Biomass Energy Development

September 30th 2010

Nishinippon Environmental Energy Co., Inc.

Project Development Department

Corporate Profile of NEECO

Established： November 1990
Headquarter：17-8, Shirogane 1 Chome, Chuo-ku, Fukuoka, Japan
Capital： 1,010 million JPY
President： Takayuki Baba
Shareholder：Kyushu Electric Power Co., INC.（100%）
Major Lines of Business

① Environment and Energy Business
- Biomass energy in Miyazaki prefecture
- New energy business（Solar, wind, geothermal）
- Distributed power supply business

② Environment and Energy Consulting
- New energy and energy saving consulting

Effective Use of Biomass

- Energy resource issues due to oil depletion
- Environmental issues generated from use of fossil fuels.

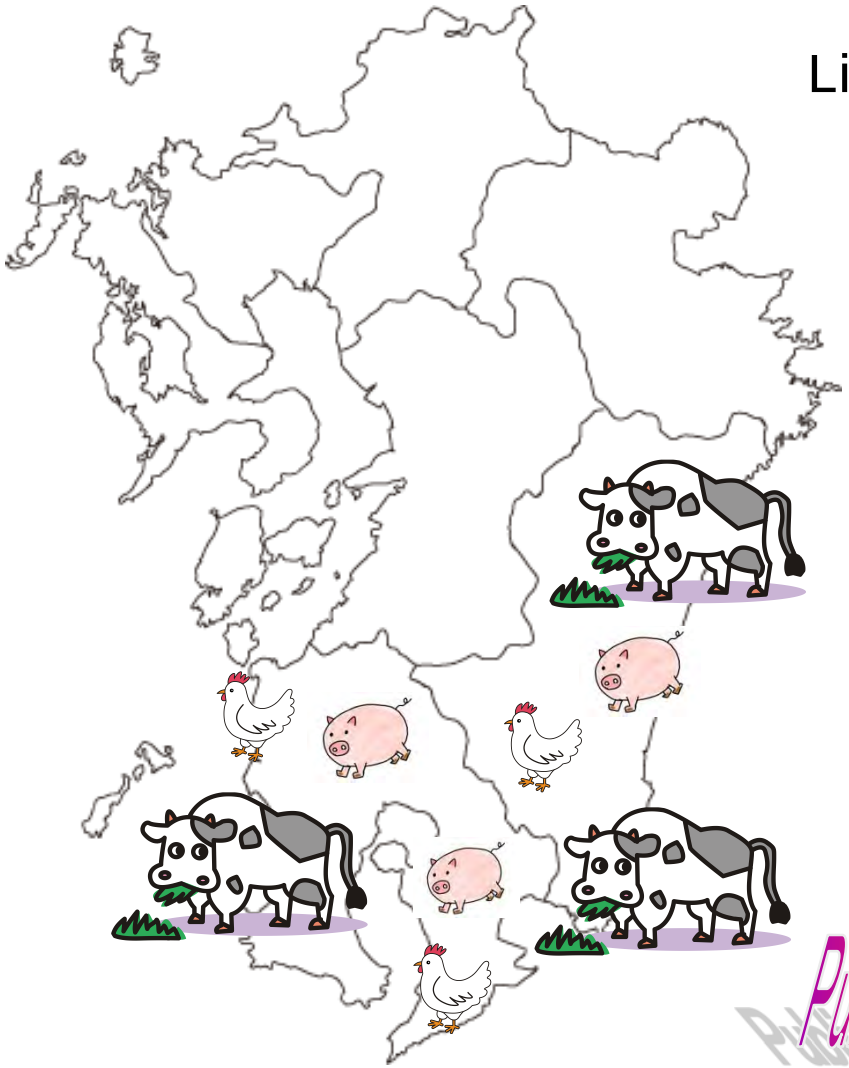
Establishment of energy transfer technology from renewable energy resources

Benefits of biomass

- Reduction on greenhouse gases
- Establishment of recycle-oriented society
- Revitalization of farming villages

→Biomass exist in these areas

Research on Organic Waste Recycling System（2003～2004）



Livestock farming is prosperous in the south Kyushu

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Massive animal excrements!!

