Introduction of Small Biogas Generator ~Using Local Biodegradable Materials~

OHARA Corporation

Contents

1. About OHARA Group

◆**Head Office : Nagaoka-city, Niigata**

1. About OHARA Group

◆ **Established** :Oct 1907

OHARA Corporation
Ohara Dengyo Company
Niigata Koshuha Dengyo

◆ **No of Employees in the Group**
:250

◆ **Major sales items**

-Biogas power generation facilities
-Oil well drilling equipment
-Water processing & sewage equipment
-Environment Equipment
-Watergates for dams and Irrigation
-Snow vehicles for various applications

2．About Small Biogas Generator

■Features

①Compact & High Efficiency

②Power Control

③Economies of Scale by Sharing Basic Equipment

④Excellent Serviceability

⑤Optional Settings for Various conditions

2．About Small Biogas Generator

■Small Biogas Generator Line Up

2．About Small Biogas Generator

■High Efficiency Generating System

Model	BG30A	BG60A	BG90A
Electrical output	25 / 30	50 / 60	75 / 90
Frequency (Hz)	50 / 60		
Voltage (V)	200/220 or 400/440		
Methane(%)	55～65		
Fuel Input (Nm^3/h)	13.1 / 16.1	26.2 / 32.2	39.3 / 48.3
Gas Pressure (kPa)	2.0～3.0		
Type	Spark Ignition（Mono-Fuel）		
Cylinders	4	6	BG60A
Displacement (L)	4.329	7.961	11.94
Speed (rpm)	1,500 / 1,800		
Electrical Efficiency(%)	35 / 34		
Thermal Output(kW)	32 / 40	67 / 85	99 / 124
Thermal Efficiency(%)	45 / 46		
Size（W×L×H）(mm)	860×3,000×1,610	1,180×3,890×1,720	1,300×3,530×2,150

2. About Small Biogas Generator

■Remodel a Commercial Diesel Engine Generator

1) The Engine Technology Based On Snowmobile Development

2)Gathering Technologies of Companies in Niigata

・Base Diesel Engine Generator is Made by Hokuetsu Industries CO.,LTD. in Niigata.

・”Made in Niigata New Technology” Certificated

(Now apply for “Gold Technology” Certification)

3. About Biogas Plant

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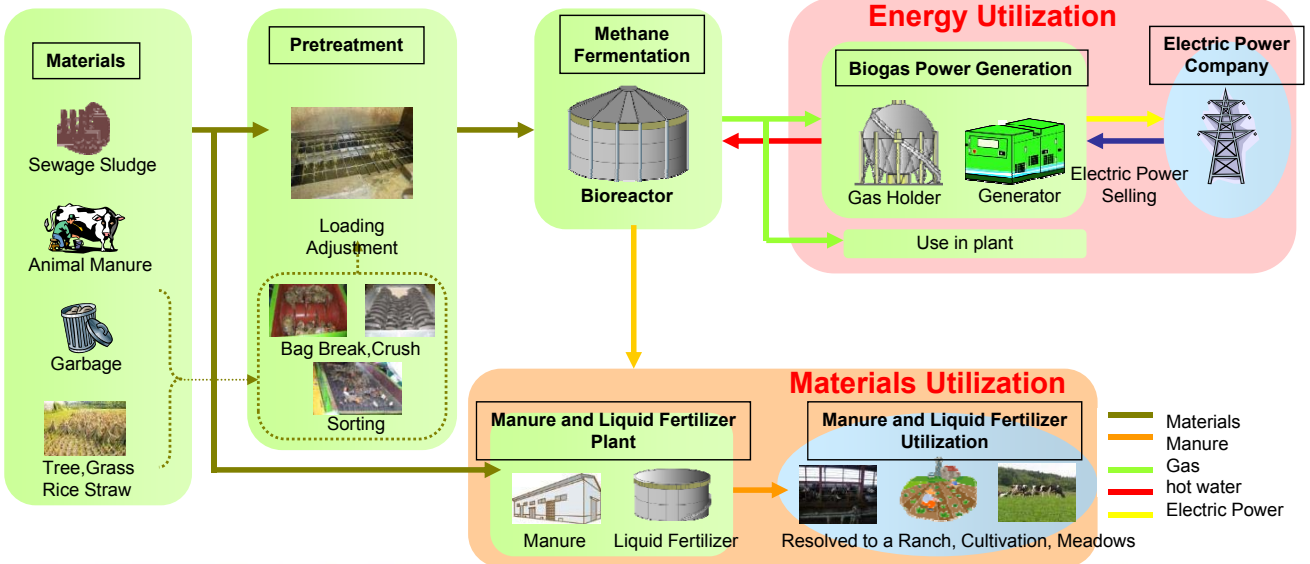
■ Biogas Power Generation System

