Explosion-proof Calorimeter

Model: OHC-800

2. Application overview

< Crucial notice >

We know some applications using OHC-800; however, it is normally based on the experience only in Japan and China.

Please note each country has each situation especially for energy market.

We do not believe that the application in Japan is always suitable all around the world.
We must find the application which is completely suitable for each countries step by step.

We are open and consider how we can find it together with you. Also, OHC-800 can be flexibly modified for the new applications.

Custom-made order for each customer is available from 1 set of OHC-800.

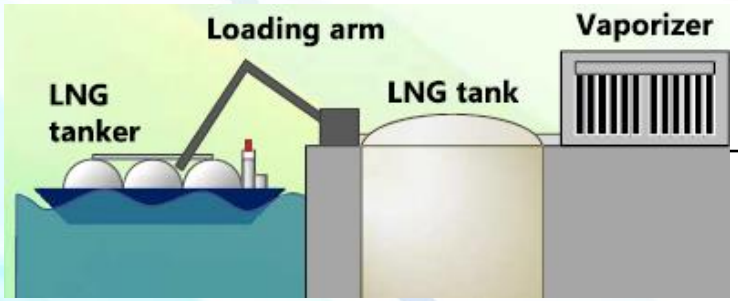
Applications

1. Calorie adjustment for natural gas & city gas
2. Optimize air-fuel ratio for gas turbines
3. Recycle by-product gas from iron steel plant
4. Analyze gas composition & calorie of by-product gas from iron steel plant in real-time.
5. Recycle by-product gas from refinery
6. Power to Gas: H2 injection & Methanation
7. Calorie adjustment for glass production
8. Evaluate methane number
9. Optimize combustion for waste plant, crematory etc.
10. Fiscal metering (Pricing)

Application example 1

Calorie adjustment for city gas and natural gas.

In Japan, city gas must be supplied with 45MJ in accordance with our regulation. In order to adjust the calorie, city gas company adds propane to vaporized LNG. High accurate calorie meter is crucial to save the cost of propane by adding minimum necessary propane.



