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# POTENTIAL FOR GHG MITIGATION IN MONGOLIA: Possible Projects & Programs

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# Brief introduction

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## Geography and Economy



**Area:** 1,564,115.75 sq.km

**As of 2010**

**Total population:** 2,754,685

**Urban population:** 67.9%

**Rural population:** 32.1%

**Population density:** 1.76 person per sq.km

**GDP:** 6.125 billion USD (nominal)

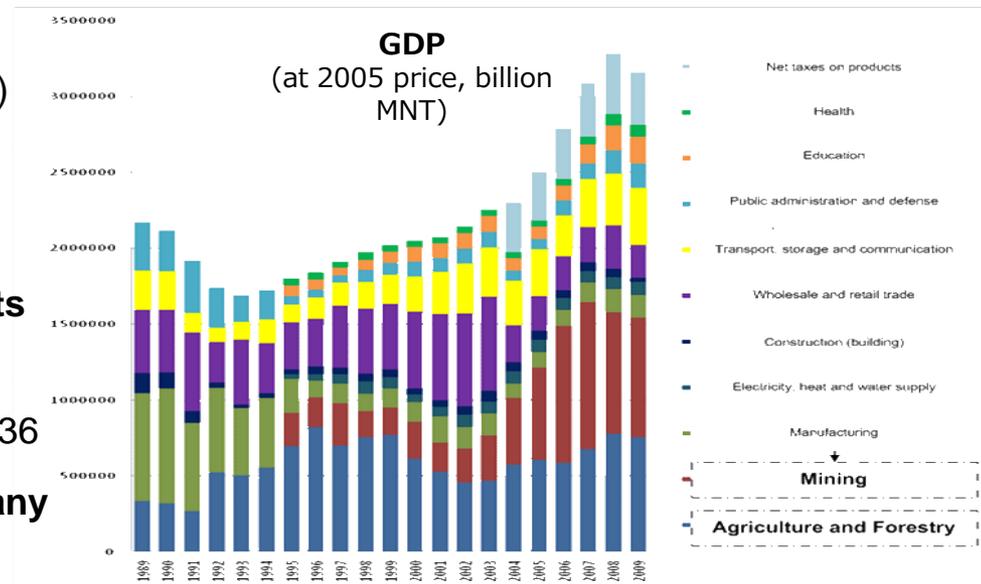
**GDP per capita:** 2,227 USD

**Literacy rate:** 98.3

**Households living in apartments and houses:** 382,808

**Households living in ger:** 322,836

**Households not connected to any electricity sources:** 3.3%



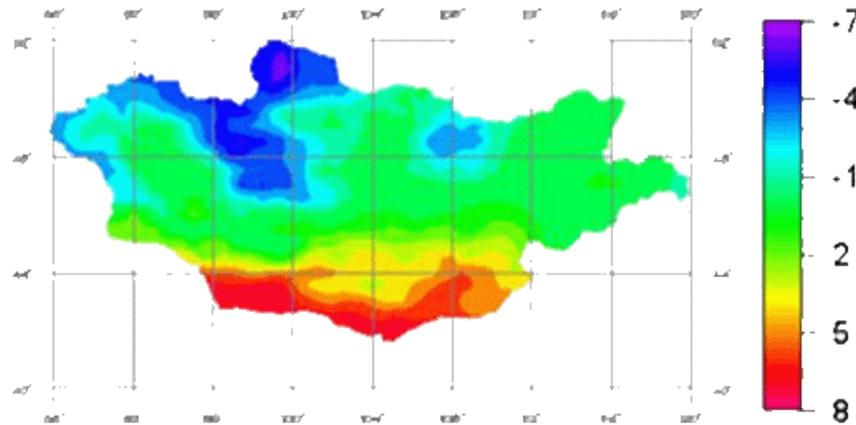
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## Climate



Map of annual average temperature

**Key characteristic:** extreme continental climate with long cold winter and short summers.

### Average temperature:

- **in summer months-** 6 degree (celsius) in the north to 24 degree in the south
- **in winter months-** minus 32 degree in the north to minus 8 in the south

**Total annual precipitation-** 50-450 milometre (south and north respectively)

Heating season in Mongolia covers over 8 months starting in late September to early May.

