





# The Cooperation Programme on Developing the JCM Seeds in Mongolia

September, 2013 MEGD (Ministry of Environment and Green Development) The OECC (The Overseas Environmental Corporation Center, Japan) On the behalf of MOEJ (The Ministry of the Environment, Japan)

# The JCM (The Joint Crediting Mechanism)

JCM: A financial and technology transfer option for NAMAs.

Facilitates diffusion of leading low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries.

Appropriately evaluates contributions to GHG emission reductions or removals from developed countries in a quantitative manner, through mitigation actions implemented in developing countries and use those emission reductions or removals to achieve emission reduction targets of the developed countries.

Contributes to the ultimate objective of the UNFCCC by facilitating global actions for emission reductions or removals.



# What is NAMAs?

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PROCESS	The Conference of the Parties (COP), at its fifteenti 2/CP.15. The text of the Copenhagen Accord can be	h session, took note of the be found h <mark>ere</mark> .	Copenhagen Accord o	f 18 December 2009 by way of decision
Essential Background	The chapeau of the Copenhagen Accord lists the fo	ollowing 114 Parties agree	ing to the Accord:*	

# Actions for Green House Gas Emission Reduction in Each Country !!

# What is NAMAs?

# Mongolia Also Submitted the NAMAs to The United Nations!!

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NEGOTIATIONS Meetings Documents & Decisions	Appendix II - Nation Parties *	Appendix II - Nationally appropriate mitigation actions of developing country Parties *		
Bodies	Non-Annex   Parties	Actions		
FOCUS	Afghanistan	Note Verbale (40 kB)	Communications received from	
Adaptation	Antigua and Barbuda	Dote Verbale (1385 kB)	Parties in relation to the listing the chapeau of the Copenhag	
Finance	ince		Accord	
Mitigation	Armenia	developing country Parties (760 kB)		
Technology	Benin	Note Verbale contenant des actions d'atténuation appropriées au niveau national (33 kB)		
Essential Background	Bhutan	Letter (870 kB)		
Kyoto Protocol	Botswana	Device including mitigation actions by non-Annex I Parties (114 kB)		
Cooperation & Support	F			
Science	Brazil	Letter including nationally appropriate mitigation actions (62 kB)		

# **Mongolian NAMAs**



# **Copenhagen Accord**

APPENDIX II

#### Mongolia: Nationally appropriate mitigation actions of developing country Parties

Non-Annex I	Actions			
Mongolia	1. Energy supply: Increase renewable options			
	a. PV and solar heating Mongolia is located in a region with abundant sunshine, typically between 2,250 to 3,300 hours per year. The PV systems have been shown to be the less expensive option compared to small gasoline generators. At present, small- scale PV systems (10 to 1,000 W) are used in remote areas. It has been assessed that PV power systems are competitive with conventional energy sources for small power applications for nomadic families and communities in Mongolia.			

# **Mongolian NAMAs**



are no detailed research and projects have been carried out yet.

# NAMAs Advisory Committee in Mongolia



NB1 MEGD: Ministry of Environment and Green Development, Mongolia NB2: MOEJ: The Ministry of the Environment, Japan

# Preliminary Results of Joint Study for NAMAs in JFY2012

	Potential NAMA menu	Projected emissions reduction
CHP3	Combustion Improvement (Low O <sub>2</sub> operation) Adoption of speed control for Boiler Feedwater Pump Replacement by Top runner Transformer Adoption of Light Emitting Diode (LED) Resin coating of blades surface of Condenser Pump Reinforcement of insulator	CHP3: Approx. Energy Efficiency (Elec.): 3.87% Energy Efficiency (Heat): 6.87% = Approx. 77,360tCO <sub>2</sub> /year
CHP4	Installation of Soot Blowers Replacement to high efficiency turbine Replacement by top runner LED Adoption of LED Resin coating on blades surface of Cooling Water Pump Resin coating on blades surface of Condenser Pump Reinforcement of insulator	CHP4: Approx. Energy Efficiency (Elec.): 6.57% Energy Efficiency (Heat): 0.32% = Approx. 208,888tCO <sub>2</sub> /year











# Present and Future Potential Source of Finance for NAMAs



NB1: All ideas are subject to further consideration and discussion under the UNFCCC NB2: The above graphic does not include how accounting of GHG should be sorted out, in relation to offset mechanisms **OECC** Related Projects on Climate Change in Mongolia

1. NAMAs (Nationally Appropriate Mitigation Actions) Project Name:

Capacity Building Cooperation Project for NAMAs

2. JCM (The Joint Crediting Mechanism)

**Project Name:** 

Cooperation Programme on Developing the JCM seeds in Mongolia

# **Consultation between Mongolia and Japan**

- 3 July 2012 Governmental consultation (Ulaanbaatar)
- 1 November 2012 Governmental consultation (Tokyo)
- 30 November 2012 Governmental consultation (Doha)
- 6 December 2012 Joint Statement (Doha)



