

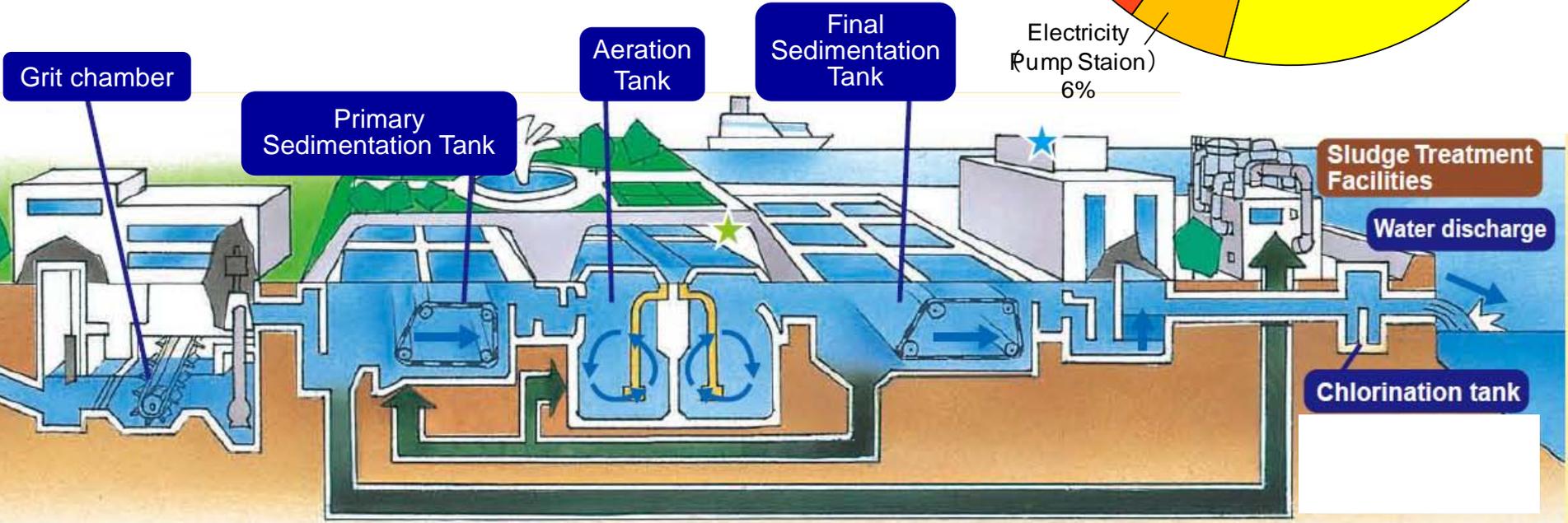
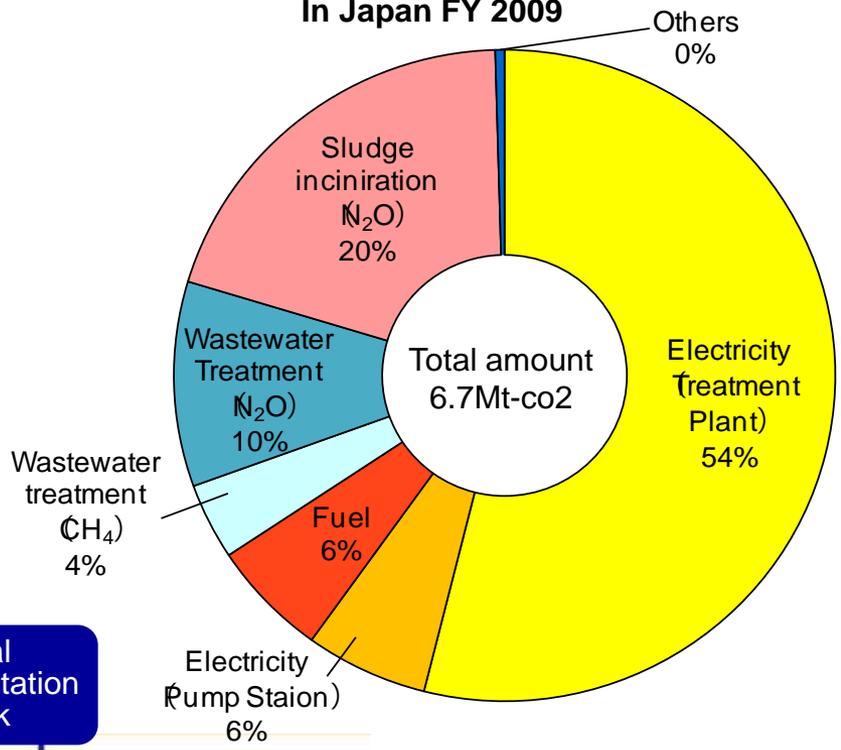
# Efforts for effective use of sewerage resources in Japan

