17 January 2002

Technology that Powers the 21st Century

Masaru Takayama

MEIDEN

Agenda

- *Introduction of MEIDEN*
- *CHP Installed Base in Japan*
- *MioSpectrum Platform*
- *Micro CHP System powered by Capstone*
- *Case Study 1:Heat Recovery System*
- *Case Study 2:Biomass Energy Solutions*
- *New Resource Recovery*
- *What's New?*
- *On The Horizon*

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Introduction of MEIDEN CORPORATE DATA

- Head office: Nihonbashi Hakozakicho Tokyo Japan
- Founded:December 22,1897
- Representative Director

  Dr Keiji Kojima, Chairman of the Board

  Mr Shigeo Seko, President and C.E.O.

  Mr Keiji Kataoka, Executive Vice President

  Mr Mineo Itakura, Executive Vice President
- Paid up Capital: \17,070million
- Number of Shareholders:14,010
- Number of Employee:4,009
- Stock Listing: Listed on Tokyo Stock Exchange
- Home Page :http://www.meidensha.co.jp

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Introduction of MEIDEN
Product Portfolio

Energy Business Group

* Hydro Power Plant
* Diesel Power Plant
* Turbine Generator
* Co-generation Systems
* Substation Sys.
* VI, VCB, Switchgear, GIS
* Surge Arrester
* RailwaySystems

Environmental Solutions Business Group

* Water Treatment
* Water Resource Administration System
* Refuse Treatment System

Info. & Com. Business Group

* Industrial Computer
* SCADA System
* Topographical Map Input & Editing System
* Pulse Source for Krypton Flouride (KrF) Excimer Laser
* Programmable Controller

Industrial Sys. Business Group

* Motor
* Inverter
* Dynamometer-applied Sys.
* Factory Auto-mation System

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MioSpectrum Platform

- *MicroTurbine: Capstone MicroTurbine*
- *MEIDEN Packaging: MioSpectrum Series*
- *Creating MioSpectrum Platform*
  MEIDEN's Added Values:
  - Proprietary Grid Connection Technology
  - Packaging to Reduce Noise
  - Non-stop Power: by going UPS Application
  (Japan First as MGT Apps)
  - Exploring the Potentials: Maximum Utilization of the Waste Heat and the Maximum Utilization of Otherwise Wasted Resources as A Fuel
- *Finding the New Application:*
  - Teaming with Creative Application Providers (by Strategic Alliances)

