

Second international workshop on “Energy, Environment and Ecosystems (3E)
Nexus Initiative for Sustainable Development in Asian Countries”
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Challenges and opportunities for the development of 3E Nexus initiative in Mongolia

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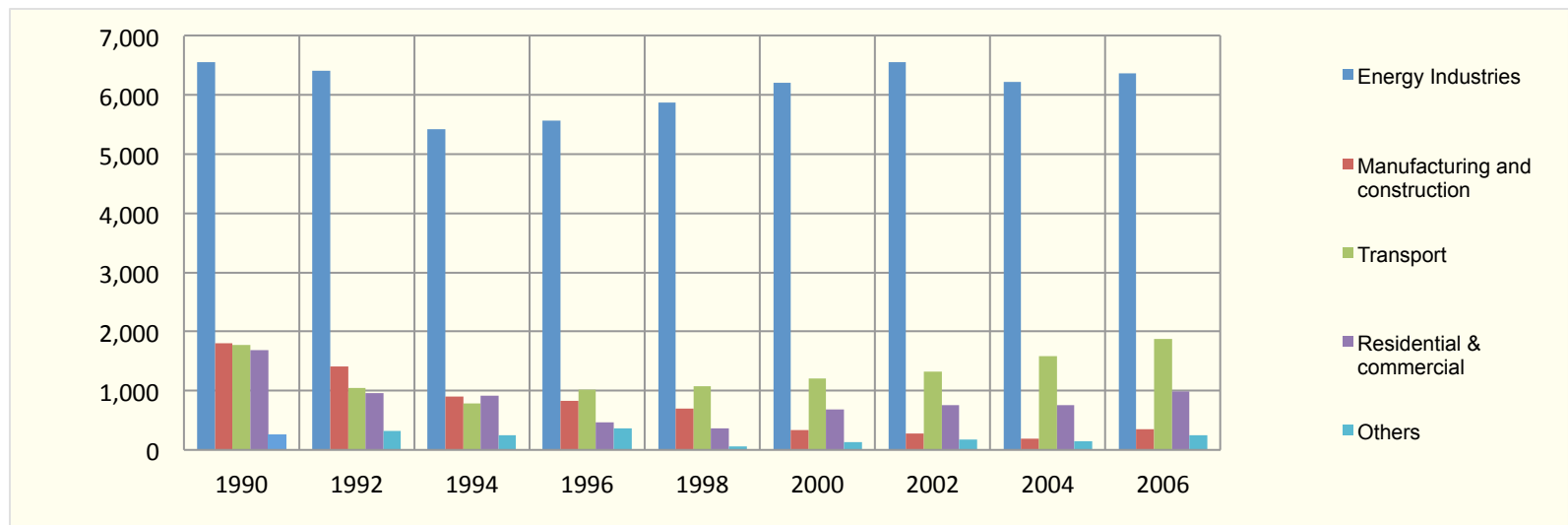
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GHG Emissions by sectors in Mongolia, GgCO₂-eq

Sectors	2006		2020		2030	
	GHG	%	GHG	%	GHG	%
Energy	10,220	57.7	25930	74.9	32800	77.6
Agriculture	6462	36.5	6657	19.2	6870	16.2
Industry	892	5.0	1840	5.3	2320	5.5
Waste	138	0.8	209	0.6	294	0.7

Carbon dioxide emissions from fuel combustion by source, Gg



Present Situation of energy supply system in Mongolia

Service	Category	Technology	Brief descriptions
Electricity supply	Fossil Fuel	Combined heat and power, large scale	There are coal fired 7 Combined Heat and Power plants (CHP) in Mongolia. They produce the majority of electricity and heat energy. (90%)
		Diesel for electricity generation	The province centers which are not connected to the central grid have diesel generators for electricity supply.
	Renewable energy	Small-scale hydropower plants	There are currently 13 hydro plants in operation, with capacities ranging from 150 kW to 12.0 MW.
		Small-scale solar PV	Most herders have independent solar PV systems to generate electricity for using lights, radios and TVs
		Solar and wind hybrid technologies	Recently, wind power stations as well as combined solar-Wind stations were built in some soum centers.
	Heat supply	Fossil fuel	Combined heat and power, large scale
Heating stations for space heating and domestic hot water			Coal fired heating stations are used in province centers.

