

# Upgrading and Installation of Centralized Control System of High-Efficiency HOB

PP from Japan: Suuri-Keikaku

PP from host country: Anu-Service

# Outline of Project (1)

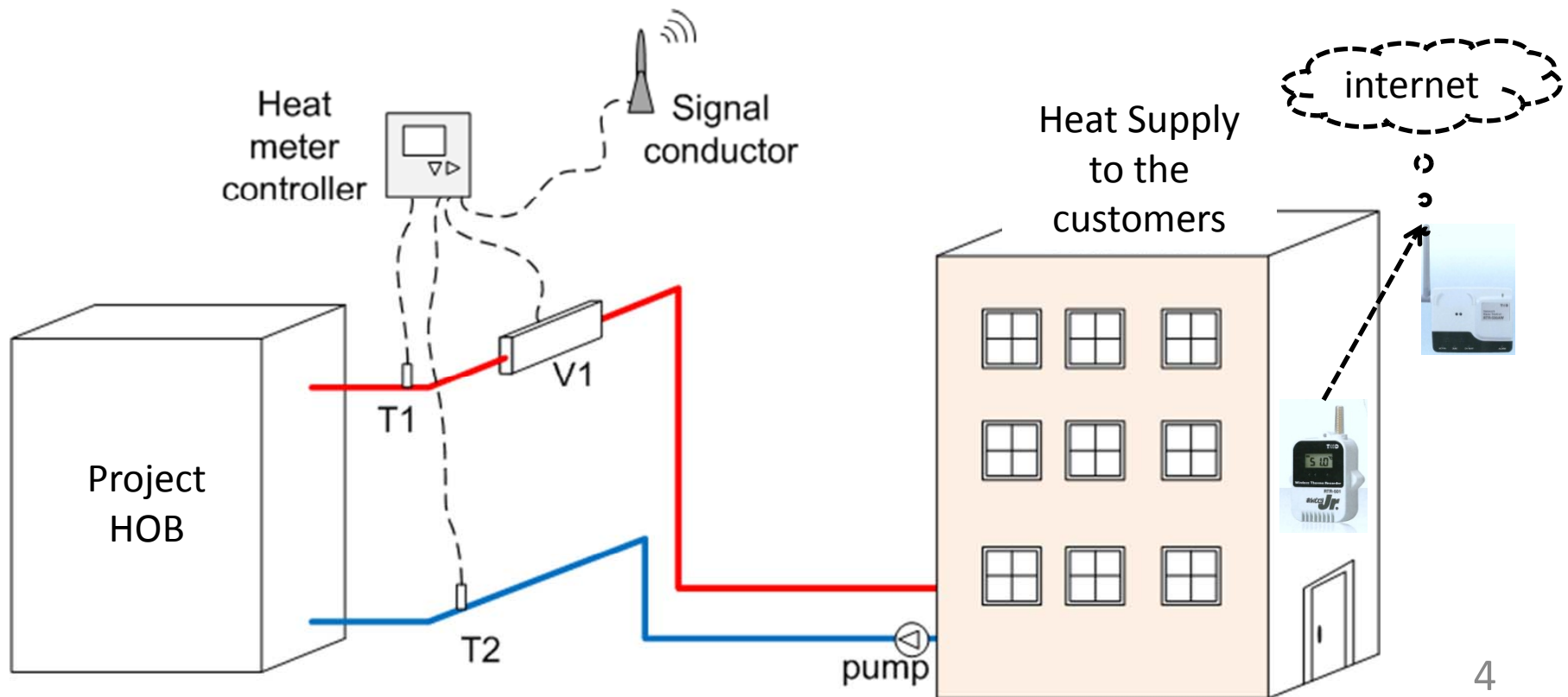
- The project is the infrastructure building in Bornuur sum, composed of the installation of Heat Only Boilers (HOBs) as well as pipe laying work, electrical construction and boiler building construction.
- The project will alter the current heat supply system in Bornuur sum of individual building-based heating, under which the low efficiency HOBs and stoves are used.

