

Global Solutions for Industrial Refrigeration with “Natural Refrigerants”



March 2nd 2012

mAYEKAWA ASEAN

Contents of this presentation

- Company Introduction
- Few Example of Global Warming
- MYCOM Heat Pump Application
 - NH₃ HEAT PUMP
 - CO₂ HEAT PUMP

Corporate Office of MAYEKAWA Japan



みんなで止めよう温暖化

チーム・マイナス6% www.team-6.jp

Products and Applications



1924
Piston
Compressor



1964
Screw
Compressor



1978
4°K Super Low Temp.
Particle Accelerator
(Helium)



1981
Nuclear
Fusion
(Helium)



1984
MagLev
Train
(Helium)



1989
Rocket Fuel
(Hydrogen)



1993
Super GE
(Super Conductive
Electric Generator)



1958
Multi-Cylinder
Piston
Compressor



Ethylene Plant



LNG/LPG Tanker



Organic(EOEG)



Inorganic (NH3)



Pharmaceutical

1924

1960

1970

1980

1985

1990

● Company founded in 1924.

● Over 70,000 Screw and Piston compressors running in more than 100 countries.

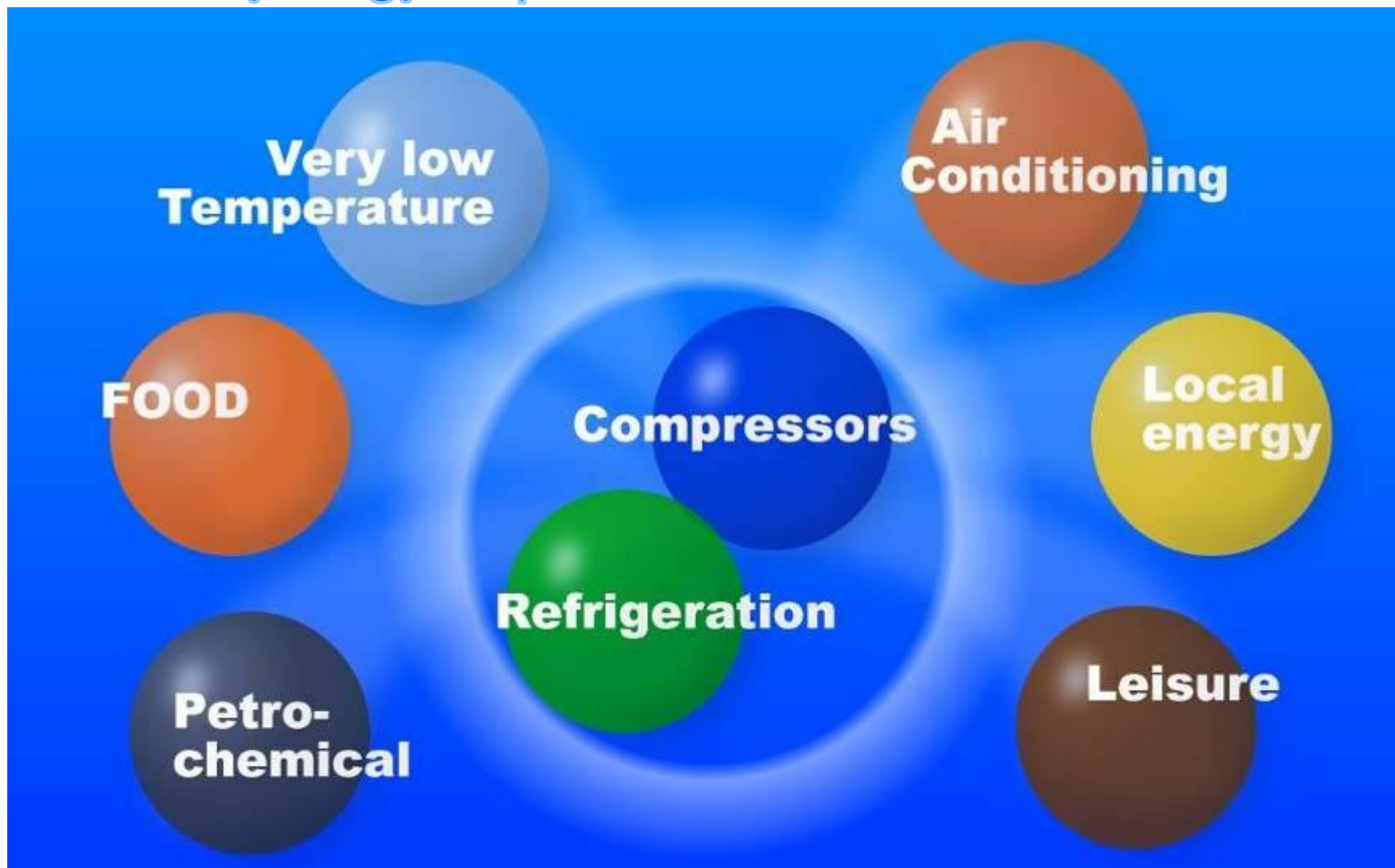


みんなで止めよう温暖化

チーム・マイナス6% www.team-6.jp

MAYEKAWA

Synergy Expansion of Business Fields



Around the world



Main operations

Mayekawa is doing business globally, having 57 domestic offices and 3 plants, and 90 overseas offices including 8 plants.

Corporate offices

3-14-15 Botan, Koto-ku,
Tokyo 135-8482, Japan
Established in 1924
Capital 1,000,000,000 yen
President Yoshiro Tanaka

Main plant: Moriya, Higashi-Hiroshima, Saku
Overseas plant: Mexico, Brazil, USA, Belgium, South Korea, India, Turkey

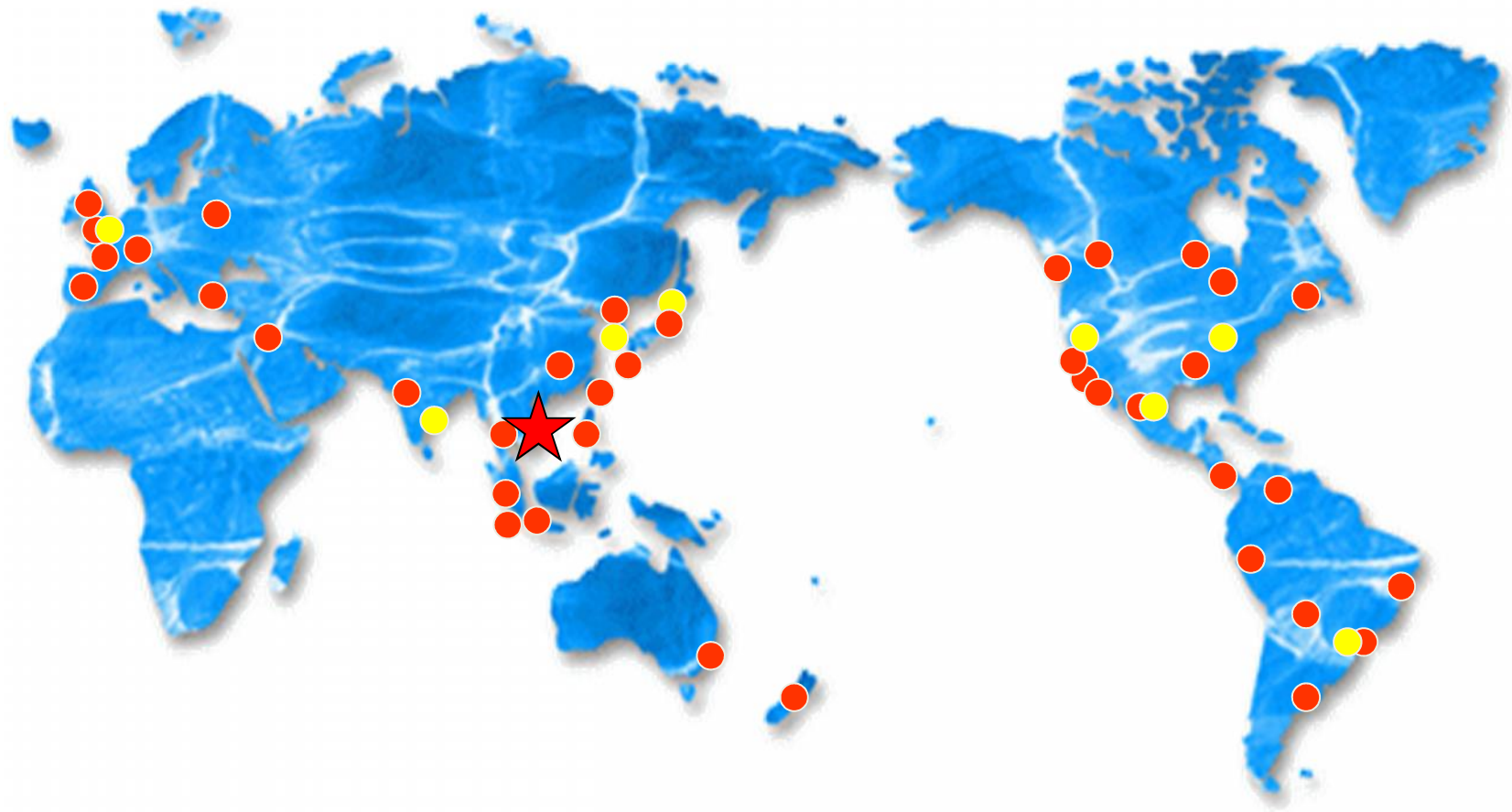


Brazil plant



Moriya plant

MYCOM International Branches



Worldwide:

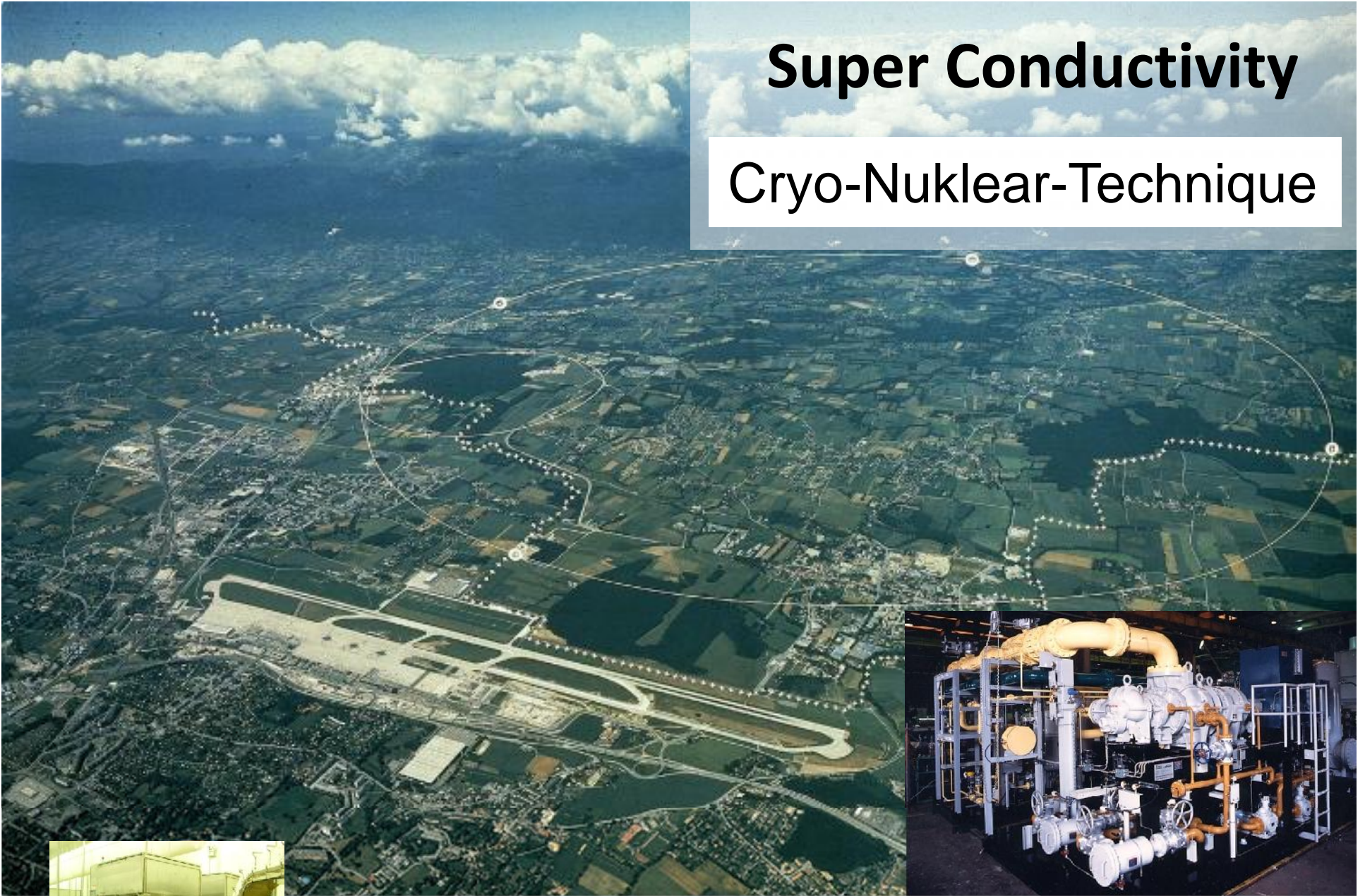
- 33 countries
- 8 production plants
- 119 offices

ASEAN:

- 11 offices (6 countries)
- 7 offices

Super Conductivity

Cryo-Nuklear-Technique



MYCOM

CERN, Genf, CH

FRONT ZU

Schlagzeilen
Blickpunkt
Kommentare
Foren

REGIONAL

Furtaler
Glattaler
Rümlinger

RESSORTS

Sport
Mixer
Agenda

UMFRAGEN

Aktuelle
Bisherige

LINKS

ZU-Links
Leserlinks

MARKTPLATZ

BranchenBox
Online Inserate
Fotomanager

«ZÜRCHER UNTERLÄNDER» SCHLAGZEILEN VOM DONNERSTAG, 15. DEZEMBER 2005

Donnerstag, 15. Dezember 2005

**Niederhasli: Warmes Wasser im GC-Campus durch moderne Technologie
CO₂-Wärmepumpe installiert**

Im GC-Campus in Niederhasli liefert eine der ersten CO₂-Wärmepumpen in der Schweiz pro Tag 4000 Liter Warmwasser. Die Maschine stammt aus Japan.