Mongolian energy sector development scenarios

The projection of GHG emissions from Power and heat plants was calculated by using Long-range Energy Alternatives Planning system (LEAP) model. The LEAP is a scenario-based energy-environment modeling tool. Its scenarios are based on comprehensive accounting of how energy is consumed, converted and produced in a given region or economy under a range of alternative assumptions on population, economic development, technology and etc.,

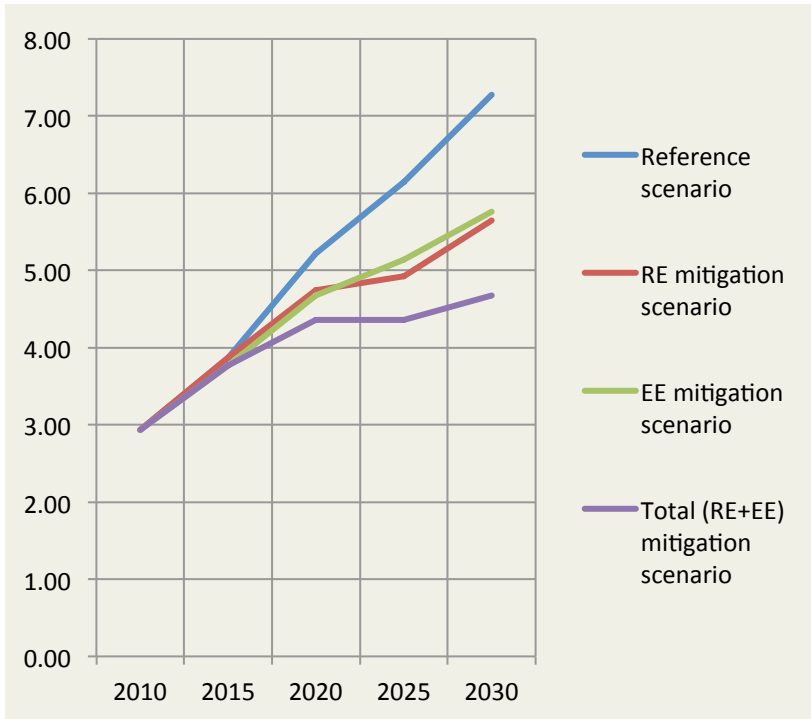
Key assumptions for energy sector development scenarios

Indicators	2010	2015	2020	2025	2030
Pop Growth Rate, %	1.6	1.6	1.6	1.6	1.6
Population, 1000 person	2761	2989.1	3236.0	3503.3	3792.6
Households , thousands	742.3	803.6	870.0	941.9	1019.6
Income, 1000 USD	2.1	2.7	4.1	6.8	11.7
Income Growth Rate, %	3.5	6.8	10.0	11.0	12.0
GDP, Billion USD	5.7	8.0	13.2	23.7	44.4