# Outline of Project (2)

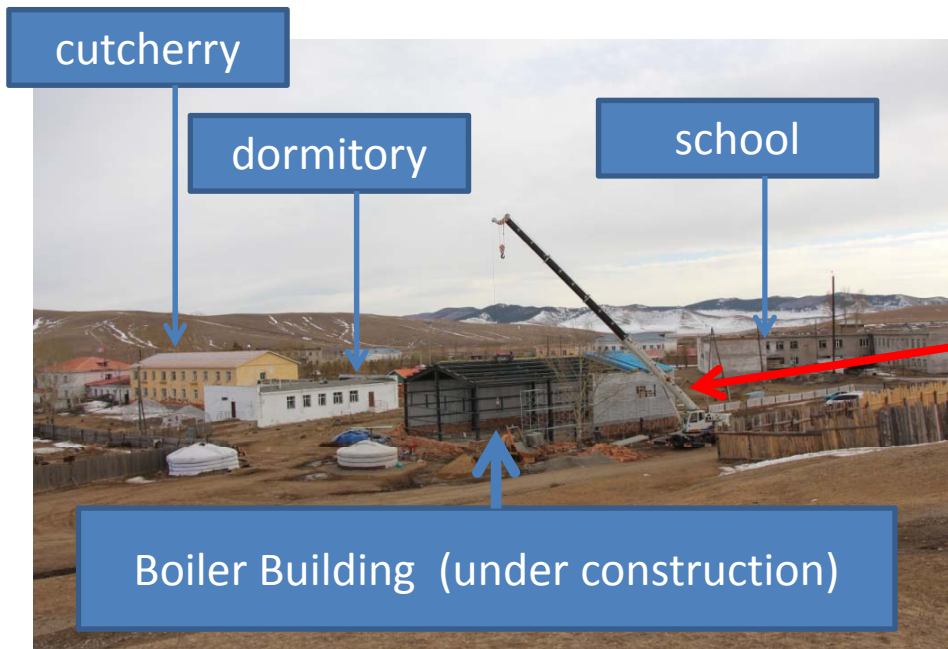
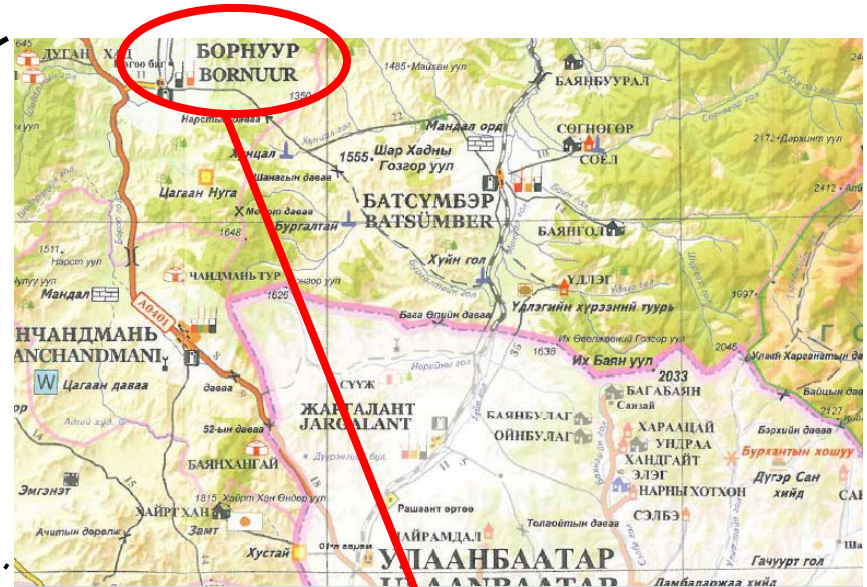
- The centralized control system of high efficiency HOBs will be installed in this project.
- The improvement of boiler efficiency leads to CO2 emission reductions and other air pollutants, because the fuel (coal) consumptions are reduced.
- The replacement of low-efficiency old-type boilers with high-efficiency latest model boilers at a school in Ulaanbaatar city. The project also leads to the reduction of coal consumptions to mitigate CO2 emissions as well as air pollutants.

# Outline of Project (3)

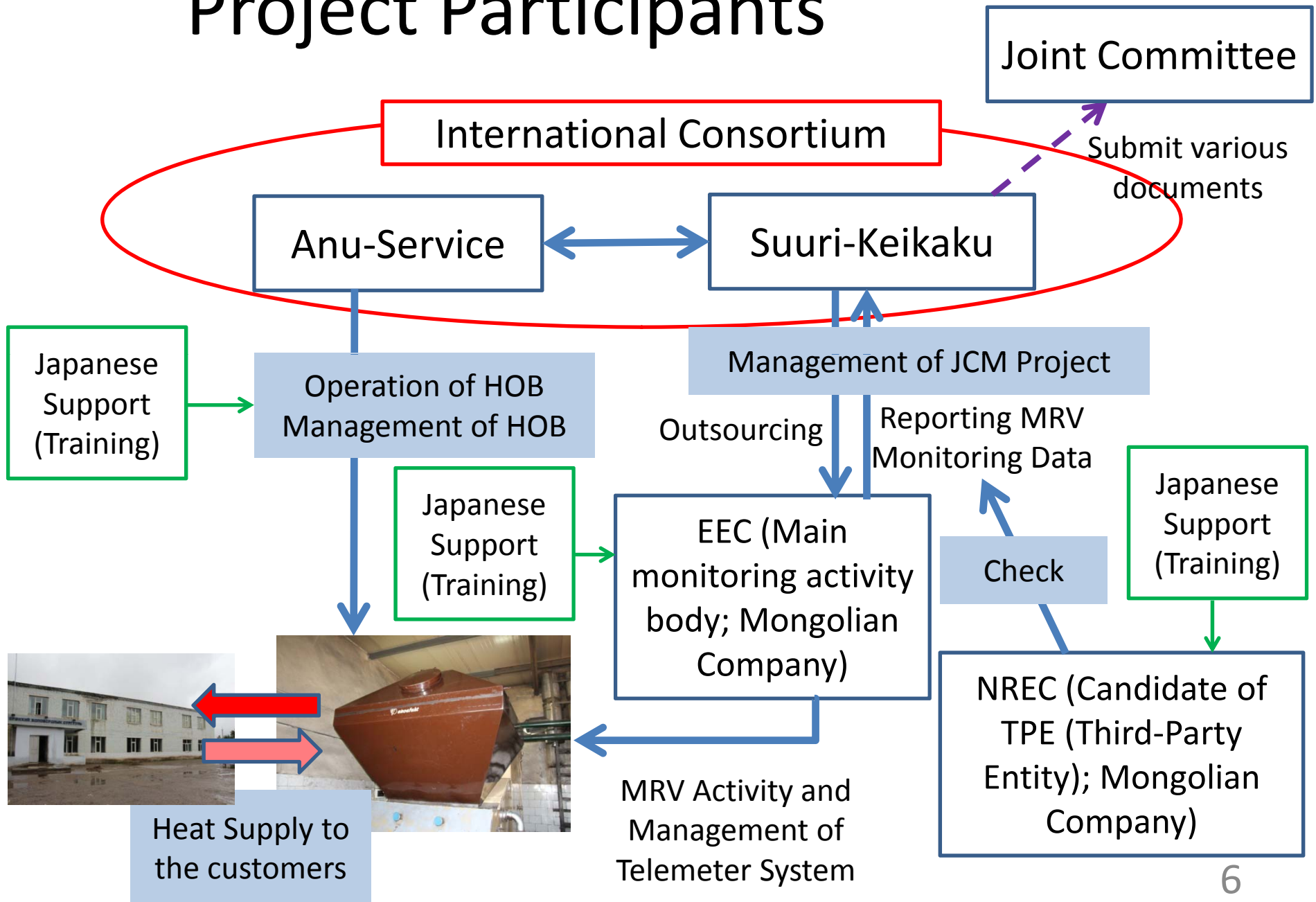
- We will develop the system of the remote control and the automatic record by the telemeter, as the core of the MRV activity.