Inga Struve



EWZ-Projektleiter Georg Dubacher (von links), Masao Maekawa, Vorsitzender der japanischen Firma Mycom, und EWZ-Direktor Conrad Ammann erläutern die CO₂-Wärmepumpe. (David Baer)

GOOG

wi
wi

WEIT

Nieder
Wasser
durch i

Bülach
Zwisch
Arbeits
Planun

Bülach
Compu
Primar

Steinn
Gemüs
werder
beheizt

Obere
Ferien
Embra



MYCOM GC Campus, Zürich

Energy

Energy supply Zürich

CO₂- Heat pump

Mycom & EWZ





MYCOM Air Conditioning

Petrochemical



MYCOM Production of liquid hydrogen



MYCOM Winter Olympic Games Nagano, 1998

80% of ARAL SEA disappeared



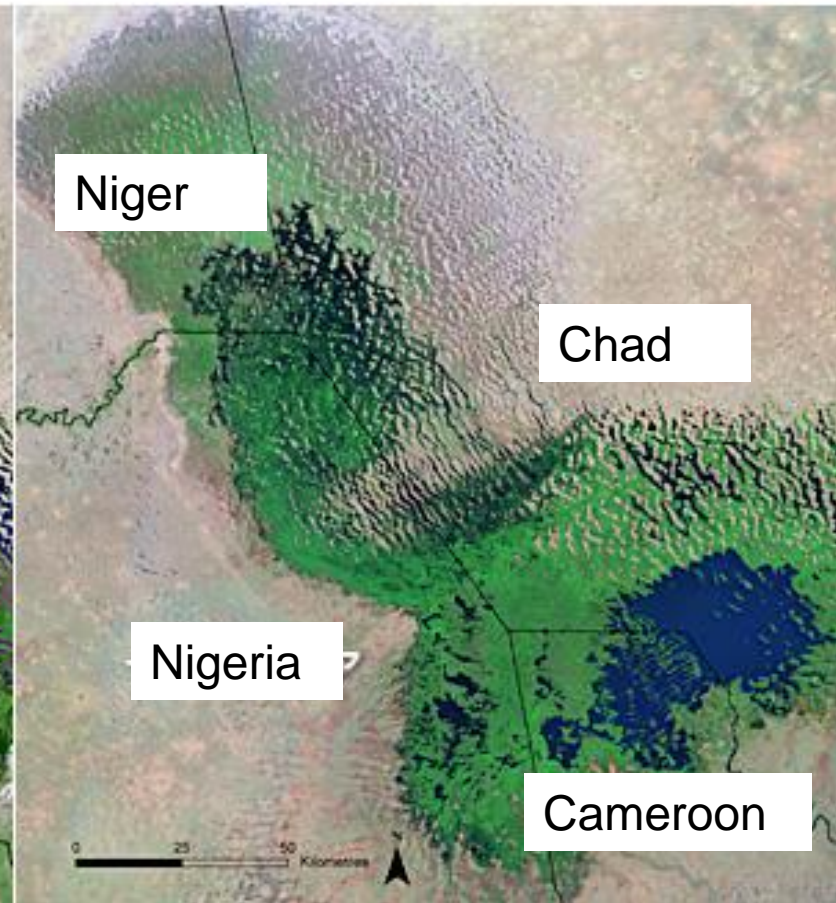
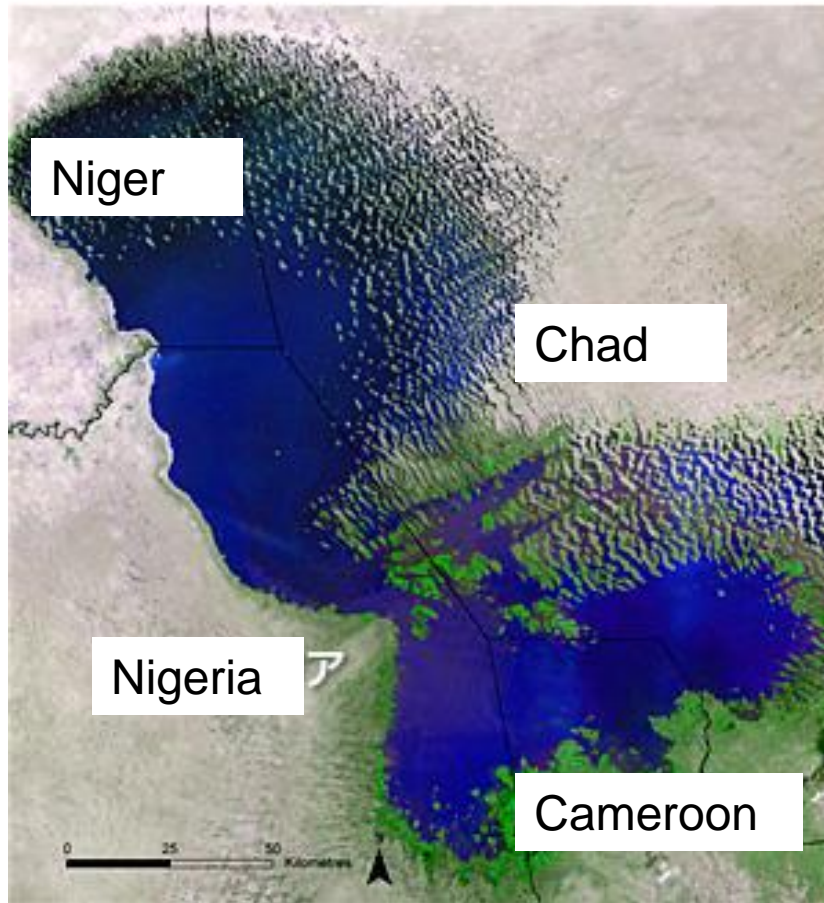
July - September, 1989



October 5, 2008

90% of Lake Chad Disappeared

チャド湖 1972年/2007年



Glacier Kilimanjaro will disappear in 2022



270 billion tons of ice disappearing
every year in Greenland



20-20-20 Rules

R744.com - EU Parliament approves weak climate & car emissions deal

1/3



"R744.com is our indispensable tool to know the world, and to get the world to know us."

Nikola Kallio, President, Nihon Ironic

become a partner

bringing you the R744 news of tomorrow

news

> product

> industry

> events

> policy

partners

events

products

knowledge

forums

jobs

NEWS > POLICY NEWS

<< PREVIOUS | NEXT >>

EU Parliament approves weak climate & car emissions deal

R744.com - 2009-12-18

Rate: ☆☆☆☆ Results: ★★★★★

0 Comments



[-] Text [+]

European lawmakers have given the final thumbs up to a set of measures to fight climate change in the European Union. Although dubbed as "the most ambitious environmental package ever", the deal includes significant concessions to industry.

On Wednesday 17 December, the European Parliament adopted the so-called "20-20-20" climate change package aimed at reducing greenhouse gas emissions by 20% by 2020 from 1990 levels, achieving 20% energy savings union-wide and raise the share of renewable energies from currently seven to 20% by 2020.

The package comprises legislation in up to six areas ranging from renewable energy, emissions trading, carbon dioxide capture and storage, efforts by Member States, overall reduction of CO₂ emissions, and the reduction of car emissions. It went through with a large majority, with between 559 and 370 parliamentarians voting in favour out of the total of 755.

Lifting the deal heralds the end of the long, the approval came five days after EU heads of state worked out a compromise deal on the package at a summit in Brussels. Within the overall targets, each EU nation and industry sector has its own obligations. Last minute concessions to some Member States' heavy industries and automotive manufacturers has secured the overwhelming approval urgently needed to speak with one voice at next year's international climate negotiations.

CO₂ cars reductions - three more years to comply

The package also prescribed emission limits for passenger cars sold in the EU, which has probably been the most hotly debated issue over the last months at the Parliament. Contrary to the initial European Commission proposal of limiting CO₂ emissions to 120 g/km by 2012, a compromise negotiated two weeks ago now gives carmakers three more years to comply. More specifically, the car deal contains the following elements:

- Volume Phase-in:** Under the phase-in, 65% of Europe's new-car fleet must meet the 120 g/km target in 2012, 75% in 2013, 80% in 2014, and 95% from 2015 on. A joint study by A.T. Kearney and Credit Suisse suggests that auto makers must cut CO₂ emissions by almost 3% annually over the next six years, thereby nearly doubling the reduction rate seen over the past decade.
- Lower penalties:** The car deal comes as a major concession to Europe's automotive industry, currently hit by weak sales and the global financial crisis. The planned penalties of €95 per gram of excess CO₂ emissions were lowered to €65-25 per gram for the first four grams of exceedance.



Les pompes a chaleur sont considerees comme energie geothermique renouvelable

<http://www.r744.com/article/view.php?id=852>

2009/12/18

R744.com - EU Parliament approves weak climate & car emissions deal

2/3

- Fractional discount:** Carmakers can make so-called "boni-transitions" and for up to 7 g/km of emissions discount. Ultimately the system for recognizing eco-innovations will be replaced by a new revised regulatory test procedure that reflects real world emissions. A review of the test procedure is due by 2014.

- Ultra-low carbon vehicles:** The deal contains a compromise for very low emitting vehicles. Each registered vehicle that emits below 50 grams per kilometre of CO₂ will obtain "supercredits" to be treated as more than one vehicle for the purpose of calculating a manufacturer's average emissions level.

- Long term objectives:** By 2020, new cars must meet a 95 g/km of CO₂ emissions. This is a slight increase on 2013.

Renewable energies - step forward for heat pumps

The new renewable directive seeks to ensure that by 2020 energy produced from hydro power, solar, wind, biomass or geothermal sources makes up at least 20% of the EU's total energy consumption. To achieve this target, the new directive will lay down mandatory national targets to be achieved by the Member States through promoting the use of renewable energy in the electricity, heating and cooling, and transport sectors.

The legislation also takes into account high efficiency geo-thermal, geothermal and hydro-thermal heat pumps. Hence, only energy delivered by heat pumps whose output significantly exceeds the primary energy input is considered as renewable energy in the directive. All Member States are asked to promote heat pumps which fulfil the minimum requirements of eco-labeling set down in Decision 2007/742/EC.

EU package to serve as global model

Already today the deal is being touted as a crucial prelude to next year's international climate change conference in Copenhagen, where leaders hope to reach an international agreement for a Post-Kyoto period. With the climate change package approved, the European Union is hoping to lead the way towards a new alliance including other big polluters, such as China, India and the United States. Opel hopes rest on the U.S. where Europe is looking forward to cooperate more closely on tackling climate change with U.S. president-elect Barack Obama than president George W. Bush. If other nations join their climate change deal, EU nations are prepared to raise their CO₂ cuts to 30% instead of the 20% overall target now.

MORE INFORMATION

- Approved Texts Climate Change Package, 17 Dec 2009
- Overview of approved measures - European Parliament
- Press Release, European Parliament, 17 Dec 2009

RELATED KEYWORDS

EU Kyoto Protocol climate change heat pumps

COMMENTS

First Name

Last Name

Email

(If you wish to receive notifications of new comments, please enter your email)

Post a comment: (Please do not add any links)

<http://www.r744.com/article/view.php?id=852>

2009/12/18



The Voice of the European
Cold Storage Industry

ECSLA Newsletter

Edition n°2

FEBRUARY 2009

Issues covered:

- ECSLA [eurammon](#) Position on the Review of the ODS Regulation
- HCFC phase-out. Counting down to 2010. Are you Prepared?
- Natural Refrigerants, interview with Monika Witt
- [eurammon](#) Awards Thesis on Natural Refrigerants
- Antitrust Officials Raid Compressor Makers
- Road charging: Commission final warning to 4 Countries
- Roadmap for Climate Change action - Europe must lead the way
- B2B Web Platform for Hydrocarbons Goes Live!
- Website DuPont facilitates replacement of HCFCs
- Climate Change and Food Crisis
- Food and Drink Sector critical of Green Road Charging
- Sainsbury's to Use 'Green' Trucks
- Labeling and Traceability for Foodstuffs of Animal Origin
- Unilever faces Removal from Delhaize shelves
- Scares Prompt Tighter Controls on Food
- Iceland could join EU by 2011
- Events Listing
- ECSLA Newsletter Subscription
- Join ECSLA!

Dear Readers,

Environment ministers from the EU 27 will meet in March to fine-tune the EU's position ahead of international climate negotiations for the period after 2012.

But views differ as to how the world's richest countries should contribute, with member states at odds over criteria such as GDP and population size.

The EU has already committed to a 20% reduction in its greenhouse gas emissions by 2020 compared to 1990 levels, regardless of the outcome of international negotiations.