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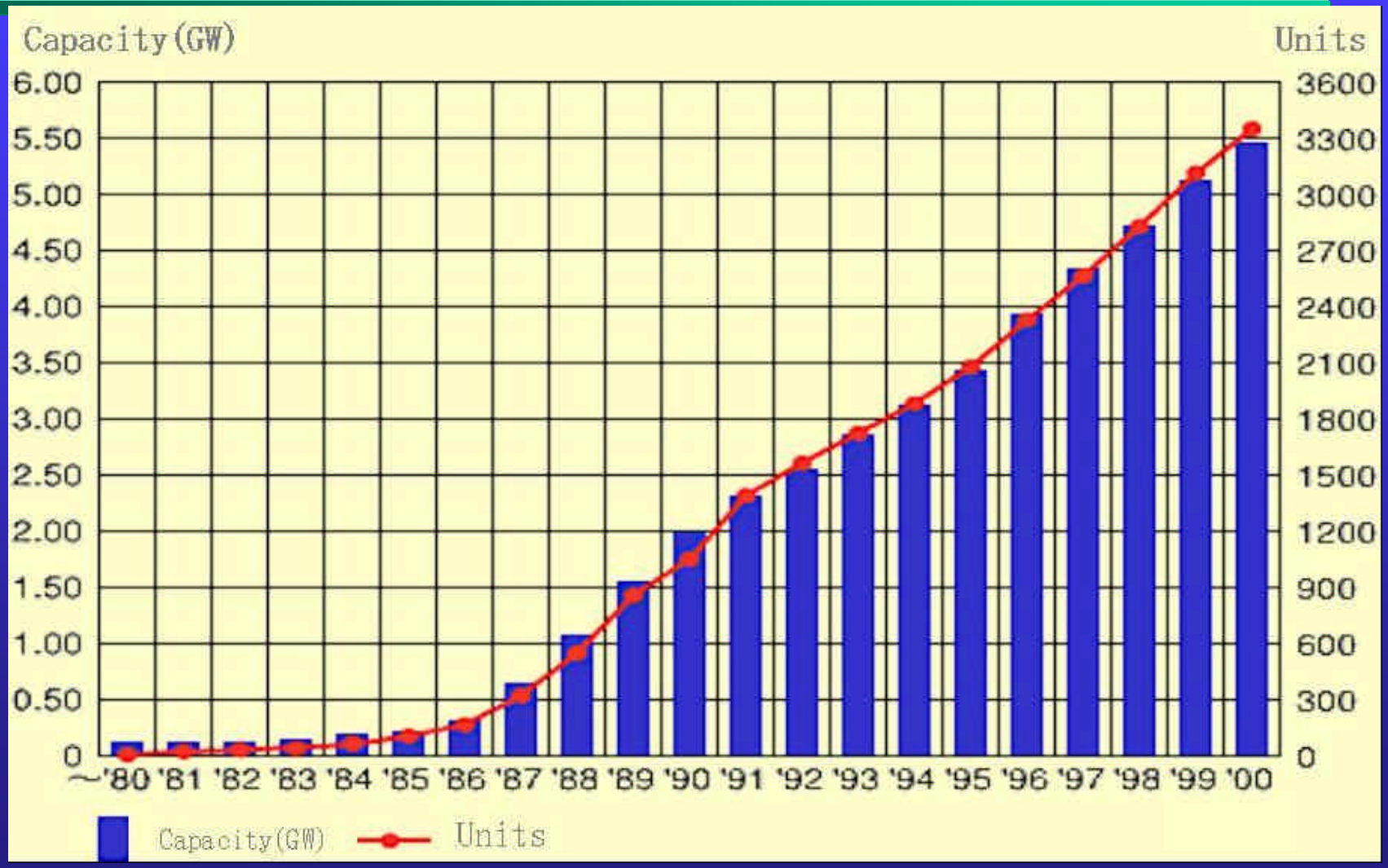
CHP Installed Base in Japan (Aggregated Base)