# Project Site



# Project Participants

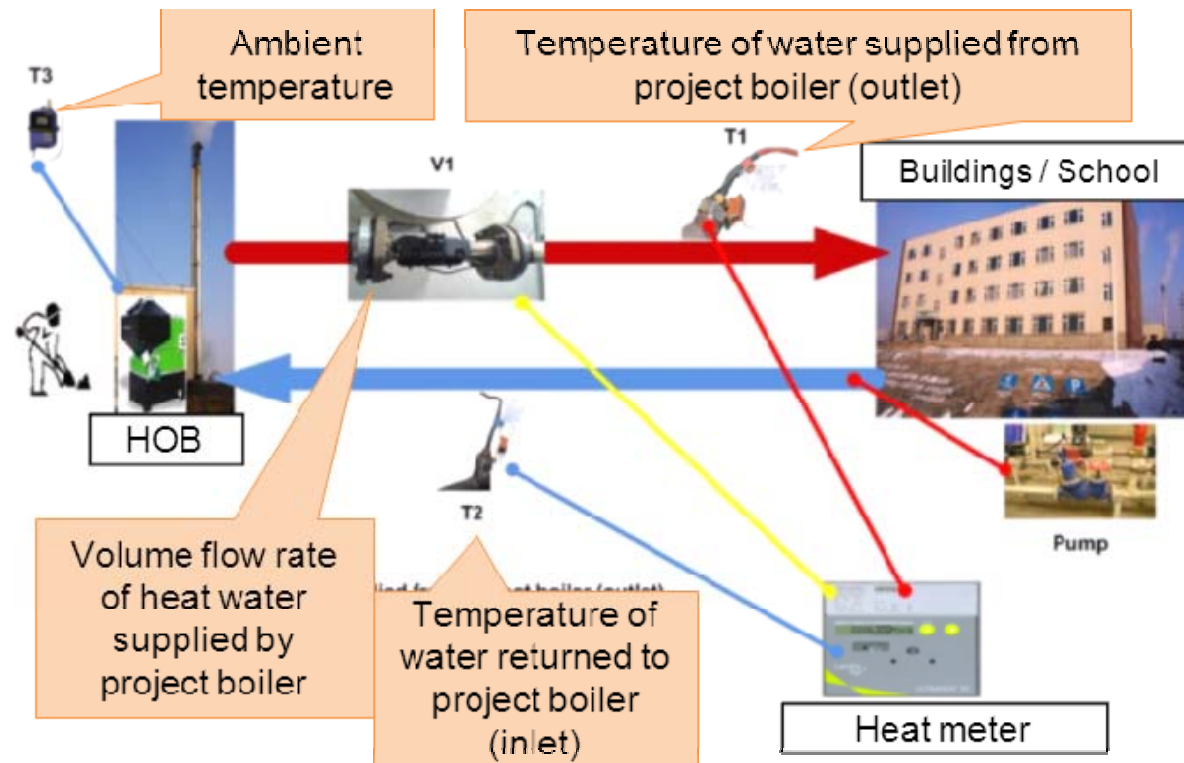


# Characteristics of this Project

- In a heat meter, the telemeter system using the cell-phone is built. By this system, data necessary for energy management are available in remoteness.
- We will monitor the temperature in the building and outside temperature in remoteness and will develop the feedback system of the operation of HOB using these temperature data.
- We introduce the monitoring equipment which measures exhaust gas temperature or exhaust gas O<sub>2</sub> concentration. The Japanese engineer performs the technical guidance optimizing the operation of the boiler from these measurement results.



