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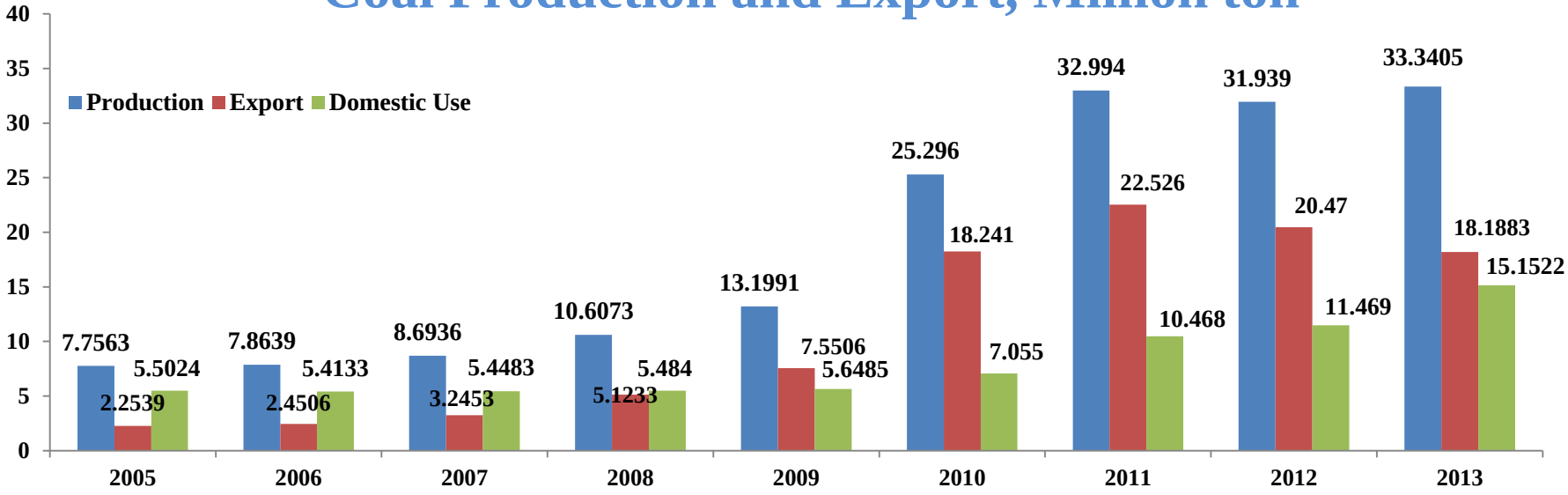
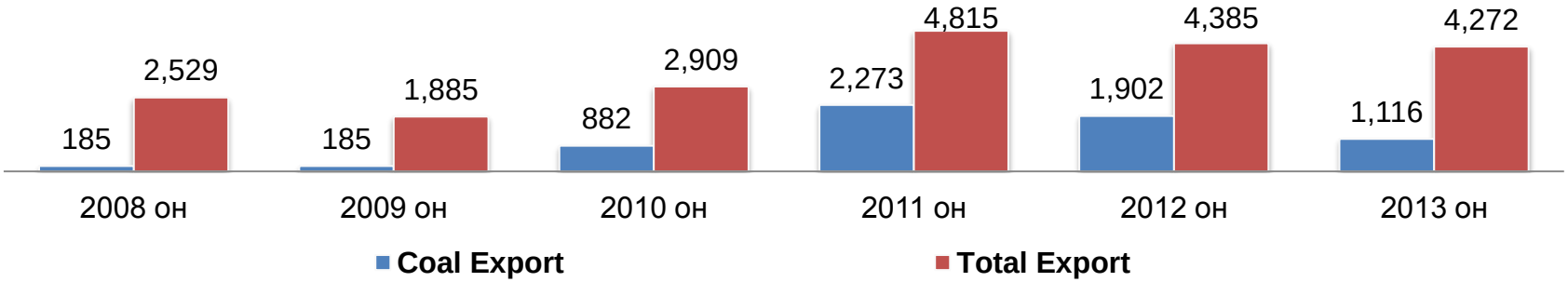
ENERGY TRADE