Quoted from Japan Co-generation Center

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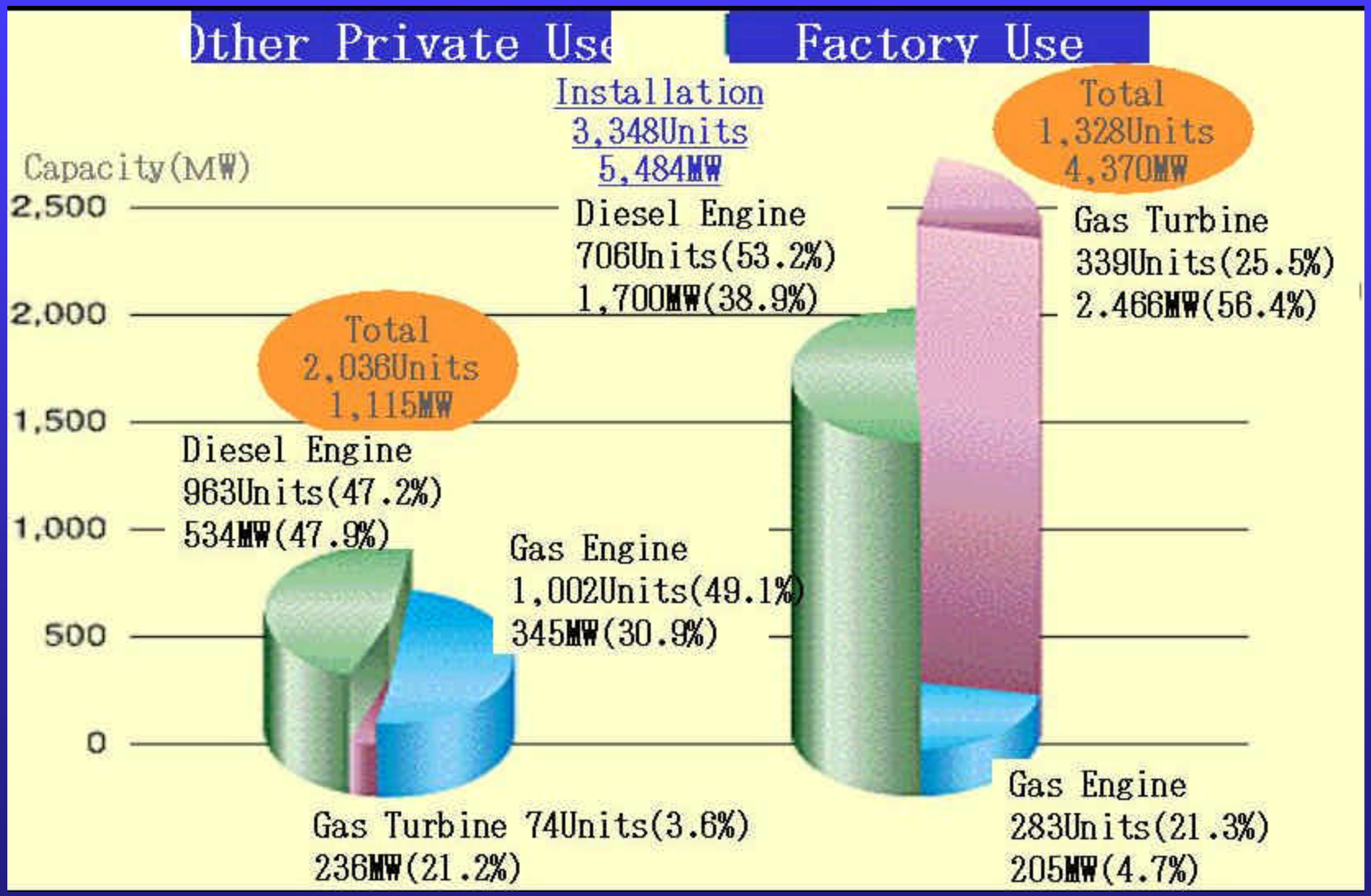
CHP Installed Base in Japan (Engine Type)