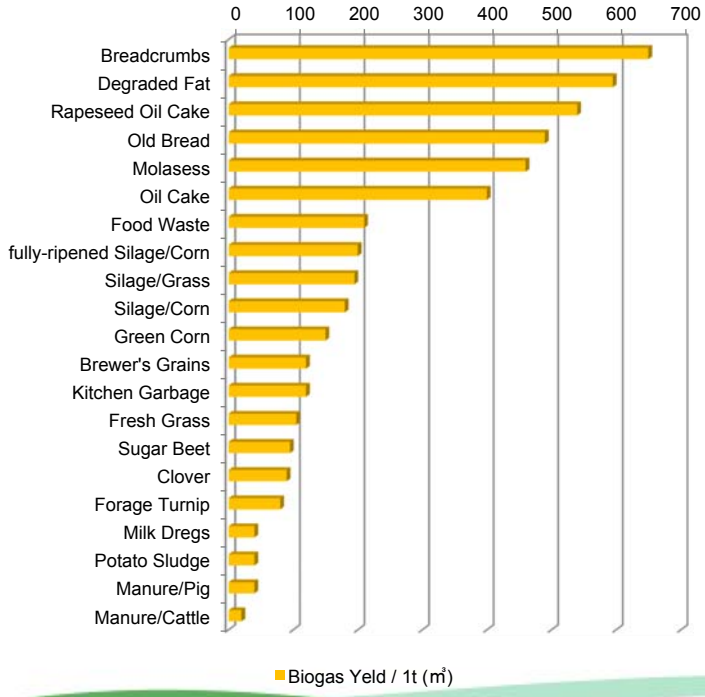
Biodegradable Organic Matter ⇒ Methane Fermentation
⇒ Biogas（Methane Gas） ⇒ Power Generation



3. About Biogas Plant

■Biogas Yield / 1t Organic Matter

-"*Biogas Manual*" Japan Organics Recycling Association (Aug 2006)



Various Raw Materials for Biogas

3. About Biogas Plant

■Background of Biogas Power generation plant (in Japan)