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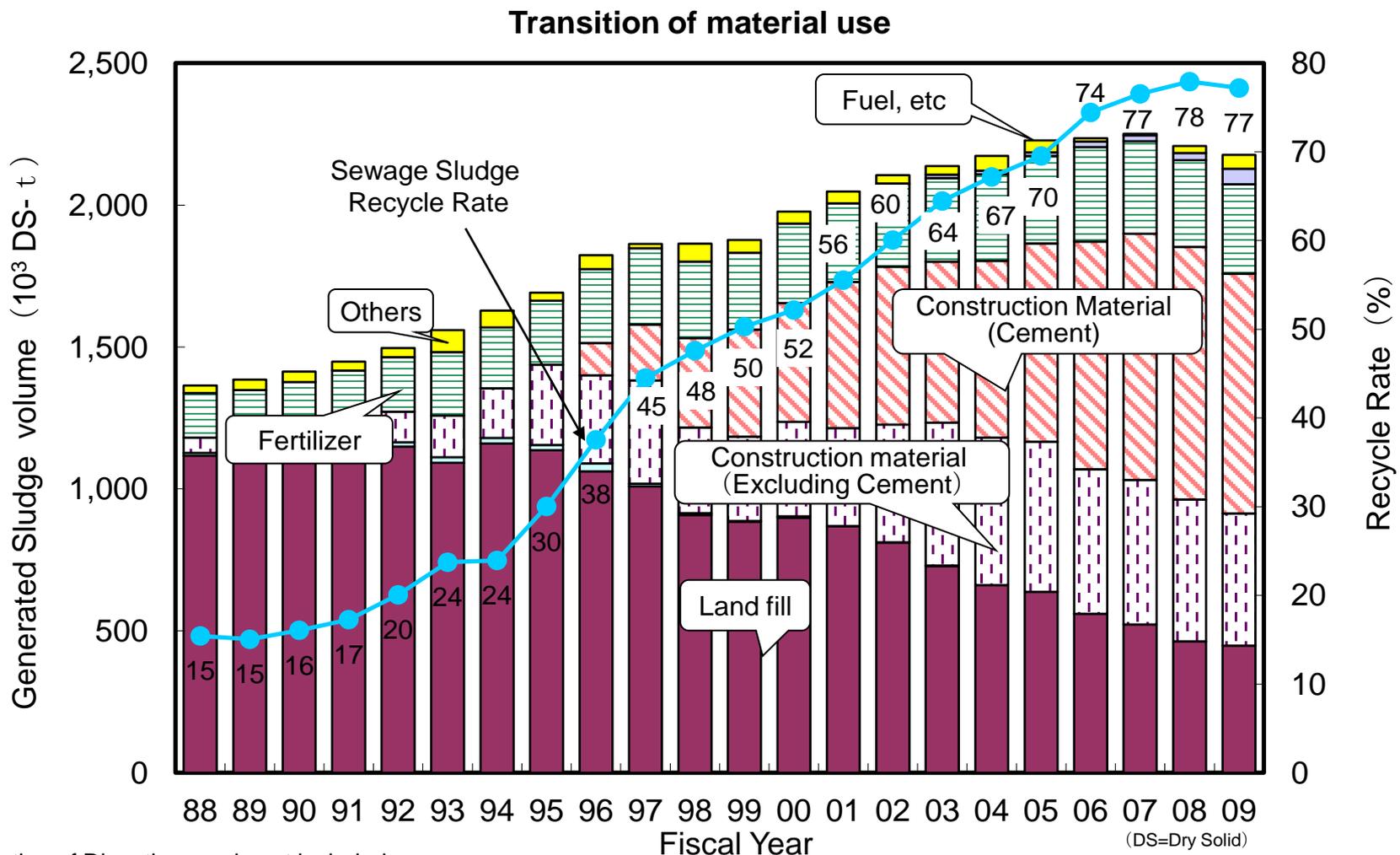
**Sewerage and Wastewater Management Department  
Ministry of Land, Infrastructure, Transport and Tourism,  
Japan**

- ◆ There are about 2100 wastewater treatment plants in Japan. Most plants adopt aerobic treatment methods such as conventional activated sludge process or oxidation ditch process.
- ◆ As for the GHG emission from sewerage system, the emission from electricity(treatment plant) accounts for 54% and the emission from sludge incineration accounts for 20%.