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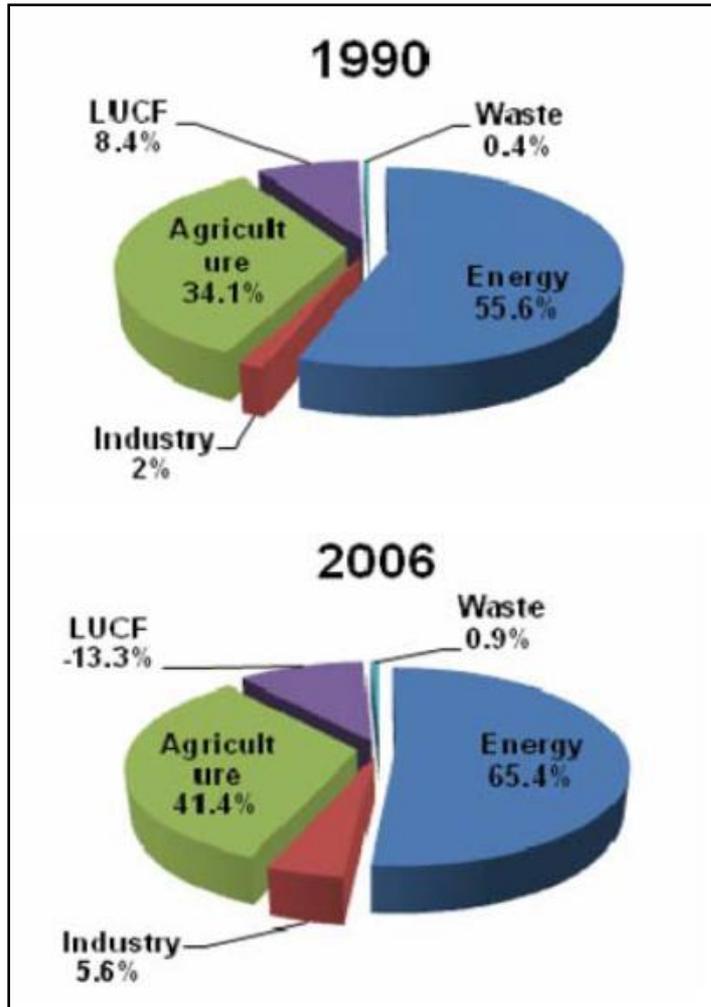
## GHG emissions in Mongolia

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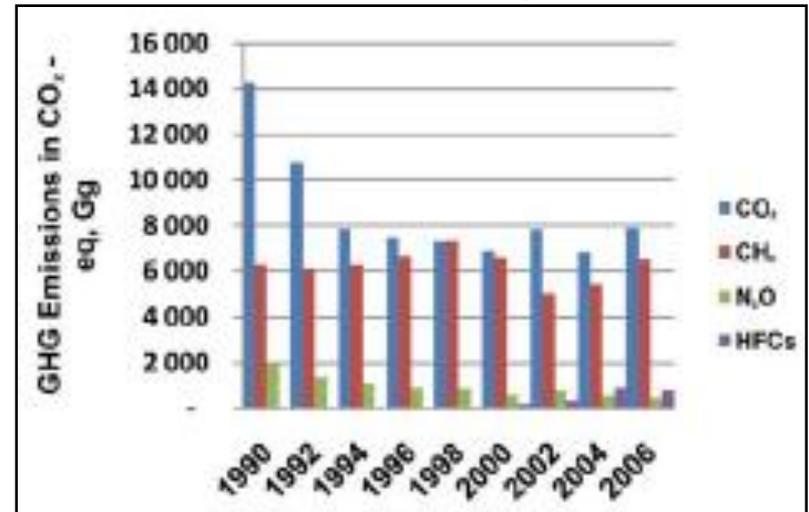
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## GHG emission in thousands tons of CO<sub>2</sub> eq



In 1990, Mongolia's net GHG emissions were 22532 thousand tons of CO<sub>2</sub> eq and due to economic downturn in early and mid 1990ies GHG emissions decreased.

Due to abundant coal resource and usage, energy sector is very Carbon intensive. Even though absolute size of GHG emissions in Mongolia is tiny, GHG emission per capita is twice as much as world average and GHG emission per 1000 USD of GDP is ten times higher than world average reflecting cold climate as well as inefficient use of resources.

