Introduction of Small and Distribution Type Biogas Generator Using Renewable Energy (Biogas by Methane Fermentation) as Fuel

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1. Company Profile

Ohara Ironworks Co., Ltd

1) Head Office: Nagaoka-city, Niigata
2) Established as Drilliring equipment Maker in 1907
3) Main Business Item

① Snowgroomer
   - For Skiing slope
   - For Self-Defense Forces
   - For South Pole

② Environmental Business
   Water Disposal, Refuse Disposal Plant
   Biogas Power Generation System
   Apparatus, Design, Manufacture, Construction

2. What is Biogas Power Generation System?

Biogas Power Generation System

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

Materials
- Sewage Sludge
- Animal Manure
- Garbage
- Tree, Grass
- Rice Straw

Pretreatment
- Acceptance Adjustment
- Bag Break, Crush
- Sorting

Methane Fermentation
- Bioreactor

Energy Utilization
- Gas Holder
- Generator
- Use in plant
- Electric Power
- Electric Power Company

Materials Utilization
- Manure and Liquid Fertilizer Plant
- Manure and Liquid Fertilizer Utilization
- Resolved to a Ranch, Cultivation, Meadows
2. What is Biogas Power Generation System?

Background of the conventional biogas Power generation plant (in Japan)

Many Introduction Examples of the Methane Fermentation
- For Animal Manure
- For Volume Reduction of Sewage Sludge etc…

Few Examples of the Profit Inflection of the Biogas (Generation)
1) Only High Power, Expensive Biogas Generator
2) Difficulty of the Maintenance

Restrain the Introduction to the Small Scale Site Occupying Most of Japan → Control Profit Inflection of the Biogas

3. Technology of Ohara

Small and Distribution Type Biogas Generator

BG60A
50/60kW 50/60Hz

BG30A
25/30kW 50/60Hz

1) Remodel the Commercial Diesel Engine Generator
   【High Marketability of a Product and Parts】
   → Reduction of the Initial Cost
   → Everybody Can Maintain (Low Running Cost)

2) Small Size, Small Output  25kW, 50kW

3) High Generating Efficiency  35%

4) Applicable to Various Sites by Number Control and Output Control
3. Technology of Ohara

- Remodel the Commercial Diesel Engine Generator
  
  1) The Engine Technology Cultivated by Snowmobile Development

2) Technical Collection of the Company in Niigata
   - Base Machine is Made in Hokuetsu Industries in Niigata.
   - Made in Niigata New Technology Spread, Utilization System Registration Product

4. Case Study etc...

- Biomass Materials for Biogas Power Generation System

- Biogas for Methane Fermentation
- Garbage
- Animal Manure
- Sewage Sludge
- Factory effluent
- Tree, Grass
- Rice Straw
- Thinning Materials
- Thermolysis Gas
4. Case Study etc…

■ Quantity of Biomass Materials necessary for Output 100kW Generation

**Biomass Materials**
- Milk cow: 600 Scales
- Animal Manure: 40 t/Day
- Garbage: 10 t/Day

**Treatment**
- Water throughput: 30,000 m³/Day
- Concentration Sludge: 120 t/Day

**Generation Electric Power Selling**
- Acceptance Adjustment
- Bioreactor
- Gas Holder

4. Case Study etc…

■ FIT System Starts in Japan from July, 2012

<table>
<thead>
<tr>
<th></th>
<th>10kW Over</th>
<th>10kW Under</th>
<th>10kW Under (Double Generation)</th>
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<tbody>
<tr>
<td>Solar Light</td>
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<tr>
<td>Cost (¥)</td>
<td>37.8 (34)</td>
<td>38 (34)</td>
<td>31 (34)</td>
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<td>Procurement period (year)</td>
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<td>Wind Power</td>
<td>20kW Over</td>
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<td>Cost (¥)</td>
<td>23.1</td>
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<td>57.75</td>
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<tr>
<td>Procurement period (year)</td>
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<td>Water Power</td>
<td>1,000kW Over 30,000kW Under</td>
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<td>200kW Under</td>
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<td>Biomass</td>
<td>Methane Fermentation</td>
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<td>Cost (¥)</td>
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<td>Procurement period (year)</td>
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</table>
4. Case Study etc…

**FIT System Starts in Japan from July, 2012**

In same 100KW/h • • •

<table>
<thead>
<tr>
<th>Use in plant (power purchase ¥10)</th>
<th>100kWh × ¥10/kWh</th>
<th>¥1,000</th>
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<tr>
<td>FIT (Electric Power Selling ¥39)</td>
<td>100kWh × ¥39/kWh</td>
<td>¥3,900</td>
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The law Maintenance Supports Profit Inflection of the Renewable Energy

**In Russia**

1) Potential demand for renewable energy
   - Unconnected area to large number of center grids (Distant place inhabitants, datcha)

2) Recent legislation for the biomass profit utilization
   - 2007 electricity premium schemes (Electricity wholesale purchase system)
   - 2012 Biotechnological development program 「Bio 2020」
   - There is the construction plan of the biogas plant in the Belgold state
   - Assume 1/4 of the domestic alternative energy the production target in the level by 2015.

A small and dispersion type biogas generation plant contributes

Thank you for your attention!

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