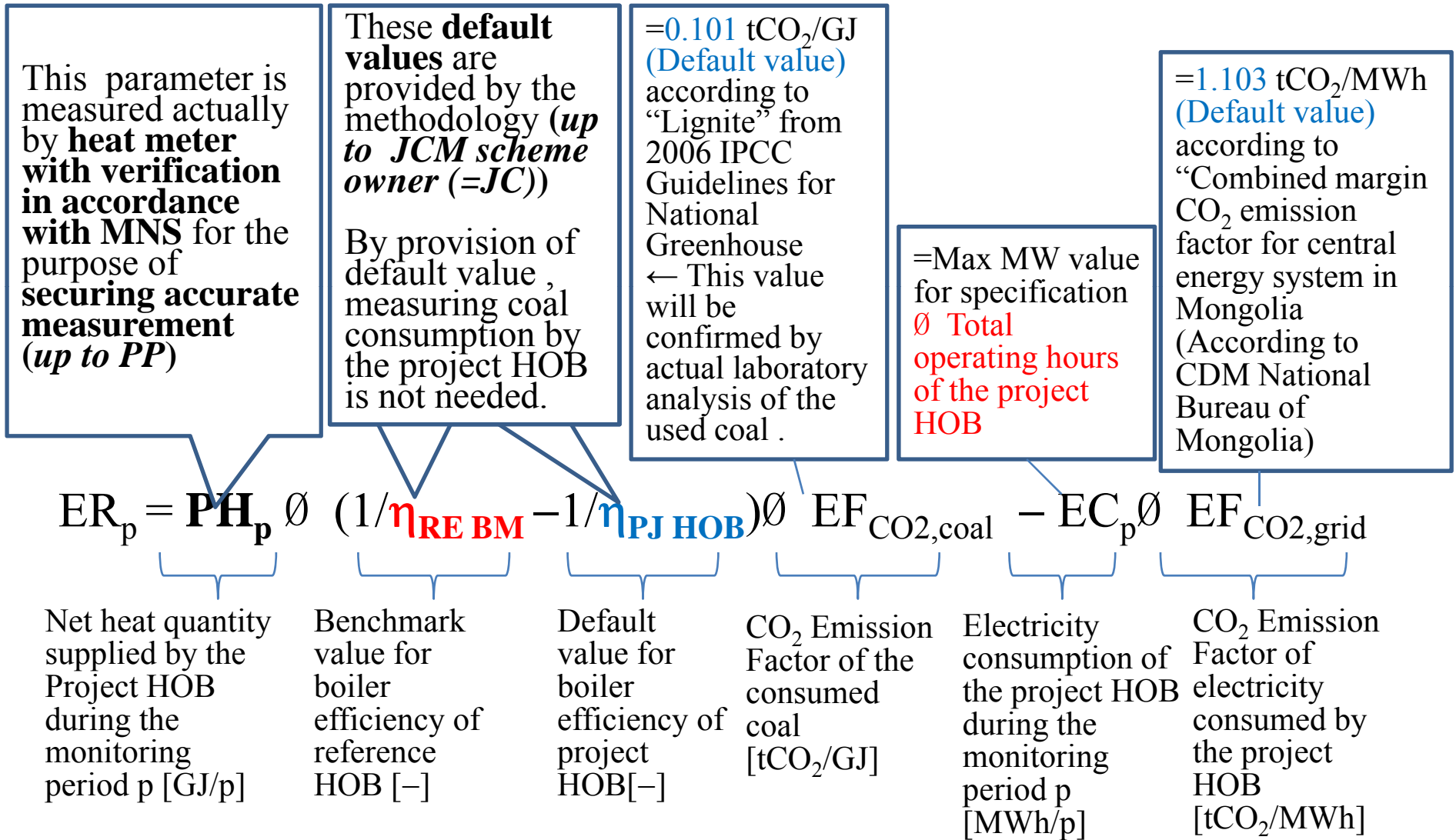
# Basic System of MRV Activity



- Monitoring Item is only the Net heat quantity supplied by the Project HOB. The monitoring method shall meet the industrial standard of the host country (Mongolian National Standard).



# Equation of Emission Reductions



# Example of Data/Parameter Table (Monitoring Plan & Monitoring Report)

<b>Data/Parameter</b>
<b>Unit</b>
<b>Description</b>
<b>Purpose of data</b>
<b>Measurement/Calculation /Default</b>
<b>Source of data</b>
<b>Values of parameter to be monitored</b>
<b>Monitoring equipment</b>
<b>Measuring/Reading/ Recording frequency</b>
<b>Calculation method (if applicable)</b>
<b>QA/QC procedures</b>
<b>Trouble shooting procedure of missing data</b>
<b>Additional comment</b>

# Draft Eligibility Criteria (1)

- The technology to be employed in this methodology is coal-fired heat only boiler (HOB) for heat water supply system.
- The HOB to targeted for the project activity is defined as a boiler used for heat supply which has capacity of 0.10 MW – 3.15MW.
- The project activity encompasses installation of new HOB, replacement of the existing coal-fired one and expansion of the capacity for the existing coal-fired one.

## Draft Eligibility Criteria (2)

- The project HOBs have dust collectors. In case of a HOB which dust collector is not set up, dust collector shall be additionally installed with the installed HOB for pollution-abatement measure.
- The manual of boiler operation and management shall be prepared.

# Draft Eligibility Criteria (3)

- The project participants shall show the evidence of high boiler efficiency of project HOB as follows ;(such as)
  - The built in sensors of Project HOB control the autonomous operation while there is fuel in the container.
  - The fire bed is hearth instead of stoker, and the combustion air is blown into the combustion room from the nozzle on hearth.
  - Because of the hermetically-sealed boiler, the boiler is the structure that the invasion atmosphere in the furnace is low.

# Default Values

- Boiler Efficiency Investigation: (The Input-Output Efficiency Measurement Method)
  - Measurement of Heat Supply (Using the equipment of Heat meter / Ultrasonic Flow Meter & Thermocouples)
  - Measurement of Coal Consumption
- CO2 Emission Factor
  - Coal Analysis Survey

# About Reference HOB (1)

- We interviewed well-informed independent personalities (experts).