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## Institutional and legal framework for GHG mitigation

### **INTERNATIONAL**

Mongolia ratified

1. UNFCCC in 1993
2. Kyoto Protocol in 1999
3. Energy Charter Treaty and Protocol on Energy Efficiency and Related Environmental Aspects in 1999

### **DOMESTIC**

#### **Laws:**

1. Renewable Energy Law (2007)
2. Law on Air (2010)
3. Law on Air Pollution Payment (2010)
4. Law on Air Pollution Reduction of the Capital City (2011)

#### **Long term sustainable development programs:**

1. The Mongolian Action Program for the 21st Century (MAP 21)
2. The MDG-based Comprehensive National Development Strategy of Mongolia

#### **Mid term programs:**

1. National Action Program on Climate Change (2011)
2. National Renewable Energy Program (2005)
3. New Reconstruction Mid-term (development) Program (2010)

# Current status of CDM in Mongolia

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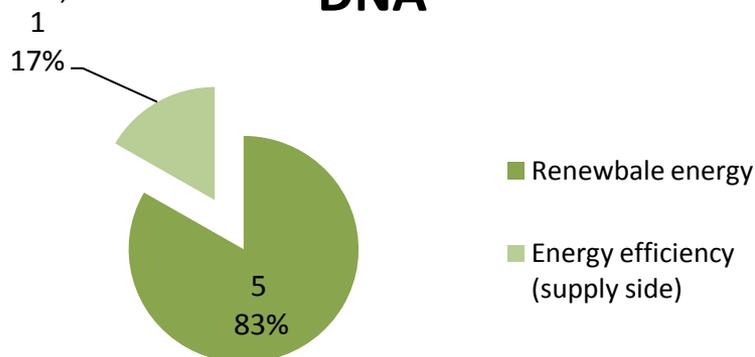
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## Projects approved by the DNA

(AMS-II.B.ver.7)



**Renewable energy:**

**Hydro:** 3 (AMS-I.D.ver.9,15)

**Wind:** 1 (ACM0002 ver.6)

**Thermal energy for the user:** 1  
AMS-I.C.ver.18

## Registered projects

Name of CDM Project Activity	Annual emission reduction (tCO <sub>2</sub> /yr)	Project Participants (Host Country)	Project Participants (Others)	Status
Durgun Hydropower Project in Mongolia	30,400	Energy Authority, Mongolia	Mitsubishi UFJ Securities Co., Ltd.	Awaiting issuance request (11/08-05/10) CERs requested: 14468tCO <sub>2</sub>
Taishir Hydropower Project in Mongolia	29,600	Energy Authority, Mongolia	Mitsubishi UFJ Securities Co., Ltd.	✓ Issued CERs are 48tCO <sub>2</sub> ✓ Awaiting issuance request (01/09-05/10) CERs requested: 838tCO <sub>2</sub>
A retrofit programme for decentralised heating stations in Mongolia	11,904	Prokon Nord Energiesysteme GmbH Mongol Zuukh XXI Ltd.		Registered

# Current status of CDM in Mongolia

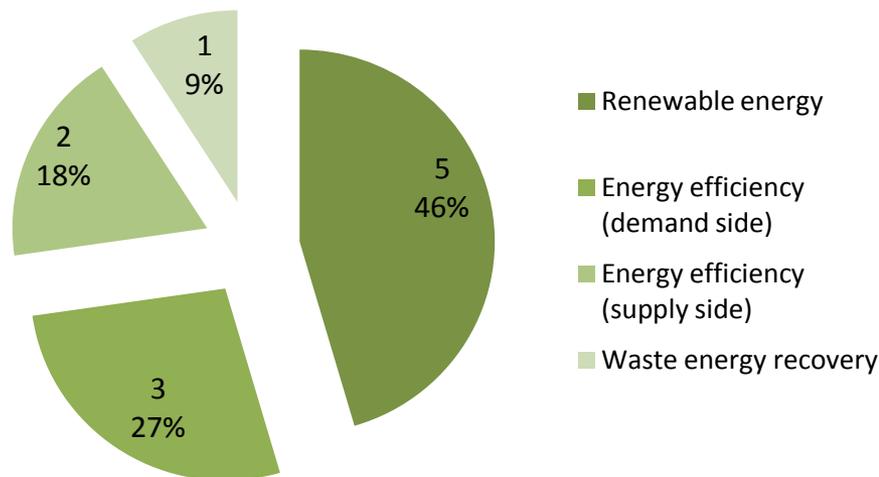
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## Projects endorsed by the DNA