Introduction Examples of Methane Fermentation System ⇒ **Many**

- For Animal Manure
- Sewage Sludge Volume Reduction etc…

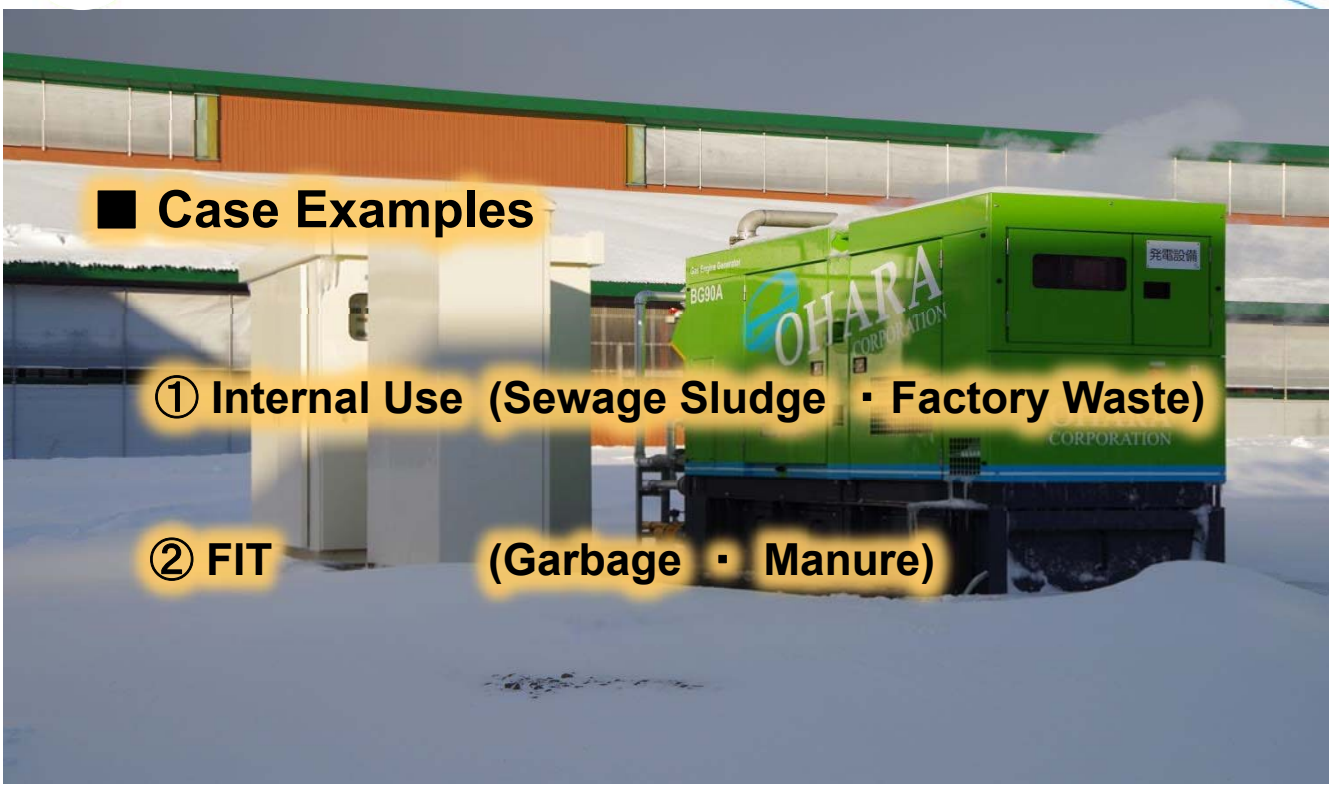
Utilizing Biogas (Electric Generation) ⇒ **Few**

1) Only High Power Generator, Expensive Cost
2)Difficulty of the Maintenance

Discourage Small Scale Site(Most of the site in Japan) from Introducing Generator
⇒Inhibit Utilizing Biogas

FIT encourage to utilize BIOGAS

4．Case Examples



4．Case Examples -①Internal Use

■Power Generation from Sewage Sludge ~2 Unit Parallel Operation~

BG30A x2(50kW) Unit Running in Horinouchi Sewage Treatment(@Niigata Pref.)

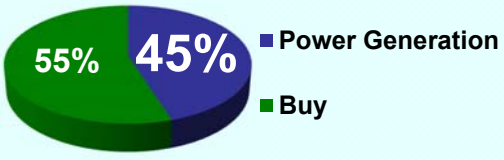
○Facility Overview

	Plan(H42)	Actual Performance
Population	26,900	28,593
Capacity	14,450 m³/Day	14,450 m³/Day
Removal Process	Separate System	
System	standard-activated sludge process	
Start Up	Aug 1992	
Biogas	35,000 m³/Year	
Methane Level	50～60 %	

Initial Cost : 28 Million Yen
Maintenance Cost/Year : 3.4 Million Yen
Power Generation Amount : 5.25 Million Yen (12Yen/kWh)

Cost Recovery : 15 Years

○Electricity Usage



CHP Provide 45% of Electricity Usage

4．Case Examples -①Internal Use

■Power Generation from Food Factory Waste

HIKARI MISO "Iijima Green Factory"
(@Iijima Kamiina-gun Nagano Pref.)