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Concerns about local environment

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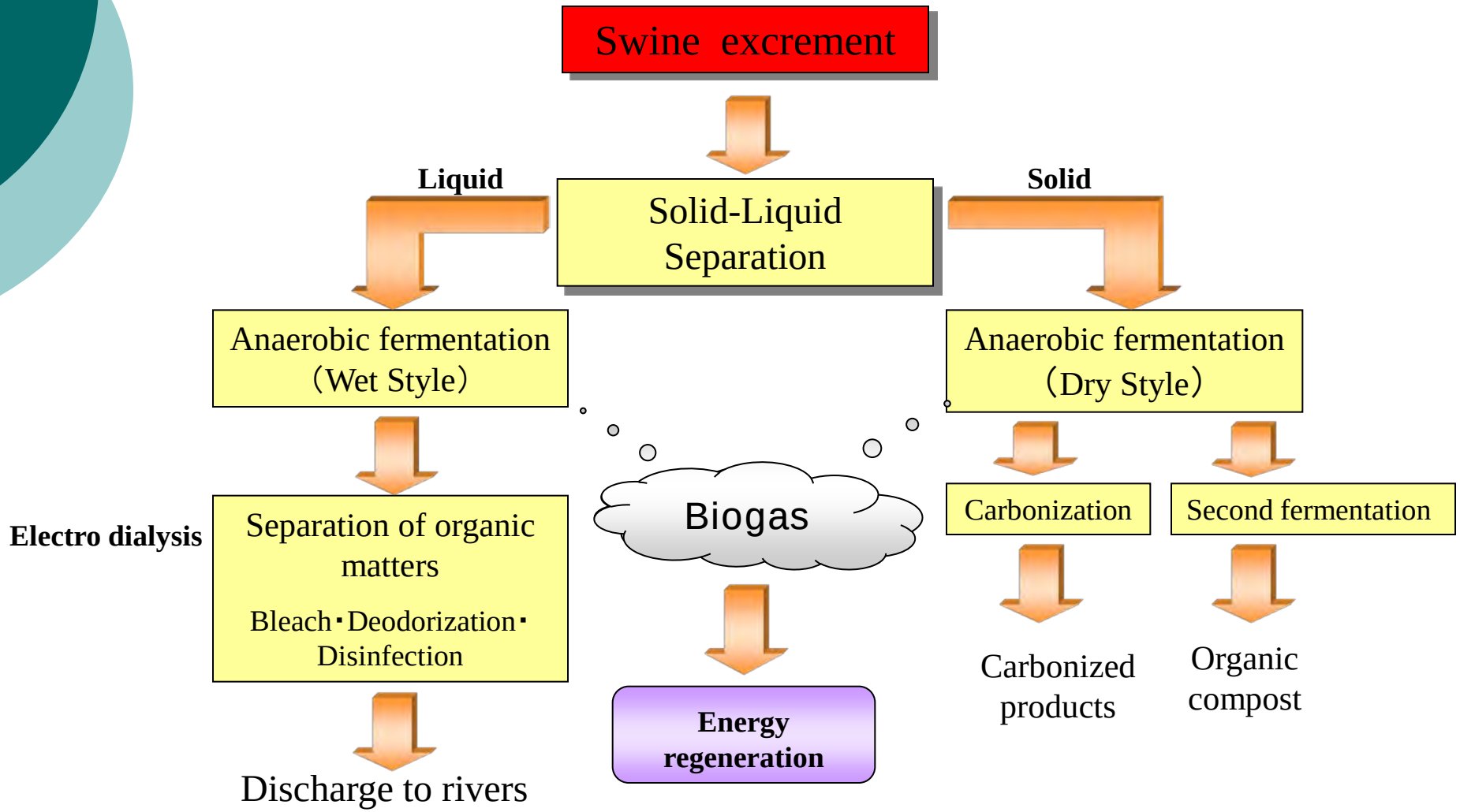
Establishment of Biomass Energy System