**RENEWABLE ENERGY: 5**

**Wind:2** (ACM0002 ver.6)

**Waste Incineration: 1** (AM0025)

**Biogas:1**

**Geothermal heat: 1** (AM0072 or AMS-I.C.)

**ENERGY EFFICIENCY: 5**

**Supply side:3**

**Building energy efficiency(insulation of gers, pre-cast panel buildings, houses):3** (AMS-II.E)

**Demand side:2**

**Retrofitting HOBs and boilers:2** (AMS-II.B)

Name	Annual CERs (tCO <sub>2</sub> e)
Building Energy Efficiency MON/09/301 Project	63 thousand
Project of generating energy from garbage treatment	459 thousand
Energy conservation and emission reduction from poor households	75.0 – 90.0 thousand
Community based heating supply in rural remote areas of Mongolia	17.0-23.0 thousand
Sainshand wind farm project	174.0 thousand
Biogas Plant Project in Mongolia	2.3 thousand
WGGE-waste gas to green energy	28.5 thousand
Oyu tolgoi wind power project (250MW Khanbogd high power wind farm)*	1,412 thousand
Replacement of coal and wood fired heating by renewable heating system	15.4 thousand
Reconstruction boilers in Power Plants of Darkhan and Erdenet cities	32 – 33 thousand
Energy efficiency rehabilitation for pre-cast panel buildings	100.0 –110.0 thousand

# GHG emission projection and reduction potential

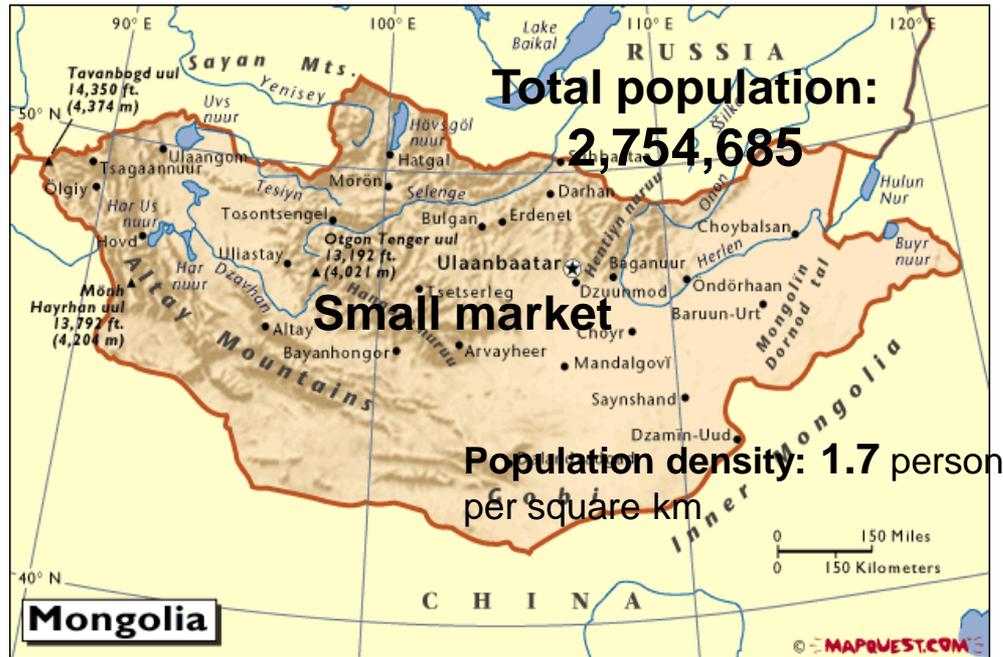
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## Constraints for CDM project implementation

1. Market size
2. Transaction cost
3. Methodological barrier (project type)
4. Capacity and awareness
5. Financing

## Common characteristics of projects having difficulty to be implemented as CDM in Mongolia:

1. Scattered over wide geography
2. Low emission reduction per project basis
3. Involves heating and coal technologies (which often faces difficulties in applying approved methodologies)
4. Financing difficulty