Feed forward control

Gas mixture facility to adjust gas calorie

Gas Holder

Propane gas

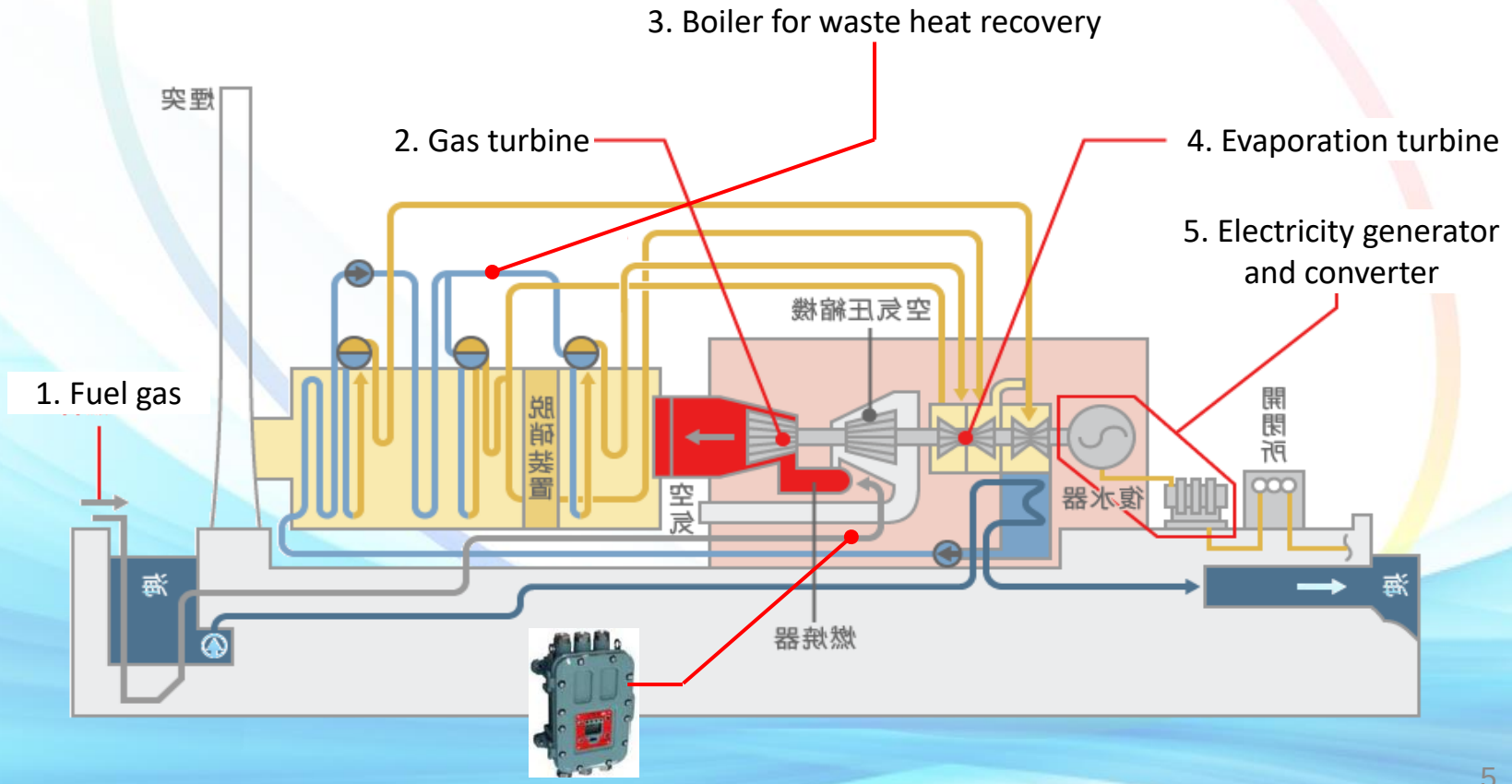
or feed back control

Check the calorie

Application example 2

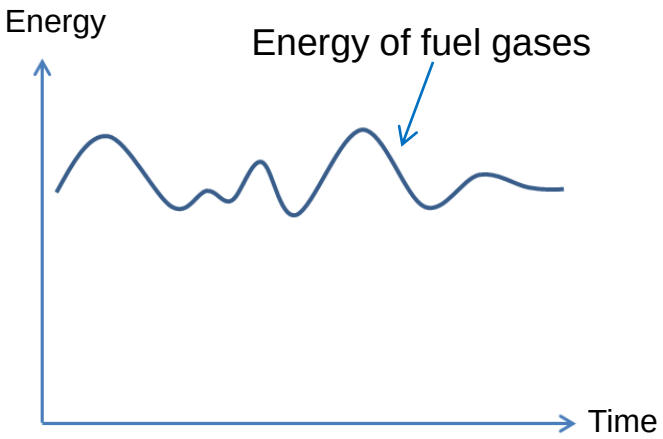
Optimize air-fuel ratio for gas turbines

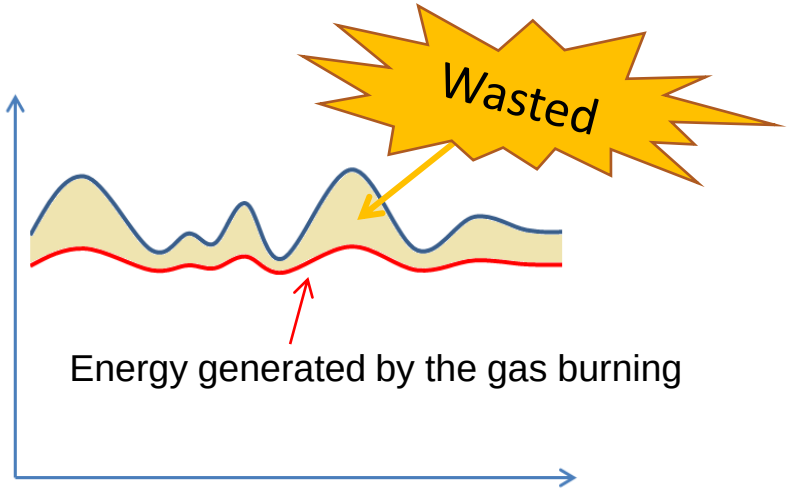
This is mainly for thermal power houses, IGCC(Integrated coal Gasification Combined Cycle), etc.
As you can see it in supplement 1 (next slide), one of the way to optimize energy is air-fuel ratio control. Air-fuel ratio control is very strict for some high grade gas turbines so that gas turbines can be sustainably used with maximum combustion efficiency.