**Greenhouse Gas Emissions from sewerage system In Japan FY 2009**



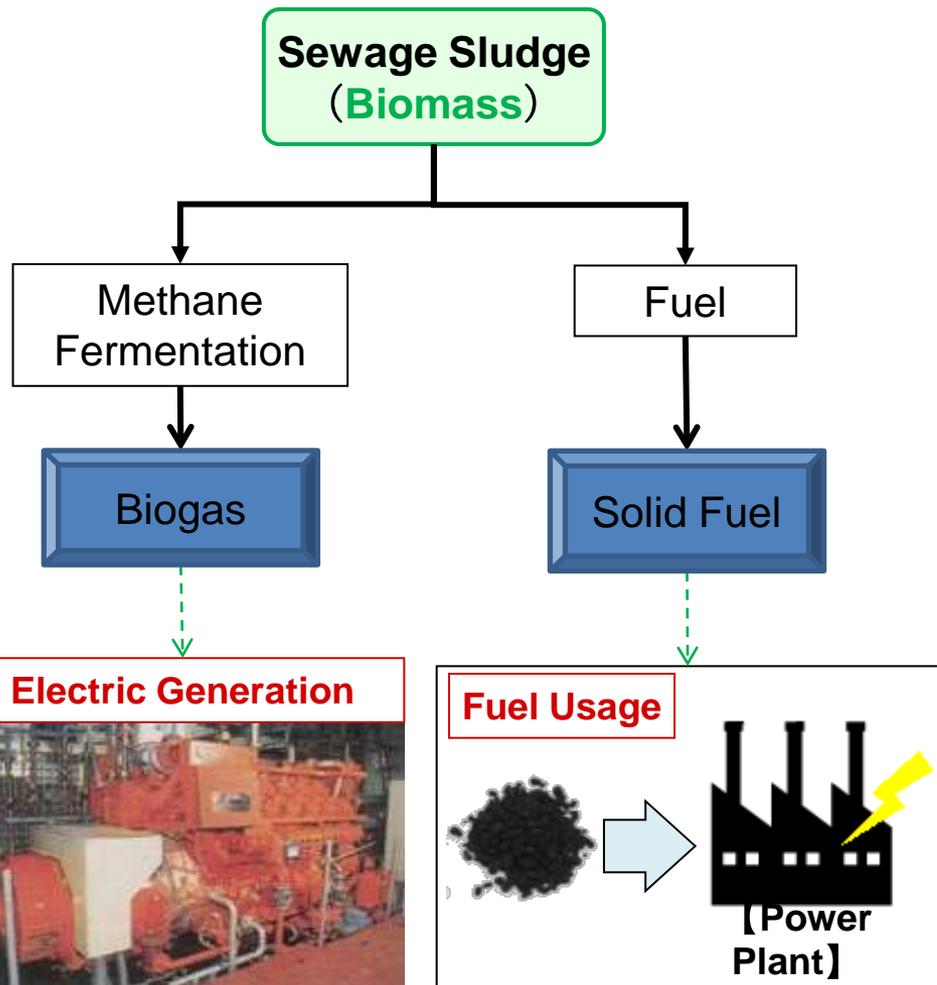
- ◆ The material use of sewage sludge has steadily increased, since the efforts on reduction of sludge volume became obligation by new Sewerage Law
- ◆ The rate of material use has reached about 77% in 2009.
- ◆ The rate for cement use is the largest in any use.



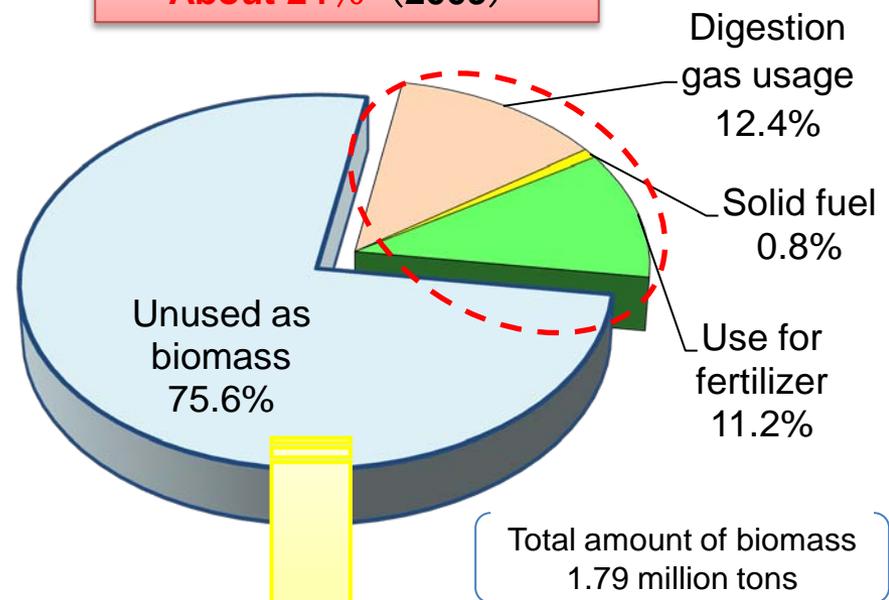
※Utilization of Digestion gas is not included