# GHG emission projection and reduction potential

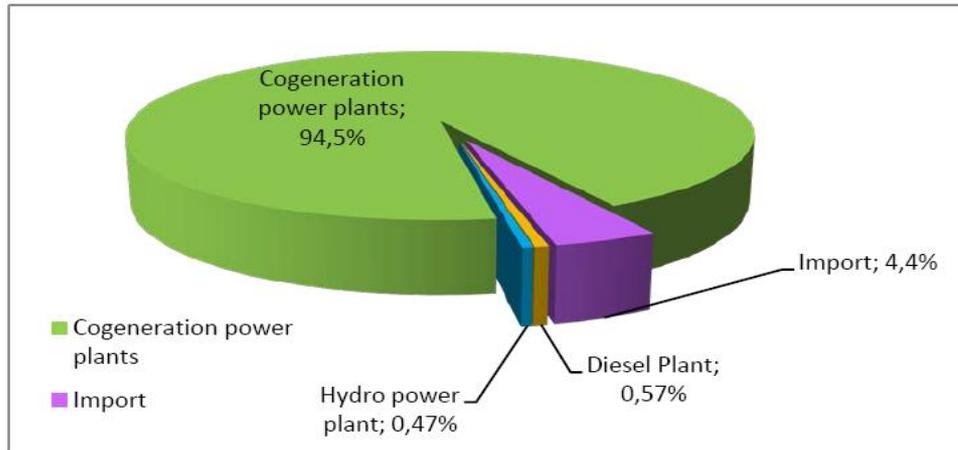
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## Energy Production in Mongolia (2009)



Source: Energy Statistical Indicators 2009

The percentage of the renewable energy share in the total installed power generation capacity

Capacity unit	Thermal Power Plant	Power Generation from Renewable Energy			
		Total	Hydro	Solar	Wind
MW	827.4	37.5	28.3	5.32	3.8
%	95.66	4.34	3.28	0.62	0.44

According to the National Statistical Year book, in 2009 total 4 billion (4,038,800,000) KWh of electricity and 8.32 million Gkal heat is generated locally. And due to rapid economic growth and development in mining sector , energy demand is expected to double in 10 years. And to meet this growing demand government is planning to expand energy generation facilities.

# GHG emission projection and reduction potential

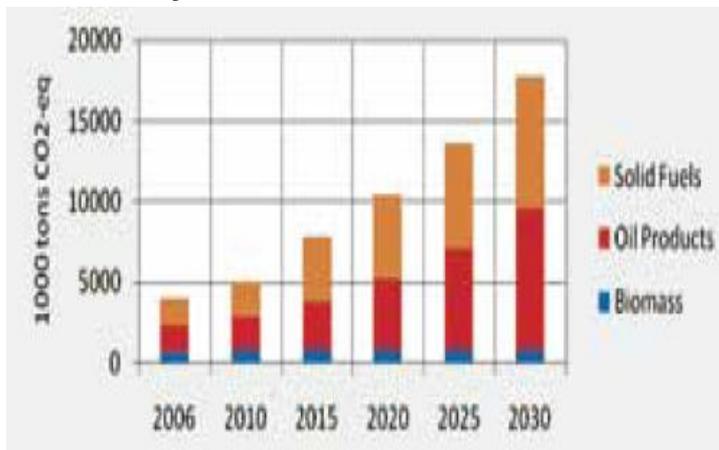
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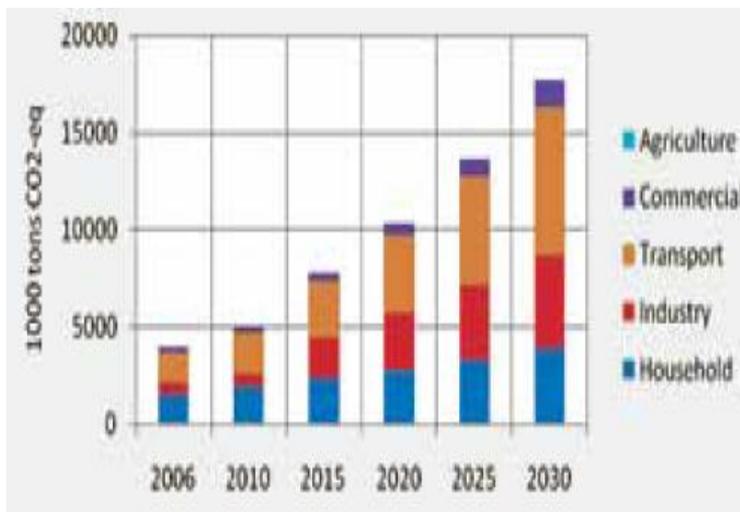
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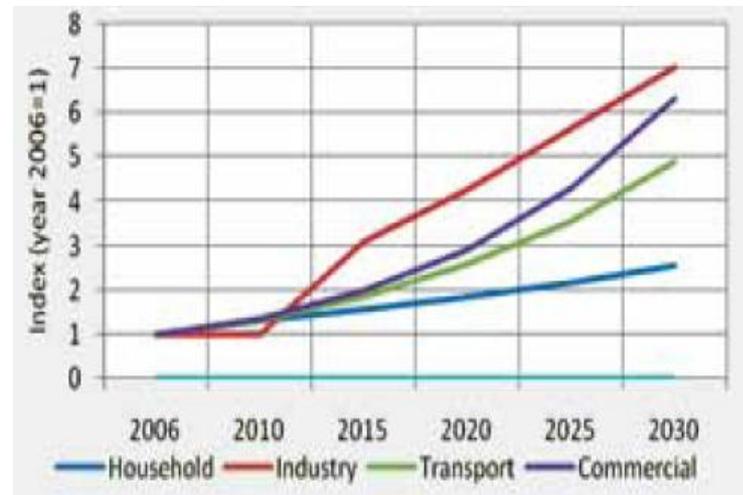
**GHG emissions projection from energy demand by fuels**