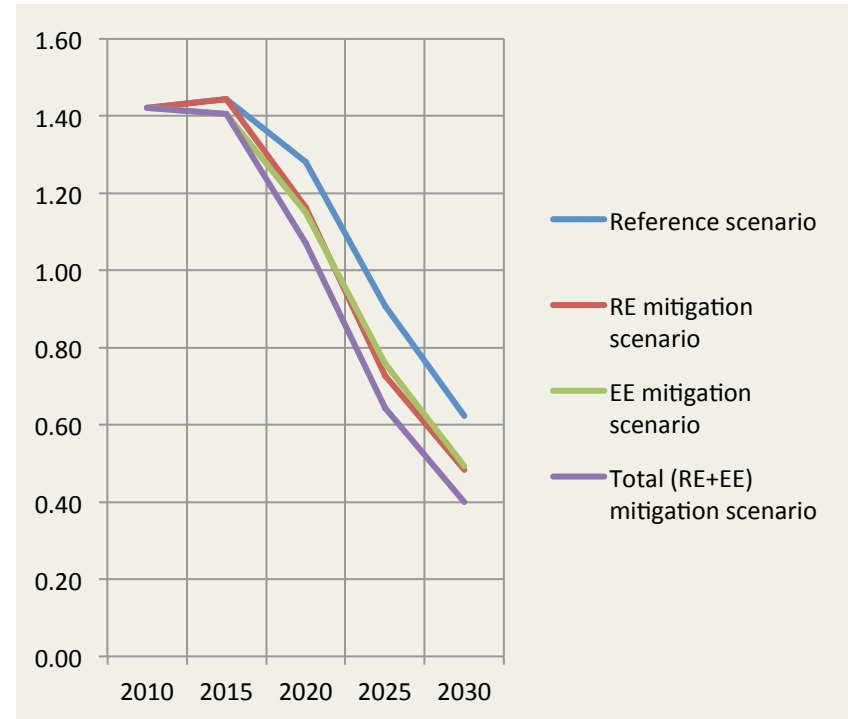
Source: GHG Mitigation Scenarios in Energy Sector, MEGD, 2013

Mongolia energy sector development: Mitigation Scenario

Per capita and per GDP emissions from energy industry



Per capita GHG Emissions, tons/capita



Per GDP GHG Emissions, kg/USD

Mongolia energy sector development: Mitigation Scenario

Electricity generation from RE sources, million kWh

	2010	2015	2020	2025	2030
<i>Total electricity generation</i>	4445.9	6015.5	11634.1	15086.5	19822.6
<i>Electricity generation from RE sources</i>	80	287.3	1969.8	3824.1	5764.5
Salhit Wind Park	0	165.5	133.7	140.9	152.4
Smal Hydro PP	80	121.8	98.4	103.7	112.2
Hydro PP	0	0	802	1747.5	2499.5
Wind Parks	0	0	668.4	1268.3	1828.9
Large Solar PV	0	0	267.3	563.7	914.4
<i>Share of electricity generation from RE sources</i>	1.8%	4.8%	17.0%	25.3%	29.1%

Source: GHG Mitigation Scenarios in Energy Sector, MEGD, 2013



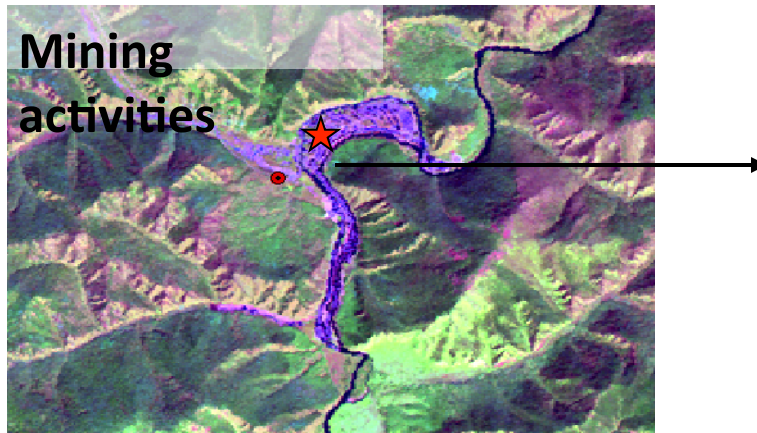
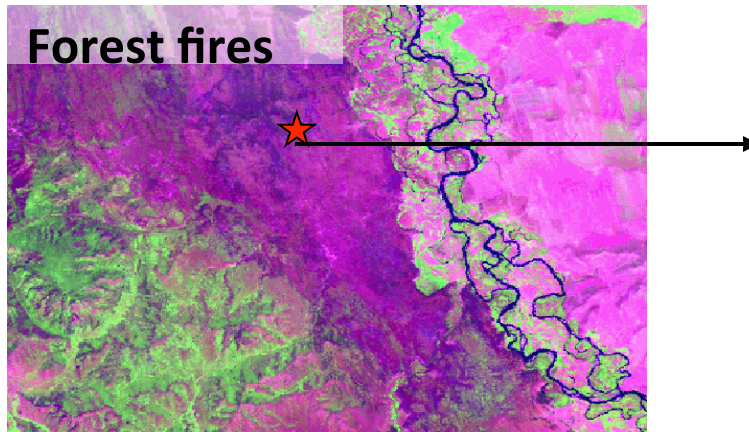
Natural zones and ecosystems of Mongolia