- ◆ About 80% of sewage sludge comprises organic matter and it can be used to generate energy by producing solid fuel or biogas.
- ◆ Biomass recycle rate remains 24% in 2009 (The rate for energy generation is only 13%).
  - ※ Biomass recycle rate: percentage of the organic matter which is efficiently used as digestion gas or fertilizer.

## Energy Use of Sewage Sludge



**Biomass Recycle Rate**  
About 24% (2009)

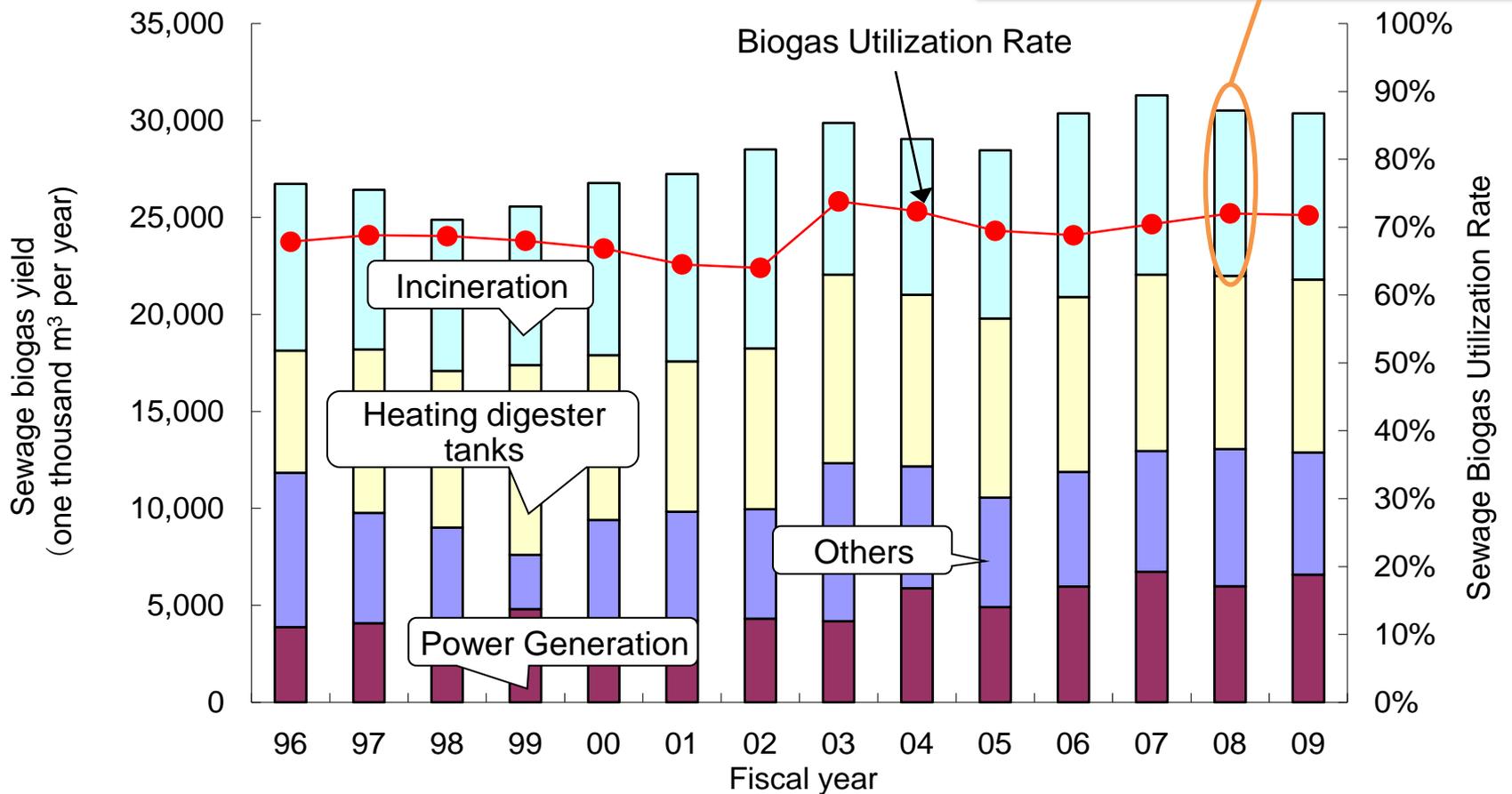


- Electric generation by Digestion gas
- Fuel for natural gas vehicles
- Injection of biogas into city gas pipe
- Solid fuel usage