Experts	Comments
<p>Dr. TSEYEN0OIDOB            “Mongolian University of Science and Technology Power Engineering School”</p>	<p>It is good to classify the reference HOB/ project HOB by the boiler efficiency.            The reference HOB is the boiler that coal is thrown into a fixed fire grate by manual operation.</p>
<p>Ms.ENKHMAA Sarangerel            “Government Implementing Agency for Meteorology &amp; Environmental Monitoring”</p>	<p>The boiler of the brickwork type will decrease in future.            “CSLG” (made in China) and “HP10/60Ж” (made in Mongolia) are cheap and easy to be introduced.</p>
<p>PhD S.MANGAL            “Millennium Challenge Account-Mongolia Energy and Environment Project”</p>	<p>Without the help of the overseas donor, the old HOBs are just used, or cheap HOBs are easy to be introduced.</p>
<p>Mr.ZANDANPUREV.Z            Ulaanbaatar City Authority of Partial Engineering Supply</p>	<p>The cheap HOBs such as the vertical type will be often used.</p>

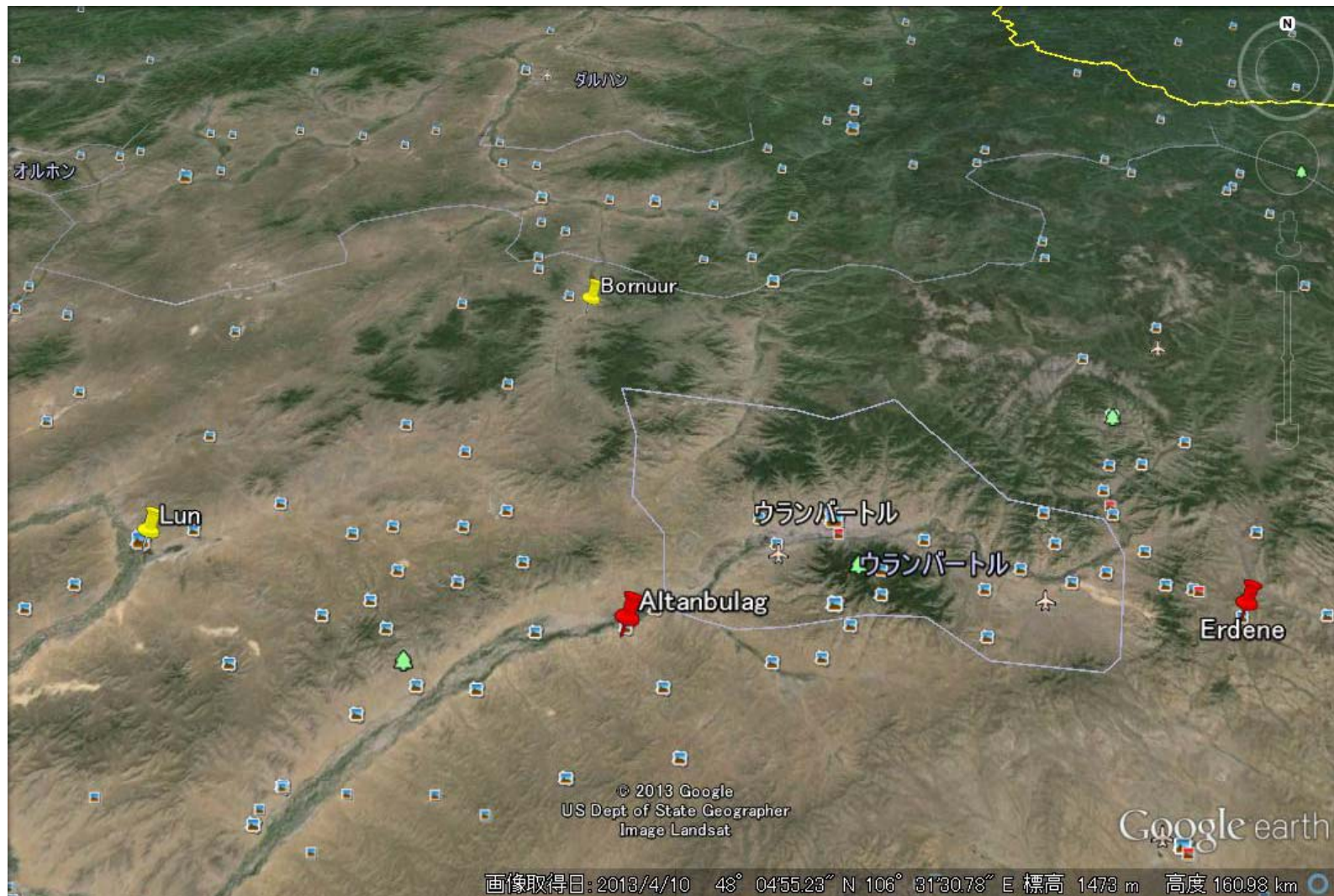


# About Reference HOB (2)

- We implemented the field survey of HOBs in local area (Lun sum, Bornuur sum, Erdene sum, Altanbulag sum).