8 January 2013 Signing of the bilateral Document for the JCM (Ulaanbaatar)

# Scheme of the JCM





# Present and Future Potential Budget for the JCM

	JFY2013	JFY2016
Budget for JCM	Approx. 13 mil. USD	?
Environmental tax in Japan	Approx. 240 mil. USD	Approx. 2,600 mil. USD
Countries which have signed	2 countries	At least more than 8 countries
Expected scale of 1 project	Less than 10 mil. USD	Around 10 mil. USD

NB1: The environmental tax's number of 2016 is predicted value and it is from the article from The Mainichi Newspapers (5th of October, 2012) NB2: The rate is "1USD = 100JPY"

# Countries with which Japan has signed on bilateral documents

Japan has held consultations for the JCM with developing countries since 2011 and signed the bilateral document for the JCM with Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Lao PDR and Indonesia.



<u>Mongolia</u> On January 8, 2013 (Ulaanbaatar)



Kenya On June 12,2013 (Nairobi)



<u>Bangladesh</u> On March 19, 2013 (Dhaka)



Maldives On June 29, 2013 (Okinawa)



Ethiopia On May 27, 2013 (Addis Ababa)



<u>Viet Nam</u>On July 2, 2013 (Hanoi)

Japan will continue consultations/briefing with any countries which are interested in the JCM, i.a. with Asian countries such as Thailand and Cambodia.
 Japan and Mongolia held the 1st Joint Committee.

# The JCM Model Projects in Japanese Fiscal Year 2013

#### Mongolia:

#### ★ Upgrading and Installation of Centralized Control System of High-Efficiency Heat Only Boiler (HOB)

The high-efficiency Heat Only Boilers (HOBs) will replace outdated low-efficiency HOBs, to supply heated water for winter indoor heating. The project will also introduce centralized control system for the integrated heat supply in collective buildings.

#### Bangladesh:

#### ★ Brick Production based on Non-Firing Solidification Technology

In place of the existing brick production with the firing process with the combustion of coal, the new brick production with the non-firing solidification technology will be introduced. Since the new process utilizes waste as main materials and grew and pressing process, and does not require the use of fossil fuel, GHG emissions will be reduced.

#### Cambodia:

#### ★ Small-scale Biomass Power Generation by Using Stirling Engines

The introduction of small-scale biomass power generation systems with stirling engines will replace diesel-based power generation at rice mills. The stirling engine, external-combustion engine, is suitable for the utilisation of biomass such as rice husk.

#### Viet Nam:

#### ★ Integrated Energy Efficiency Improvement at Beer Factory

A set of high performance equipment for energy efficiency improvement and renewable energy generation will be introduced in beer factories. Before the installation, the potential of energy saving and possible high potential points in the beer production process will be identified by using the energy structure analysis simulation technology.

#### Indonesia:

#### ★ Energy Saving for Air-Conditioning and Process Cooling at Textile Factory

At the textile industry where air conditioning is necessary for the product quality control, the high performance refrigerating machine with efficient compressor and economizer cycle will be introduced. In addition, the refrigerating machine also utilize HFC245fa refrigerant – non-ozone depleting substance – as well as adopt the recovery system of the refrigerant to avoid the release in the atmosphere.

#### ★ Energy Savings at Convenience Stores

The latest, highly efficient equipment is installed in the three major energy consumptions sources at food retail stores (Refrigeration, Airconditioning and Lighting). Total electricity consumption is estimated to be decreased by 21% with LED lighting, natural refrigerant (CO2) refrigeration system and highly efficient air-conditioning system.

# The JCM FS in Japanese Fiscal Year 2013

#### Mongolia: 10MW-Scale Solar Power Plant and Rooftop Solar Power System Centralization of Heat Supply System by Installation of High Efficiency Heat only Boiler (HOB) △10MW-Scale Solar Power Generation for Stable Power Supply (EVs) △Energy Conservation at Cement Plant AImprovement of Thermal Installation and Water Cleaning /Air **Purge at Power Plants** Bangladesh: ∆High-Efficiency Rice Husk Based Cogeneration △Solar Power Generation with Long-Life Storage Battery in Non-Electrified Regions Kenya: △Expansion of Geothermal Project Myanmar: △Geothermal Binary Power Generation Myanmar (and Indonesia): △Solar–Diesel Hybrid Power Generation

Sri Lanka: **A**Sustainable Biomass-Based Power Generation JCM Project Planning Study (PS)
 JCM Demonstration Study (DS)