- ◆ There are digester tanks in about 300 treatment plants. About 70% of the biogas generated by digestion (218 million m<sup>3</sup>) is utilized, but the rest(86 million m<sup>3</sup>) is incinerated.
- ◆ Sewage biogas can be used more efficiently, because although about 20 % of biogas(66 million m<sup>3</sup>) is used for the power generation, about 30% (86 million m<sup>3</sup>) is used only for heating digester tanks.
- ◆ In 2009, electricity generated from sewage biogas covered about 2% of the total electricity consumption in sewerage facilities.

## 【Biogas Yield and its Usage】

About 30% of biogas is unused



## (Measure 1)

It is necessary to develop technologies such as **low cost and high efficient energy utilization technology by the leadership of the government** in order to promote the energy use by the local governments.



**B-DASH Project** (Government funded technology R&D and demonstration project :  
**Breakthrough by Dynamic Approach in Sewage High technology**)  
【2011~】

## (Measure 2)

It is necessary to prepare for the promotion of energy use of sludge **under the cooperation between public and private sectors.**

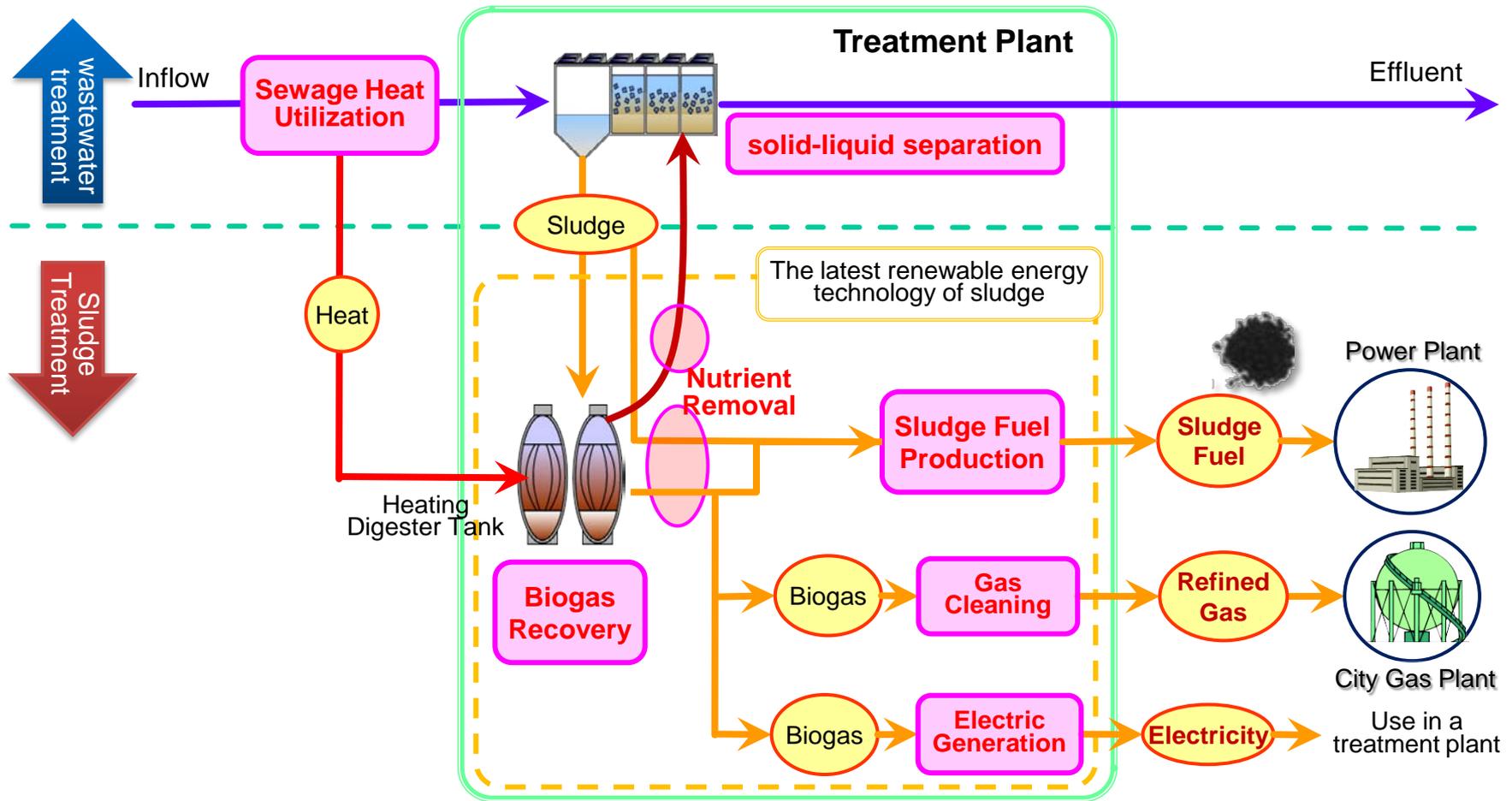


### ■ Feed-in Tariff

(The Act on Special Measures concerning the Procurement of Renewable Electric Energy by Electric power company)

■ **Obligation of Biogas Use by Energy Supply Companies**(Act of Sophisticated Methods of Energy Supply Structures)

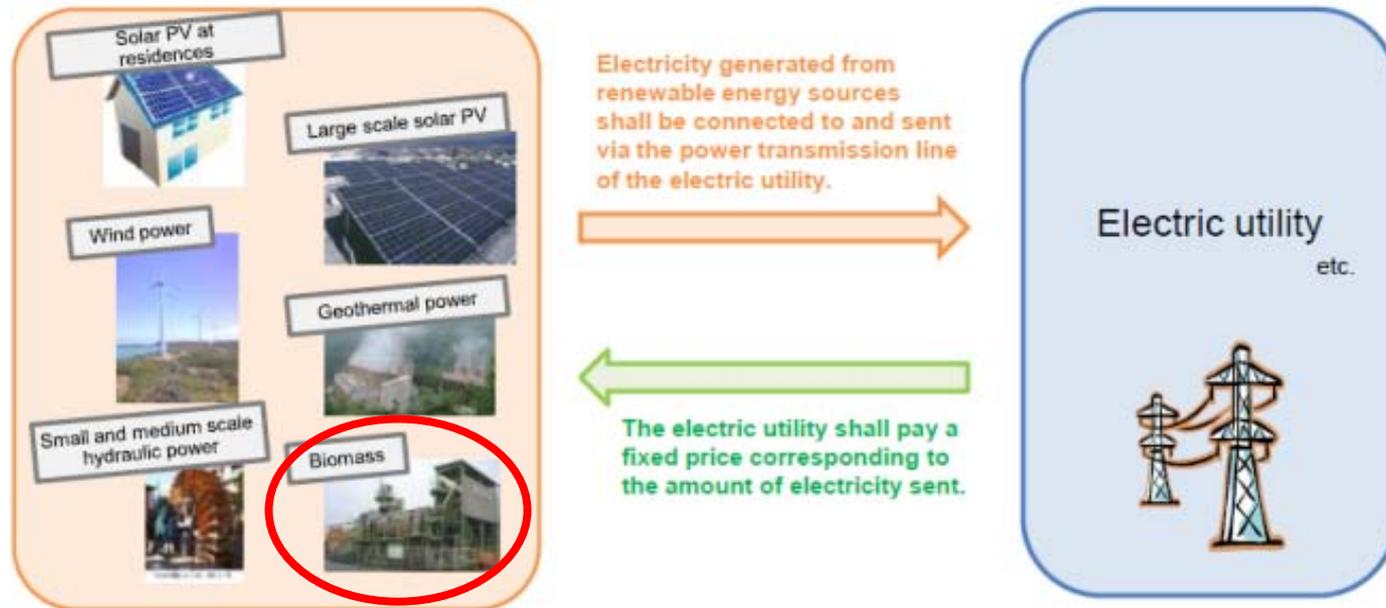
- ◆ Accelerate the government-led development of new technology and its practical application by promoting technical validation through installation of actual size plants and by formulating guidelines.
- ◆ Achieving cost reduction in the sewerage projects and generation of renewable energy.
- ◆ As for the methane gas, implementing high-efficient and high-temperature digestion with carrier filling digester, and high-efficient gas purification technology, etc.