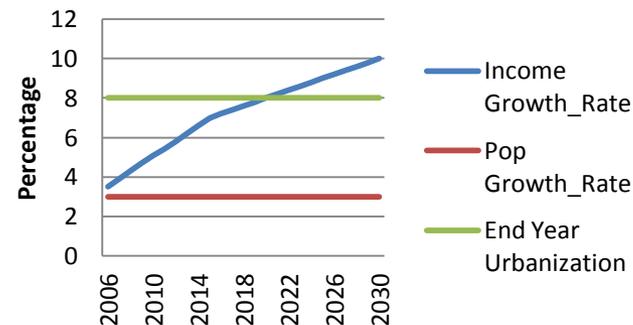
**GHG emissions projection from energy demand by sectors**



**Projected GHG emission trend index**



**Key assumptions**



Source: Mongolia 2<sup>nd</sup> National Communication

# GHG emission projection and reduction potential

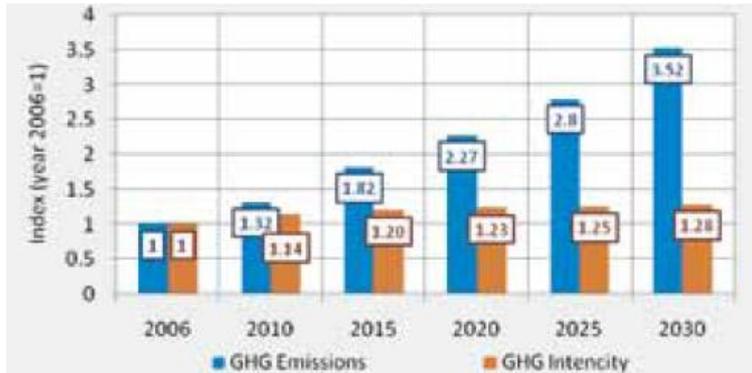
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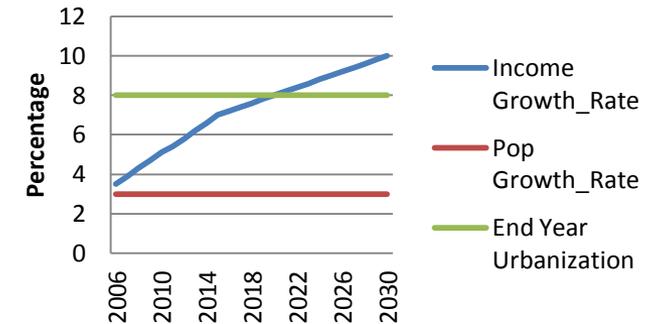
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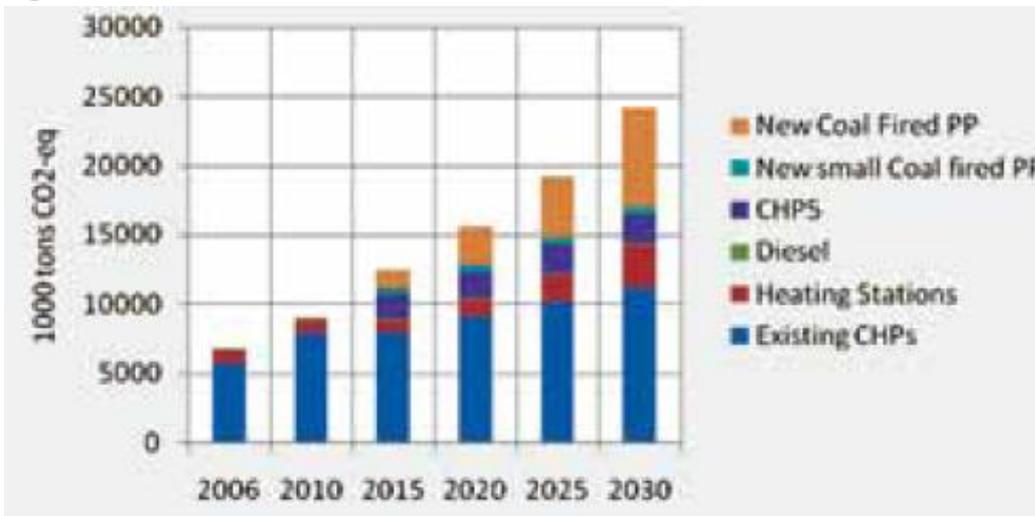
## Projection of major GHG index (base 2006=1)