It announced its willingness to sign up to a 30% reduction target, should other developed countries commit to comparable emission cuts, provided that "economically more advanced developing countries," like China and India, make "appropriate contributions" too.

In previous discussions, EU heads of state and government agreed that Europe, the US, Japan and other industrialised nations should jointly reduce their emissions by 30% by 2020 compared with 1990 levels.

The 30% figure is consistent with findings by the Intergovernmental Panel on Climate Change (IPCC), which advised developed countries to reduce their emissions by 25-40% by 2020 and 80-95% by 2050 to keep global temperature rises below 2°C. But how to divide this overall target is still the subject of negotiation at UN level and is also set to divide EU member states.

A final decision on the Union's position is expected to be taken by EU heads of state and government at a summit on 19-20 March in Brussels. It will then be taken to the UN global climate conference in Copenhagen in December 2009.

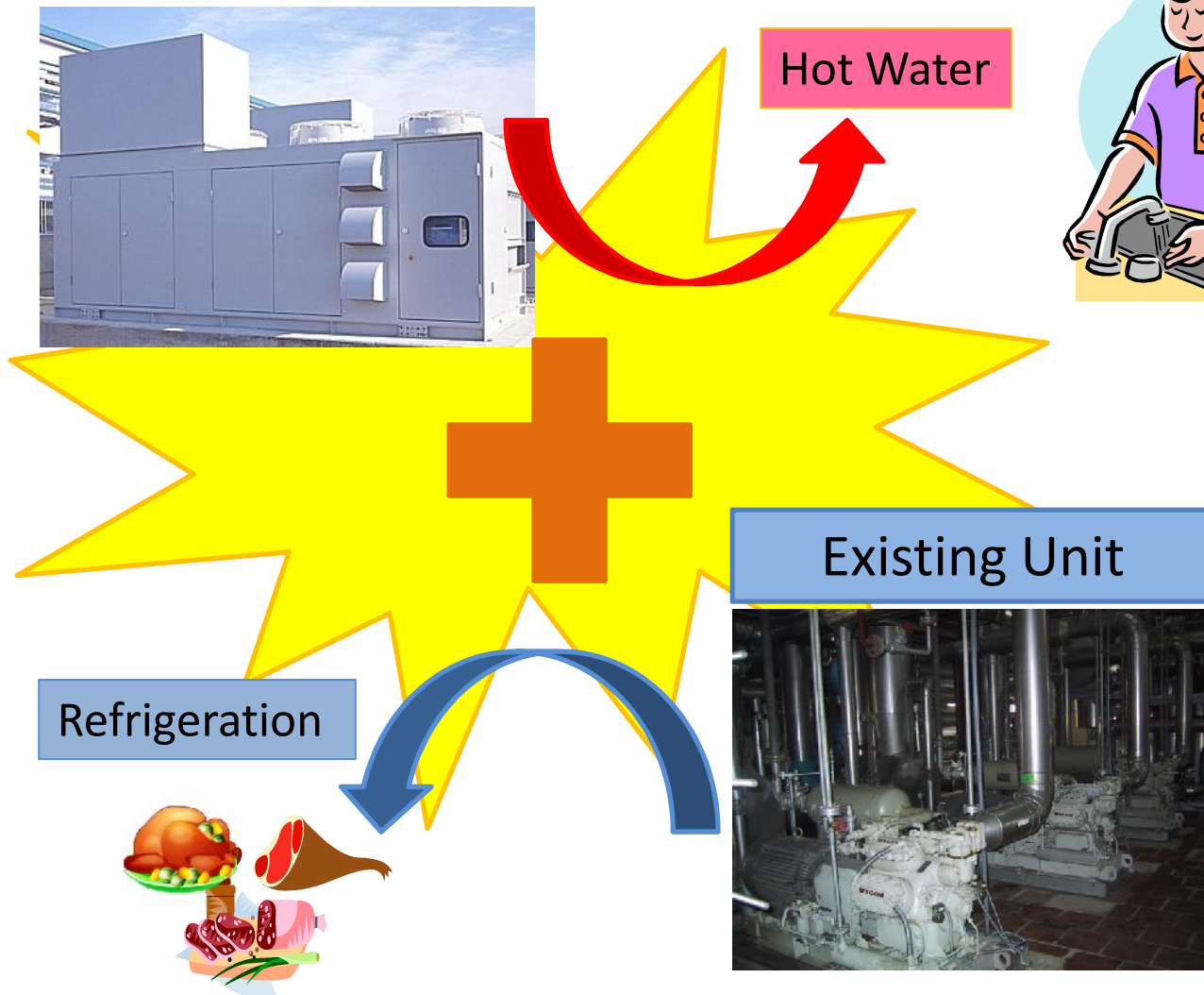
Enjoy your reading!

Christianna PAPAHAHAROU
Secretary General

IPCC says "We need reduce CO2 emission 25-40% by 2020 and 80-95% by 2050 in order to keep global temperature rises below 2°C.

Energy Saving: Heat Pump Application

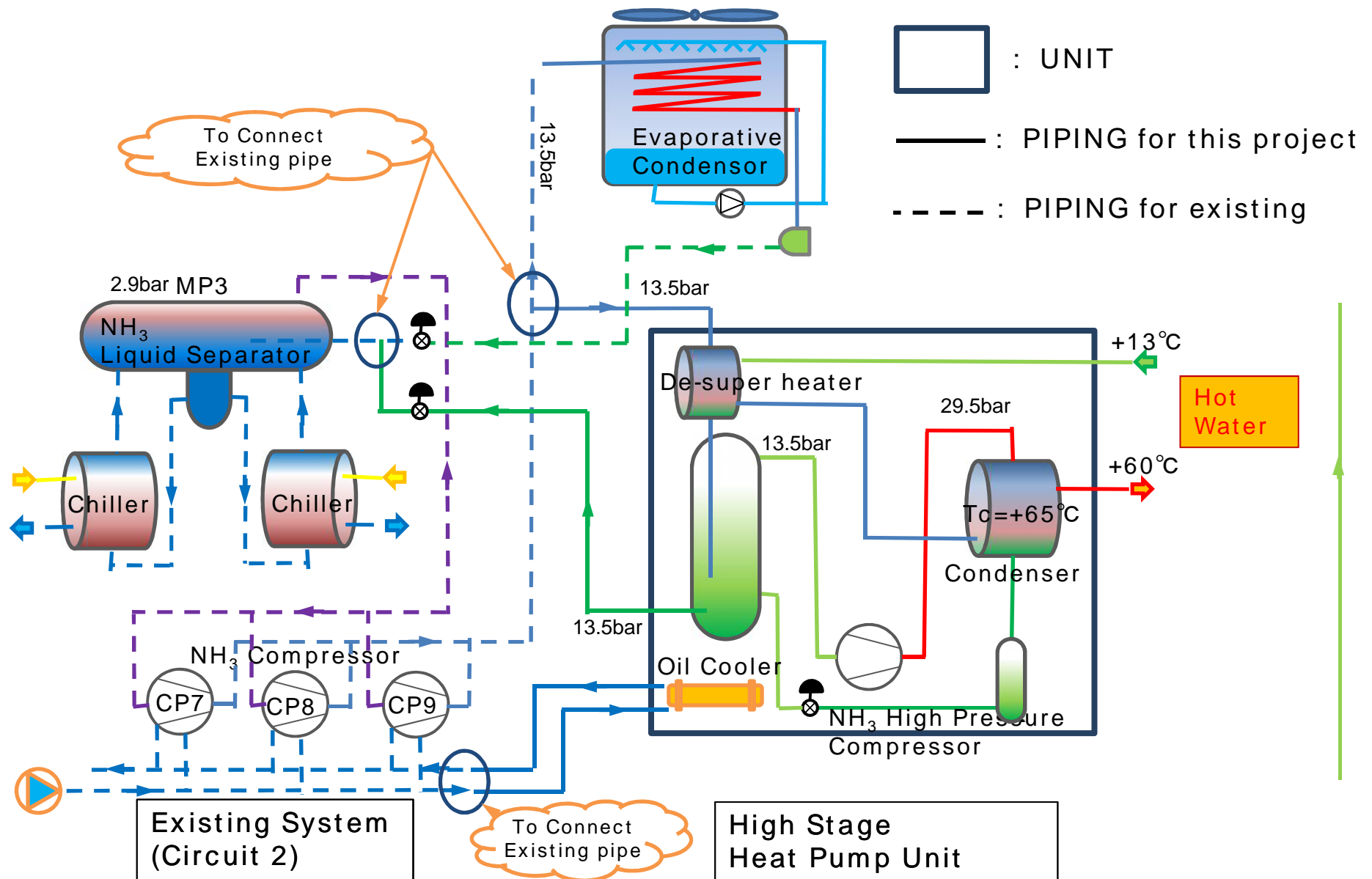
Over Compression Unit



Features

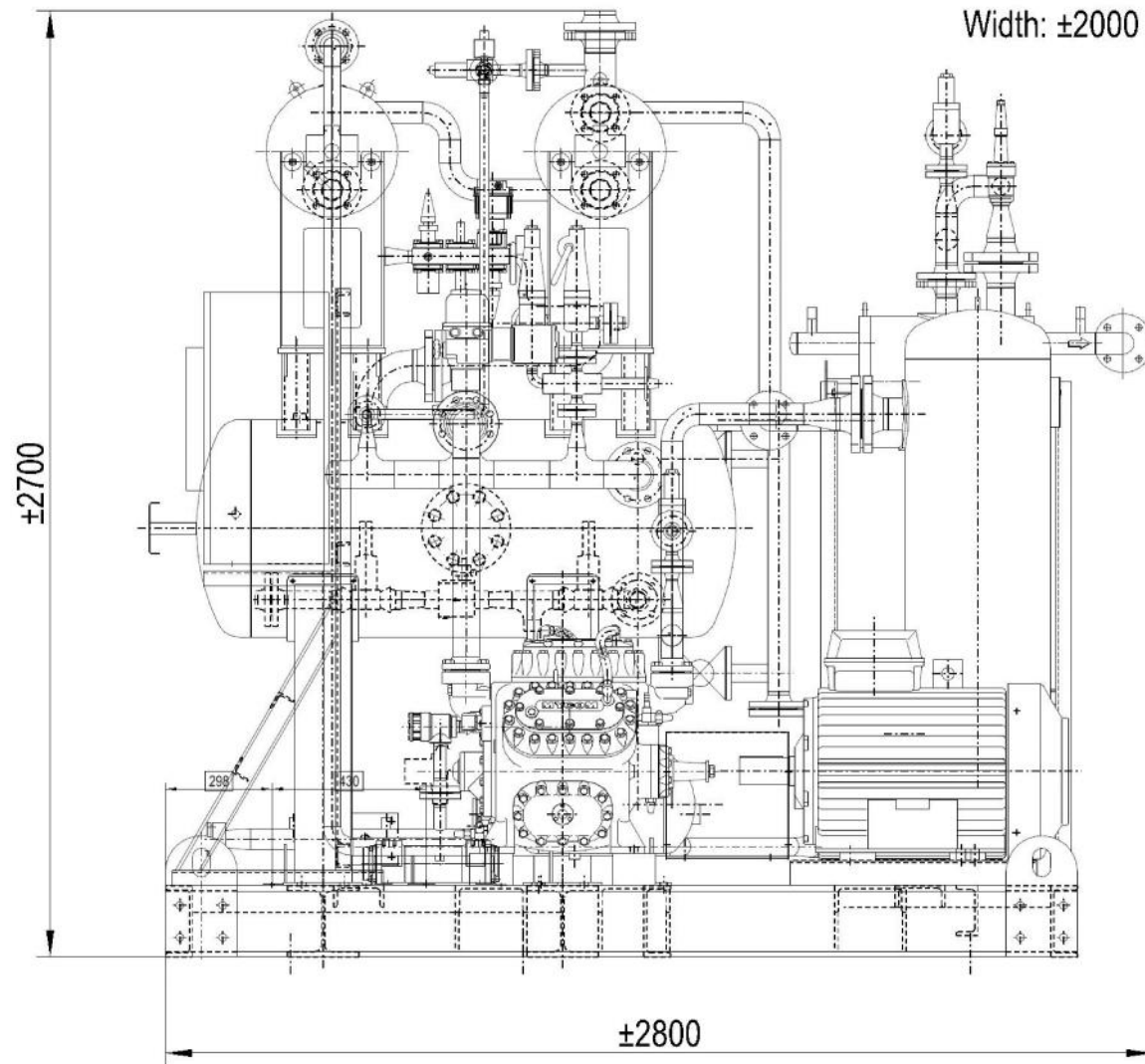
- 1) Less initial investment
- 2) High Energy Saving
- 3) Short ROI
- 4) Reduction of CO2
- 5) Utilization of Renewable Energy