Supplement 1

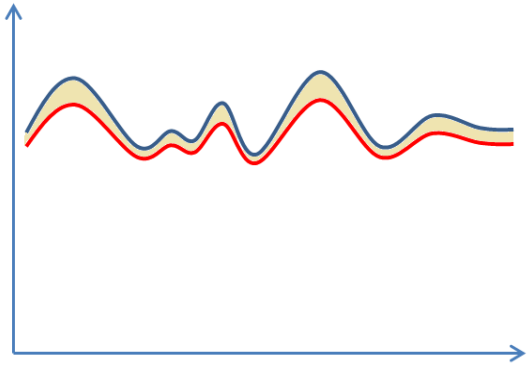
Method to optimize energy



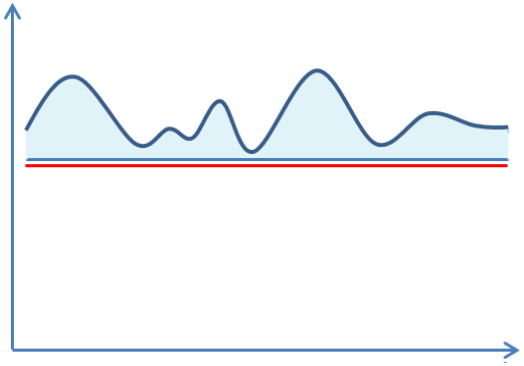


No control

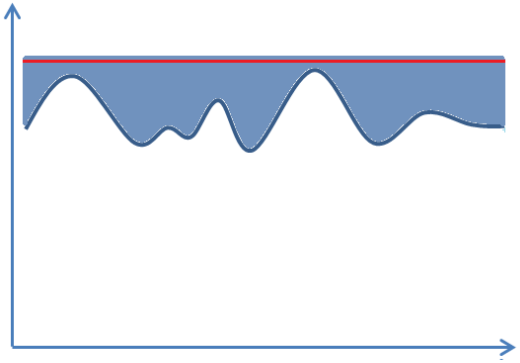
1. Air-fuel ratio control



2. Calorie adjustment by dilution with N2 or Air (low calorie gases)



3. Calorie adjustment by adding propane etc. (high calorie gases)



Application example 3

Recycle by-product gas from iron steel plant

By-product gases from iron steel plant

1. COG（Coke Oven Gas）

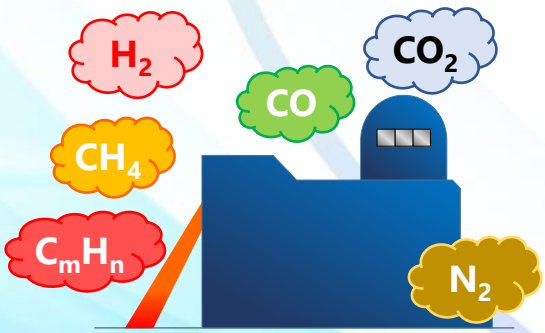
H_2 : 56vol%
CH_4 : 30vol%
C_mH_n : 3vol%
CO : 6vol%
CO_2 : 2.5vol%
N_2 : 2.5vol%