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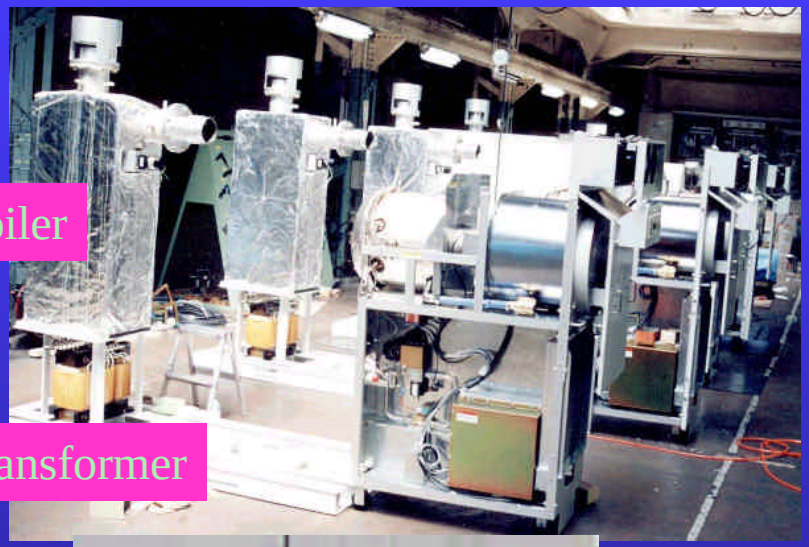
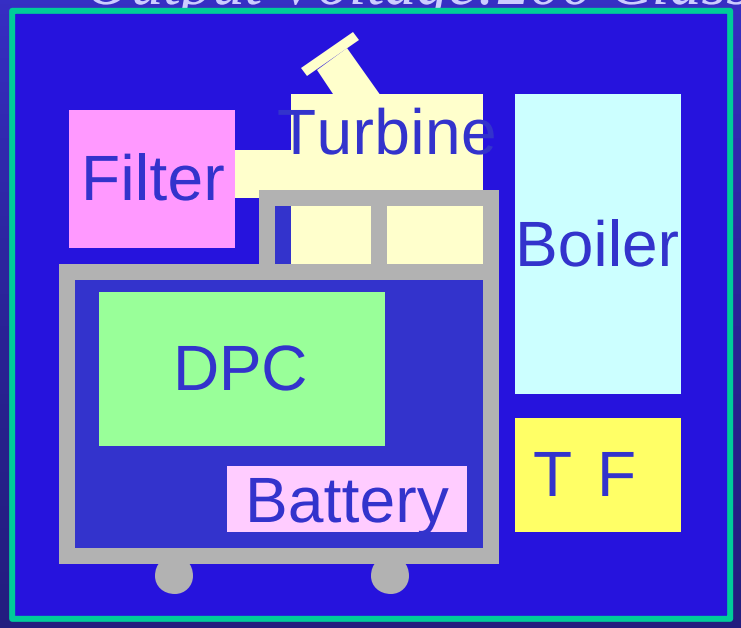
Quoted from Japan Co-generation Center