Flow Diagram



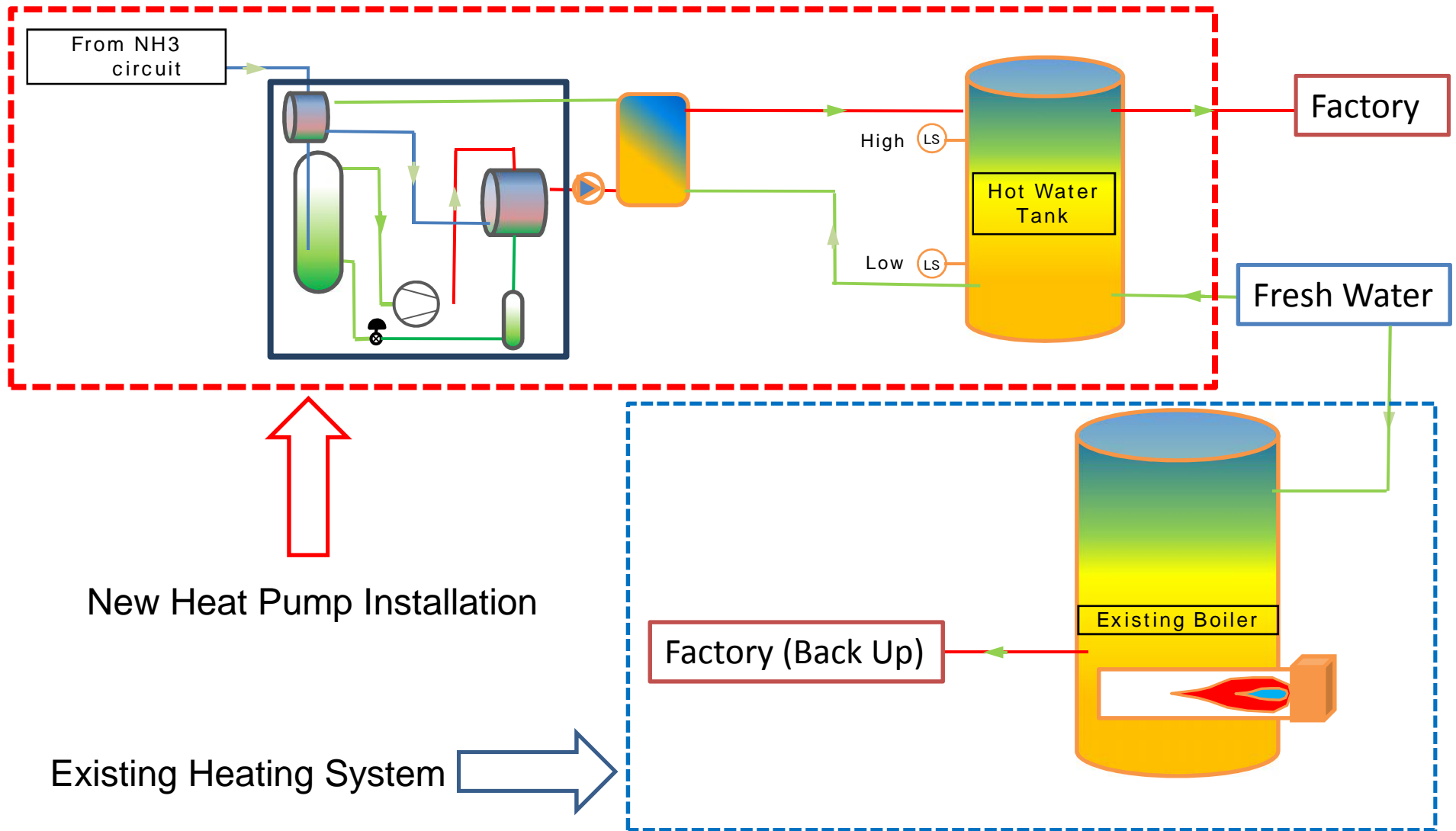


REFERENCE DRAWINGS



65 °C HOT WATER MAKING

Heat Pump Application with tank



High stage heat pump unit (Food production in France) **MYCOM**

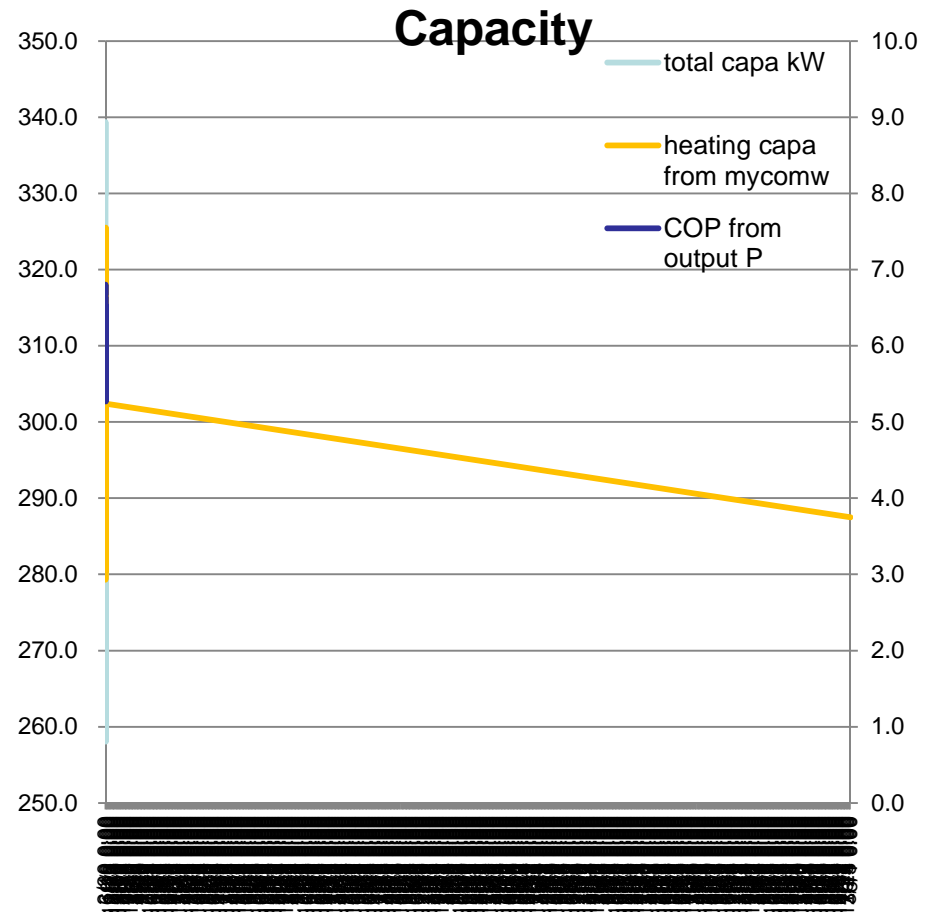
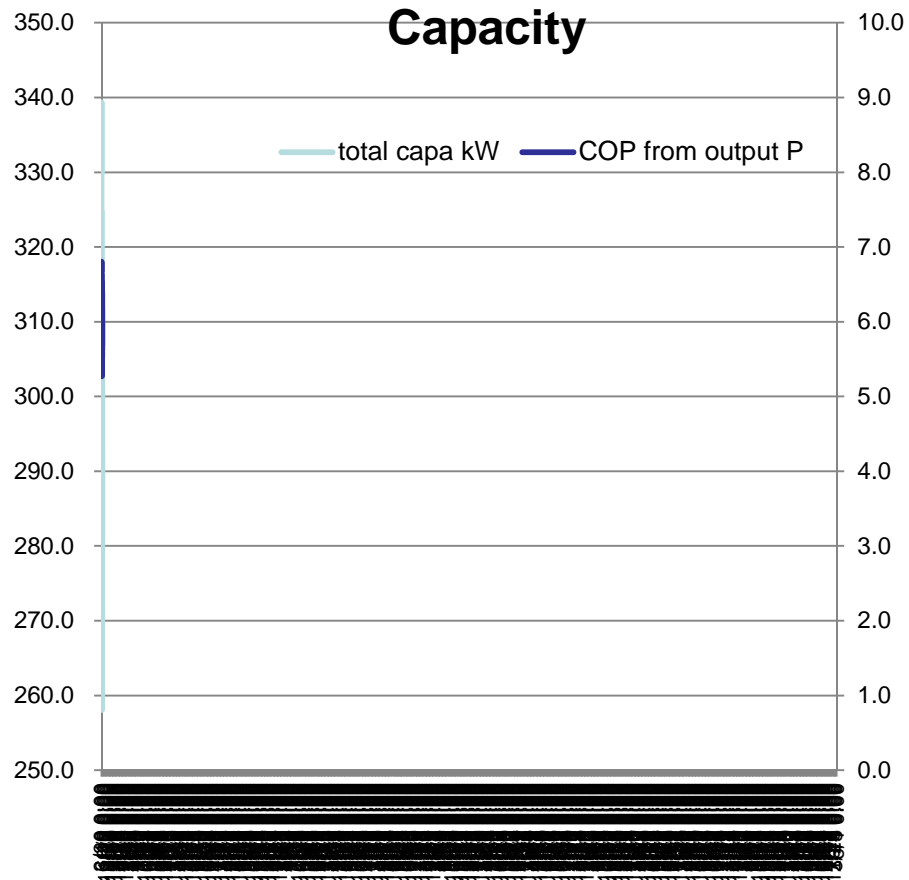


Thermal stratification tank

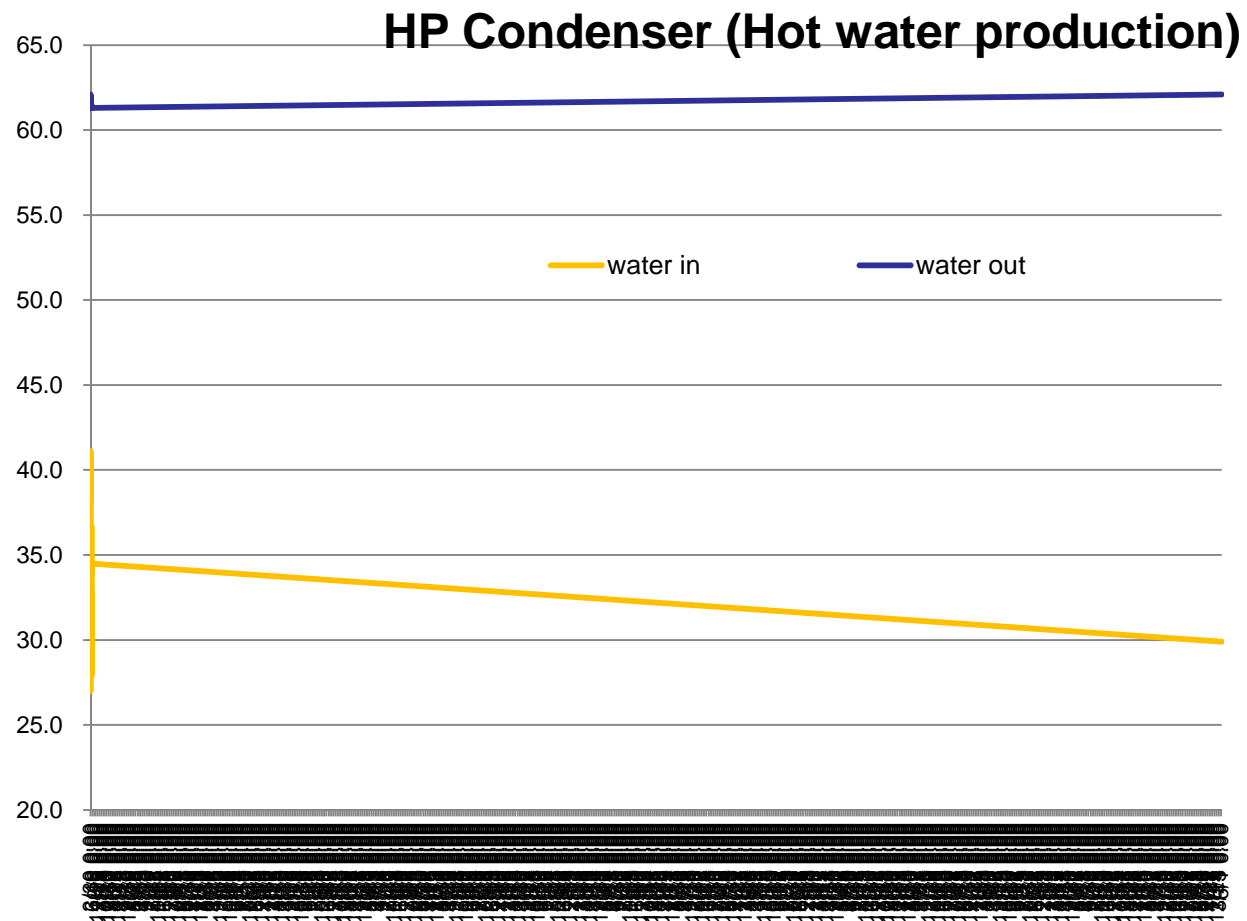


| COSTS | | STEAM | HP SUMMER | HP WINTER |
|---|--------|------------------------|------------------------|-------------------------|
| Heating capacity | kW/day | 5581 | 5581 | 5581 |
| Steam load (latent heat 0.6395kW/kg) | Kg/day | 8727 | | |
| Heating capacity/hr | kW | | 406 | 305 |
| Running time/day | hr | | 13.7 | 18.3 |
| Operating days | days | 300 | 115 | 250 |
| Yearly heating capacity | mWh | 1.674 | 640 | 1.396 |
| Energy per year | | 2.618 (ton) (steam) | 65.698 (kW, 41.7kW/hr) | 191.235 (kW, 41.8kW/hr) |
| Energy cost | € | 91.342 (34.89€/ton) | 4.599 (0.07 €/kWh) | 13.386 (0.07 €/kWh) |
| Installation cost (excl.watersystem) | € | | | 186.000 |
| Yearly running cost saving | € | | | 73.357 |
| Payback time | years | | | Approx.2.6 |