△-- JCM Feasibility Study (FS)

Lao PDR: Promotion of Use of Electric Vehicles (EVs)

Thailand:

Dissemination of High-Efficiency Inverter Air Conditioners A Heat Recovery to Generate Both Cooling and Heating Energy

#### Viet Nam:

- Anaerobic Digestion of Organic Waste for Cogeneration at Market
   Integrated Energy Efficiency Improvement at Beer Factories
- Energy Efficiency Improvement of Glass Furnace
- △Promotion of Public Transport Use by Park-&-Ride System
- ▲Energy Saving Glass Windows for Buildings
- ▲ REDD+ with Livelihood Development and Biomass-based Power Generation

#### Indonesia:

- Energy Saving by High-Efficiency Centrifugal Chiller
- Power Generation by Waste Heat Recovery in Cement Industry
- Regenerative Burners for Aluminum Melting Furnaces
- △Anaerobic Treatment for Wastewater from Rubber Plants
- △Solar Power System at Off-Grid Cell Towers
- △Improvement of REDD+ Implementation Using IC Technology

#### Indonesia (and Myanmar):

△Solar–Diesel Hybrid Power Generation



# Focus for the programme



# Actions for the programme

## 1. Survey on Developing the JCM Seeds

- Inviting Japanese experts to find detailed technical needs for practical implementation

## 2. (1) Workshop

- (2) Study tour to Japan
- Organising technical training sessions
- Match-making between Mongolian and Japanese stakeholders

## 3. Inter-city cooperation between Mongolia and Japan

- Capacity building on low carbon society planning through inter-city cooperation between Mongolia and Japan (such as through sharing Japan's empirical experience of subnational level and technical cooperation between UB City and a Japanese City)

## 4. Finance Scheme for the JCM

 Studying appropriate finance scheme that contribute to JCM development Mongolia: Clean Air Fund, private banks and etc.
 Japan: SMBC (Sumitomo Mitsui Banking Co.)
 International Developing Banks: ADB and etc.

# Scopes of the activities



# An example of JCM seeds (potential)



In Case of the project, KandenPlant Co. / Suuri Keikaku Co.



# An example of JCM seeds (potential)

## An Example of JCM Seeds in Water Treatment Facility



# An example of possible cooperation



Basic concept of Eligibility criteria in JCM methodology

(Subject to further consideration and discussion with host countries)

The eligibility criteria in each JCM methodology should be established, in order to reduce emissions by:

- accelerating the deployment of <u>low carbon technologies</u>, <u>products and services</u>, which will contribute to achieving net <u>emission reductions</u>;
- facilitating the nationally appropriate mitigation actions (NAMAs) in host countries.
- Both Governments determine what technologies, products, etc should be included in the eligibility criteria through the approval process of the JCM methodologies by the Joint Committee.
- Project participants can use the list of approved JCM methodologies, similar to <u>positive list</u>, when applying for the JCM project registration.

# **Eligibility Criteria of the JCM**

(Subject to further consideration and discussion with host countries)

- Eligibility criteria in JCM methodologies shall contain the following:
  - 1. The requirements for <u>the project in order to be registered as a</u> <u>JCM project</u>. *<Basis for the assessment of validation and registration of a proposed project>*
  - 2. The requirements for the project to be able to apply the JCM methodology. <same as "applicability condition of the methodology" under the CDM>
- Examples of eligibility criteria 1.
  - Introduction of <u>xx</u> (products/technologies) whose design efficiency is above <u>xx</u> (e.g. output/kWh) <Benchmark Approach>
  - Introduction of <u>xx</u> (specific high efficient products/technologies, such as air conditioner with inverter, electric vehicles, or PV combined with battery) <*Positive List Approach>*
- > Examples of eligibility criteria 2.
  - Existence of historical data for <u>x</u> year(s)
  - Electricity generation by <u>xx</u> (e.g. PV, wind turbine) connected to the grid
  - Retrofit of the existing boiler

# Image of Eligibility criteria

Simple check list is provided for project participants to determine the eligibility of a proposed project under the JCM and applicability of the methodology.

> All the criteria have to be met in order to apply a methodology.