Type of HOB	Quantity	Remarks
Vertical Type Boiler	12	Example: HP10/60Ж, CLSG, etc. The newly purchased boiler was the vertical type boiler.
Brickwork Boiler	3	
Small Size Boiler	7	The quantity of this type of boiler is many in the supply to the small building.
Total	22	

# HOBs Field Survey Spots in 2013



# Example of Erdene sum



School



Culture Center



Technical School



Town Office



Dormitory



# Other Information

№	Зуухны марк	Хүчин чадал (кВт)	Насжилт			Нийт	Утаа цэвэрлэх төхөөрөмжтэй эсэх
			5 хүртэлх	5-10 хүртэл	10-аас дээш		
1	Китурами, БНСУ	240, 350	4			4	үгүй
2	MDZ, Монгол	250, 300, 800	8	2		10	үгүй
3	Карборобот, Унгар	140, 180, 300	9	17		26	ТИЙМ

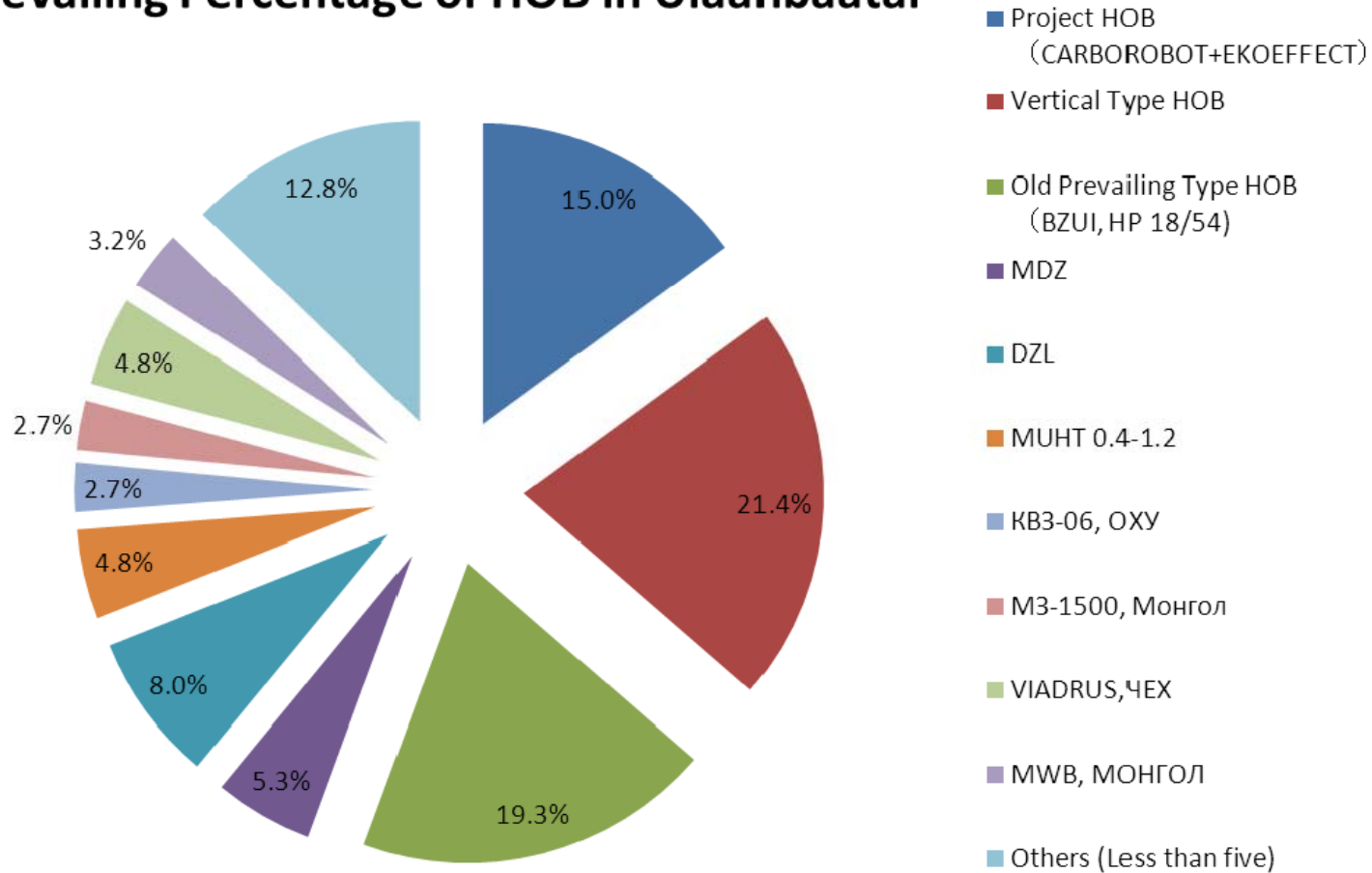
АГААР БОХИРДУУЛАХ ЭХ ҮҮСВЭРИЙН  
2011 ОНЫ УЛСЫН НЭГДСЭН ТОО БҮРТГЭЛ

## • Challenge

- Data of only Ulaanbaatar City (Central six districts)
- There are no data of HOB of local area.

# Other Information

## Prevailing Percentage of HOB in Ulaanbaatar



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# Other Information

	Аймгийн нэр		Усан халаалтын болон уурын зуух		Технологийн болон тусгай зориулалтын зуух		1000кВт-аасдээш хүчин чадалтай зуух	
			Тоо	Жилд хэрэглэдэг түлшний хэмжээ, тн	Тоо	Жилд хэрэглэдэг түлшний хэмжээ, тн	Тоо	Жилд хэрэглэдэг түлшний хэмжээ, тн
1	Архангай	аймаг	80	2961	–	–	9	19200
		аймгийн төв	23	2330,6	–	–	9	9200
2	Баян-Өлгий	аймаг	156	7584	2	290	5	16226
		аймгийн төв	2	6300	38	2111	5	16226
3	Баянхонгор	аймаг	187	7980	–	–	8	20000
		аймгийн төв	46	21330	–	–	–	–

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2011 ОНЫ УЛСЫН НЭГДСЭН ТОО БҮРТГЭЛ

- The information of HOB in local area is only the quantities of HOB and the coal consumption of HOB.