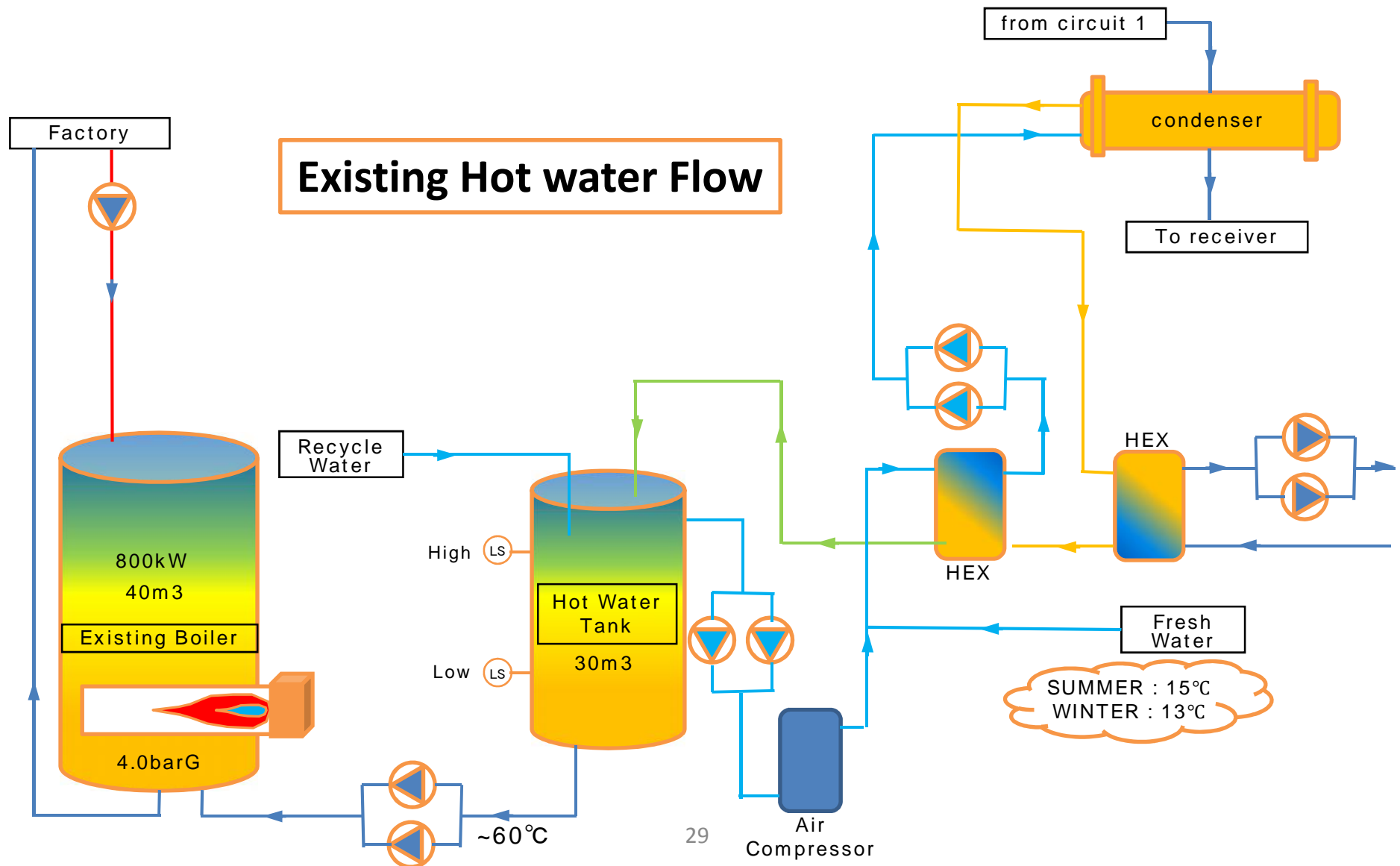
Operation Data 1



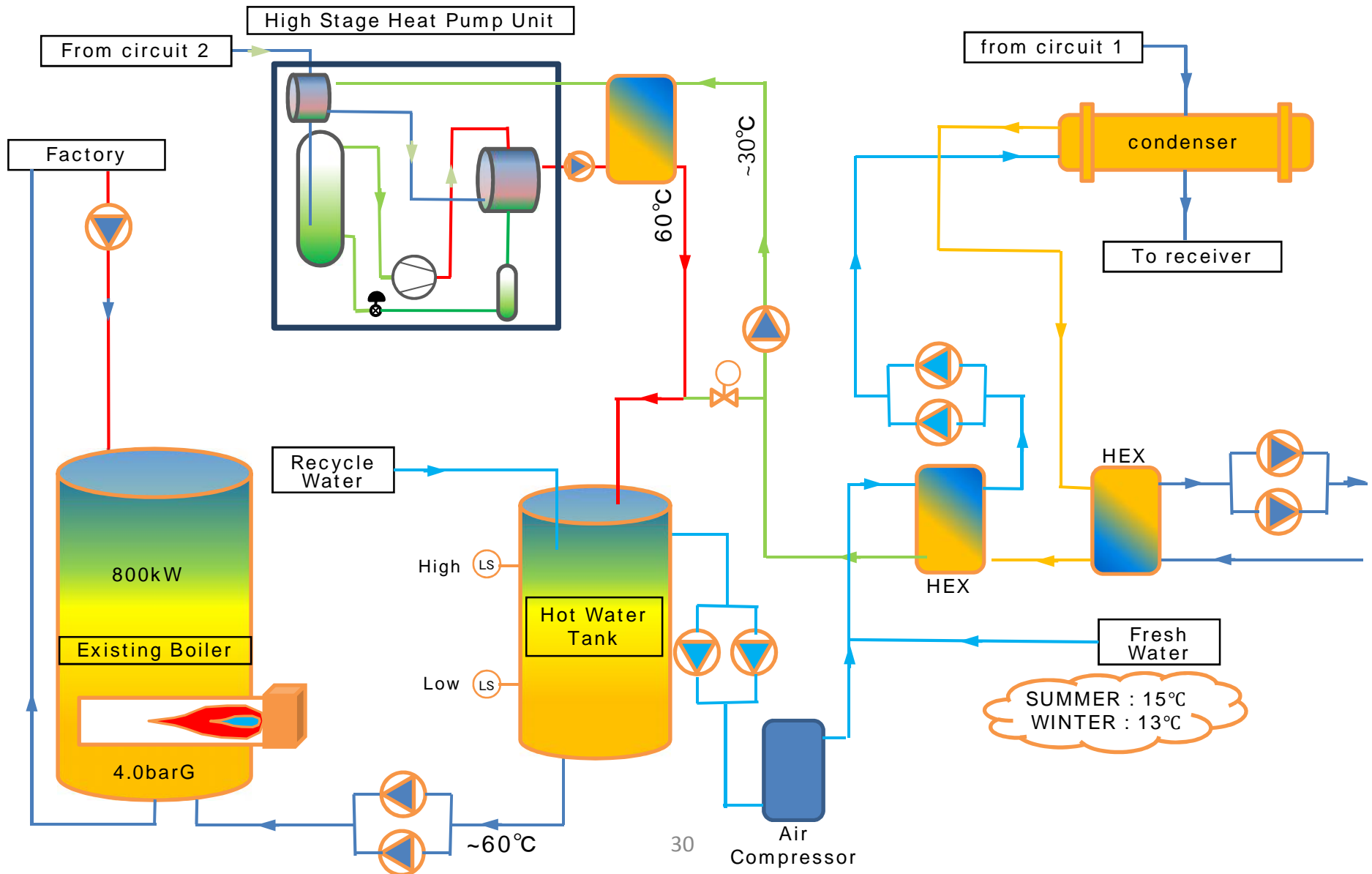
Operation Data 2



Heat Pump Application without additional new Tank



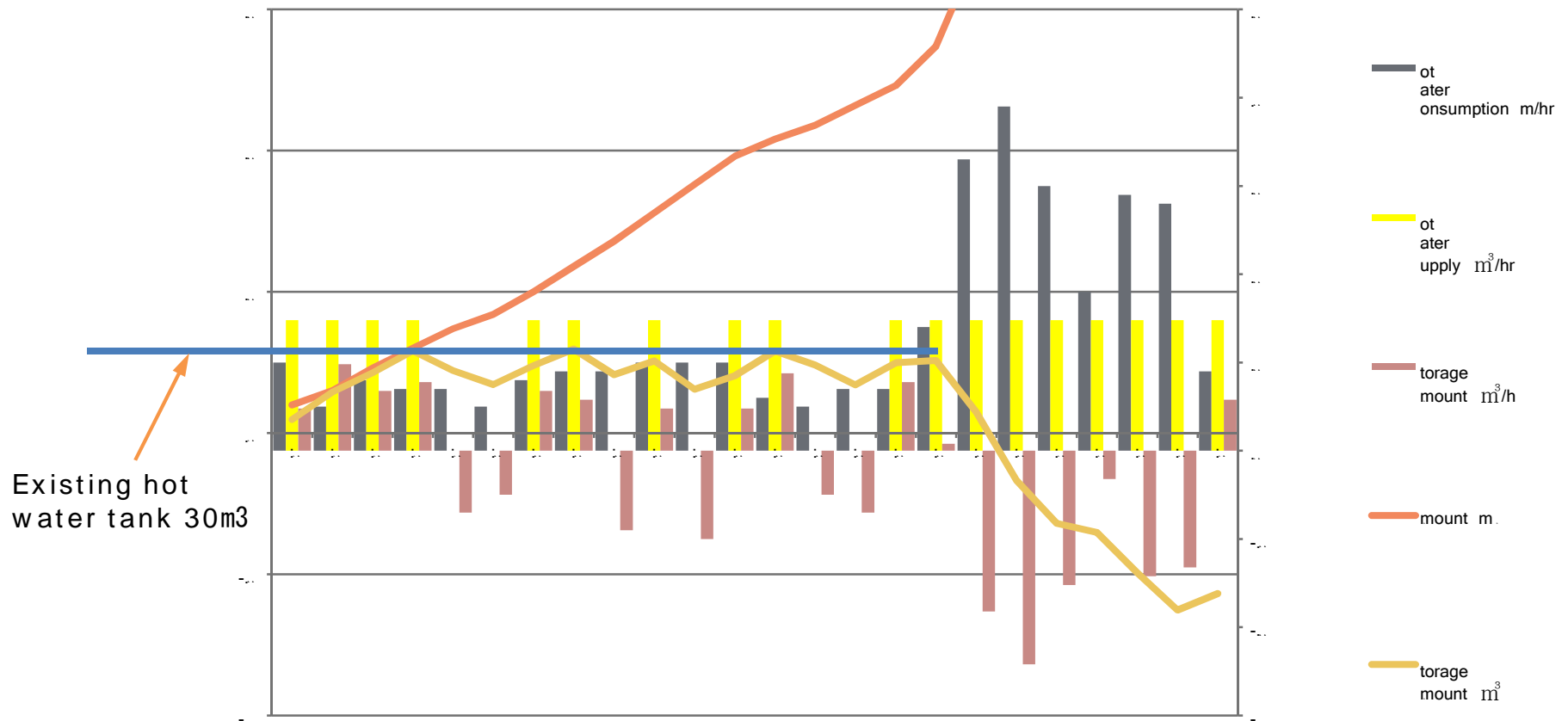
Heat Pump + Existing heating line



SPECIFICATION OF HEAT PUMP UNIT

| Subject | Spec | Remark |
|---|-----------------------|------------------------------|
| Heating Capacity | 515kW | Motor BkW: 78.8kw |
| Inlet/Outlet Hot Water Temp | 32/62 degC | |
| Tc/Te | 27/67 degC | |
| Flow Rate of Hot Water | 14.6m ³ /h | |
| Motor Power | 90kW | With Frequency Controller |
| Motor Speed | 900~1600rpm | |
| Required Flow Rate of NH3 at 1 st stage | Approx. 1200kg/hr | NH3 Charege:130kg |
| Dimension (reference) | W2000 × L2800 × H2700 | |
| Weight (reference) | 3500kg | |

CONSUMPTION AND MAKING AMOUNT OF HOT WATER



- Yellow line is amount of making hot water.
- * Total amount is 266.4 m³/day

MERIT OF THIS SYSTEM

Gas Boiler

| | | |
|--------------------------|---------------------|-----------|
| Hot water Consumption | m ³ /day | 266.4 |
| Inlet water temperature | °C | 32 |
| Outlet water temperature | °C | 62 |
| Heat load | kcal/day | 8,081,408 |
| effeciency of boiler | — | 0.85 |
| Heating Capacity | kcal/day | 9,507,539 |
| | kWh/day | 11,055 |
| Unit Price | €/kWh | 0.035 |
| Comsumption(year) | ton/year | 3,316,500 |
| Running cost (day) | €/day | 386.9 |
| Operating days | day/year | 300 |
| Running cost(year) | €/year | 116,070 |