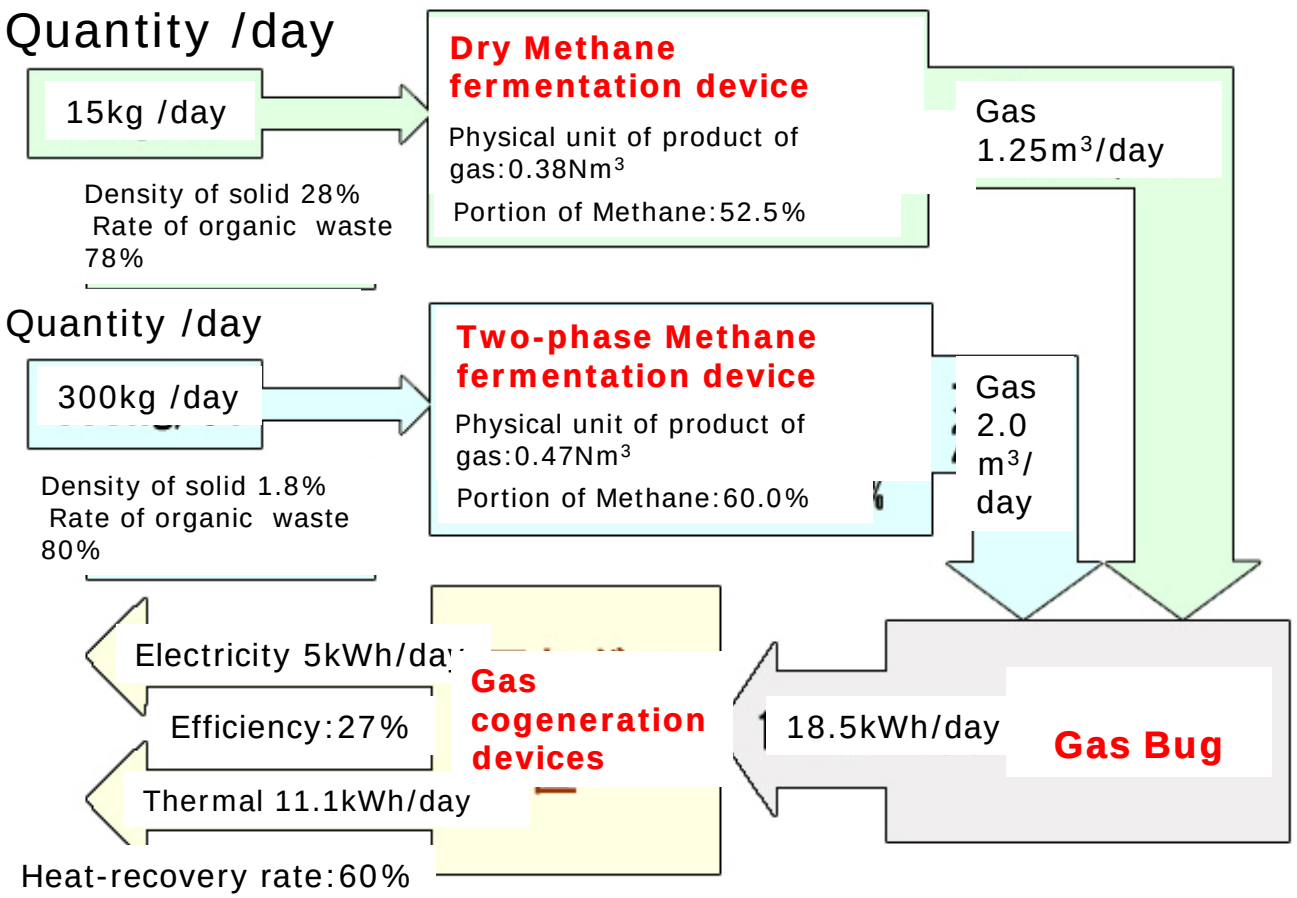
Public-private-academic partnership projects

Recycling system flow of organic wastes



Pilot Results（Energy Balance）

Energy balance of Gas Cogeneration Devices



Piloting in gasification of wood biomass (2003～2007)

- Joint research by NEDO and Kyushu Electric Power Co.,Inc.
- Gasification of wood biomass – Internal-combustion power
- Airtight double tube entrained bed

