< 12th Asia-Pacific Eco-Business Forum in Kawasaki >

PROJECT FOR LOW-CARBON CITY DEVELOPMENT THROUGH THE INTRODUCTION OF PACKAGE-STYLE WOODY BIOMASS POWER GENERATION IN PENANG STATE, MALAYSIA

マレーシア国ペナン州における 木質系バイオマス発電技術 のパッケージ型導入を通じた低炭素社会実現プロジェクト

For the future of people and nature





18-Feb. 2015

Company Profile - Kureha Ecology Management

Kureha Ecology Management Co.,Ltd.

Company Name: Kureha Ecology Management Co., Ltd.

Head Office : Iwaki-City Fukushima-Prefecture

Stock Holder : Kureha Corporation (100%)

Establishment : December 1, 1971

Capital : US\$ 2 million

Net Sales : US\$ 90 million (2014 JFY)

Number of Employees: 364

Plants (Waste Treatment Facilities)

: Iwaki, Fukushima

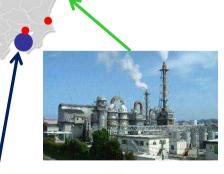
: Kawasaki, Kanagawa

Activities:

- Waste Management Service
- > Environment Engineering
- Environment Restoration Services
- > Low Carbon City Development Project



- Kawasaki Plant
- Sales Offices





Company Profile - Kureha Ecology Management

Kureha Ecology Management Co., Ltd.

KEM is good at handling variety of difficult (hazardous) industrial waste with self-developed incinerators (lwaki plant) and

KEM has 40 years experience for the stable operation incl. **pre-processing**.

Also, maintaining 4.8MW electric power generation from waste (partly using biomass waste) in Kawasaki plant.

Background of this Project

Kureha Ecology Management Co.,Ltd.

Based on the Collaboration between Penang State and Kawasaki City

Project for Developing a Low Carbon Society through <u>'Waste</u> <u>to Energy'</u> Technology in Penang, Malaysia in JFY2013

(Implemented by Kawasaki City and Global Environment Centre Foundation)

- 1) Efficient woody biomass use
- 2) Small-scale biomass power generation
- Recycle plastic fuels (RPF) development using mixed wastes and waste plastics
- 4) Composting
- Waste plastics derived oils generation and disposal
- 6) Methane gas recovery from organic wastes
- 7) fluorescent light tubes recycling
- 8) E-waste disposal and recycling

NEDO F/S Project in 2014



Signing of MoU for collaboration btw. Kawasaki City and Penang State

NEDO Feasibility Study 2014.Oct – 2015. May

Kureha Ecology Management Co.,Ltd.

 KEM completed a NEDO FS Pj in Penang State successfully with Kawasaki City based on "City to City collaboration"

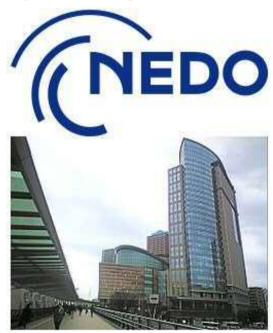
NEDO: New Energy and Industrial Technology Development Organization

JFY2014 NEDO FEASIBILITY STUDY PROJECT FOR PROMOTION OF TECHNOLOGY FOR CLIMATE CHANGE COUNTERMEASURES

THE PROJECT FOR LOW-CARBON CITY
DEVELOPMENT THROUGH THE INTRODUCTION
OF PACKAGE-STYLE WOODY BIOMASS POWER
GENERATION IN PENANG STATE, MALAYSIA

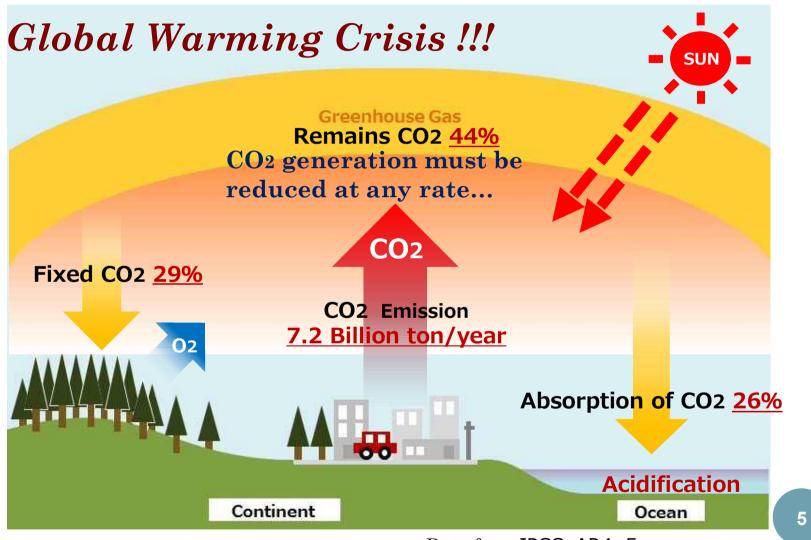
October 2014

Kureha Ecology Management Co., Ltd.
Oriental Consultants Global Co., Ltd.
Kawasaki City
Global Environment Centre Foundation (GEC)



