

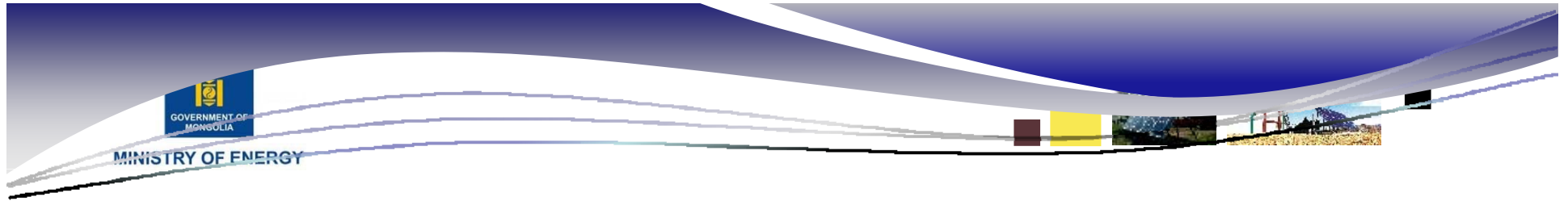


MINISTRY OF ENERGY



Existing and planned renewable energy projects in Mongolia

2nd December, 2013



Overview

- Renewable energy utilization
- Policy support for renewable energy
- International cooperation on Renewable energy
- National Renewable Energy Program and Update
- Planned renewable energy projects

Renewable energy utilization



•Totally 143146 nomadic households using solar and wind home systems, capacity 7.1 MW. (101146 – Govt., 43000 - market)

•**19.3 % of total population.**

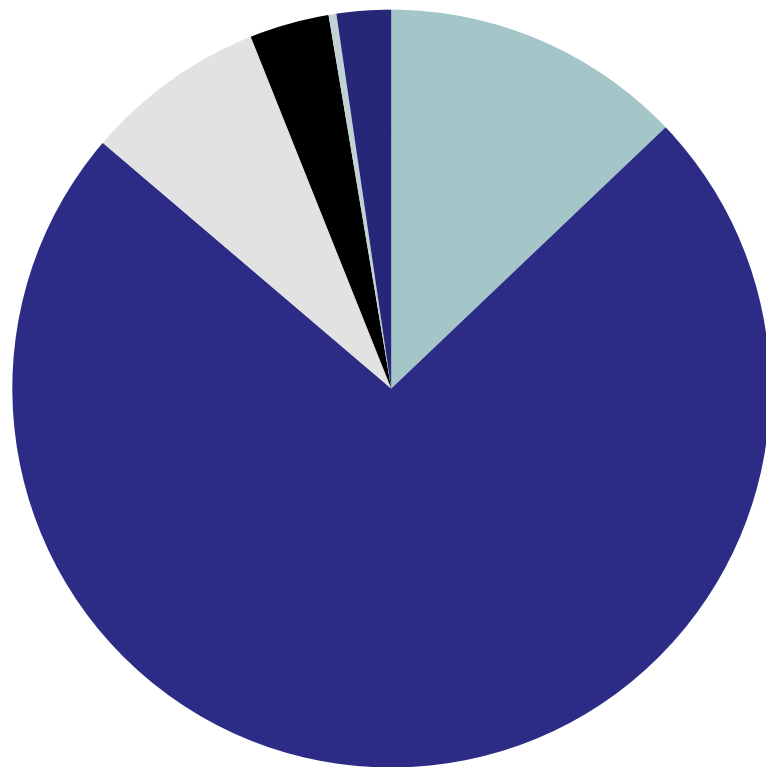
•14 soum centers using wind and solar diesel hybrid power plants, capacity is to reach 1.43 MW.

•4 mobile operator company`s, 321 soum centers telecommunication offices, army`s, television transmission towers and ... etc. using like as backup power source.

•**64 % of total population.**

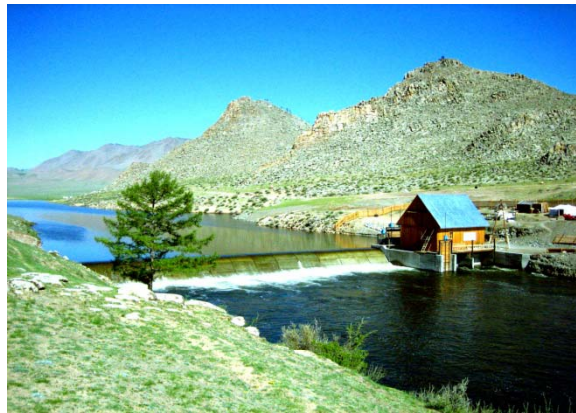
•Renewable energy utilization

•Solar energy applications 9912.63 kW.



- 1277 кВт Solar plants
- 7270 кВт Solar home systems
- 336 кВт Mobile operator companies
- 766 кВт Telecommunication offices
- 32.7 кВт Hospitals and schools
- 229.5 кВт Others

Renewable energy utilization



- In territory of 4 provinces installed 9 hydro power plants with 28.1 MW supplying 93 soum centers of 5 provinces.



- 97.1 thousand households,
- 406.7 thousand people
- 14.6 % of total population.