Over Compression Heat Pump

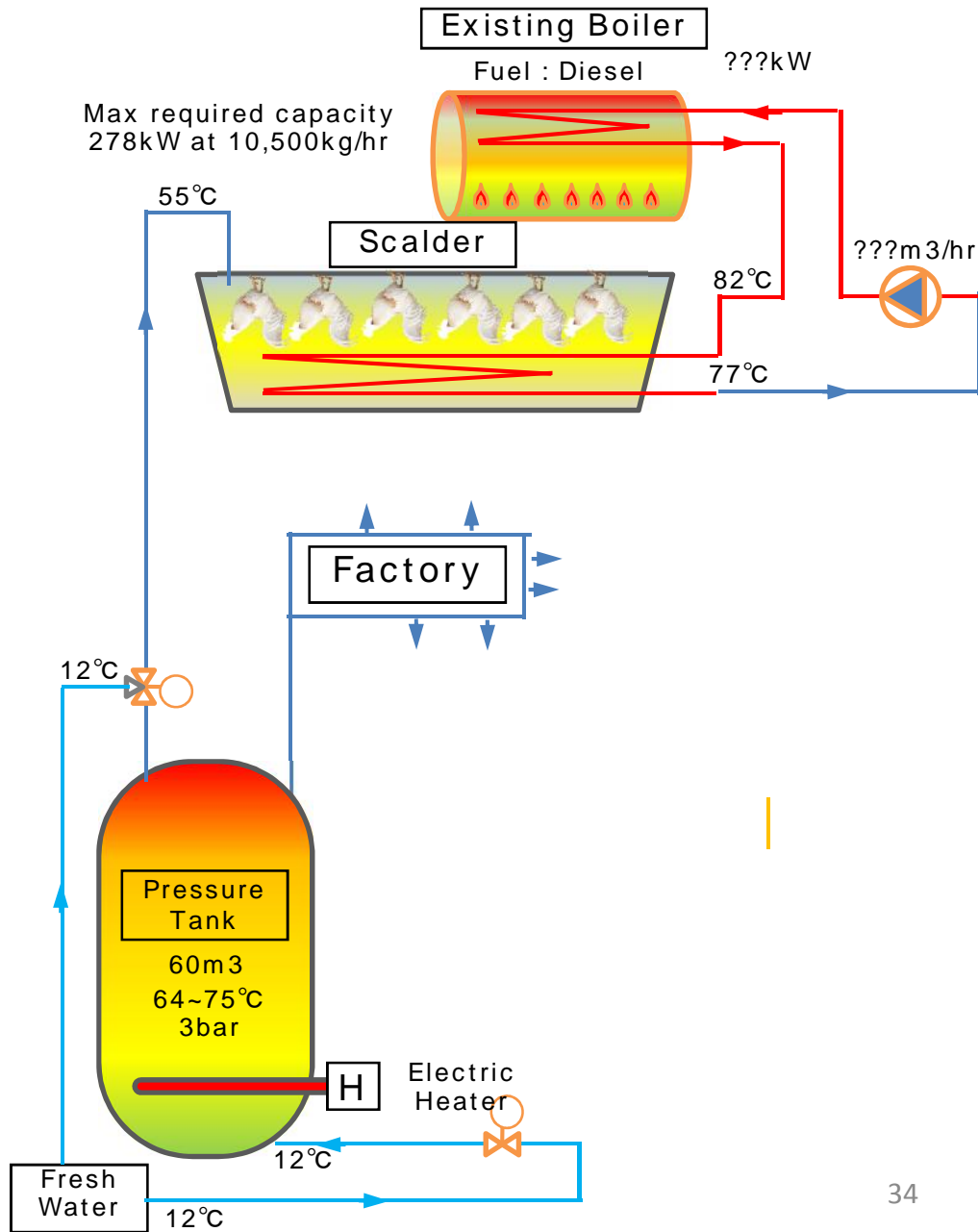
| | | |
|--------------------------|---------------------|-------------|
| Hot water Consumption | m ³ /day | 266.4 |
| Inlet water temperature | °C | 32 |
| Outlet water temperature | °C | 62 |
| Heat load | kcal/day | 8,081,408 |
| | kWh/day | 9396.986301 |
| Heating capacity | kW | 515 |
| Running time (day) | hrs/day | 18.2 |
| Break kilowatto | BkW | 78.8 |
| Comsumption(day) | kWh/day | 1437 |
| Unit price | €/kWh | 0.065 |
| COP | | 6.54 |
| Comsumption(year) | kWh/year | 431,349 |
| Running cost(day) | €/day | 93.46 |
| Operated days | day/year | 300 |
| Running cost(year) | €/year | 28,038 |
| Merit (vs Gas Boiler) | €/year | 88,032 |

| | |
|---------------------------------|---------|
| Instlation Cost(part of unit) € | 197,400 |
|---------------------------------|---------|

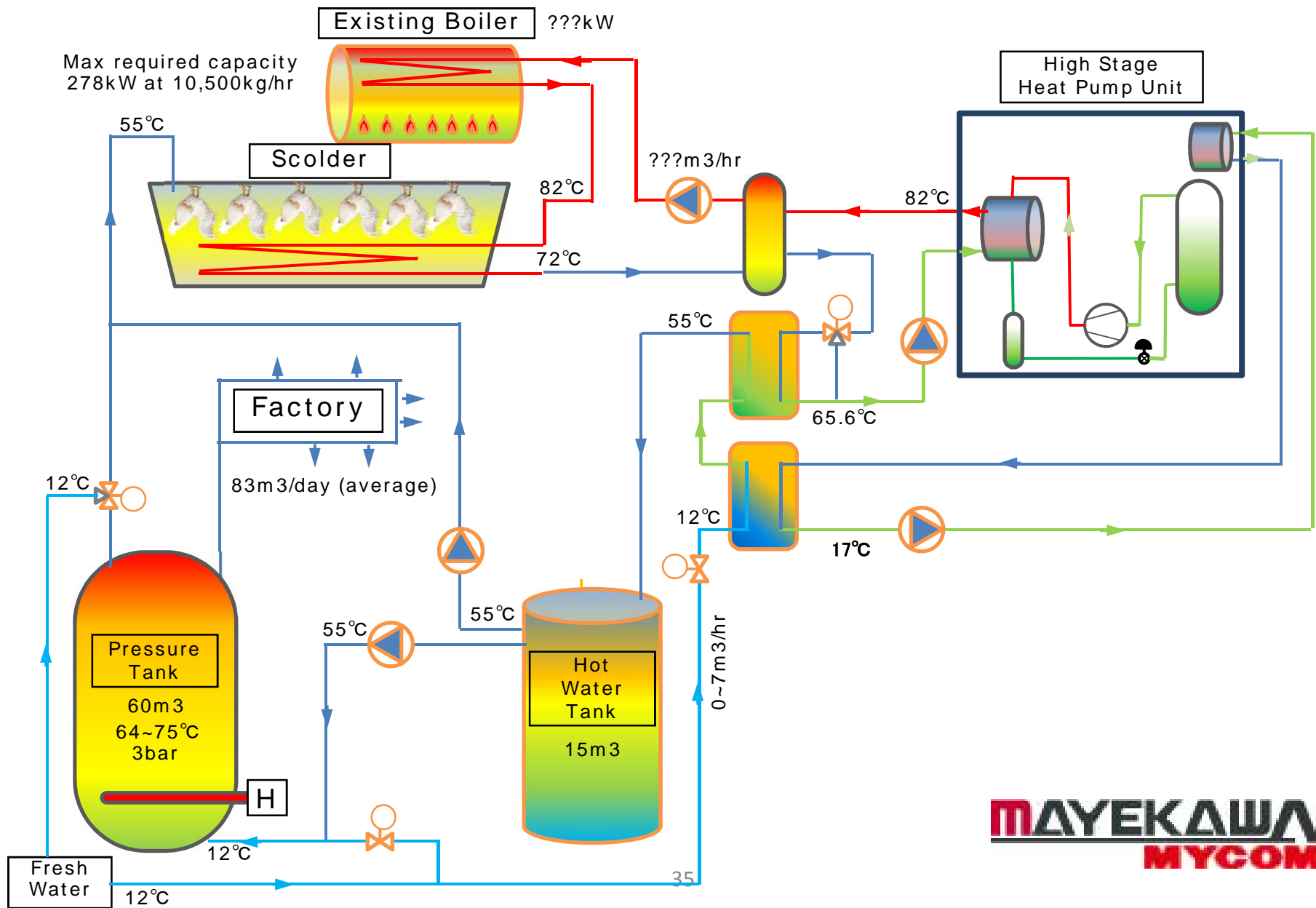
| | | |
|----------------------|------|------|
| Peturn Of Investment | year | 2.24 |
|----------------------|------|------|

- C.O.P(heating) : 6.54
- Cost of Merit is 88,032€/yr !!
- Return of Investment : 2.24₃₃ years