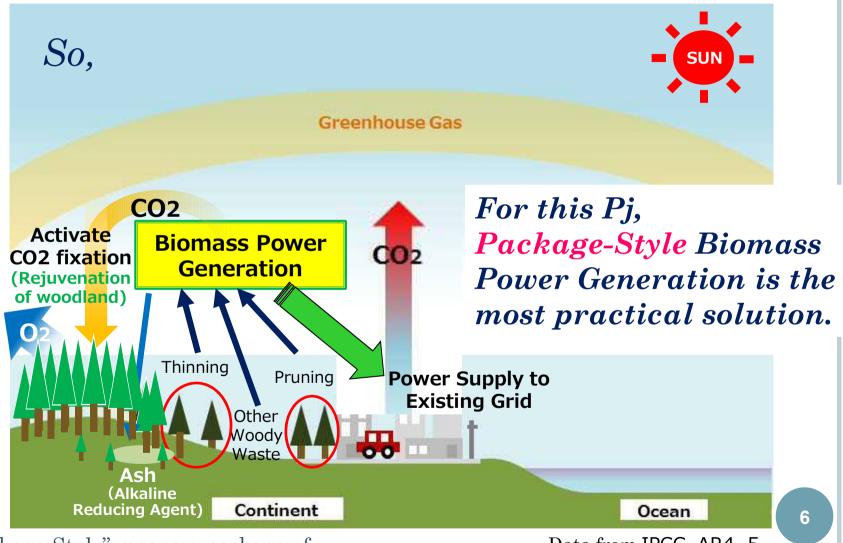
Headquarters of NEDO in Kawasaki City

GLOBAL WARMING MECHANISM



Data from IPCC AR4, 5

SOLUTION OF GLOBAL WARMING PROBLEM



"Package-Style" means a package of Data from IPCC AR4, 5 hardware construction and software (know-how) for stable operation.

Issues and Countermeasure of Waste Management in Penang State Kureha Ecology Management Co., Ltd.

Issues

- > Increasing total amount of waste generation
- ➤ Increasing waste management cost for collection/transfer/treatment (landfill) (occupies ~40% of state budget)
- No comprehensive facilities of waste treatment

Countermeasure

- ⇒ Separation and volume reduction of waste and improvement of waste treatment
- ⇒ Efficient use of woody biomass waste and reduction of GHGs

Survey implementation scheme

Kureha Ecology Management Co.,Ltd.



Kureha Ecology Management Co., Ltd.

Business operator of woody biomass power generation plant

Penang State implementation

Oriental Consultants Global Co., Ltd.

Consulting company with experiences of foreign project implementation

Kawasaki City

City to city collaboration with Penang State

Global Environmental Centre Foundation

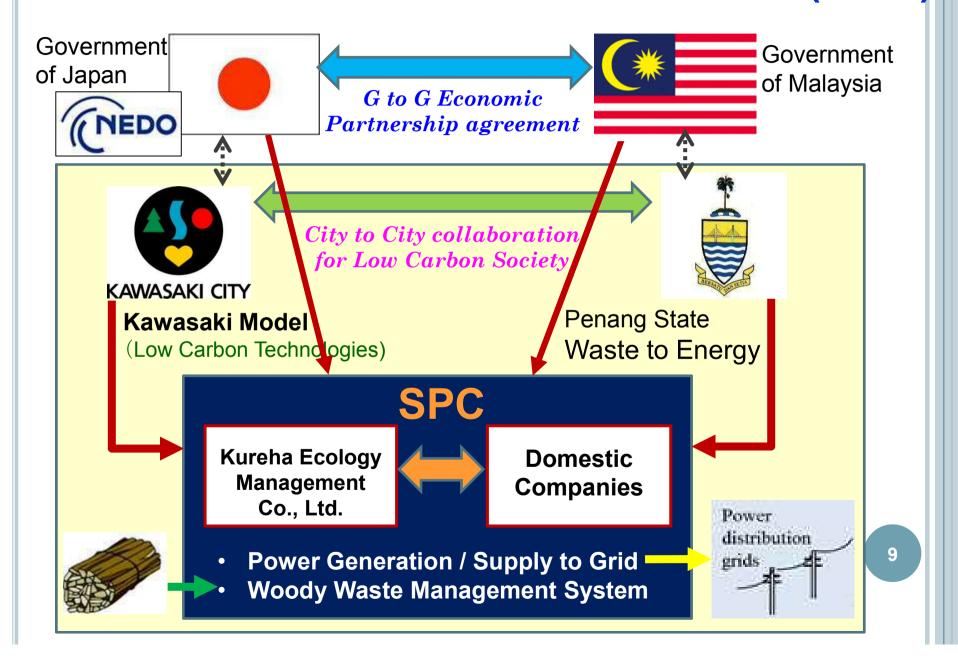
Coordination between NEDO Expert Team and Penang side

NEDO

Affiliated organization of Government of Japan for financial support for this feasibility study project



PROJECT IMPLEMENTATION MODALITY (PLAN)



Survey schedule and contents

Kureha Ecology Management Co.,Ltd.