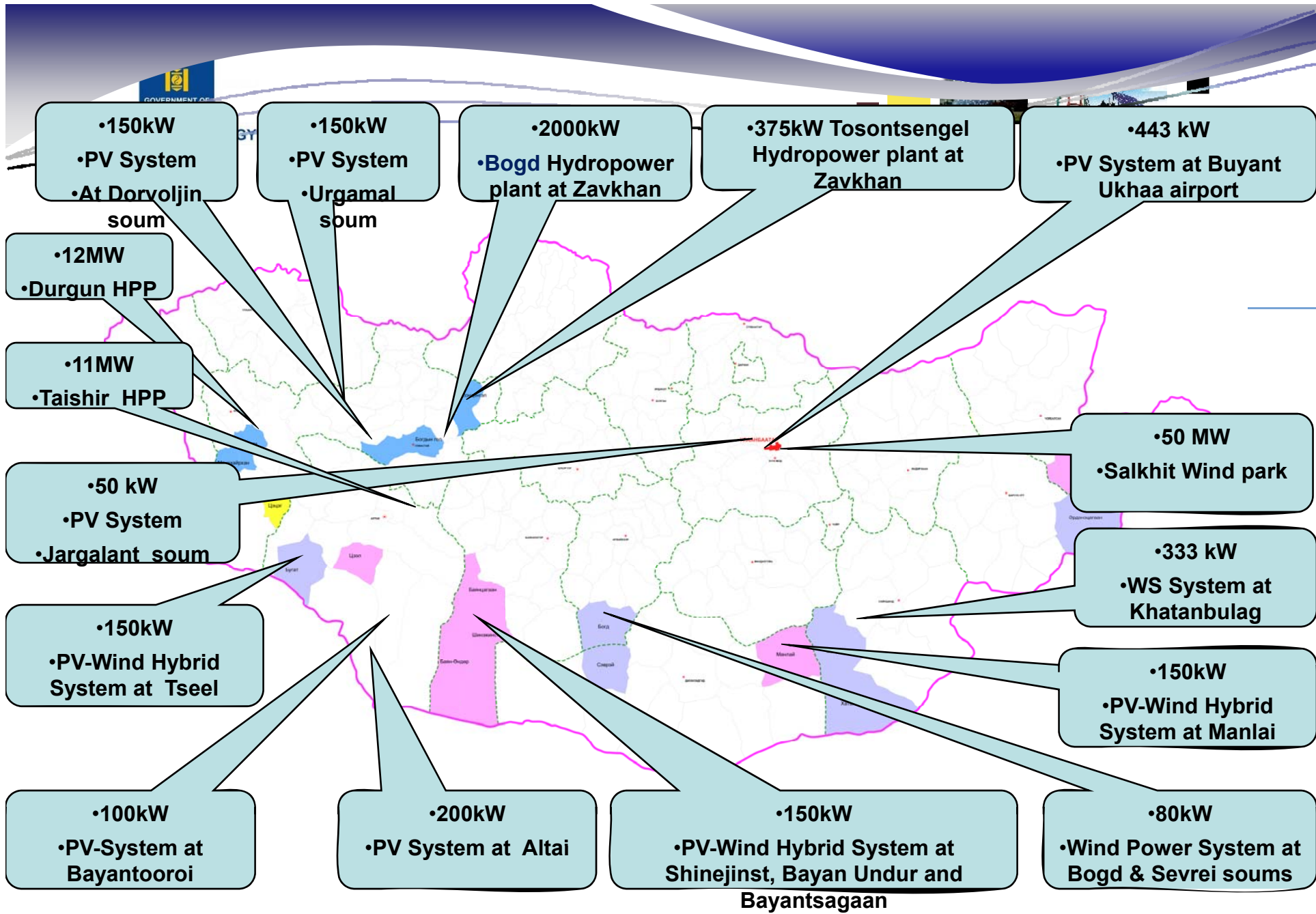
Renewable energy utilization



- First 50 MW wind park near Ulaanbaatar city started production electricity from June 2013.

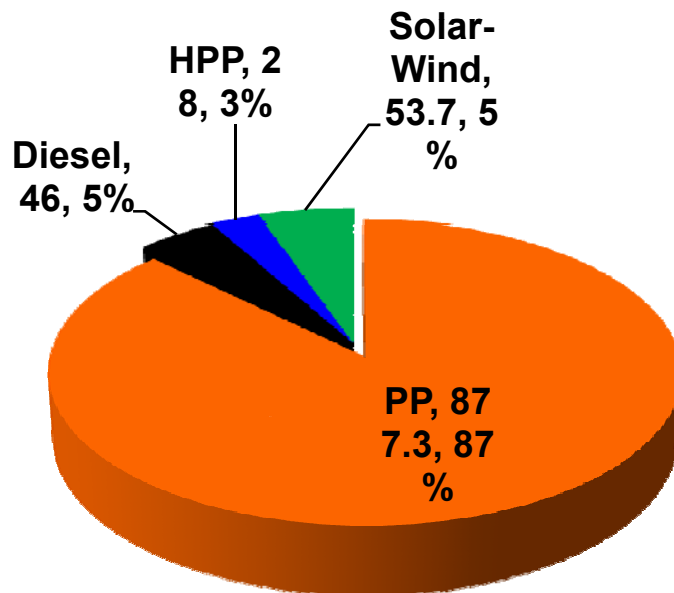


- 100000 households are using electricity from wind park
- **12.4 % of total population.**



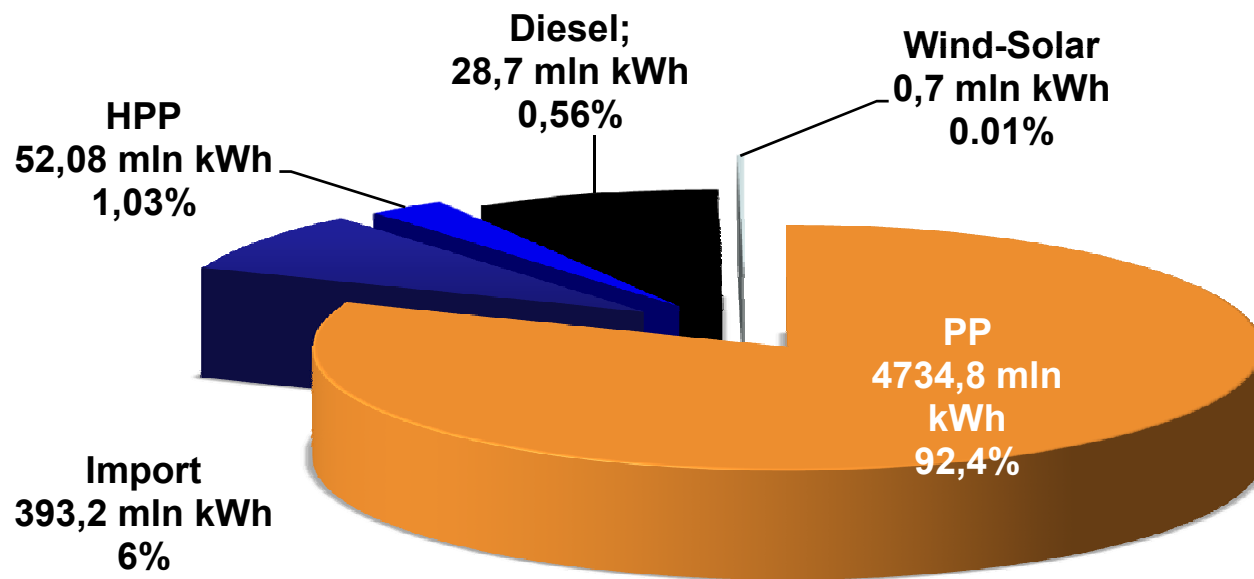
Installed capacity of renewable power in 2013