Existing Flow Of Hot Water




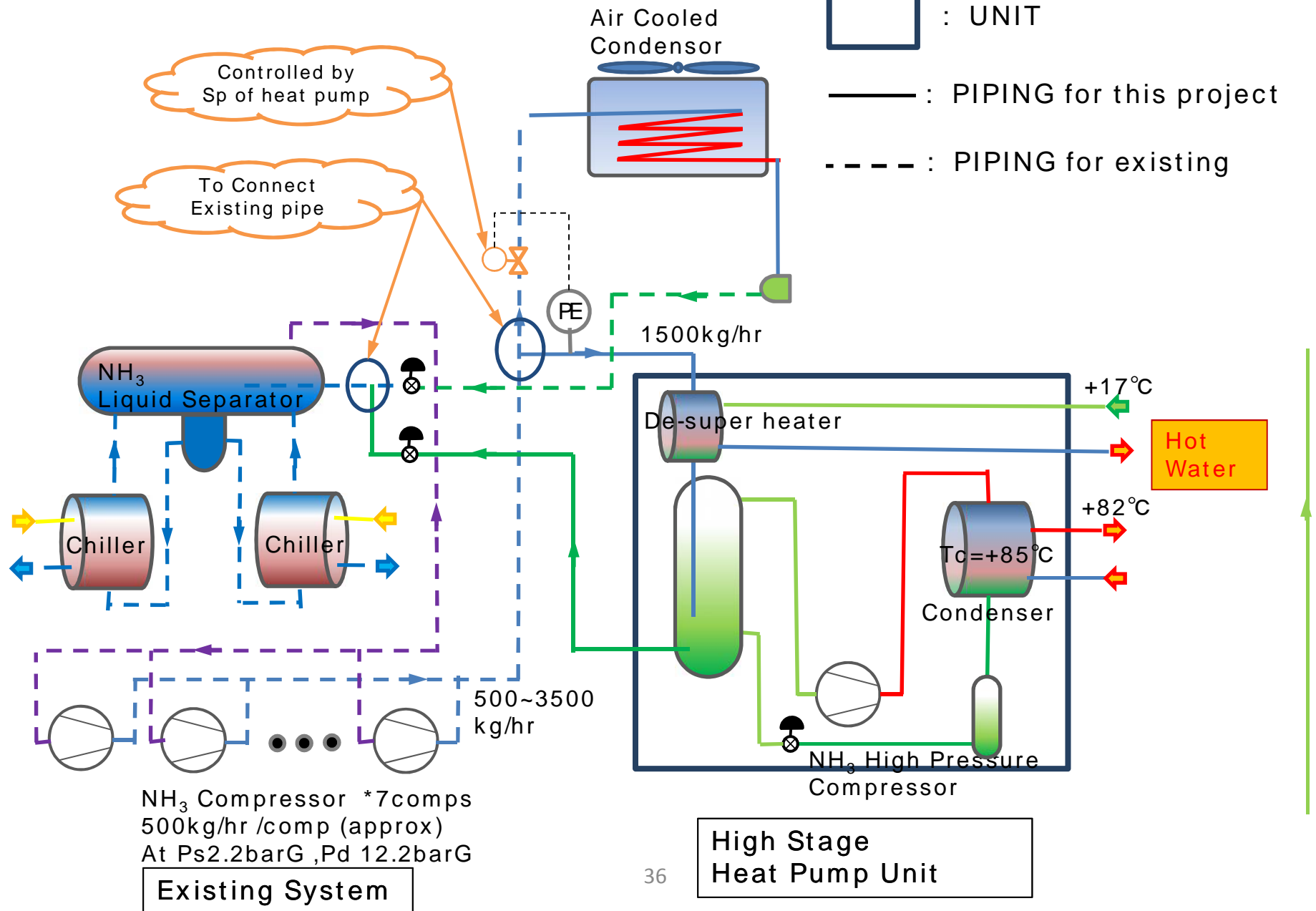
Future Flow Of Hot Water



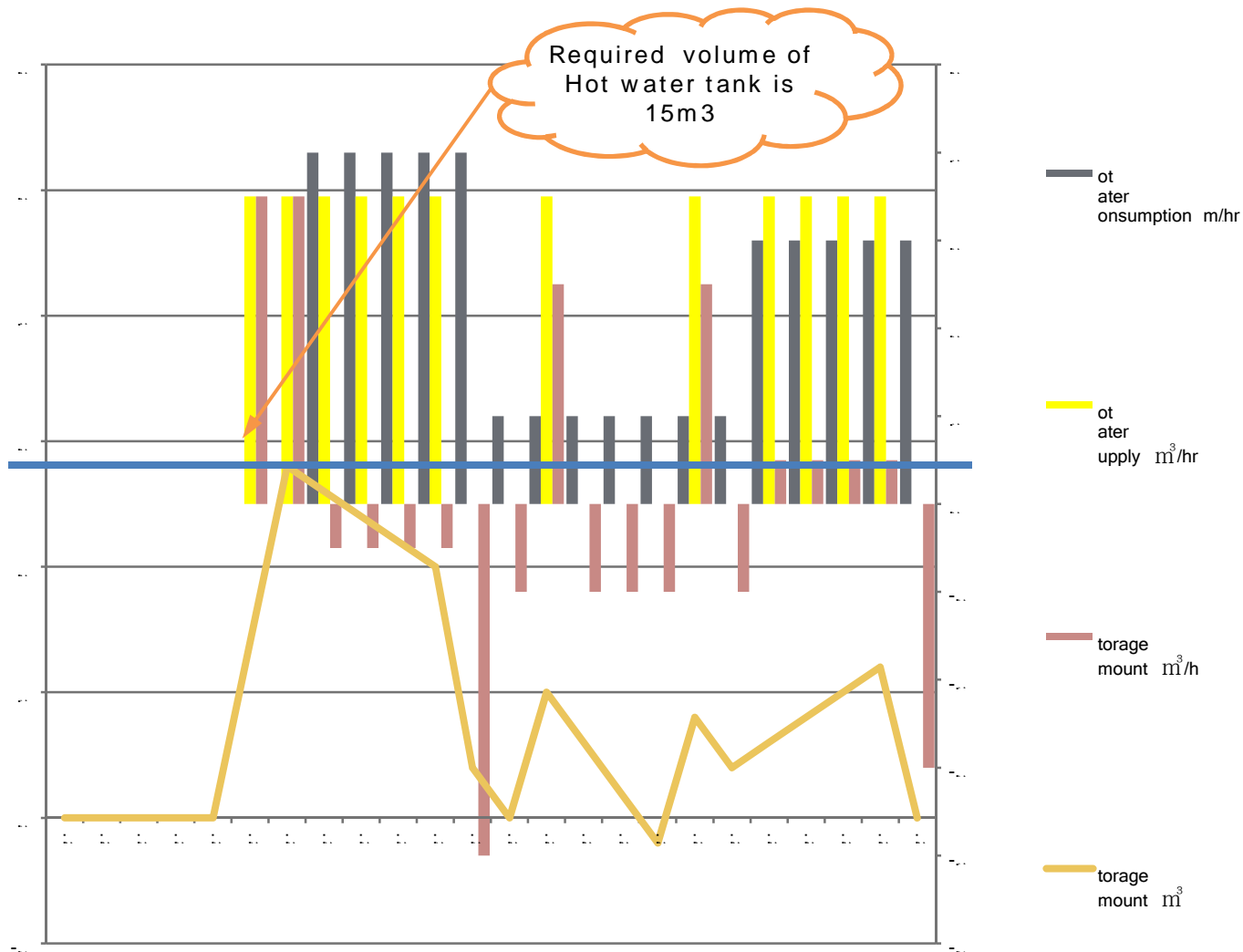
Future Flow Of NH3

MAYEKAWA
MYCOM

 : UNIT
 — : PIPING for this project
 - - - : PIPING for existing



Capacity of Hot water Tank



Average consumption of hot water 83m³/Day

Hot Water consumption and needed capacity of Hot water Tank

Calculation Conditions

- Tc of Low Stage is 35degC all seasons
- Tc/Te of High Stage Heat Pump is 85degC / 35 degC.
- Consumption of hot water is assumed as follows

10h pm ~ 5h am 0m³ (0m³/hr)

5h am ~ 10h am 40m³ (8m³/hr)

10h am ~ 5h pm 14m³ (2m³/hr)

5h pm ~ 10h pm 30m³ (6m³/hr)

TOTAL 84m³/day

(Aug-2010 : 1743m³/month ÷ 21 days = 83m³/day)

Merit of This SYST

Diesel Boiler

| | | |
|------------------------------|---------------|----------------|
| | | |
| Oil Consumption | l t /6months | 31,000 |
| | lt/yr | 62,000 |
| Unit Price of Diesel oil | €/lt | 0.53 |
| Running cost(year) | €/year | 32,860 |
| | kWh/lt | 10.6 |
| Boiler efficiency | — | 0.85 |
| Produced heating capa | kWh/yr | 558,620 |

Electrical Boiler

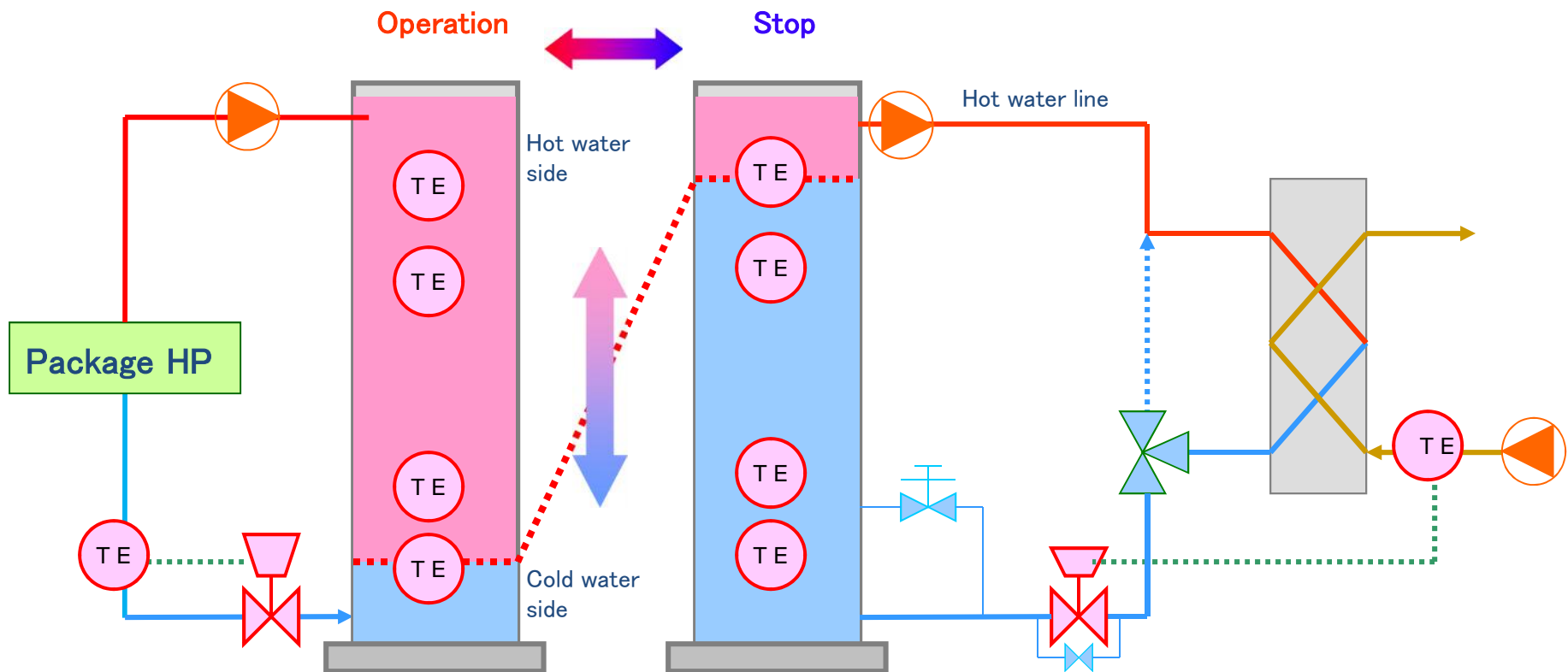
| | | |
|------------------------------|---------------------|------------------|
| | | |
| Hot water Consumption | m ³ /day | 83 |
| Inlet water temperature | °C | 12 |
| Outlet water temperature | °C | 55 |
| Heat load | kcal/day | 3,569,000 |
| | kWh/day | 4,150 |
| Unit Price of electricity | €/kWh | 0.0645 |
| Running cost (day) | €/day | 267.7 |
| Operating days | day/year | 250 |
| Running cost(year) | €/year | 66,925 |
| Produced heating capa | kWh/yr | 1,037,500 |

High Stage Heat Pump

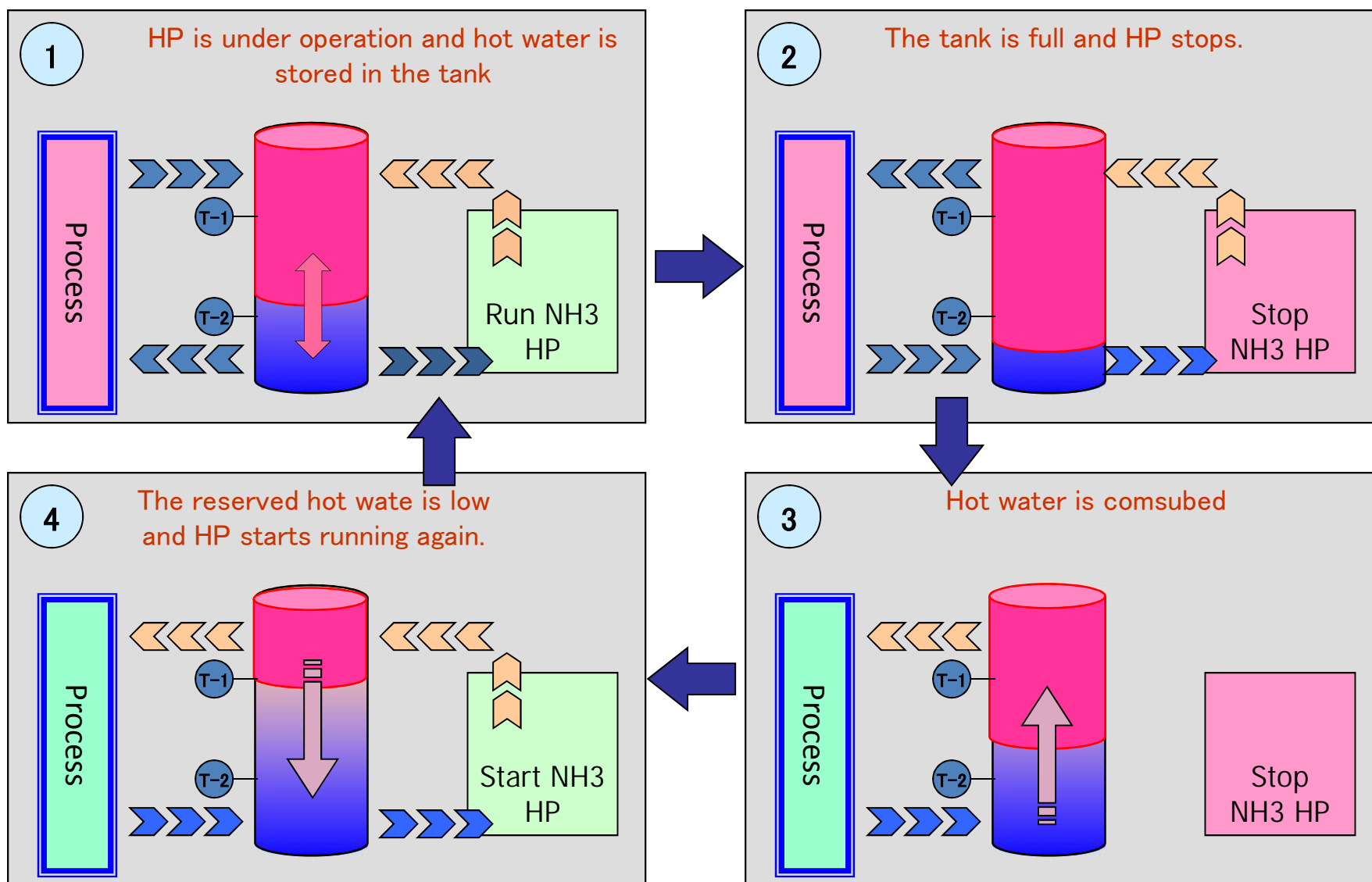
| | | |
|-----------------------------------|---------------|---------------|
| | | |
| Produced heating capa | kWh/yr | 1,596,120 |
| COP | | 6.25 |
| Electricity | | |
| Consumption(year) | kWh/year | 255,379 |
| Unit Price of electricity | €/lt | 0.0645 |
| Operated days | day/year | 250 |
| Running cost(year) | €/year | 16,472 |
| | | |
| Merit (vs Existing system) | €/year | 83,313 |

- C.O.P(heating) : 6.25
- Cost of Merit is 83,313€/yr !!

NH3 Heat pump with the buffer tank



Operation of heat pump and hot water line



Example of HP Package with the reservoir tank



The factory made mobile package is more reliable and easy to install.