Coal Production and Export, Million ton



Share of Coal Export on Total Export of Mongolia /Million USD/



Comment: Coal export takes 25 % of total export of Mongolia

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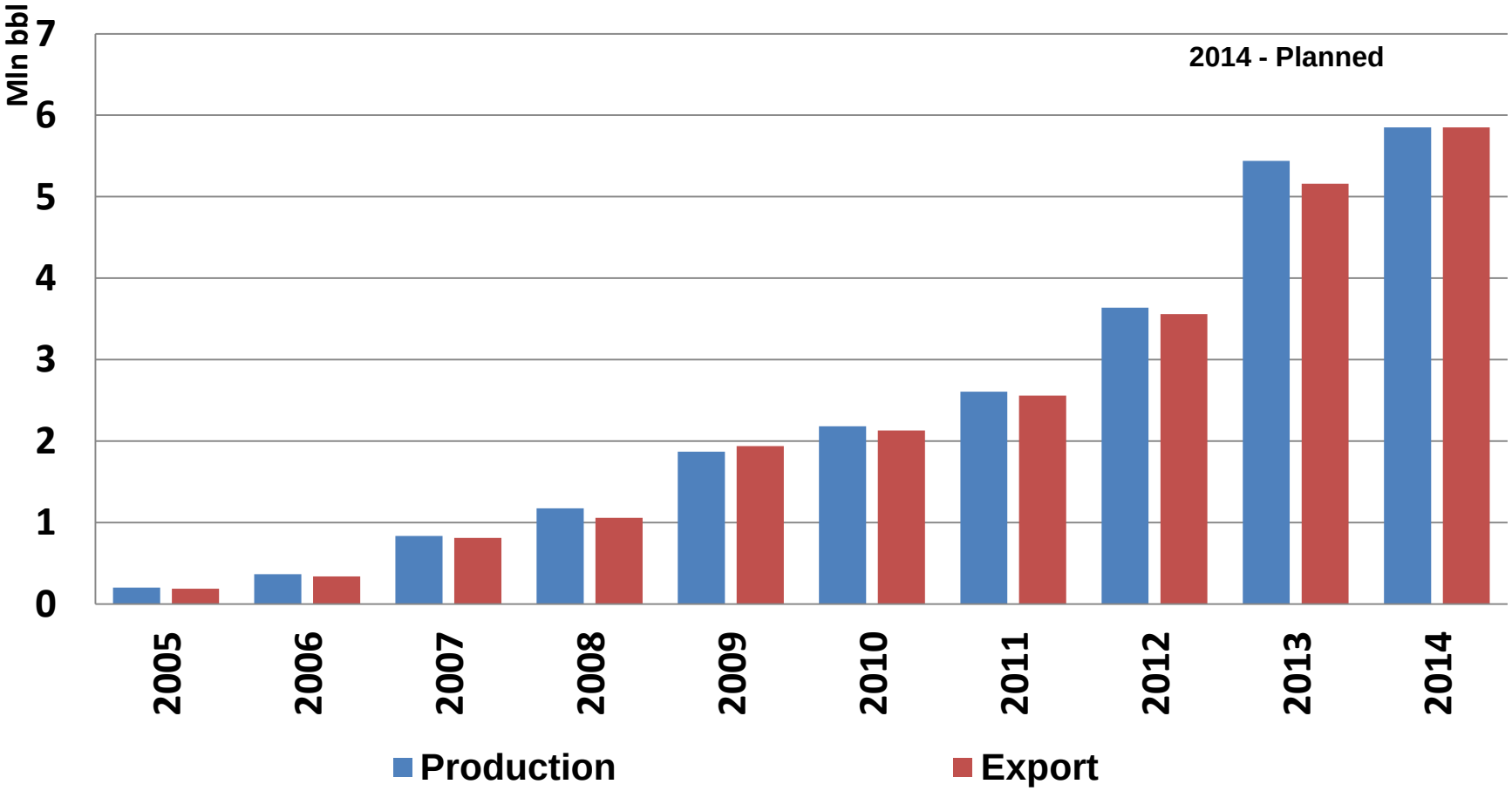
ENERGY TRADE