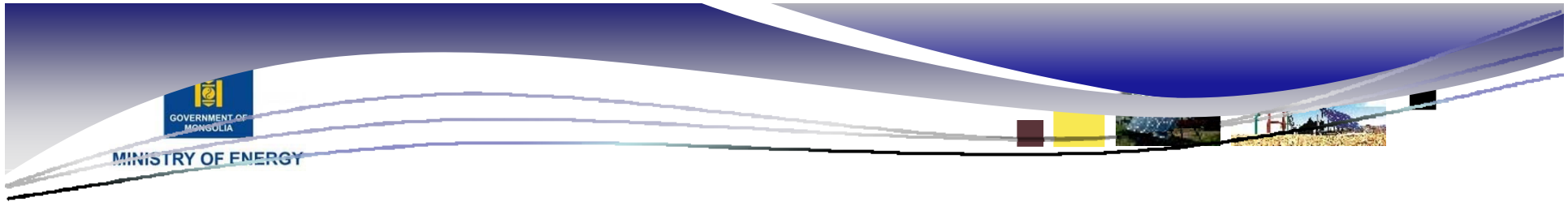
Power capacity 955 MW



Power Plant	Capacity	Share
Thermal PPs	877.3 MW	87 %
Renewable power	81.7 MW	8 %

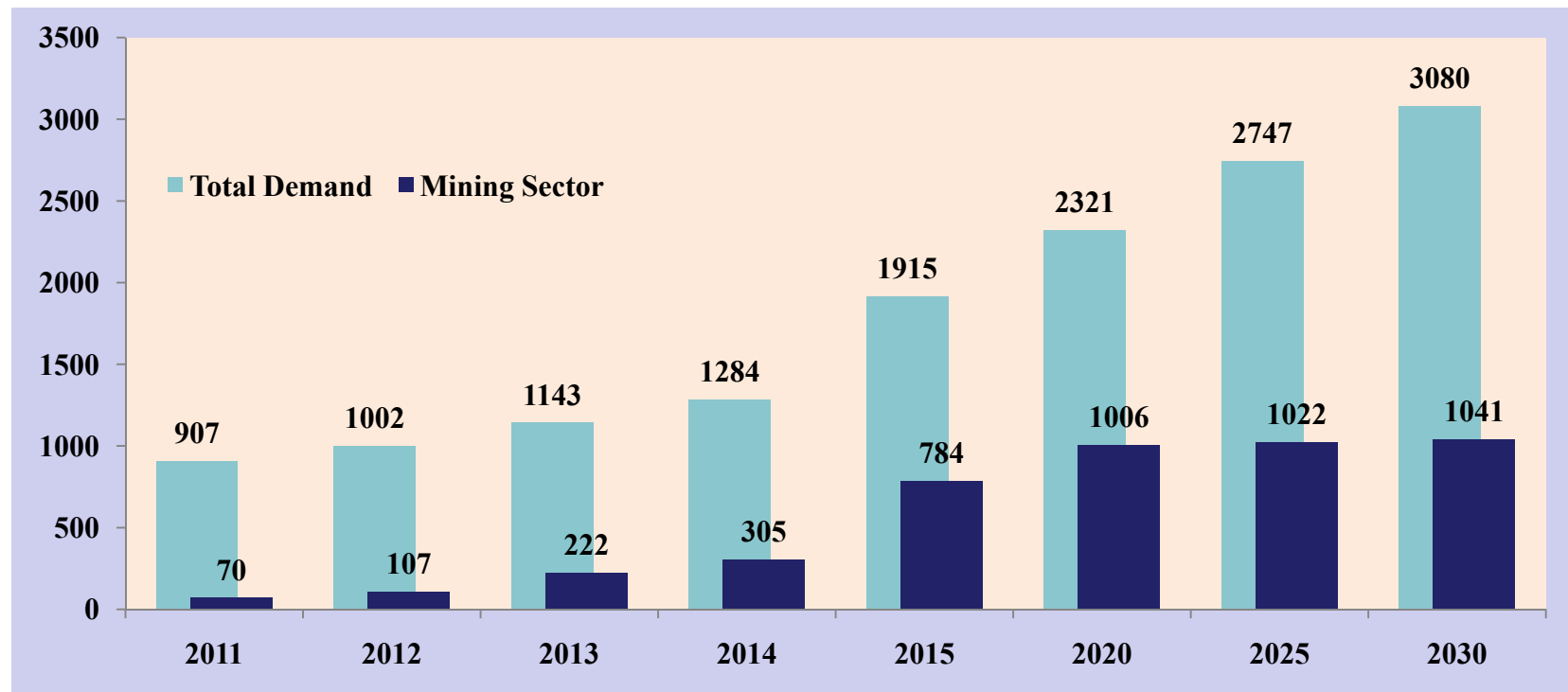
Renewable electricity generation in 2012

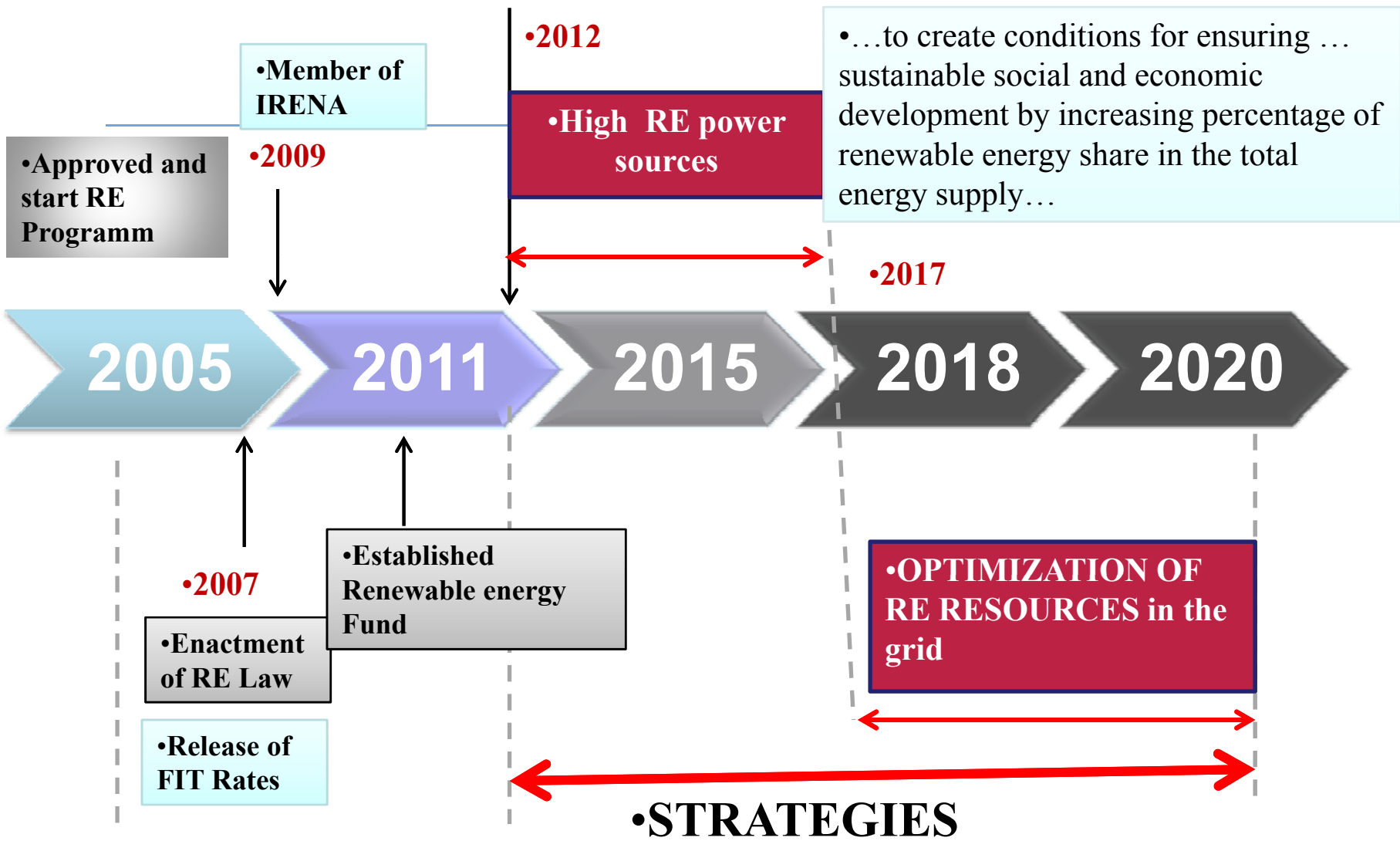
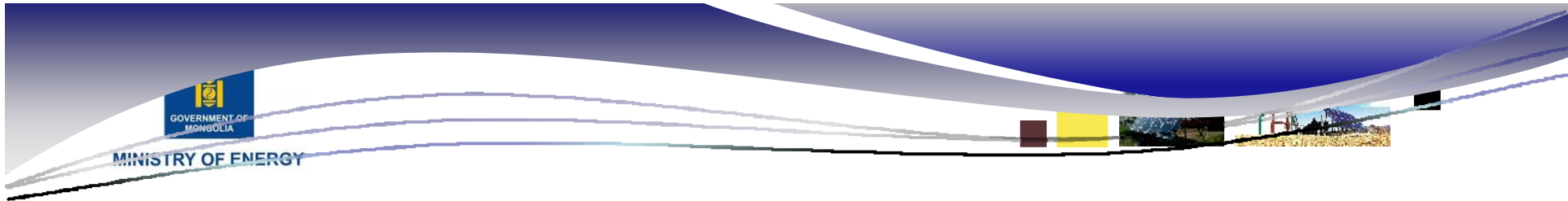