Key ecosystems in Mongolia

Ecosystems	Area (mln. km2)	Percentage
Desert	0,297	19
Desert steppe	0,329	21
Steppe and grassland	0,407	26
Forest steppe	0,125	8
Forests	0,063	4
Mountains	0,344	22

Disturbances in ecosystems in Mongolia



Landsat 7 ETM+ Band 5, 4, 3 (RGB)

Main environmental problems in Mongolia:

1. Water pollution and scarcity
2. Biodiversity loss
3. Land degradation and desertification
4. Air pollution in the settlements
5. Climate change impact

Current status of Mongolia under the UNFCCC

The Mongolian government's response to address the issue of climate change has been positive

- Ratification of the UNFCCC (1993)
- Ratification of the Kyoto Protocol (1999)

Undertaken steps to implement UNFCCC's goal

- Initial national communication (1st November 2001)
- Submission on NAMAs (28th January 2010)
- Second national communication (10th December 2010)
- **National Action Program on Climate Change (6th January 2011)**
- Technology Needs Assessment (2013)

Upcoming steps to implement UNFCCC's goal

- Preparation of first Biennial Update Report (BUR)
- Preparation of Third national communication



Government Policy goals and targets for Low Carbon Development

Name	NATIONAL ACTION PROGRAM ON CLIMATE CHANGE (approved by Parliament in 2011)
Specific Targets	Specific fuel consumption of electricity generated in the central energy system will be reduced by 10-20 gJ/ kW h, Specific fuel consumption of thermal energy production will be reduced by 20 kgJ/gCal compared to 2010, Share of Renewable energy sources in the energy balance will reach 10 % , Heat use will be reduced by 25 % [by the end of first phase].
Duration	2011-2021 (to be implemented in 2 phases)
Name	NATIONAL RENEWABLE ENERGY PROGRAM (approved by Parliament in 2005)
Specific Targets	To increase share of renewable energy in total energy generation to 20-25% by 2020, and to reduce system loss by more than 10% (baseline yr. 2005) by 2020
Duration	2005-2020
Name	NEW RECONSTRUCTION MIDTERM DEVELOPMENT PROGRAM (approved by Parliament in 2010)
Specific Targets	To decrease air pollution -30% by 2012, -50% by 2016 compared to 2010
Duration	2010-2016
Name	GREEN DEVELOPMENT POLICY (Approved by Parliament in 2014)
Specific Targets	To increase share of RE in the total installed capacity to 20% by 2020, and 30% by 2030 and to reduce CO2 emissions per GDP twice compared to 2006 by 2020, and 2.5 times by 2030.
Duration	2014-2030 (to be implemented in 2 phases)

National Action Program on Climate Change

The “National Action Program on Climate Change” (NAPCC) was approved by the second resolution of State Great Khural (Parliament) on 6th January, 2011. The following five strategic objectives will be implemented in **two phases** over the period **2011-2016** and **2017-2021**.

➤ **In the first phase (2011-2016)**, national mitigation and adaptation capacities will be strengthened, legal, structural and management systems will be set up and community and public participation will be improved.

➤ **In the second phase (2017-2021)**, climate change adaptation measures will be implemented and start up greenhouse gas mitigation actions.

1. Establish the legal environment, structures, institutions and regulatory framework supporting the activities directed to solve the issues due to climate change.