Crude Oil production and Export, bbl, 2005-2013



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COOPERATION POTENTIAL

Recourse Based Power Trade

Coal Based

- **On-Site Electricity Production for Purpose of Export.**
  - **Abundant thermal coal resources in Mongolia**
  - **China, Korea, Japan lead its Electricity demand in the region**
  - **One of the potential ways to support economic development for Mongolia**

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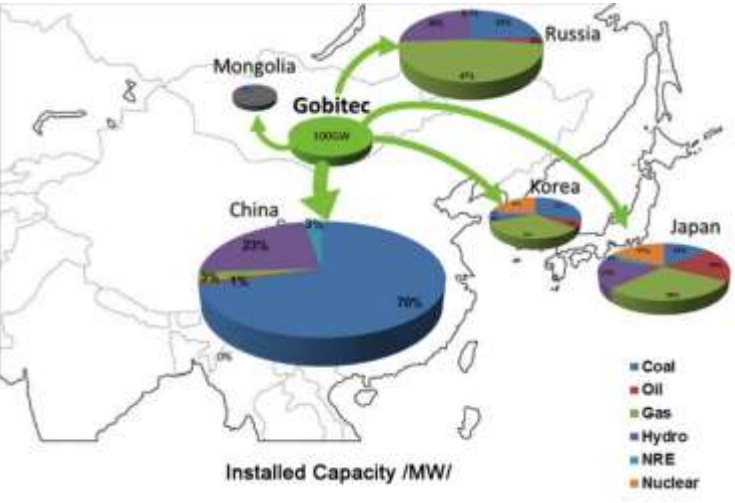
COOPERATION POTENTIAL

Recourse Based Power Trade

Renewable based

- Rich Solar and Wind Rich Resources in Gobi Area /Southern part of Mongolia and Northern part of China/
- Green and Sustainable Energy
  - Gobi Tec and Asia Super Grid Initiative