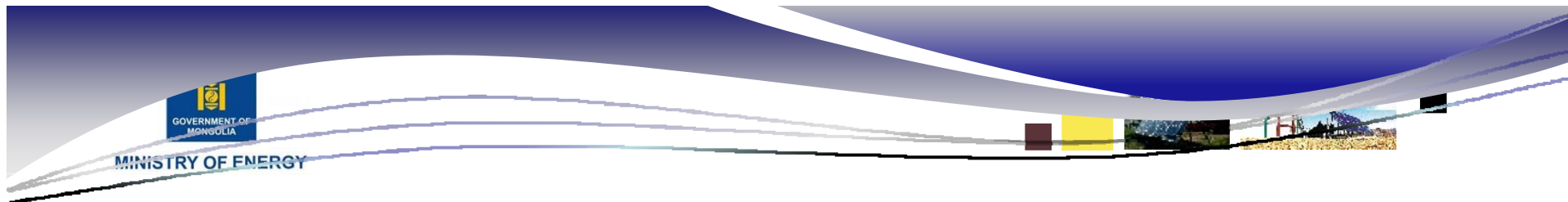


Energy demand (MW) – Source: EA 2012

Due to recent intensive activities in mining sector, in near future Mongolia should become a large producer and exporter of electricity







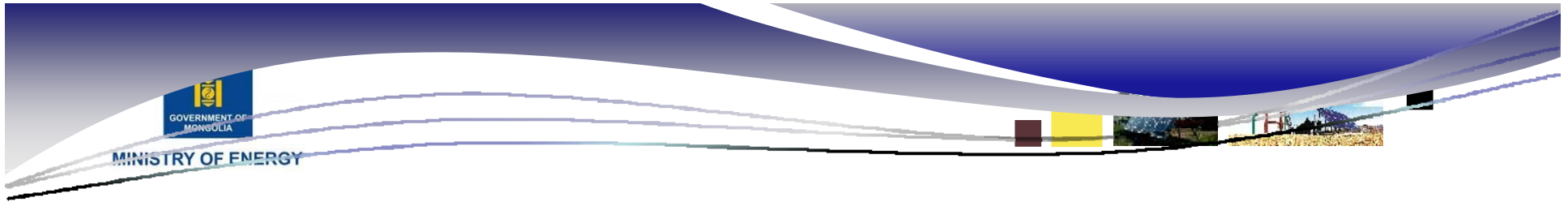
Policy support for renewable energy

■ **Parliament approved following strategic documents.**

- “National Renewable energy program” in June 2005 to promote and extend renewable energy development in Mongolia. Program shall be implemented in two stages /2005-2020/.
- “Renewable Energy Law” in January 2007 to regulate generation and supply of energy utilizing renewable energy sources.
- Government program /2012 – 2016/

■ **Government resolutions**

- “100000 solar home” national program in 1999 to supply nomadic family by solar home system. The program had implemented during 2001 – 2012.
 - No. 193 by 2012
 - No. 23 by 2013
 - No. 303 by 2013
 - No. 375 by 2013

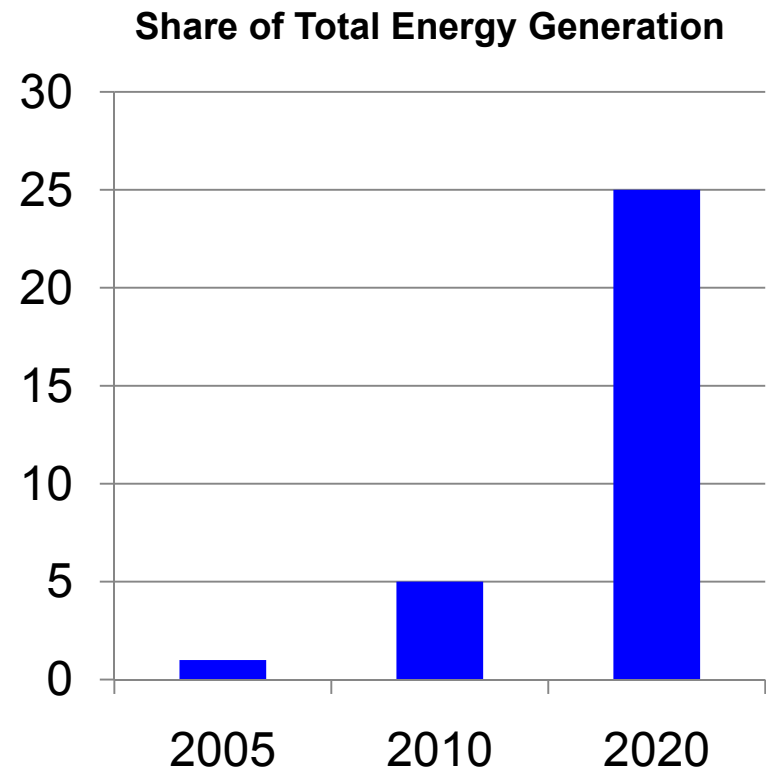


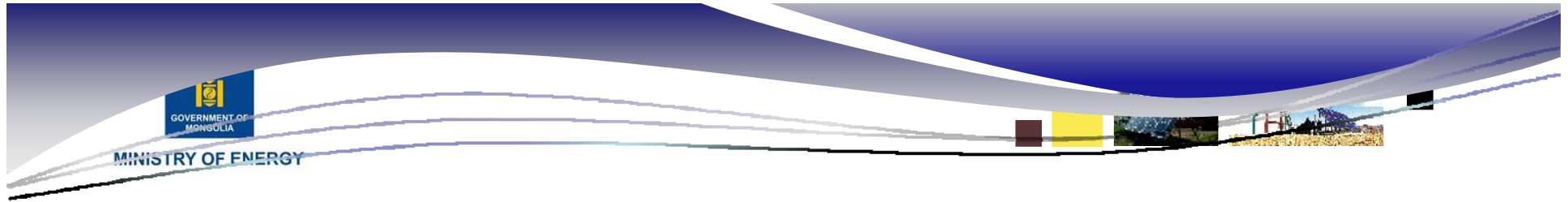
Mongolian Parliament approved NREP

According to the “National Renewable energy program (2005-2020)” the Government of Mongolia has set the target to increase the share of Renewable energy in total energy supply and reach:

- 3-5% share by the year 2010
- 20-25% share by the year 2020

which implies that an increased use of renewable energy systems will be an important contribution





Renewable energy Act

■ Feed-in tariffs (FIT) for renewable power sources

	Hydro			Wind	Solar
	up to 0.5 MW	from 0.5 to 2 MW	from 2 to 5 MW		
Grid-connected	0.045 - 0.06	0.045 - 0.06	0.045 - 0.06	0.08 - 0.095	0.15 - 0.18
Stand alone	0.08 - 0.10	0.05 - 0.06	0.045 - 0.05	0.10 - 0.15	0.2 - 0.3

Prices are given in USD per kWh

- Renewable energy fund
- Promotes, incentives and supports the production of energy from renewable sources by regulating generation, transmission, and pricing of green energy.