2. BFG（Blast Furnace Gas）

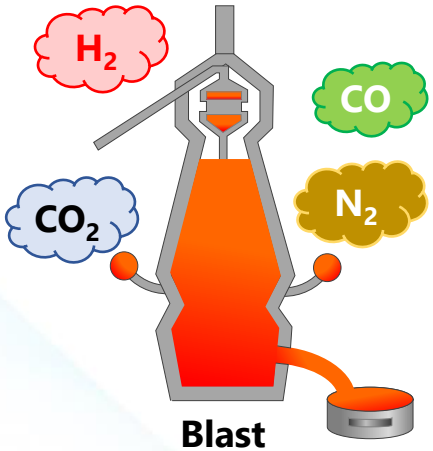
H_2 : 4vol%
CO : 22.5vol%
CO_2 : 22.5vol%
N_2 : 51vol%

3. LDG (Linz-Donawitz converter Gas)

H_2 : 1vol%
CO : 68vol%
CO_2 : 16vol%
N_2 : 15vol%

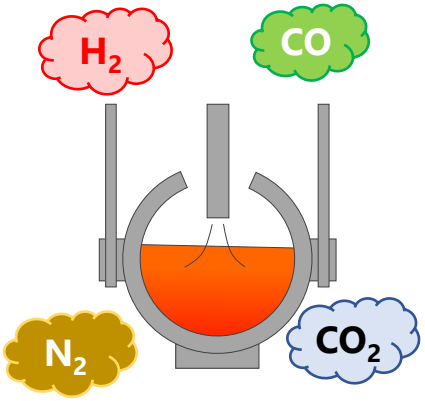


Coke Oven



Blast Furnace

Pig iron



Converter

COG

BFG

LDG

Byproduct Gases

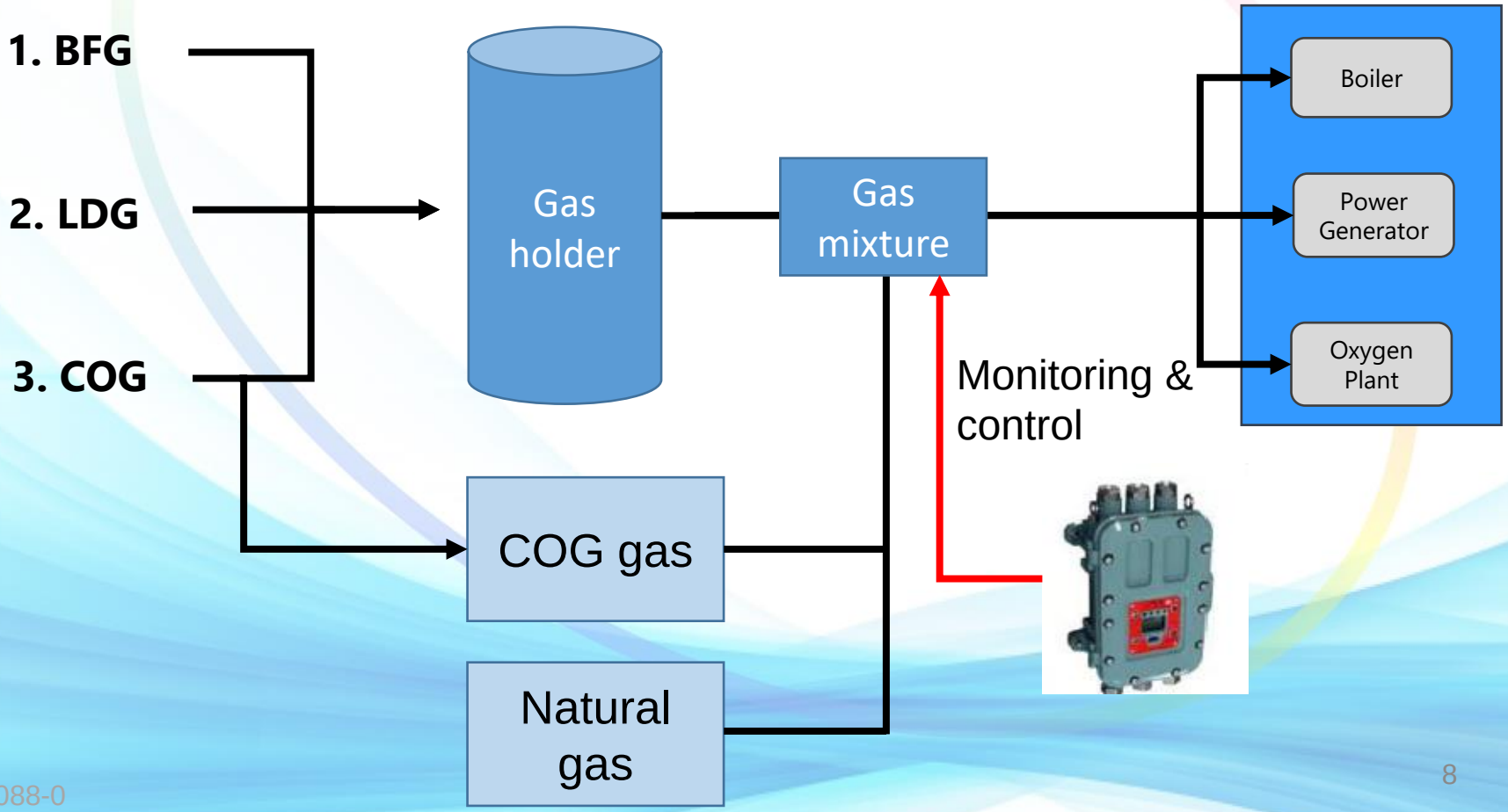
Energy Conversion

- Boiler
- Power Generator
- Oxygen Plant

Application example 3

Recycle by-product gas from iron steel plant

By-product gas from iron steel plant is recycled as a fuel gas, but the calorie is normally lower than natural gas. The gas calorie is adjusted by adding natural gas or COG (higher calorie than BFG & LDG), or natural gas is diluted by adding air to compatible with by-product gases.



Application example 4

Analyze gas composition & calorie of by-product gas from iron steel plant in real-time.

Please find the presentation No.3 OHC+SD-1RI+PLC, specialized for iron steel plant