Oct. 2014	Nov.	Dec.	Jan. 2015	Feb.	Mar.	Apr.
Info. Collection	n on Laws, Reg i	ulations and pe	rmits in Malaysi	a and Penang st	ate for biomass	power gen.
Research on existing MRV (Measuring, Reporting and Verification) methodologies						
1st Field	Research	on Characteris	stics of biomass	waste in Pena	ng state	
Survey		Fundar	nental design o	f Biomass powe	r gen. facility	•
	2 nd Field	Evaluation	of candidate co ı	nstruction sites	of biomass pow	er gen. plant
	Survey		OMOU sign	ng ceremony	at Kawasaki c	ty hall
		3 rd Field Survey		12-Jan. Kick-C held by Env. Mi	off mtg nister Penang.	
Consideration of project implementation (incl. finance scheme), operation and technical tra						nical transfer
			<u> </u>		of the biomass p	
					uation and finan	
Tr	avelling with Official of	1	4 th Field Survey	Mtg v	with local partner	company
Ka	wasaki Cit	/		Consideration of	MRV implemen	tation plan
					dissemination of	
	•	Taking Foadillap	16-Арі	r. Final FS repo takeholders in P	ort mtg. 5 th F	ield

MOU Signing Ceremony at Kawasaki City Hall

Kureha Ecology Management Co.,Ltd.

7-Jan. 2015



Mr. Nobuyuki Taniguchi
President
Kureha Ecology
Management Co., Ltd.

Mr. Norihiko Fukuda Mayor City of Kawasaki

Signing of MoU for collaboration of this Project btw. Kawasaki City and Kureha Ecology Management Co., Ltd.



Kick-Off Mtg Scenery at KOMTAR, Penang



12-Jan. 2015

Exchange of commemorative gift with

YB Phee Boon Poh

Penang State Executive
Council for Welfare,
Caring Society &
Environment



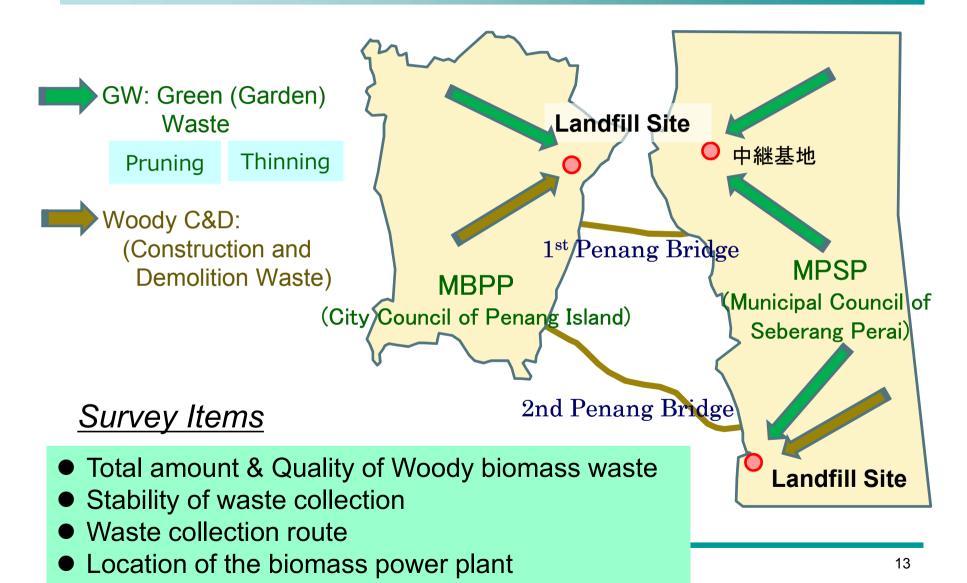
Mr. Kazuaki Aoki Manager, Kawasaki Environment Research Institute, City of Kawasaki



Mr. Nobuyuki Taniguchi President, Kureha Ecology Management Co., Ltd.

Feasibility Study of Woody Biomass Source for Power Generation

Kureha Ecology Management Co., Ltd.



FS Result - Concept of Biomass Power Generation

Kureha Ecology Management Co.,Ltd.