“100000 solar ger” National program

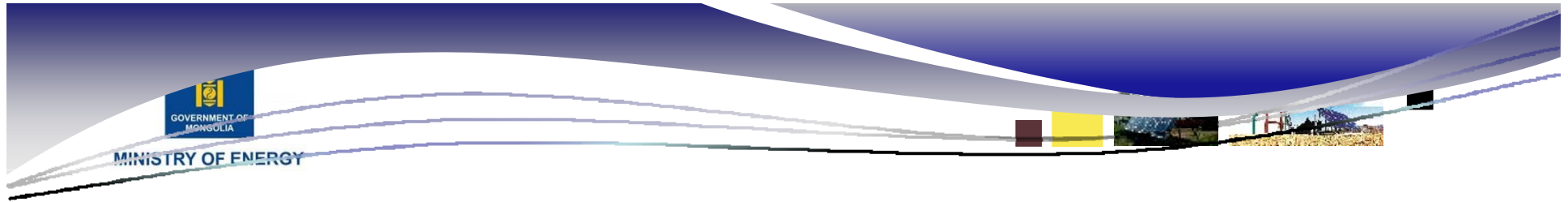
■ Started in 1999

- By 2000-2002 more than 5000 SHS distributed (supported by the Government)
- By 2003 some 11,170 SHS distributed (partially supported by the Japanese grant aid)
- By 2004 some 20,620 SHS distributed (partially supported by the Chinese grant aid);
- By 2008 40,400 SHS distributed (supported by the Mongolian Government);

■ Completed /2005-2012/

- By 2009-2011 some 25,000 SHS distributed (partially supported by the World Bank grant aid);





International cooperation

■ GIZ

- Renewable energy I, II, III
- Energy efficiency

■ IRENA

- RRA
- Global Wind & Solar Atlas

■ NEDO

- Demo project off grid 200kW PV plant

■ JICA

- Master plan for RE /2000-2015/
- Demo project grid connected PV plant /443 kW/

■ ADB

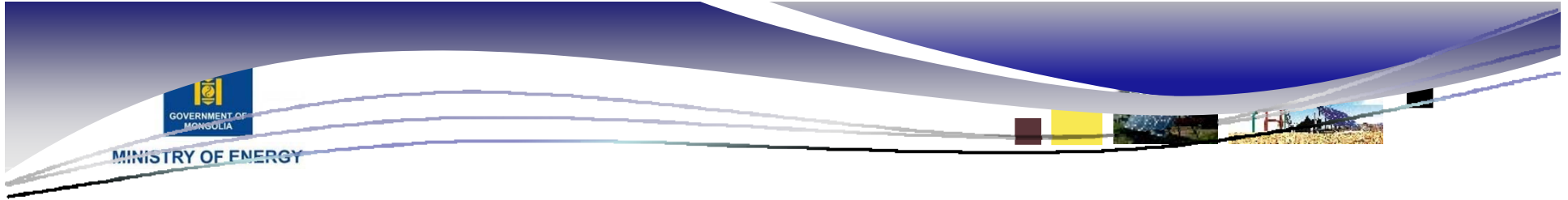
- Renewable energy for Small town & Rural areas
- Master plan for rural power supply by RE
- Solar thermal district heating

■ TACIS

- FS of RE for rural areas
- Demo project up to 5 kW solar-wind system

■ WB

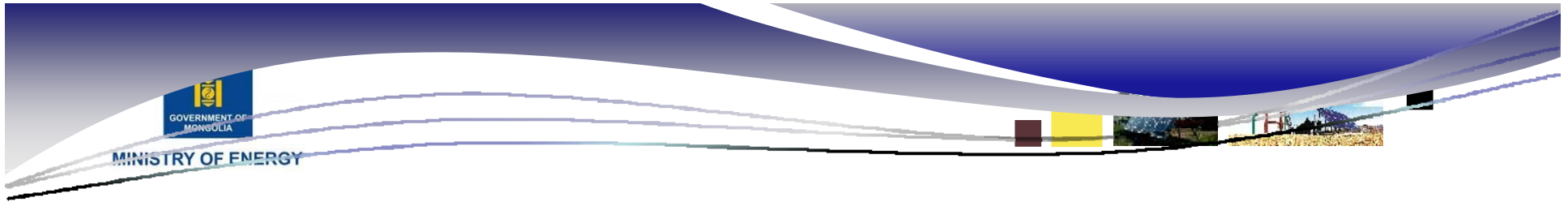
- REAP



National renewable energy program & Updates

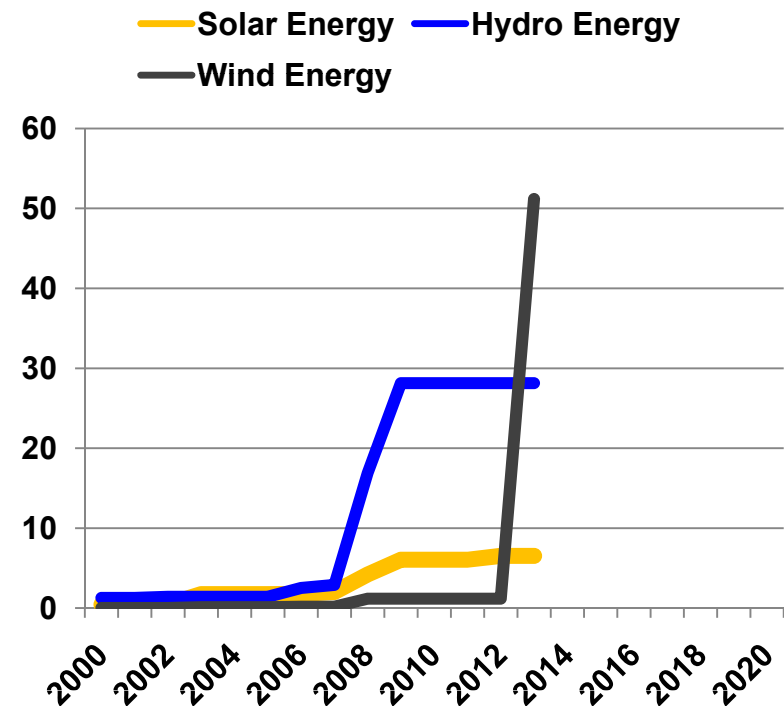
- Purpose of the Program:
 - To create conditions for ensuring ecological balance,
 - For sustainable social and economic development through increasing percentage of renewable energy in the energy supply of Mongolia,
 - Improving structure of energy supply,
 - Widely using renewable energy in providing power to rural areas.
- National program for renewable energy has been implemented in two stages:
 - First stage for 2005-2010 /near term/
 - Second stage for 2011-2020 /mid term/