Application example 5

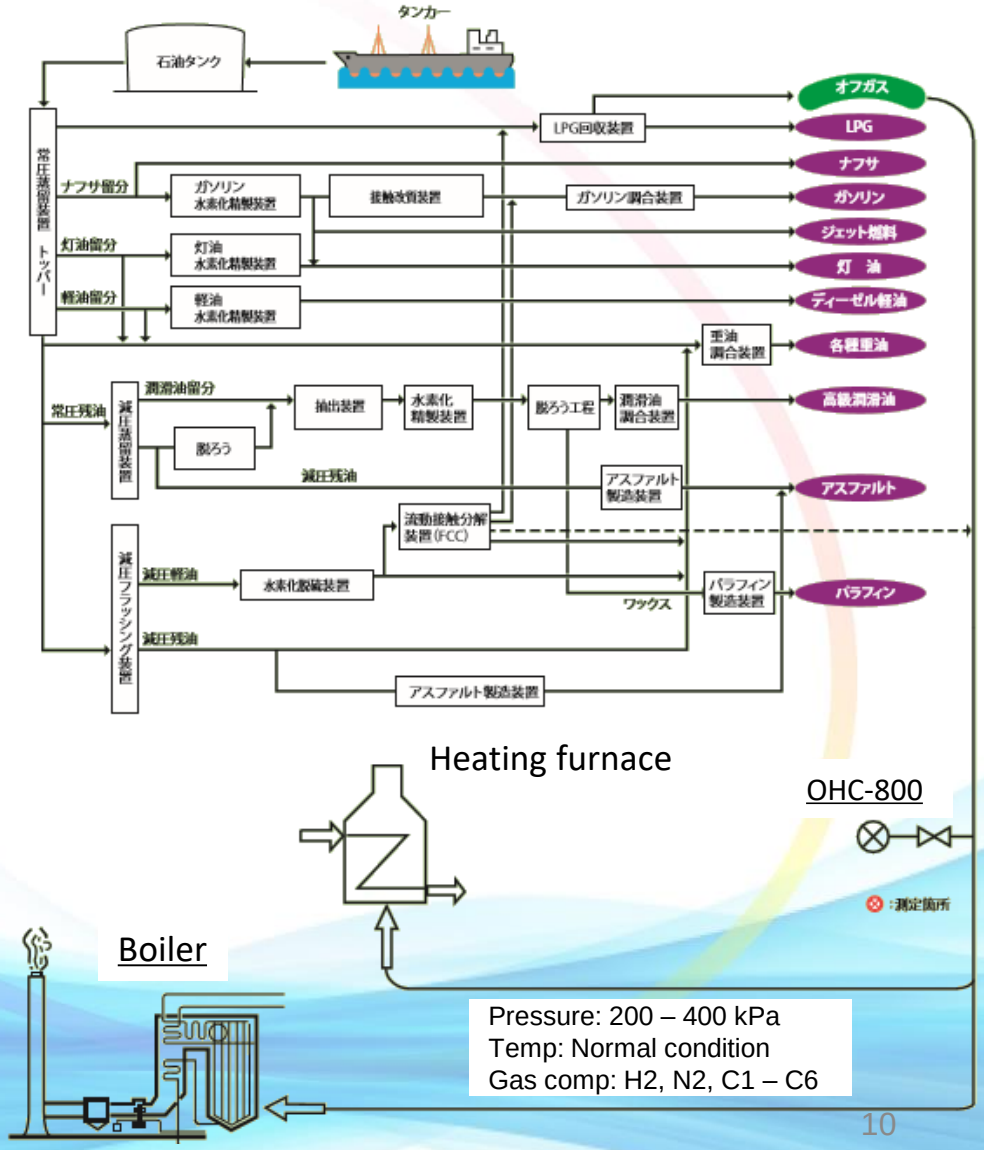
Recycle by-product gas from Refinery

We know that refinery recycles by-product gas and some refinery in Japan use OHC-800; however, we do not know the details, where/when/why it is used.

We guess, our customer use OHC-800 because it can accurately follow the sudden change of gas calorie and prevent accidental fire, otherwise the operation could be suddenly suspended.

OHC-800 is suitable to control & monitor the operation because it has high accuracy, continuous measurement, fast response and relatively reasonable price compared to the other analyzers.