Background of Pilot

- Low energy density

	Water content	Heat value
Coal	Less than 10%	About 6,350kcal/kg
Wood	30-50%	About 3,000kcal/kg
Poultry litter	45-55%	About 2,000kcal/kg

- Abundant in volume, but too scattered to collect

Large collection and transportation costs

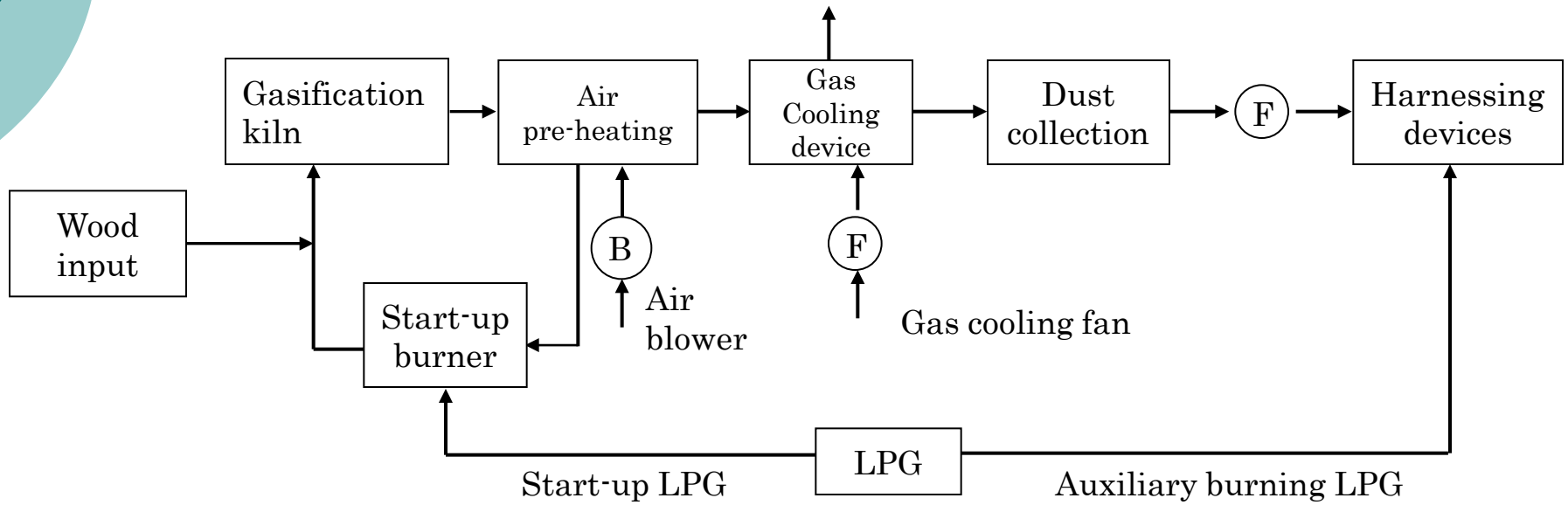
Solutions…

Local procurement and operation → small-scale decentralized facilities

Establishment of the small scale but high efficient power systems

Piloting in wood biomass gasification

《System flow》



Pilot results of wood biomass gasification

- Quantity of gas 50～80㎥/h。
- Heating value of gas 800～1,500kcal/㎥
- Failed to operate long term due to tar deposition which deteriorated fluid in the gas furnace

Lack of tar's ability to decompose

- Shortage of catalytic potassium support
- Shortage of contact time (response time)

Other cases of wood biomass gasification

- Fixed-bed downdraft, a type of furnace, enabling small quantity tar emissions
- Satake, Kawasaki and other manufacturers produce wood biomass gas plants
- Satake has projects implemented in India and Thailand
- Materials are wood and coconut hulls; Capacity ranges from 100kW to 1,500kW

NEECO consulting cases

- Research on wood biomass to utilize direct heat
- Research on generating dried biomass fuel
- Research on biomass electricity feasibility in isolated islands
- Research on recycling sludge
- Facility performance evaluation for business use solar power
- Research on various wind conditions for wind power
- Research on wasted oils generated from households

Thank you very much for your Attention!!

Nishinippon Environmental Energy Co.,Inc.

Project Development Dept.