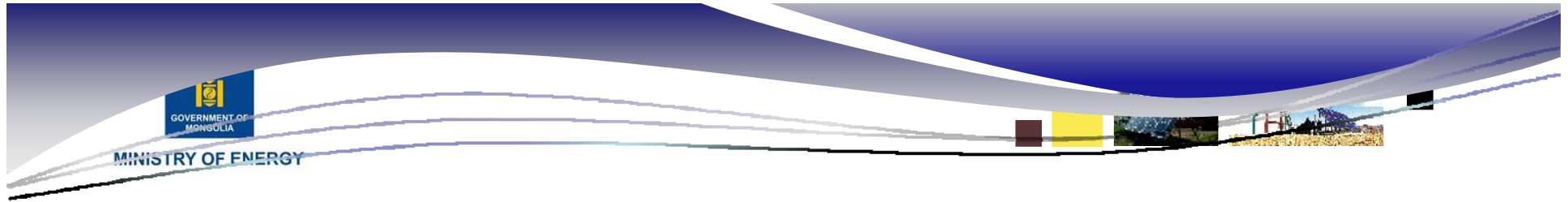




Implemented near term objectives /2005-2010/

1. Installed Durgun and Taishir HPP;
2. **To launch construction Orkhon HPP with 100 MW capacity in the Central Region;**
3. Implemented the "100,000 Solar home" national program;
4. Provided and electrified 8 soum centres remotely located from the centralized power grids by wind-solar- diesel hybrid systems, and to 5 soum centers using solar-diesel hybrid systems;
5. Carried out feasibility studies of HPP construction for electrification of selected 16 soum centers;
6. Conducted detailed survey of medium sized wind parks in sites with high wind energy potentials.





New updates & ideas to renew of the program

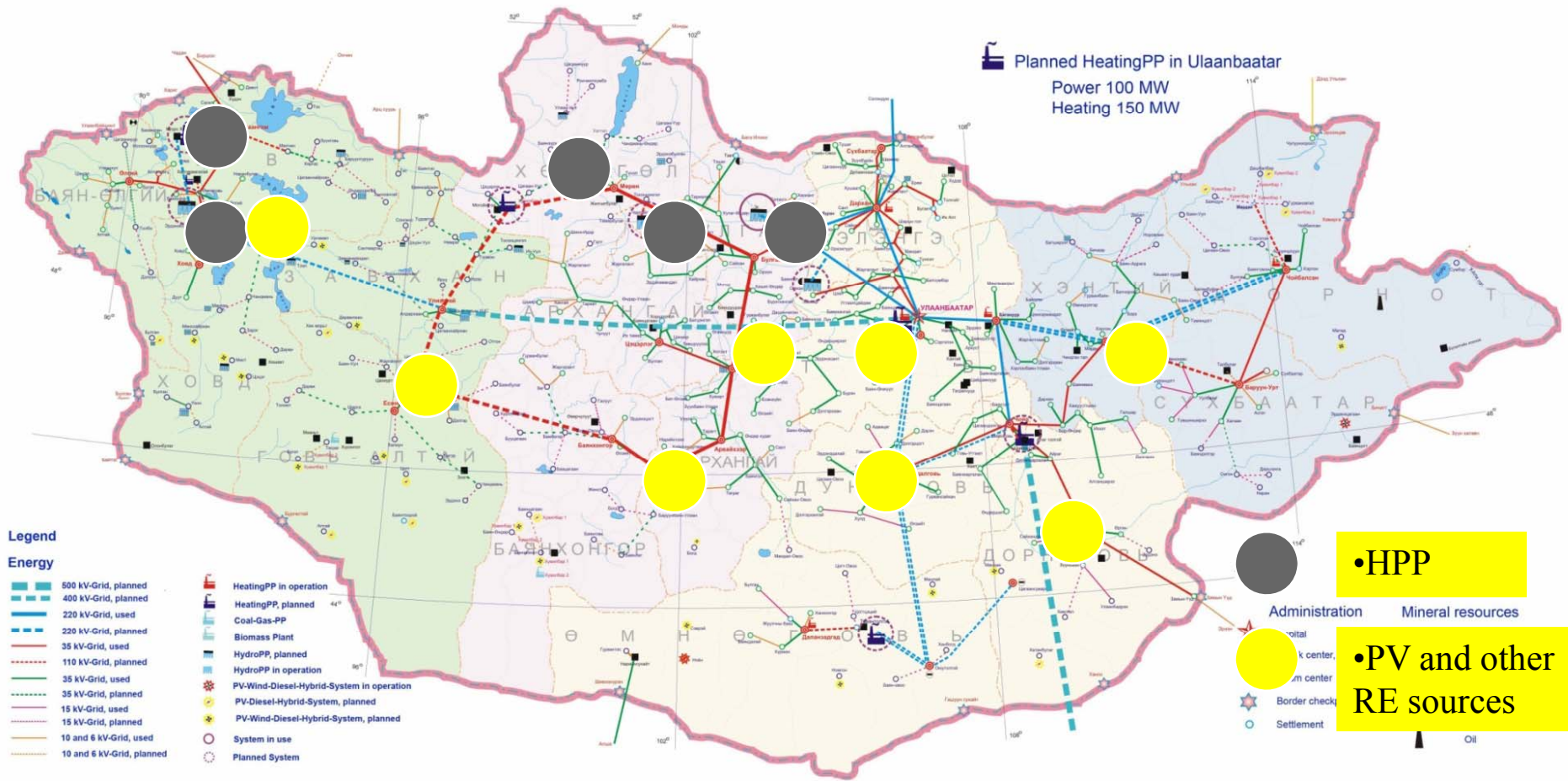
1. To increase the production and consumption percentage share of renewable energy in total energy installation to reach 15 – 20% by 2020 and 25 – 30 % by 2030;
2. To increase the efficiency of power generation through the cooperation with universities and institutes on introductions of economical usage of renewable energy power energy;
3. Detailed resource assessment of renewables
4. Build and launch cascade HPP in central region of Mongolia with installed capacity more than 100MW /Egjin HPP 220MW, Shuren 300MW/
5. Construct wind and solar PV power plant in location with good to excellent wind and solar energy resource
6. Support renewable energy with tax initiatives and soft loans /Rooftop PV system/
7. Activate renewable energy fund
8. Improve and adopt renewable energy technology standards and codes
9. Establish Fault ride through system in energy system
10. Deliver SHS with capacity at least 100Wp to all rural households which are remotely located



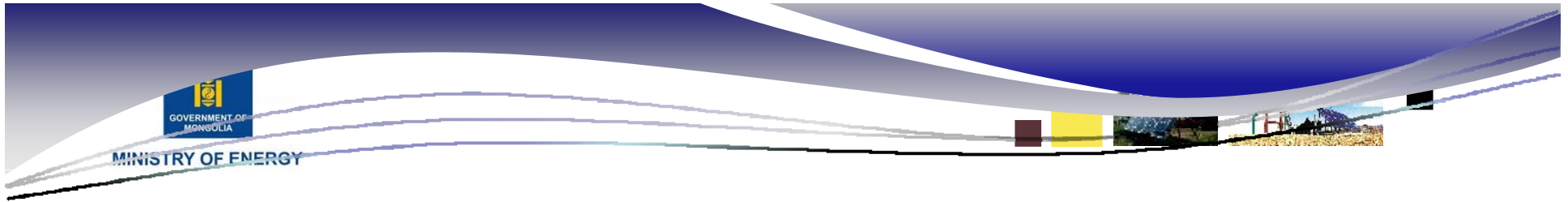
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ENERGY SYSTEM OF MONGOLIA