Basic Offering: Micro CHP System powered by Capstone



- *Output 30kW*
- *Waste Heat Recovery 52kW*
- *Total Efficiency: >70%*
- *Low Noise:65db(A)*
- *Output Voltage:200 Class*



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Exploring the Potentials of MioSpectrum Case Study 1:Heat Recovery System

- *Waste Gas HW Boiler*
- *Absorption Type Water Heater/ Chiller*
- *DBAC System*
- *Garbage Volume Reduction System*
- *Load Heating*
- *Dryer*
- *Adsorption Chiller (under development)*

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Exploring the Potentials of MioSpectrum Case Study 2: Biomass Energy Solutions

- *Water Treatment Sludge Fermented Methane Generation Sys. (Japan First as MGT Apps)*
- *Livestock Urine&Feces Fermented Methane Generation Sys (World First as MGT Apps)*
- *Raw Garbage Refuse Methane Generation System*

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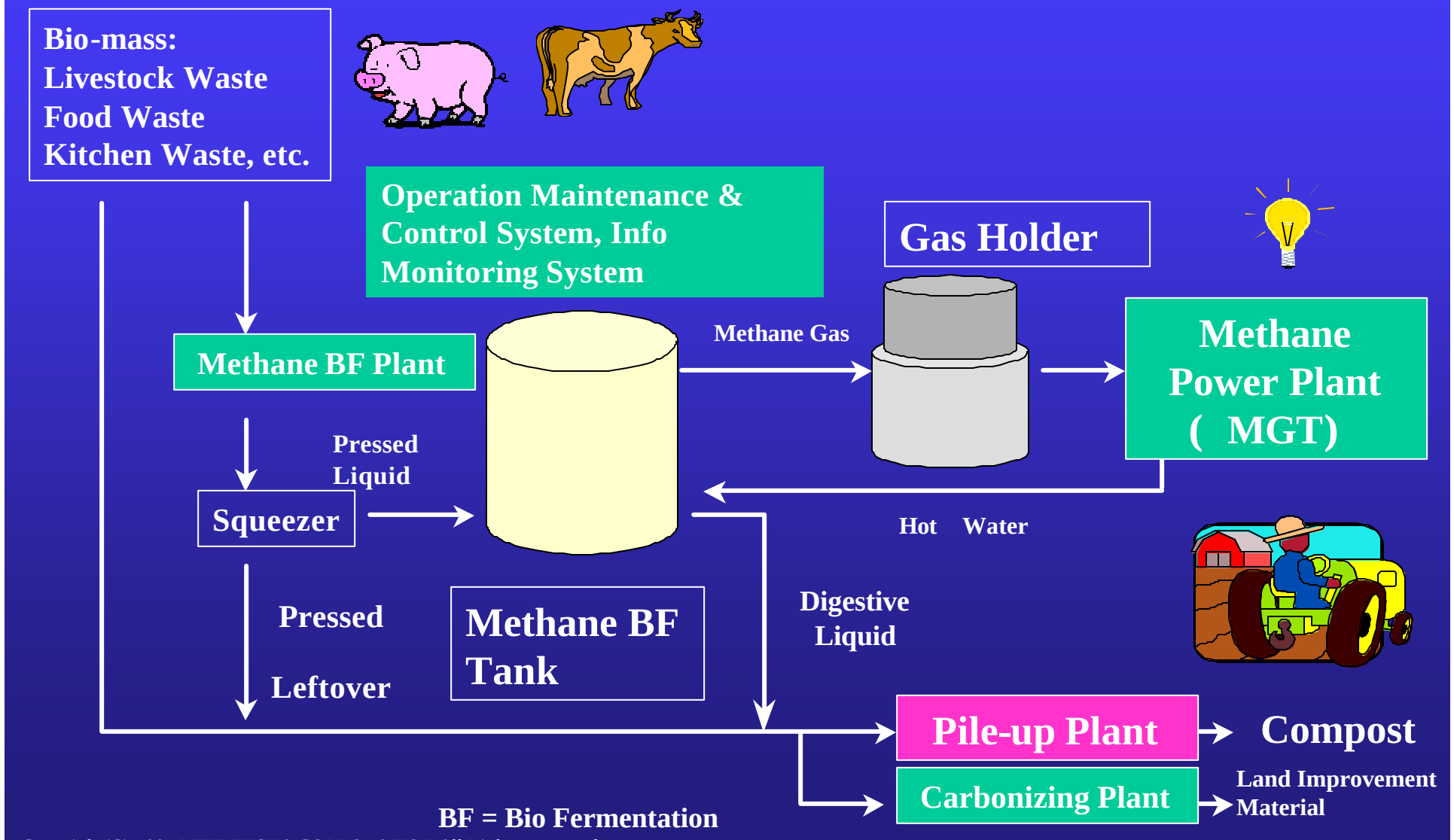
Case Study 2:Biomass Energy Solutions