Budget	2.4 billion yen (2011FY)	2.9 billion yen (2012FY)
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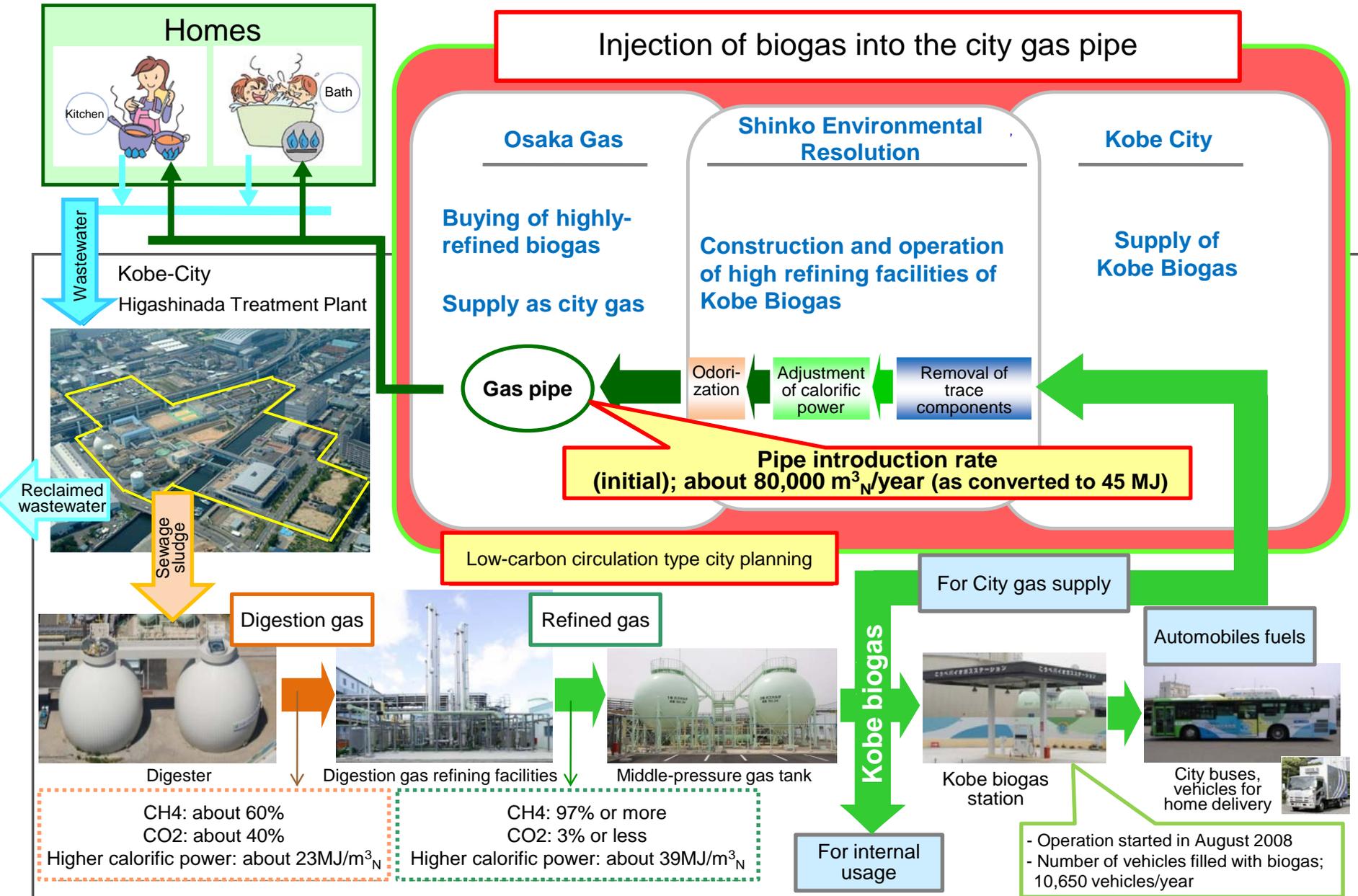
## Feed-in Tariff for Renewable Energy (July. 2012~)

- Since July 1, 2012, electric power providers will be obliged to purchase electricity generated from renewable energy sources on a fixed-period contract at fixed prices.