Planned HeatingPP in Ulaanbaatar
Power 100 MW
Heating 150 MW

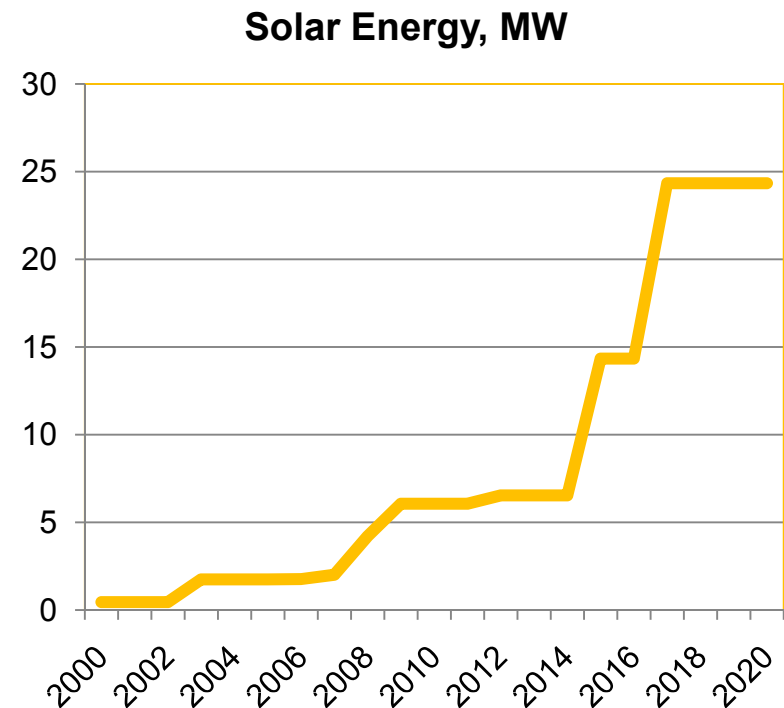


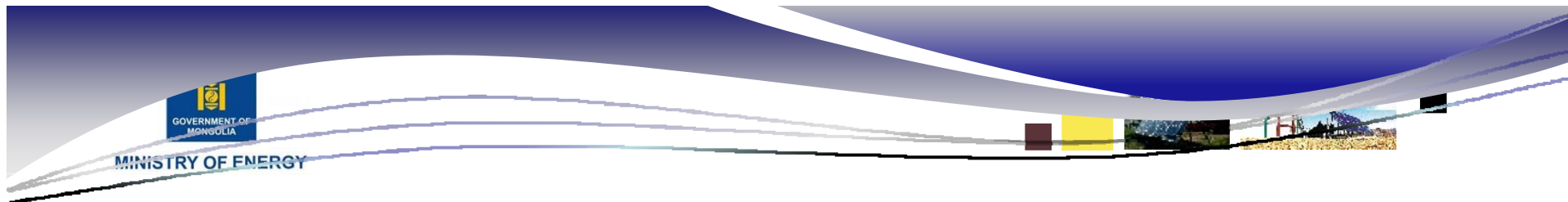
•Shuren, Egiin, Chargait, Erdeneburen, Sagsai /Bayan-Ulgii/, Delgermurun`s Hydro power plants and solar, wind power plants for reduction of drop voltage in lines and stabilization of energy system.



Proposed scenarios of the solar power to 2020

- VLS-PV /1GW/
- 30 MW PV power plant /M&P International-German/
- Taishir or Durgun 10 MW PV power plant /JCM-Japan/
- Bayanteeg 8MW PV power plant /Hyosung group-Korea/
- CSP for Town Heating Project





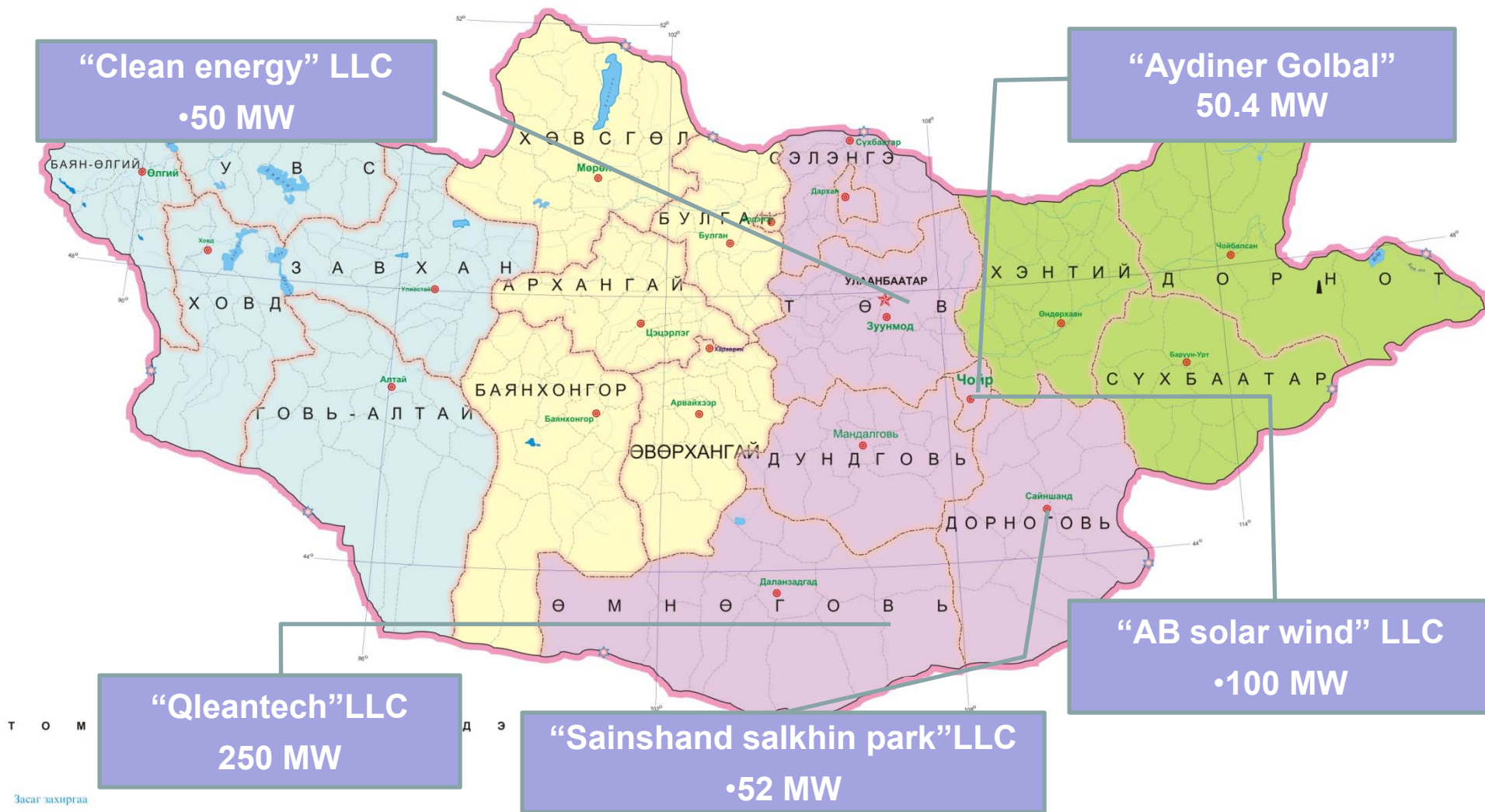
TO BE ISSUED LICENSES TO BUILD WIND PARKS

