

# ASSESSMENT OF SOCIO-ENVIRONMENT BENEFITS OF CMM IN MONGOLIA

---

# Require for CMM consumption

---

To reduce Coal consumption in Ulaanbaatar city and its Nalaikh district

- Reduce expense of households and commercial facilities
- Reduce air pollution in Ulaanbaatar city
- Reduction GHG (CH<sub>4</sub> gas) emission in Mines

# Overview of fuel consumption in Ulaanbaatar city and it's district Nalaikh

---

## ***Nalaikh:***

- ✓ Private houses or stoves – 9000  
annual coal consumption -37800 tn
  - ✓ Heat only Boilers - 24GCal/h  
annual coal consumption -33800 tn
- Total-71600 tn**

## ***Ulaanbaatar city:***

- 130000 households –  
Annual coal consumption -540000 tn
  - 100,000 vehicles-  
Annual coal consumption  $2200 * 100000 = 220000$ tn
  - Heat only Boilers-  
Annual coal consumption  $2200 * 100000 = 32350$  tn
- Total- 792350 tn**
-

# Coal price and it's volume in the expences

---

- Price of Nalaikh's coal- 35...45 U\$/tn
  - Price of Baganuur's coal- 32...40 U\$/tn
  - Heating cost
    - In heat-only boilers... 24 u\$/GCal
    - Coal price is 60% of heating cost.
  - A household spends annually:
    - ~ 4.5t (coal)\* 45000₮ = 250000...300000₮ (260 US)
  - Heat expenses rate is 30% in total expenses Schools, Health Facilities (Municipal Organizations).
-

# Air Pollution Ulaanbaatar city and it's Nalaikh district

---

Air pollution is increasing because of coal burning in inefficient stoves

Smog concentration esimating experiment

	Chemical name		Stove-2	Average
<b>1</b>	CO	mg/m3	1998.656	<b>1918.98</b>
<b>2</b>	SO <sub>2</sub>	mg/m3	2.3	<b>19.37</b>
<b>3</b>	NO <sub>x</sub>	mg/m3	2.8815	<b>12.44</b>
<b>4</b>	Ash in gas	mg/m3	1531.8	<b>1222.88</b>
<b>5</b>	GHG, CO <sub>2</sub>	mg/m3	59028.75	<b>53030.2</b>



# CMM Parameters

---

- Methane rate:
    - Kuzbass coal mine 25-30m.cub/tonne
    - Nalaikh coal mine 5 m.cub/tonne
  - Net Heating Value- 10000 kcal/kg
  - Density 0,72 kg/m<sup>3</sup>
  - Possibility of high pressure compression
  - Price is three times low than coal's
  - 4 times less Hazardous Gas Emission than Coal
-

# Methane Annual Demand

---

## ***In Nalaikh district***

- Householders -  $1400\text{m}^3 \times 9000 = 130,000\text{m}^3$
- Heat-only boilers 11,000,000 m<sup>3</sup>

**TOTAL- 11,1 million m<sup>3</sup>(8136.0 tn)**

**coal-2,2 mln tn**

## ***In Ulaanbaatar city***

- Householders - 182,000,000 m<sup>3</sup>
- Auto transport - 3,500,000,000 m<sup>3</sup>
- Heat Plants- 45,000,000

**TOTAL-185 million m<sup>3</sup>**

---



# Environmental benefits

---

## Reduction of GHG emission

- Per household: CO<sub>2</sub> - 2.2 tn/year  
NH<sub>4</sub> - 1.1 tn/year
- Per GCal heat: CO<sub>2</sub> - 0,33 tn/year  
NH<sub>4</sub> - 0.1 tn/year

### in Nalaikh district

1. Households: CO<sub>2</sub> - 19800 tn/year; NH<sub>4</sub> - 9900 tn/year
2. HOB's: CO<sub>2</sub>-66000\*0,33=21780 tn;NH<sub>4</sub>-66000\*0,1=6600tn

### in Ulaanbaatar

1. Households: CO<sub>2</sub>-130000\*2,2=286000 tn; NH<sub>4</sub> -143000 tn
  2. HOB's: CO<sub>2</sub>-275000\*0,33=90000 tn;NH<sub>4</sub>-275000\*0,1=27500tn
-



# Economical benefits of CMM Consumption

---

- a) heat-only boilers will reduce their heating cost by 16000₮ or 14\$/Gcal
- b) Householder will economy 100000₮ or 86 u\$ in fuel expenses
- c) Vehicle fuel expenses-500000₮ or 460\$/year

## in Nalaikh district

- 1. heat-only boilers- $66000 * 14 = 924000$  \$
  - 2. Household's - $9000 * 86 = 774000$ \$
- total-1,9 million**

## In Ulaanbaatar

- 1. heat-only boilers- $275000 * 14 = 3,8$  mln \$
  - 2. Household's - $130000 * 86 = 11,2$  mln \$
  - 3. Vehicles- $80000 * 460 = 36,8$  mln \$
- total- 51,2 mln \$**
-

---

THANK YOU

---