## Example: Building energy management system

	Eligibility	Check
Criteria 1	<ul> <li>Electronically controlled building energy management system is installed in the planned project.</li> </ul>	$\checkmark$
Criteria 2	<ul> <li>Building energy management system installed in the planned project is designed for optimal operational control of facilities and equipments to reduce energy consumption by taking interior conditions into account.</li> </ul>	V
Criteria 3	<ul> <li>Regularly scheduled feed back (at least once in 6 months) to enhance system outcome is provided by the system provider based on a contract with its beneficiary.</li> </ul>	$\checkmark$
Criteria 4	<ul> <li>Buildings in which building energy management system is installed are in existence of longer than 5 years at the time of system installation.</li> </ul>	$\checkmark$

# An example of possible cooperation

Utilization of waste gas of semi-coking production facility



## Summery

#### Project Funded by the Ministry of the Environment, Japan

## Cooperation Programme on developing JCM seeds in Mongolia

Duration: July 2013-March 2014 (8 months)



# Importance of MRV in the JCM

# 2. Establishing The MRV (Measurement, Reporting Verification) Scheme and Team in CHP

To apply for JCM, we need to prepare the data and formula to quantify GHG emission reduction (effect of energy efficiency).



# Importance of MRV in the JCM

	Unit	No.1	No.2	No.3	No.4
	-	BKZ-420- 140	BKZ-420- 140	BKZ-420- 140	BKZ-420- 140
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	times	1	1	1	1
		1983	1984	1984	1985
	-	Japan	Japan	Japan	Japan
	-	carbon steel			
Designed value	t/h	420	420	420	420
t Actual measured value	t/h	385	376	390	386
Designed value	M Pa	13.7	13.7	13.7	13.7
t Actual measured value	M Pa	140	139	138	140
Designed value	Degree (C)	560	560	560	560
Actual measured value	Degree (C)	555	555	555	555
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Overview of JCM Methodology, Monitoring Plan and Monitoring Report

(Subject to further consideration and discussion with host countries)

 Developing a Project Design Document (PDD) and a Monitoring Plan
 A PDD form should be filled in with information of the proposed project.
 A Monitoring Plan consists of Monitoring Plan Sheet and Monitoring Structure Sheet, and it should be filled in as well.







Let's work together !!

# Баярлалаа !! バヤルララー !! ご清聴有難うございました !!



# JCM Feasibility Studies by MOEJ in FY2011



## MRV Model Projects and Feasibility Studies by MOEJ in FY2012



#### Host Country: Mongolia

**DS Entity: Shimizu Corporation** 

## Replacement of Coal-Fired Boiler by Geo-Thermal Heat Pump for Heating

### Outline of GHG Mitigation Activity

**Geothermal heat pump** technology is installed to replace coal-fired boilers for building/district heating systems. For future JCM projects, a specific target sector will be public buildings such as local governmental offices, schools, kindergarten, and hospitals, where some model projects could be identified.

In this study, a model project – a kindergarten already equipped with geothermal heat pump system for heating – demonstrates that the proposed MRV methodology is applicable and feasible and that the entire MRV process is completed in the host country.



### Draft Simple MRV Methodology

The central concept for the proposed MRV methodology is "degree-day" theory. The "degree-day" is defined as the annual integral value of multiplications of the difference between outdoor and indoor temperature and the duration (hours). Thanks to "degree-day" theory, the only monitoring item should be **outdoor temperature** in a climate zone, based on the Meteorological Agency's data. Coal-fired boiler efficiency is defaulted. Standard emission is calculated ex-ante taking into account standard meteorological data, building's heat-insulation characteristics, soil characteristics, and heat pump performance. Real emission is calculated by correcting standard emission and based on monitored degree-day.

#### Site of Modeled MRV Project



## Expected GHG Reductions

80tCO<sub>2</sub>/year (for a model project (1 unit))
 Potential: 113,000tCO<sub>2</sub>/year (estimated from 1.3 million m<sup>2</sup> of total floor area of all public buildings in entire Mongolia)



Existing

power plant

## Upgrading and Installation of High-Efficiency Heat Only Boilers (HOBs)

## **Outline of GHG Mitigation Activity**

The replacement of low-efficiency old-type boilers with **highefficiency latest model boilers** leads to the reduction of coal fuel consumptions to mitigate emissions of CO<sub>2</sub> as well as air pollutants. The target boilers to be replaced under this activity should be heat only boilers (HOBs) to generate thermal energy for district heating systems. JICA's Two-Step Loan (TSL) is used for the introduction of the high-efficiency HOBs. In addition to the replacement, the newly installation of highefficiency HOBs should be also eligible.

## Draft Simple MRV Methodology

Neither the coal consumptions nor the amounts of heat supply of the small-scale HOBs are supposed to be easy to monitor. However, the heat supply is assumed to depend on the boiler capacity, building volume, ambient temperature, operation hours, etc.

Therefore, the monitoring items under the draft simple MRV methodology are building volume, ambient temperature, and operation hours, which should be backed up by building drawings, specifications of ambient temperature, etc.





 26,000tCO<sub>2</sub>/year is expected to be reduced, if the efficiency of all HOBs in entire Ulanbaatar improves by 10%

#### DS Entity: Suuri-Keikaku

GEC