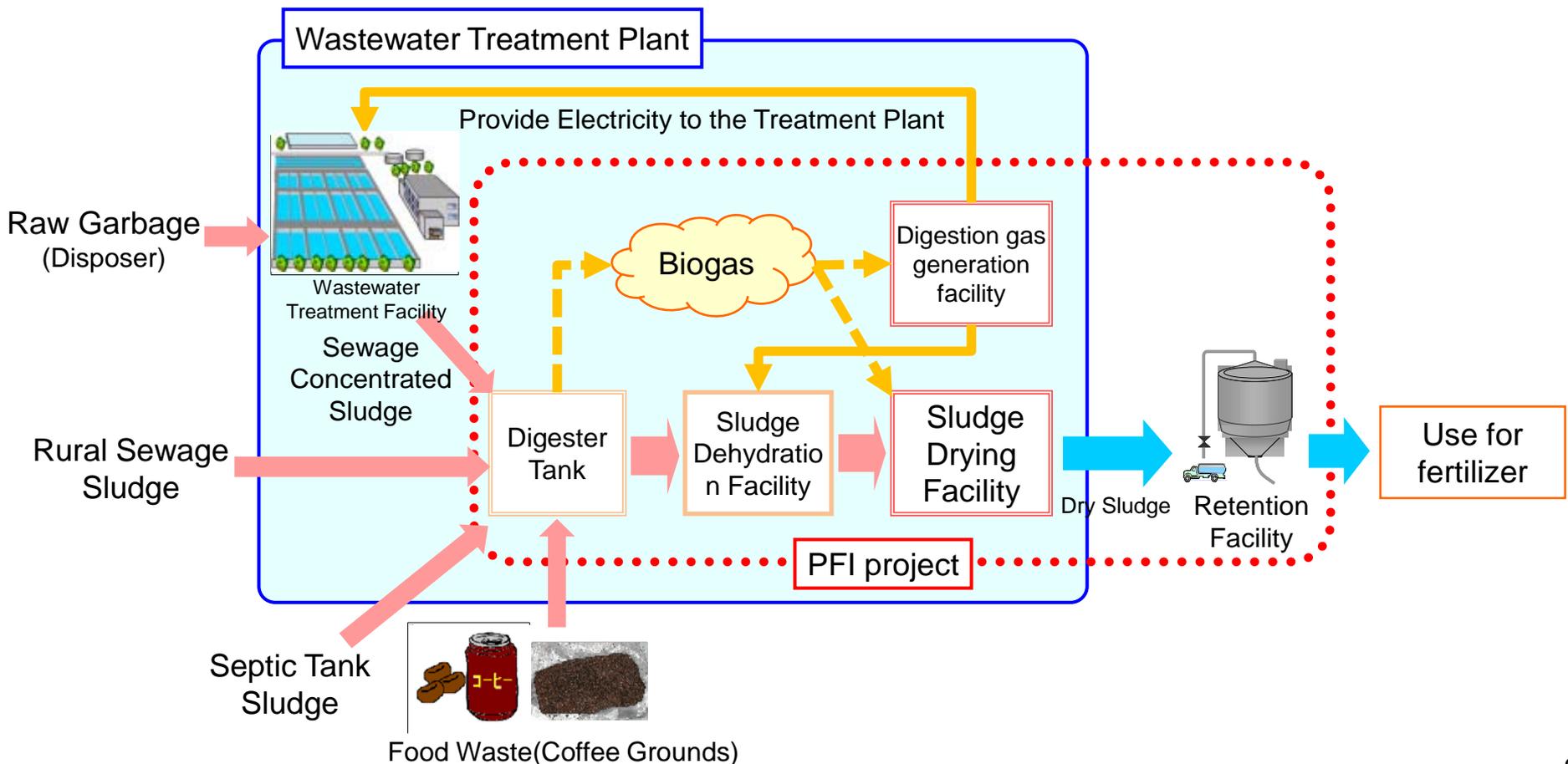
## Act of Sophisticated Methods of Energy Supply Structures (August. 2009~)

- Promote the utilization of non-fossil fuel and the efficient utilization of fossil fuel by operators of energy utilities(Electric, Oil, Gas Supplier)
- General gas providers are obliged to utilize more than 80% of biogas generated in their supply areas in 2015. ( the obligation is only for the biogas available in reasonable price for the gas providers)



- ◆ Increase the amount of biomass by treating not only sewage sludge but also food waste(coffee grounds),raw garbage(disposer) and septic tank sludge, etc.
- ◆ Generated methane gas is used to generate electricity which is used inside the treatment plant. Dry sludge is used for the fertilizer, etc.

## 【PFI (private finance initiative) Project in Kurobe City】



- **Increasing energy self supply rate** by utilizing energy from sewerage
- Work as **Energy Supply Hub** by concentrating the treatment of other biomass which generate in a region.
- **Utilization of wastewater heat** from sewerage pipe network in the city

**Benefits for Community**  
**Climate Control**  
**Business Improvement of Sewage Projects**