## Key assumptions



## GHG emissions from electricity and heat generation



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## GHG mitigation related domestic policies and programs

### Direct:

National Renewable Energy Program 2005-2020 (Parliament Decree #32, June 2005)

- ❖ aims to increase share of renewable energy in total energy generation to 20-25% by 2020
- ❖ aims to reduce system loss by more than 10% (base year 2005) by 2020

### Indirect:

New Reconstruction Mid Term Development Program 2010-2016 (Parliament Decree #36, June 2010)

- ❖ aims to decrease air pollution
- 30% (base year 2010) by 2012
- 50% (base year 2010) by 2016

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## Potential sector and measures

### Energy generation and supply :

1. Increase utilization of renewable energy:
  - *Hydro power*
  - *Wind power*
  - *Solar and PV*
  - *Biomass and geothermal*
2. Improve efficiency of heat only boilers:
  - *Rehabilitate old HOBs,*
  - *Increase use and installment of new, highly efficient boilers,*
  - *Converting steam boilers into small capacity thermal powers.*
3. Improve household stoves:
  - *Improve currently used stoves,*
  - *Introduce and spread new and efficient stoves,*
  - *Improve fuel quality or change fuel used in the stoves,*
4. Improve coal quality
  - *Increase production of pellets and briquettes from coal*
  - *Introduce primary coal processing technologies on mine site*
5. Improve combined heat and power generation:
  - *Increase efficiency*
  - *Decrease internal use*
6. Improve electricity and heat transmission lines:
  - *Decrease heat and electricity transmission losses*
  - *Eliminate water loss in the transmission line*
  - *Improve insulation of heat transmission lines*

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## Potential sector and measures

### 1. **Building (ger and houses included)**

- *Improvement of insulation*
- *Introduction of standards for insulation and heat consumption*
- *Improvement in heat supply*
- *Improvement in lighting*

### 2. **Industry**

- *Introduction of new technology (Cement industry from wet to dry technology)*
- *Increase in motor efficiency*
- *Improvement in lighting efficiency*
- *Utilization of waste heat and steam*

### 3. **Transport**

- *Vehicle fuel combustion efficiency improvement*
- *Improvement of road condition*
- *Improvement of traffic management*
- *Introduction of economic incentive in the management of buying and using of car, fuel and parking*
- *Fuel switch*

### 4. **Agriculture**

- *Improvement of animal productivity and decrease in number of animals.*
- *Increase and improvement of processing industry for animal products*

### 5. **Forest and land use**

- *Afforestation and reforestation*
- *Protection of forest from harmful insects and fire*
- *Elimination of illegal logging*
- *Increase of land productivity*
- *Use of forest residues*

### 6. **Waste**

- *Methane utilization from landfill sites*
- *Improvement of waste management*
- *Reuse and recycling of waste*

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## Boiler replacement

Methodology	AM0044, AMS-II.B
Eligibility	Additionality based on financing constraints, lack of profitability
Substantial amount of emission reduction	PoA approach can scale up emission reduction. Replication potential high.