○Facility Overview

Power Generation from Residues which is Produced During Food Production Process.

Generator :BG30A(30kW)
Unit No :1
・Heat → **Heating Digester**
・Electricity → **Internal Use**

① Reduction of Electricity Purchase Cost
3.15Million/Year
(Estimate 12Yen/kW)

② Reduction of CO2 **124t-CO2/Year**

Initial Cost	: 17	Million Yen
Maintenance Cost/Year	: 1.7	Million Yen
Power Generation Amount	: 3.15	Million Yen (12Yen/kWh)

Cost Recovery : 11Years

4．Case Examples -②FIT

■Power Generation from Garbage

KAISEI Biomass Power Plant(@Senami Murakami-City Niigata Pref.)

○Facility Overview

Power Generation from Local Hotels and Restaurants Garbage.

Generator :BG30A(25kW)
Unit :1
・Heat → **Heating Greenhouse for Fruits**
・Electricity → **Sell All (FIT)**

Maintain Stable Performance, even though 30% variability was observed in the Methane level of the biogas.

Initial Cost	: 25	Million Yen
Maintenance Cost/Year	: 1.7	Million Yen
Power Generation Amount	: 6.83	Million Yen

Cost Recovery : 5Years

4．Case Examples -②FIT

■Power Generation from Manure

Kobayashi Farm Biogas Plant(@Ebetsu-City Hokkaido)

○Facility Overview

Power Generation by Using Biogas from 300 Milk Cows Manure. And Selling All Generated Electricity.

Generator :BG90A(75kW)
Unit :1
・Heat → **Heating Digester and Road**
・Electricity → **Sell All (FIT)**

Running without problems even -10℃ in Winter

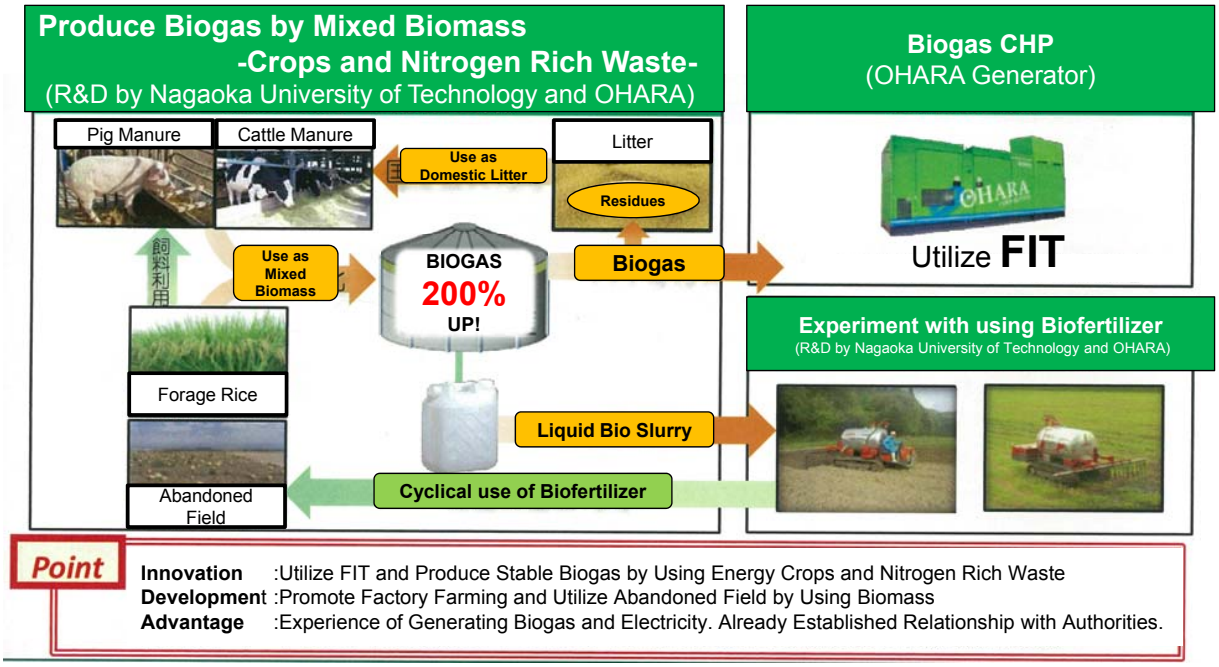
Initial Cost	: 40	Million Yen
Maintenance Cost/Year	: 3.5	Million Yen
Power Generation Amount	: 24	Million Yen