# Request as Project Participants

- I would like you to **prepare** the **basic information** of HOBs as Mongolian government.
- Since the information of HOB in whole Mongolia is prepared as "National general registration of air pollutant emission sources in 2011" (АГААР БОХИРДУУЛАХ ЭХ ҮҮСВЭРИЙН 2011 ОНЫ УЛСЫН НЭГДСЭН ТОО БҮРТГЭЛ), I would like you to **improve/expand this information**.
  - (Minimum) Information : **Number of HOB**
  - (Better ) Information: **Capacity, Type of HOB** , real boiler efficiency
  - (Best) Coal consumption of each HOB



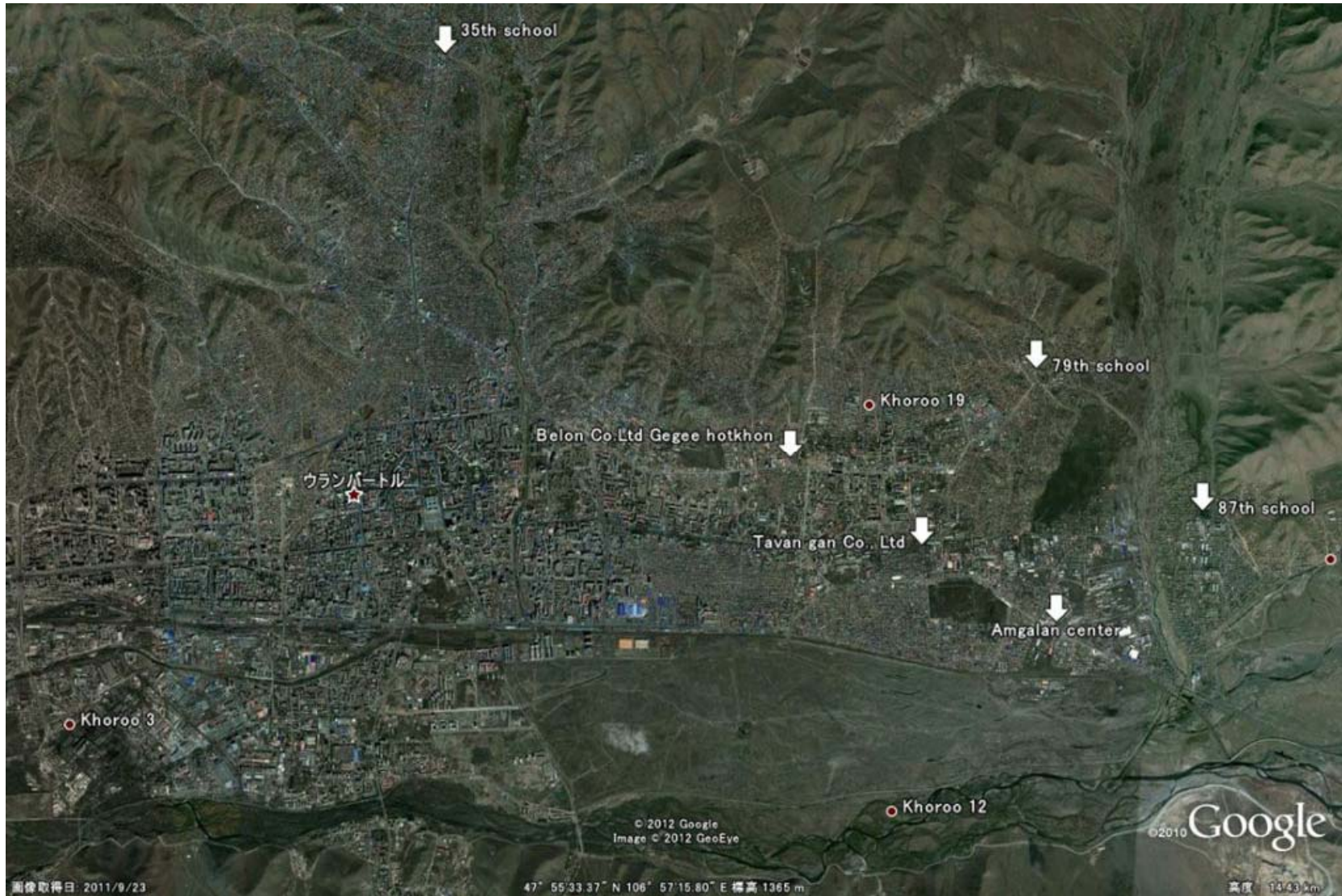
# Boiler Efficiency Investigation in 2012

Project Boilers		Reference Boilers	
Location	Type	Location	Type
79 School	Carborobot180	SEN-1 Residential Area	HP32
35 School	Carborobot300	79 School	HP10/60Ж
		87 School	HP54

Project Boilers		Reference Boilers	
Location	Type	Location	Type
Ikh Zasag Univ.	DZL	87 School	HP54
62 School	MUHT	Tavan gan Food Factory	CSLG
		Amgalan Center	HP10/60Ж

# Boiler Efficiency Investigation Site



# Boiler Efficiency Investigation (Instruments)

Heat meter ( only at 79 School & Tavan gan)





# Boiler Efficiency Investigation (Instruments)

Ultrasonic Flow Meter

Thermocouples



Data Logger

# Boiler Efficiency Investigation

- Measurement of Heat Supply

Project Boiler at 79 school



Reference Boiler at 87 school





# Boiler Efficiency Investigation

- Measurement of Coal Consumption



# Additional Boiler Efficiency Investigation in 2013

Project HOB		Reference HOB	
Location	Type	Location	Type
72 <sup>nd</sup> school	EKOEFFECT 650kW	79 <sup>th</sup> school	HP 30Ж
Bornuur sum	EKOEFFECT 650kW	TAVAN GAN TRADE LLC	CSLG
79 <sup>th</sup> school	CARBOROBOT 180kW	School in Erdene sum	HP60Ж
118 <sup>th</sup> school	CARBOROBOT 300kW		