**Key barrier:** Institutional capacity, financing and establishment of baseline. This project requires reliable data. Efficiency of typical boiler or heating device or any other device is very important in case of energy efficiency projects. One of the ways to tackle this may be referring to publically available reports.

**Initiatives:** PoA DD and generic CPA DD for HOB rehabilitation had been drafted within CBDICFP project jointly implemented by MNET and WB. Energy Authority is identified as CME for this project. Further support is needed both for building capacity of the CME and to finance the project.

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## Ger insulation project

Methodology	AMS-II.E
Eligibility	Additionality based on financing constraints
Substantial amount of emission reduction	PoA approach can scale up emission reduction. Replication potential high.

**Key barrier:** Institutional capacity, establishment of baseline and monitoring.,  
**Initiatives:** ADB carried out a pilot CDM project.

## Pellet and briquette plant project

Methodology	AMS-I.C
Eligibility	Additionality based on financial and technological barriers.
Substantial amount of emission reduction	PoA approach can scale up emission reduction and reduce transaction cost per project activity. Replication potential high.

**Key barrier:** Contractual arrangement. (For this project emission reduction is achieved in the use of the pellet not in the production of pellet. So in order to claim ER, pellet must be used by an entity whose use of the pellet could be regularly monitored.)

**Initiatives:** “Pellet and briquette plant project” PDD has been written within CBDICFP project jointly implemented by MNET and WB. ERPA signed under validation.

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## CFL distribution

Methodology

AMS-II.C, AMS-II.J

Eligibility

Additionality based on financing constraints, information barrier and prevailing practice barrier.

Substantial amount of emission reduction

Emission reduction depends on the sector targeted and scale. PoA is preferred that would ideally cover all possibilities in Mongolia and even outside Mongolia.

**Key barrier:**

Scale of the emission reduction, institutional capacity.

**Initiatives:** CPA DD for CFL distribution had been drafted within CBDICFP project jointly implemented by MNET and WB. Stakeholder consultation and EIA has not been conducted yet. Further development needed.

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## Waste gas to power

Methodology	ACM0012, AMS-III.Q
Eligibility	Additionality based on financing constraints and first of its kind argument.
Substantial amount of emission reduction	There is replication potential in Mongolia because more entities are developing plan to construct semi-coking plants which would provide an opportunity for waste gas to power project. PoA approach can scale up emission reduction and reduce transaction cost for additional projects.

**Key barrier:** Financing and institutional capacity

**Initiatives:** Waste gas to green energy PDD has been written within CBDICFP project jointly implemented by MNET and WB. Ready for validation. DOE contracted.

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## Building energy efficiency project Insulation of pre-cast panel building project

Methodology	AMS-II.E
Eligibility	Additionality based on lack of profitability, financing constraints.
Substantial amount of emission reduction	PoA approach can scale up emission reduction and reduce transaction cost for additional projects.

**Key barrier:** Methodology is not clear and establishment of baseline is difficult, financing cost high.

**Initiatives:**

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## **There are opportunities for GHG reduction in Mongolia:**

- ✓ Carbon intensive energy sector (mostly coal based)
- ✓ Cold climate
- ✓ Rapid economic growth (based on rapid growth of mining sector)
- ✓ Rapid growth of energy demand
- ✓ Government policy objective overlap with GHG mitigation (energy security and air pollution reduction)

## **What needs to be done:**

- ✓ Capacity Building and awareness raising
- ✓ Coordination of activities
- ✓ Institutional arrangement
- ✓ Explore and introduce new carbon finance opportunities (New market mechanism that addresses deficiencies of CDM)

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Thank you very much for  
your attention!!!

[www.cdm-mongolia.com](http://www.cdm-mongolia.com)

# References

1. Mongolia second national communication to UNFCCC
2. Carbon Finance in Mongolia (2<sup>nd</sup> Volume)
3. Upstream CDM project preparation and Development: Project selection by Casper van der tak, 2010 (uploaded on [www.cdm-mongolia.com](http://www.cdm-mongolia.com))
4. PDDs of projects (<http://unfccc.int>)
5. In depth review of energy efficiency policies and programmes in Mongolia (2010) (report link is provided on [www.cdm-mongolia.com](http://www.cdm-mongolia.com))