Cost Recovery : 2Years

5. Recent Developments

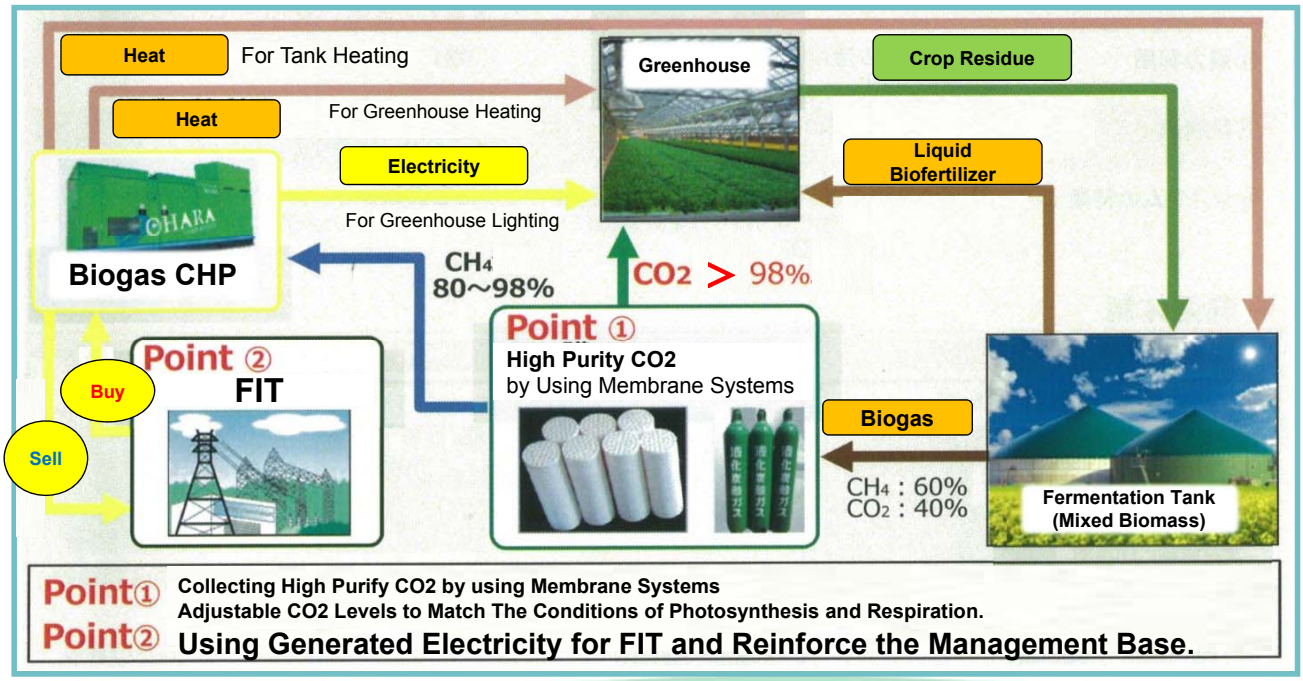
5. Recent Developments

■Resource Recycling and Renewable Energy Production by Mixed Biomass -energy crops and livestock manure-



5. Recent Developments

Development of Dutch Cultivation Technology by Using High Purify CO2



THANK YOU FOR YOUR ATTENTION!

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