No	Name of company	Capacity	Location	Date of issue	Тайлбар /үйлчлэх хүрээ/
1.	“Clean Energy” LLC	50 MW	Sergelen soum, Tuv province	2007.03.27 /6 year valid/	Central grid
2.	“Qleantech” LLC	250 MW	Khanbogd soum, Umnugovi province	2008.12.18, / 5 year valid/	102 MW /central grid/ , 148 MW /export to China/
3.	“Sainshand salkhin park” LLC	52 MW	Sainshand soum, Dornogovi province	2011.03.29, /5 year valid/	Central grid
4.	“AB solar wind” LLC	100 MW	Dalanjargalan soum, Dornogovi province	2011.11.22, /5 year valid/	Central grid
5.	“Aydiner Golbal” LLC	50.4 MW	Sumber soum, Govisumber province	2011.12.13, /5 year valid/	Central grid
	Total	502.4 MW			



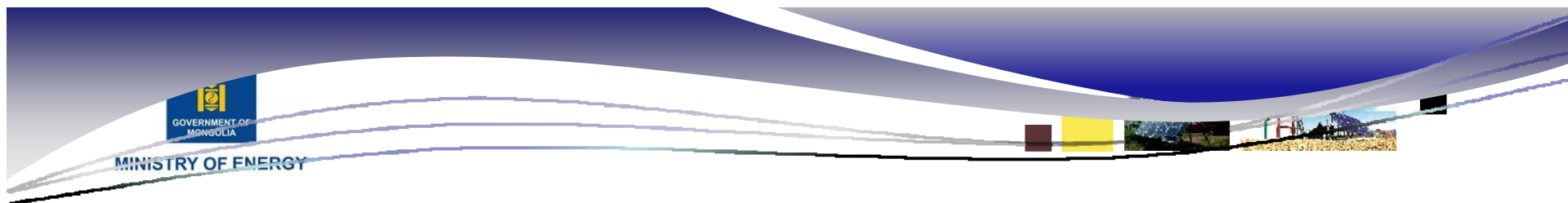
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LOCATION OF WIND PARK PROJECTS



Т О М

Д Э



Near term planned projects /2014-2017/

No	Location of project	Capacity	Annual Electricity generation	Implementing company	Feasibility study
HYDROPOWER PLANTS					
1.	Khutag-Undur soum, Bulgan province /Egiin HPP/	220 MW	500 mil kWh	(Ministry of Energy)	Yes
2.	Songinokhairkhan district, Ulaanbaatar city	100 MW	82 mil kWh	“Morit Impex” LLC	Yes
SOLAR POWER PLANTS					
3.	Sainshand city, Dornogovi province	30 MW	52 mil kWh	“M&P international” LLC	Yes
4.	Bayanteeg bag, Nariinteel soum, Uvurkhangai province	8 MW	13 mil kWh	Hyosung group, Republic of Korea	Yes
WIND POWER PLANTS					
5.	Gobi-Sumber province, Choir soum	50 MW	123 mil kWh	“Aydiner Global” LLC	Yes
6.	Khanbogd soum, Umnugovi province	102 MW	300 mil kWh	“Qleantech” LLC	Yes
7.	Dornogobi province, Sainshand soum,	50 MW	130 mil kWh	“Sainshand wind park” LLC	Pre-feasibility Study

Long term planned projects /2018-2025/

№	Location of project	Capacity	Annual Electricity generation	Implementing company	Feasibility study
HYDROPOWER PLANTS					
1.	Tsagaannuur soum, Selenge province /Shuren HPP/	300 MW	1'100 mil kWh	(Ministry of Energy)	Preparing pre-FS
2.	Orkhontuul soum, Orkhon province	100 MW	219 mil kWh	(Ministry of Energy)	Yes
3.	Erdenet city, Orkhon province	100 MW	292 mil kWh	“Erdenet uildver”Co.,Ltd	Pre-feasibility Study
SOLAR POWER PLANTS					
4.	Khurmen, Umnugovi province	30 MW	-	“Clean Energy”LLC	Preparing pre-FS
5.	Durgun soum, Khovd province	10 MW	-	Shimuzu group, Japan	Preparing pre-FS
6.	Taishir soum, Govi-Altai province	10 MW	-	Scientific academy etc	Preparing pre-FS
	Dalanzadgad city, Umnugovi province /Concentrated solar plant/	10 – 20 MW	-	“Mon Energy consult” LLC /Ministry of Energy/	Preparing pre-FS
WIND POWER PLANTS					
6.	Khanbogd soum, Umnugovi province	148 MW	-	“Qleantech” LLC	Yes
7.	Bulgan soum, Umnugovi province	100 MW	-	“Clean Energy” LLC	Preparing Pre-FS
8.	Argalant soum, Tuv province	50 MW	-	“Khiimor salkhi” LLC	Pre-feasibility Study

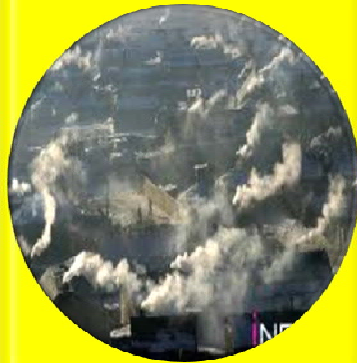


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New trends of utilization of Renewable energy



I. Heating and supply hot water



II. Reduction of air pollution



III. Agriculture



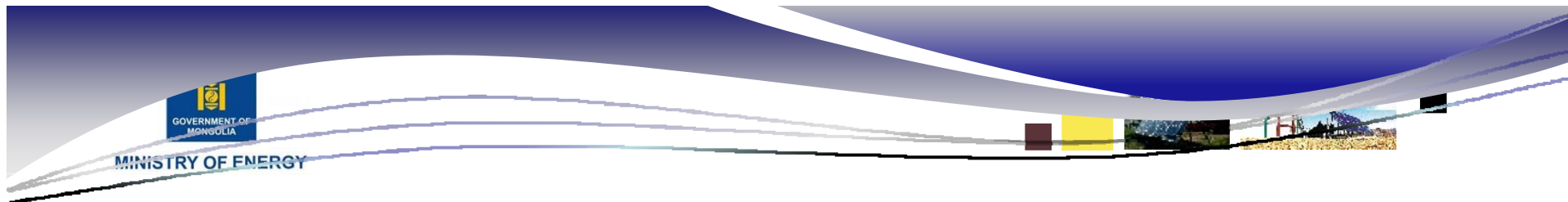
IV. Rural health



V. Rural education

•To extend applications of renewable energy sources





• Thank you for your attention

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