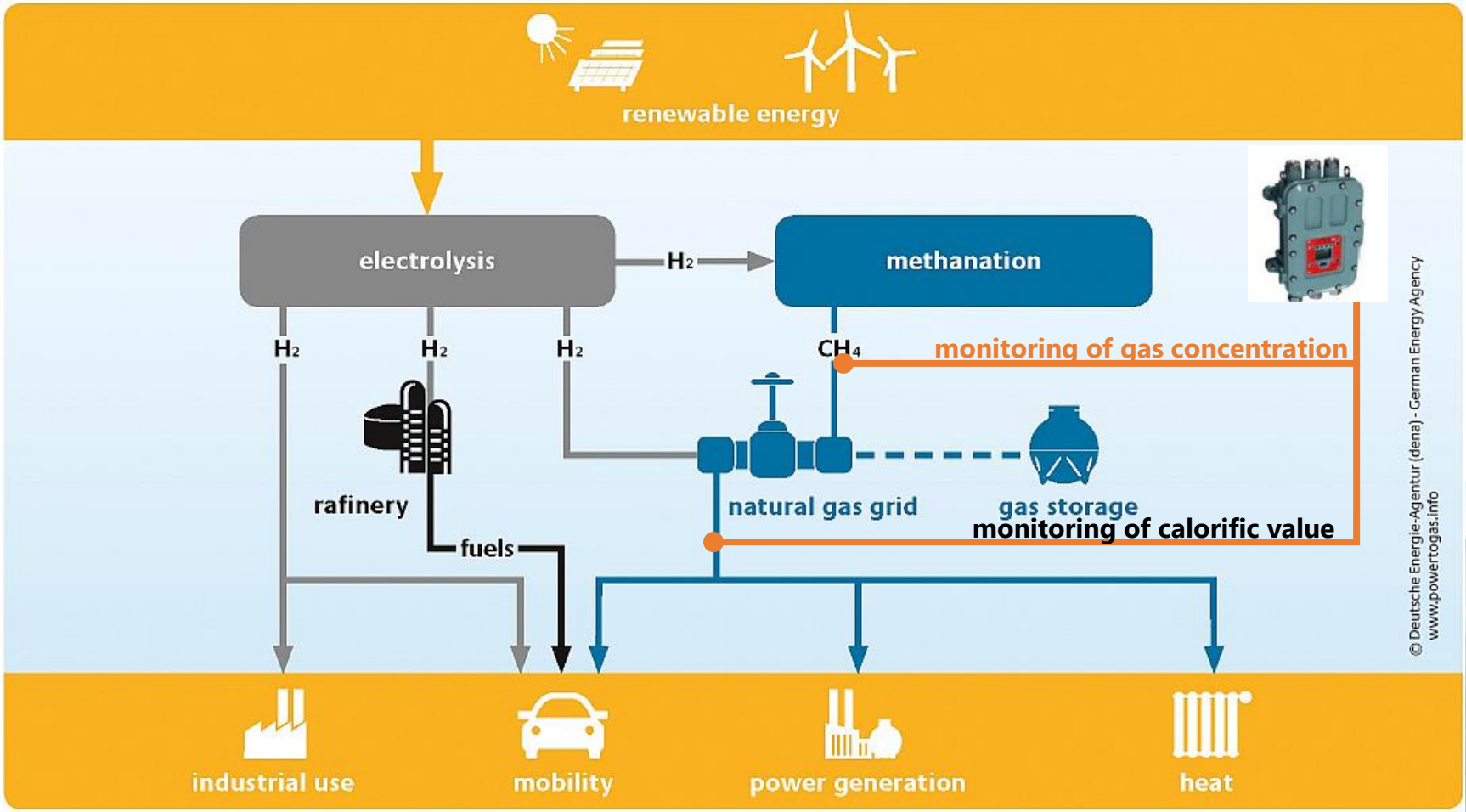
Also, the running and maintenance cost is low because no maintenance is required, the consumption gas is low and the sensor life is longer.



Application example 6

Power to Gas: H2 injection or Methanation

OHC-800 can accurately calculate calorific value even in hydrogen stream.
Methanation : Synthetic methane is generated by CO2+H2.
H2 injection : H2 generated by Electrolysis of water is injected to natural gas pipe line.
Please find the presentation No.4 Technical data for some applications



Application example 7

Calorie adjustment for glass production

Control combustion air/fuel ratio in response to changing gas supply quality to ensure consistent burner flame shape and temperature on glass production process.

We are not so sure where it is used; however, calorie meter is definitely used.

Application example 8

Evaluate methane number for gas engines

Methane number optimization is required in order to prevent knocking of gas engines for LNG vehicles and vessels. OHC-800 also can calculate it.

Please find the presentation No.4 Technical data for some applications

Application example 9

Optimize combustion for waste plant, crematory etc.

Combustion control is necessary to optimize the furnace operation for suitable combustion. Calorie control is the one of option.

Application example 10

Fiscal metering (Pricing)

LNG plant, Gas Transmission Networks and Gas Distribution Networks need to determine the price for gas dealing.

Each countries has each regulations for pricing

JIS: Japan
OIML: Europe
ISO15971: UK
ENARGAS: Argentine etc.

Gas chromatography is generally registered in the regulation.
It takes a lot of time to register OHC-800 to the regulation in your country; however, the market is the most biggest market for calorie meters.

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