2. Ensure environmental sustainability and reduce socio-economic vulnerabilities and risks through strengthening national capacity to adapt to climate change.

5
strategic
objectives

3. Mitigate greenhouse gas emissions and establish a low carbon economy through the introduction of environmentally-friendly technologies and improvement of efficiency and productivity in production and consumption.

4. Expand national climate observation network, research and assessment works, reform technologies and strengthen the capacity of human resources.

5. Conduct public awareness raising activities and support citizen and communities in participating climate change mitigation and adaptation actions.

INDICATORS OF THE FIRST PHASE (2011-2016)

- Specific fuel consumption of power plants for electricity generation will not exceed 340 gJ/ kW h.
- Specific fuel consumption of thermal energy production will be reduced by 20 kgJ/gCal compared to 2010.
- Renewable energy will account for 10 % of the total national energy production.
- Heat use will be reduced by 25 %.

INDICATORS FOR THE SECOND PHASE (2017-2021)

- Specific fuel consumption of power plants for electricity generation will not exceed 340 gJ/ kW h.
- Specific fuel consumption of thermal energy production will be reduced by 30 kgJ/gCal compared to 2010.
- Renewable energy will account for 20 % of the total national energy production.
- Heat use will be reduced by 30 %.

“Low Carbon Development Partnership” between Mongolia and Japan

Road to “LCDP”

Governmental consultation
(Ulaanbaatar -3 July 2012)

Governmental consultation
(Tokyo -1 November 2012)

Governmental consultation
(Doha -30 November 2012)

Joint Statement
(Doha -6 December 2012)



Signing of the “Low Carbon Development Partnership” (bilateral document for the JCM)

(Ulaanbaatar- 8 January 2013)

Start of “JCM”

Technical Meeting between Mongolian and Japanese Government Officials (Ulaanbaatar - 28 Feb - 01 March, 2013)

JCM first Joint Committee meeting
(Ulaanbaatar - 11 April 2013)



Joint Committee

Mongolia

Co-Chair

Members (7
Ministries and UB
City Authority)

Secretariat

Observers

Japan

Co-Chair

Members
(2 Ministries and
Japanese Embassy
in Mongolia)

Secretariat

Observers

Selected projects for FY2013 (MOEJ's Subsidy)

Type	Project title	Estimated GHG Reductions
JCM Model project	Upgrading and Installation of Centralized Control System of High-Efficiency Heat Only Boiler	750 tCO ₂ /year
JCM Project Planning Study (PS)	10MW-scale Solar Power Plant and Rooftop Solar Power Generation System	(i) 16,500 tCO ₂ /year (ii) 4 tCO ₂ /year/project
JCM Methodology Demonstration Study (DS)	Centralization of Heat Supply System by Installation of High-Efficiency Heat Only Boiler	750 tCO ₂ /year
JCM Feasibility Study	Improvement of Thermal Insulation and Water Cleaning/Air Purge at Power Plant	3,000 tCO ₂ /year
	10MW-scale Solar Power Generation for Stable Power Supply	17,537 tCO ₂ /year
	Energy conservation at cement plant	78,000 tCO ₂ /year

Challenges related to implementing JCM

- Technical barriers (e.g. methodology development, monitoring, validation and verification)
- Institutional barriers (e.g. lack of information, inter-ministerial coordination etc)
- Financial barriers (e.g. upfront investment)
- Finding appropriate partners is challenging (Japanese and Mongolian)

Challenging opportunities

- In order to encourage the development of climate technology in the energy industry subsector, government should implement concession law which was adopted by Parliament in 2010 for both public and private sectors.
- Development plans and programmes of the energy sector should align with principles of environmental protection and sustainable development.
- Economic and financial mechanisms for climate technologies should be implemented in order national programmes and projects.
- Enhanced carbon sequestration from ecosystem management in Mongolia could be achieved through integration of policy, financing, research and development, and sufficient awareness and information.

THANK YOU