# Example of Coal Analysis

## Basic Data of making the CO2 Emission Factor

STEWART MONGOLIA LLC  
West Wing, Building of Armono Corporation,  
Chinggis Avenue, Khan-Uul District  
Ulaanbaatar-17042, Mongolia  
Tel +976 11 343882



### CERTIFICATE OF ANALYSIS 12L07-CA

CLIENT: Suur-Kelkaku Co.,Ltd  
ADDRESS: Hitotsubashi Center Building, 7F  
2-4-6, Hitotsubashi, Chiyoda-Ku  
Tokyo, 101-0003 Japan  
ATTN: Mr. Fumihiko Kuwahara  
YOUR REFERENCE: xxx  
LAB. BATCH NO. 12L07-CA  
NO. SAMPLES: 7  
SAMPLE TYPE: Coal  
Notes/Comments: xxx

SAMPLES RECEIVED: 11-Dec-12  
INSTRUCTIONS RECEIVED: 11-Dec-12  
DATE OF REPORT: 26-Dec-12  
STATUS OF REPORT: FINAL  
ANALYSIS COMPLETE: 20-Dec-12  
PREPARATION CODE: CSPC, CSPG  
ANALYSIS CODE: TM, CPAA, CPAM,  
CPAV, CHNSO, CV  
APPROVED BY: Laboratory Director

Laboratory Manager

Quality Manager

*These test results are representative only of the sample received in the laboratory.*

LAB ID.	SAMPLE ID.	PROXIMATE ANALYSIS														ULTIMATE ANALYSIS							
		AS RECEIVED BASIS				AIR DRIED BASIS				DRY BASIS				DAF	AIR-DRIED BASIS								
		Total Moisture (TM)	Ash (CPAA)	Volatile Matter (CPAV)	Fixed Carbon	Calorific Value (CV)		Moisture (CPAM)	Ash (CPAA)	Volatile Matter (CPAV)	Fixed Carbon	Calorific Value (CV)		Ash (CPAA)	Volatile Matter (CPAV)	Fixed Carbon	Calorific Value (CV)	Calorific Value (CV)	Carbon	Hydrogen	Nitrogen	Sulphur	Oxygen
						Gross	Net					Gross	Net										
		%				cal/g		%				cal/g		cal/g	%								
1	SEN-1	36.46	10.48	23.12	29.92	3657	3308	4.69	15.72	34.69	44.89	5467	16.49	36.40	47.11	5757	6894	58.31	4.50	0.77	0.61	15.40	
2	87 school	29.00	14.65	25.05	31.30	3899	3585	4.38	19.73	33.73	42.16	5251	20.63	35.28	44.09	5492	6920	55.18	4.25	0.79	1.14	14.52	
3	79 school (HP)	25.52	15.32	26.91	32.24	4101	3796	4.38	19.67	34.55	41.39	5265	20.58	36.14	43.29	5506	6932	55.51	4.29	0.80	1.09	14.25	
4	Food factory	24.44	26.75	21.35	27.47	3293	3019	3.54	34.15	27.25	35.07	4203	35.40	28.25	36.35	4358	6745	45.04	3.62	0.91	0.71	12.04	
5	35 school	25.47	12.48	25.82	36.23	4415	4101	3.55	16.15	33.41	46.86	5713	16.75	34.64	48.61	5923	7115	59.21	4.55	1.33	0.77	14.44	
6	79 school (carbobot-1)	27.49	16.00	24.00	32.50	3964	3653	3.86	21.22	31.83	43.09	5256	22.07	33.11	44.82	5467	7015	55.35	4.31	1.24	0.80	13.22	
7	79 school (carbobot-2)	26.52	16.81	24.56	32.11	3935	3631	3.72	22.03	32.18	42.06	5156	22.88	33.42	43.70	5355	6944	54.48	4.19	1.11	0.76	13.70	

#### QA/QC DATA

STD-ALSW5 03/12	CPAA	CPAV	CV
Certified Value	8.80	21.50	7862
Standard Deviation	0.09	0.38	41
Analyzed value	8.85	21.82	7870

# Requirement (Demand) of Setting Default Value from PPs

- The default values are provided by the methodology up to **JCM scheme owner** (=JC).
  - **Who** have the responsibility of the decision of default values?
  - **Who** approve the methodology responsibly?
- If these responsibility is **not clear**, it becomes **very difficult** for our PP to forward the **JCM project** as a business operator.

# Requirement (Demand) of Setting Default Value from PPs

- I think that the “**Methodology Panel**” under JC is needed.
  - The process of Methodology decision is not clear for our PPs now.
  - Because, so-called "Japanese experts" do not know the Mongolian circumstances.
  - We need the guidelines of Methodology which made by the Methodology Panel (Real Experts).

# Japanese Teams Concepts

- Main player of the scheme: PP (responsible for the GHG emission reductions/removal)
- Others: Supporter (Scheme owner, Consultant, NGO, Experts, Verifier)
- Management and Operation of project activities (including monitoring activities) by PP (Main player) independently
- **JCM of the Mongolian People**
- **JCM by the Mongolian People**
- **JCM for the Mongolian People**

Thank you !

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