Basic plan of Biomass Power Plant

Capacity: 5.7 MW (1 unit)

2nd unit (extra 5.7 MW) is under consideration depends on the availability of Woody Waste

Boiler Type: CFB (Circulation Fluidized Bed) boiler or Stoker boiler

The boiler type will be determined based on the condition of biomass source characteristics and needs from local

Plant area: $\sim 34,000 \text{ m}^2 \text{ (8.5 acre)}$

Securing enough space of drying Green (Garden) waste for moisture control incl. seasonal fluctuation of total amount of biomass waste available.

Option: Methane fermentation can be combined for improving the efficiency of the biomass power plant.

FS Result – Achievement and Issues

Kureha Ecology Management Co.,Ltd.

Achieved

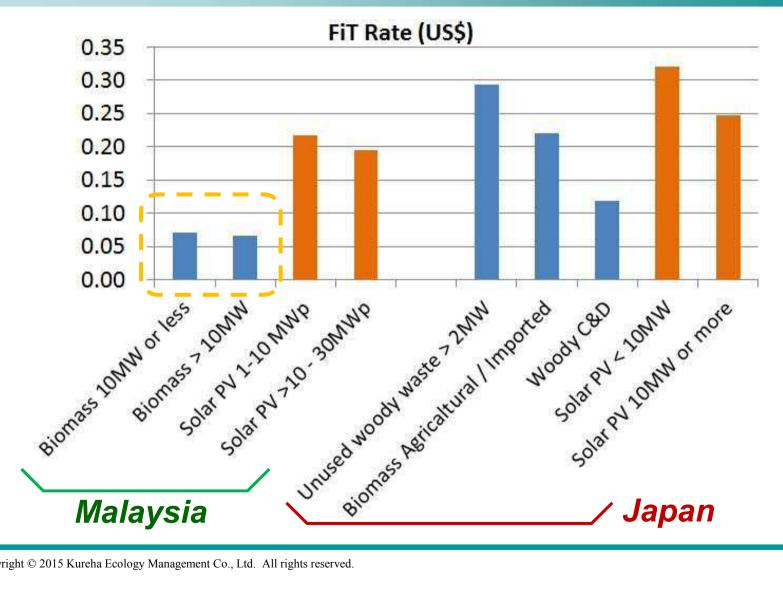
- Overall study of construction of biomass power generation plant in Penang incl. economical analysis
- Explanation of concept and plan of the package-style biomass power plant to City Council of Penang Island (MBPP), Municipal Council of Seberang Perai (MPSP) and Penang state → obtained basic understanding
- Local partner company → secured with secrecy agreement
- Construction cost of grid connection → solved (will get support from a construction project of industrial park surrounding the power plant candidate site)

To be solved

- Subsidy from Japan Gov. for non-JCM country
- Securing 16 years stable woody biomass supply incl. backup plan with alternative biomass fuel (PKS, agricultural waste and other woody waste)
- Biomass FIT quota with improvement discussion of FiT rate
- Explanation to local residents

FiT rate comparison

Kureha Ecology Management Co., Ltd.



Related ministries and agencies in Malaysia and

Penang State

Kureha Ecology Management Co.,Ltd.



Malaysia Investment Development Agency (MIDA), Invest Penang (Support in investment field) Support

Experts in universities (Support on environmental issues e.g. EIA)

Support

F/S

project

Information

Consulate-General of Japan in Penang, Malaysia Embassy of Japan in Malaysia

(Ministries and agencies related to application and permits)

Department of Environment, Ministry of Natural Resource and Environment (**DoE**)

EIA, etc.

State government, MBPP and MPSP

support, etc.

Business permit, etc.

Penang Development Company (PDC) Site acquisition, etc.

Sustainable Energy Development Agency, Malaysia (SEDA), Electrical company *FiT and electricity sales, etc.*

1. Relationship of Trust and Collaboration

Communication and information share with Penang government (MBPP, MPSP and Penang State) and local companies could be done smoothly with City of Kawasaki's full support via *City to City collaboration*.

2. Next Step

Get understanding and agreement of local residents will be required for the next step.

KEM's Eco Business Policy

Kureha Ecology Management Co.,Ltd.

It is indispensable to develop and utilize

Renewable Energy efficiently and smartly by
all means for our bright future living in our
beautiful Earth (ONLY ONE!).

- WIN WIN scenario is the Key for any business.
- ➤ WIN WIN WIN scenario for "Omi 近江" merchants, You I Public / Society

so called "三方よし - SAMPOU YOSHI"

> WIN - WIN

Local Gov. / Local Partner / Local Residence / Japan Gov. / My company / Society / Env. scenario is necessary for **Global Eco Business**.



Let's handover our beautiful Planet for our children!

Sama-sama kita pelihara Bumi kita, untuk genarasi Akan datang



Thank you very much

Terima kasih