How Bio-mass System works.



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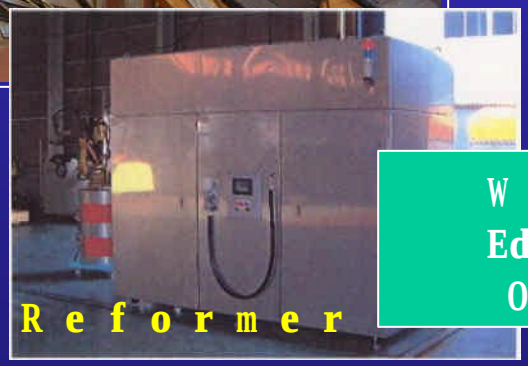
New Resource Recovery

Our Challenge to Climate Control Issues

Field Test of Waste Edible Oil Power System

- *Low NOx*
- *No SOx*
- *No Particulate Matter*
- *Low Carbon Monoxide*
- *Low Unburned Hydrocarbons*



Waste Edible Oils → Fuel Reformer → Micro Turbine

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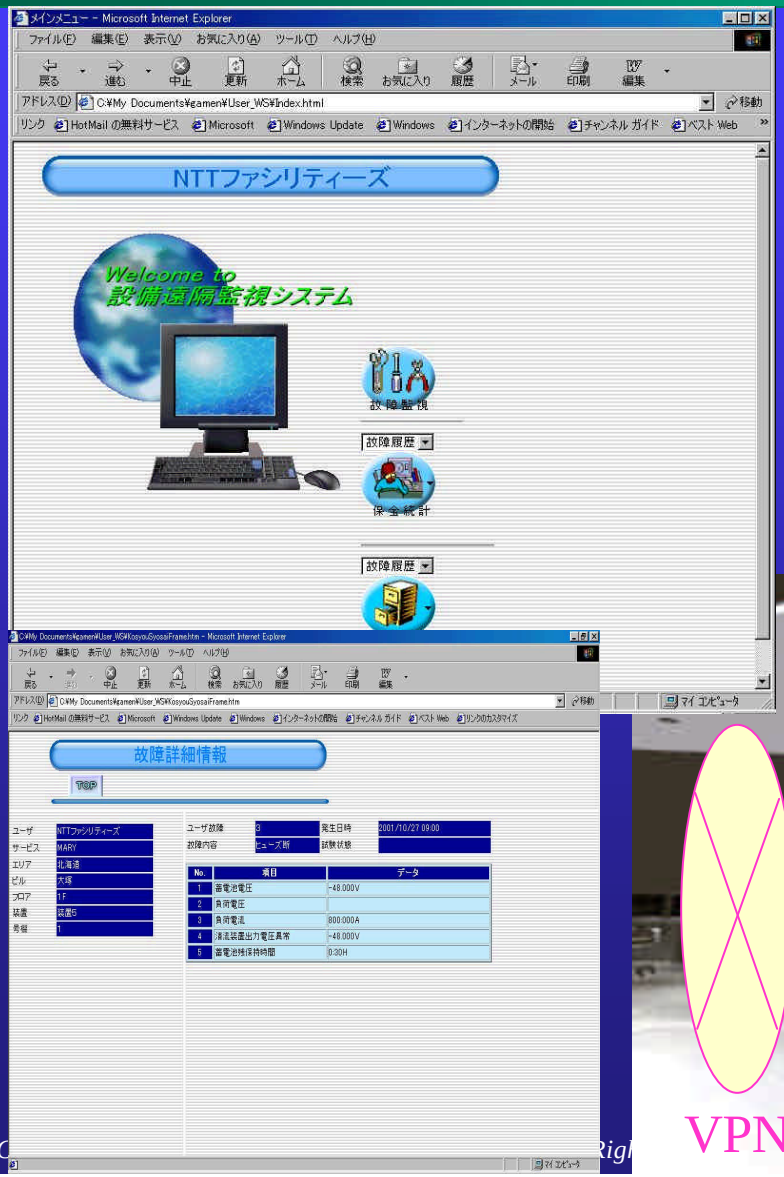
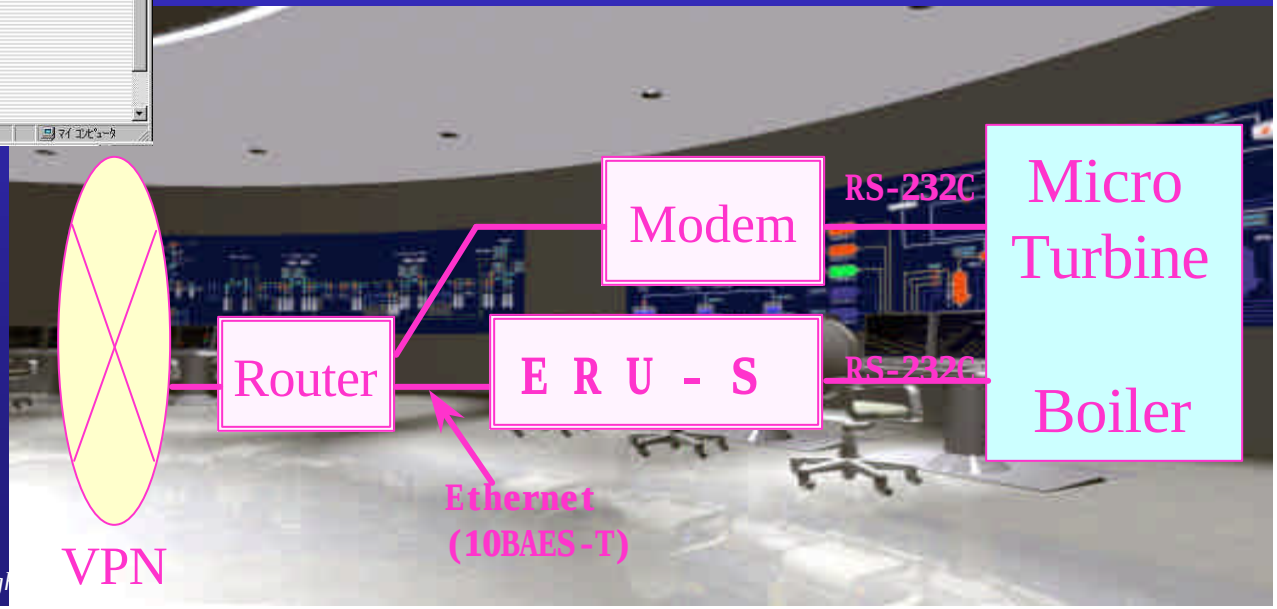
What's New?



- *Internet-based Remote Monitoring System*
- *Info Access Level Change by Password Information*
- *Operational Data Logging*



On the Horizon(Closing Thoughts)

- *Be the First Mover*
- *In Search of New Creative Applications*

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Invisible Continent

- *An Unchallenged Vast Market*
- *Key Constituting Factors*
  - Emergence of Micro turbine and Other Distributed Generation Technologies
  -Power and Gas Utilities Deregulations
  - Global Climate Control Awareness
  - Straight Forward Economics
  - Arbitrage Opportunity: Waste ->Viable Fuel

Micro turbine: A Revolution in the 20th Century

Technology that powers the 21st Century