Resource: "GOBITEC AND ASIAN SUPER GRID FOR RENEWABLE ENERGIES IN NORTHEAST ASIA" Report 2014

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COOPERATION POTENTIAL

Russia-China Infrastructure Interconnection through Mongolia

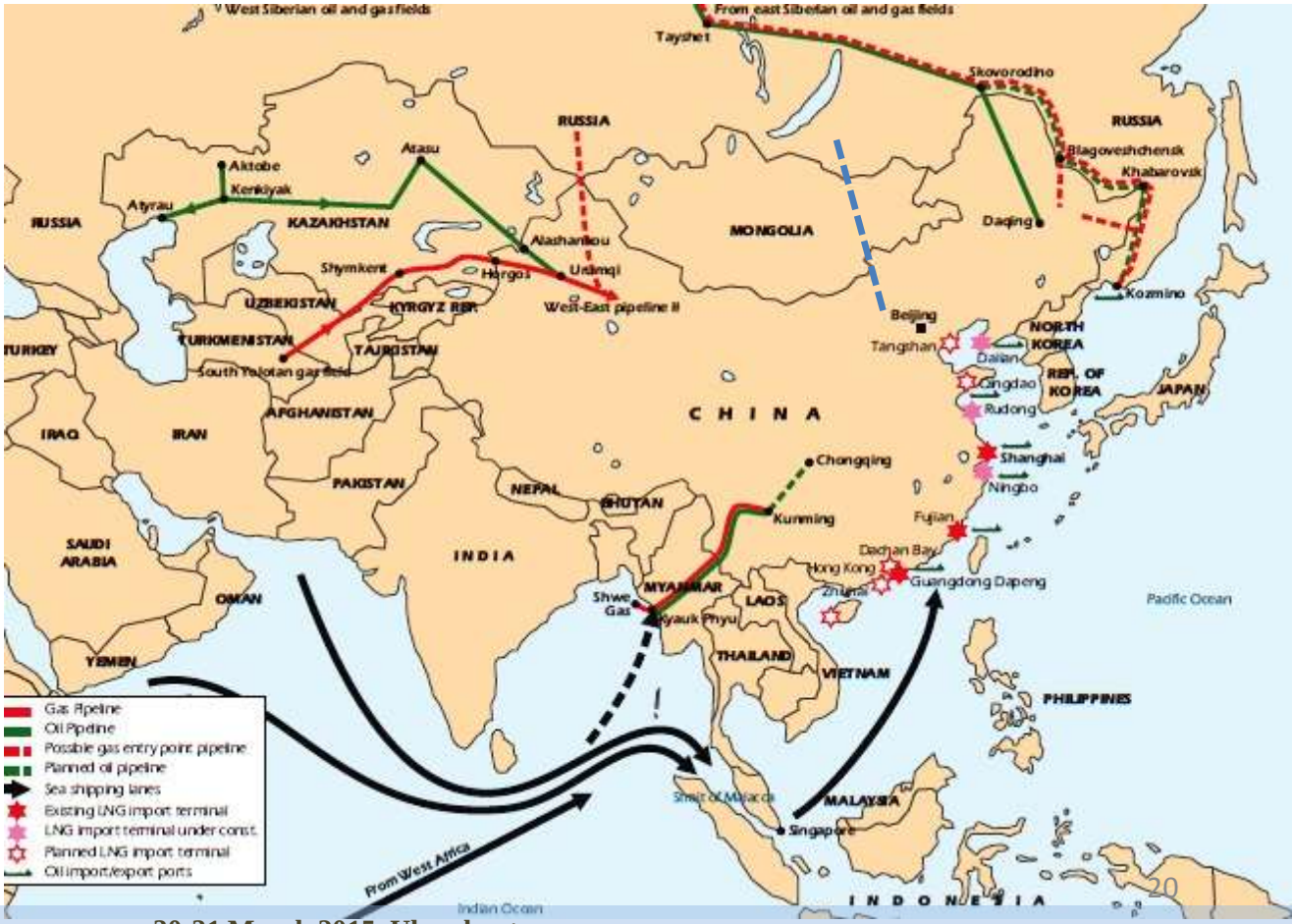
Taliin Zam /Field Gate/ Initiative

It can be:

- Gas Pipeline
- Oil Pipeline
- HVDC Line
- Rail
- High Way

It saves:

- Distance
- Investment



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INTERNATIONAL COOPERATION POSSIBILITIES

Mongolian Involvement for Regional Energy Economic Multinational Initiatives

- Central Asian Region
  - **The Central Asia Regional Economic Cooperation (CAREC) Program** –
    - Membership: Central Asia countries and multilateral development partners, /ADB, WB support /
- North-East Asian Region
  - **Greater Tumen Initiative** - Intergovernmental Cooperation Mechanism among four countries: China, Mongolia, Korea and Russian, supported by UNDP from 1995. /Government subsidy of member countries/
  - **The Intergovernmental Collaborative Mechanism on Energy Cooperation in North-East Asia Energy Cooperation in North-East**– North Asian Countries from 2005 /active participation of China, Mongolia, Korea and Russian/, /financial support from Korean Energy Economic Institute/

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INTERNATIONAL COOPERATION POSSIBILITIES

Grid Interconnection and Multinational Power Pool Development

- European union – developed
- Latin America- developed
- Africa – developing
- South Asia -developing
- Central Asia – started
- North East Asia - ?
  - Need strong leadership from Russia, China and Multilateral Development Organization

Thank you

Website: http://www.energy.gov.mn/