Transport



Installation



Installation Finished

Our products / high pressure compressor

MYCOM

Reciprocating compressor

N6HK

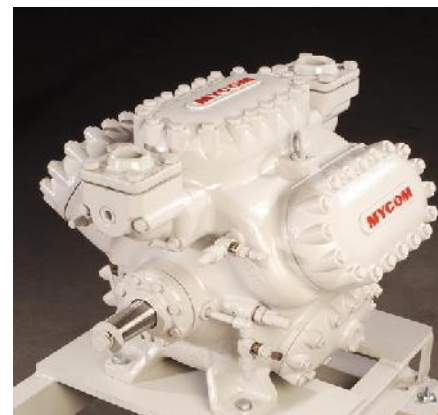
Pressure : 40bar

50bar (available February 2010)

Speed : 900~1600rpm at 40bar

900~1450rpm at 50bar

Swept volume; 120~193m³/h 100%Load



N6HK

Screw compressor

Pressure: 50bar

Speed : 2950rpm, 3550rpm

Swept volume 2950 / 3550 rpm

N160GHS: 434 / 522 m³/h

N250GHS; 1552 / 1867 m³/h

N320GHS; 3212 / 3865 m³/h



GH series

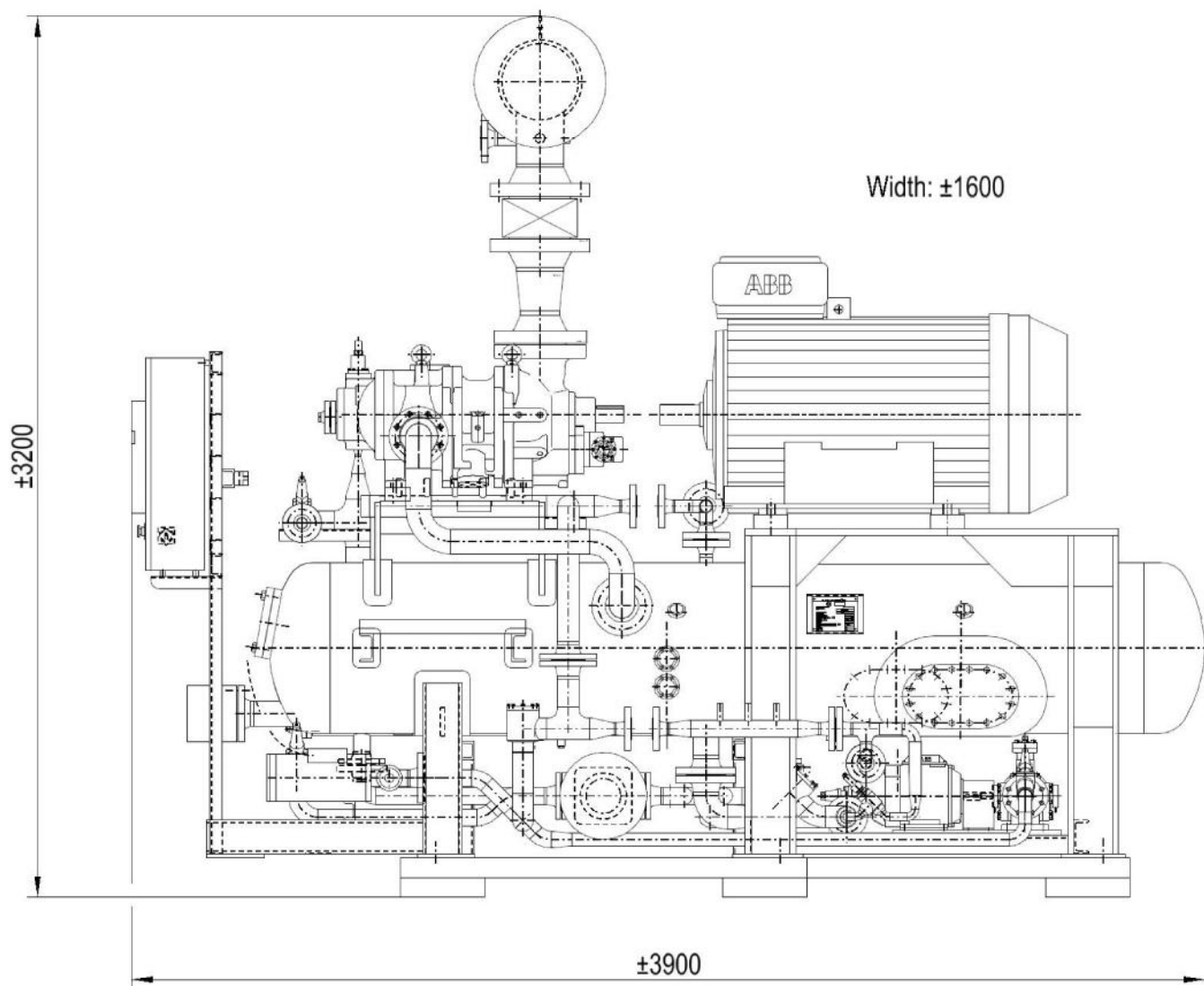
Note : N160GHS applied with frequency driven motor.

DOC.2010-141 R2

MAYEKAWA
MAYEKAWA ASEAN

Screw type heat pump unit

MYCOM



DOC.2010-141 R2

MAYEKAWA
MAYEKAWA ASEAN

MYCOM



MAYEKAWA
MAYEKAWA ASEAN

DOC.2010-141 R2

Norway / Kongsberg / 2 x N160GHS two stage Heat pump system 2.400kW



CO₂ Heat Pump Hot Water Supply Unit



CO₂

- Hot water and Hot dry air supply Heat-Pump
- Source : Air and Water

Carbon dioxide

“CO2 Heat Pump”

unimo



Eco-Cute “unimo A/W”



Eco-Cute “unimo W/W”



CO2 Heat Pump in Switzerland



**ZÜRCHER UNTERLAND
MEDIEN**

Zürcher Unterländer Die Tageszeitung für das Zürcher Unterland und amtliches Publikationsorgan der Bezirke Bülach und
redaktion@zuonline.ch sport@zuonline.ch abo@zuonline.ch



Mehr Lokalpolitik

FRONT ZU

[Schlagzeilen](#)

[Blickpunkt](#)

[Kommentare](#)

[Foren](#)

REGIONAL

[Furttaler](#)

[Glattaler](#)

[Rümlinger](#)

RESSORTS

[Sport](#)

[Mixer](#)

[Agenda](#)

UMFRAGEN

[Aktuelle](#)

[Bisherige](#)

LINKS

[ZU-Links](#)

[Leserlinks](#)

MARKTPLATZ

[BranchenBox](#)

[Online Inserate](#)

[Fotomanager](#)

«ZÜRCHER UNTERLÄNDER» SCHLAGZEILEN VOM DONNERSTAG, 15. DEZEMBER 2005

Donnerstag, 15. Dezember 2005

Niederhasli: Warmes Wasser im GC-Campus durch moderne Technologie

CO2-Wärmepumpe installiert

Im GC-Campus in Niederhasli liefert eine der ersten CO2-Wärmepumpen in der Schweiz pro Tag 4000 Liter Warmwasser. Die Maschine stammt aus Japan.

Inga Struve



EWZ-Projektleiter Georg Dubacher (von links), Masao Maekawa, Vorsitzender der japanischen Firma Mycom, und EWZ-Direktor Conrad Ammann erläutern die CO2-Wärmepumpe. (David Baer)

GOOG

WEIT

[Niederhasli: Warmes Wasser im GC-Campus durch moderne Technologie](#)

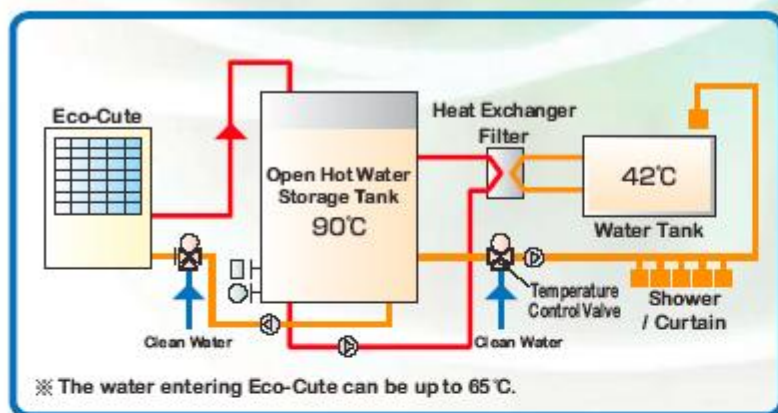
[Bülach: Zwischen Arbeitsplan und Primar](#)

[Bülach: Computermanager](#)

[Stein: Gemüse werden beheizt](#)

[Obere: Feriengestaltung](#)

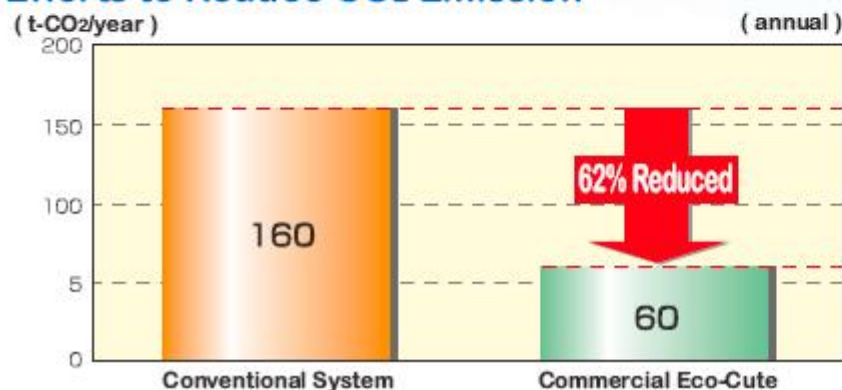
62% Reduction of CO2 Emission



Targets: Hospitals, hotels, welfare institutions, sports facilities, bathing facilities, facilities for boarding, food factories, etc.

- The best water supply ability in Japan (Air heat source 80kW, water heat source 90kW).
- Very little CO₂ emission, compared with equipments run by burning the energy source. Emission could be cut by more than 60% than heavy-oil boilers.
- 循環 heating operation (Water entering Eco-Cute at 65°C, exiting at 90°C).
- Flexible design of water supply system and storage tanks to meet your needs.
- Entering medium to large-scale water supply market as the electric equipment replacing hot-water boilers. The complete electrification is possible.

Efforts to Reduce CO₂ Emission



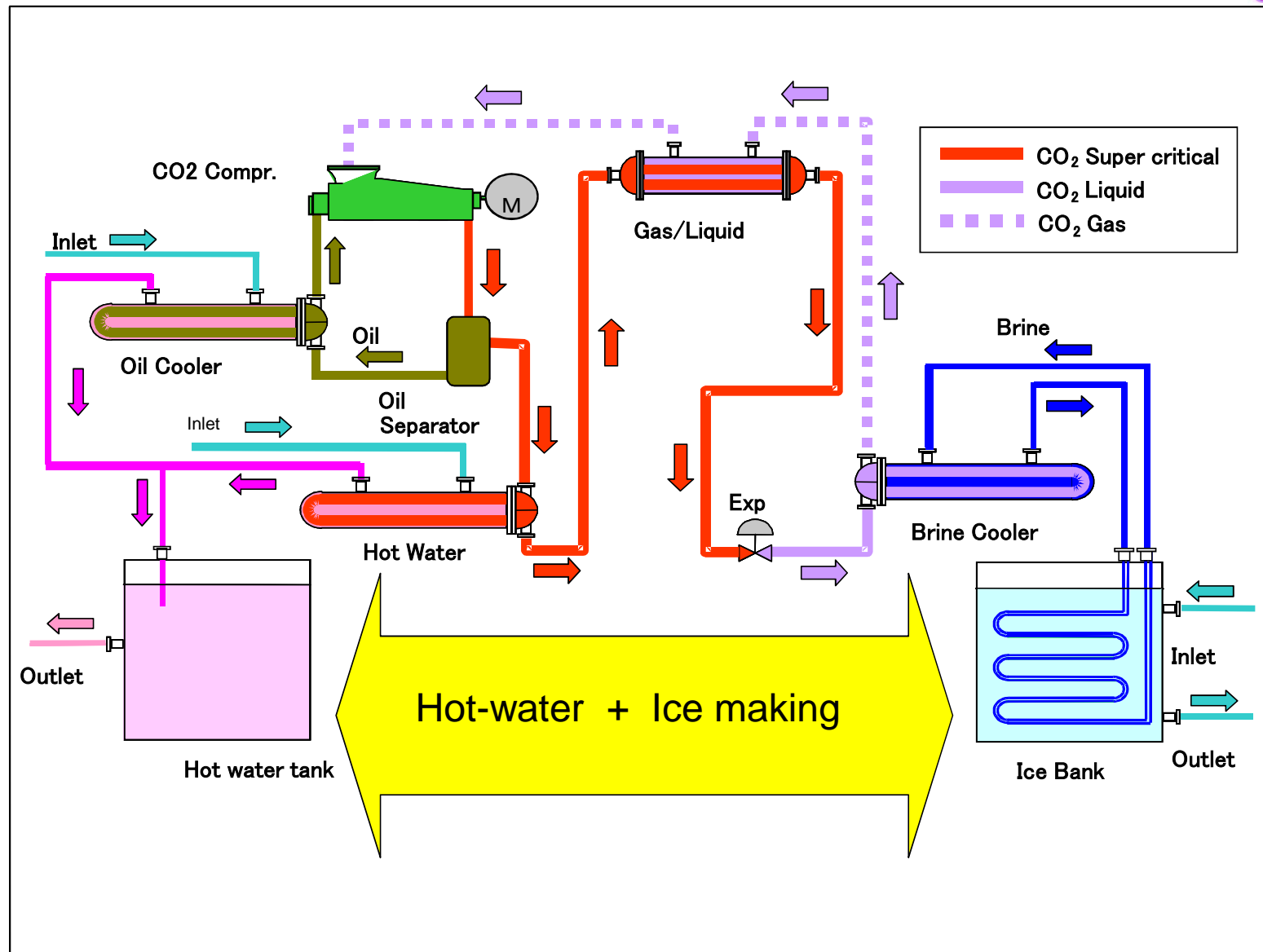
Case Study

A Company Housing where Hot Water Supply is 20m³/day
The Number of People: 200

| <Conventional System> | <Commercial Eco-Cute> |
|-----------------------|-----------------------|
| Fuel Oil Boiler | |
| Crude Oil Equivalent | Crude Oil Equivalent |
| 59,040 ℓ /yr | 22,153 ℓ /yr |

CO₂ Heat Pump

CO₂



CO₂ Heat Pump



*CO₂ Heat Pump for Air Conditioning
and Hot Water Supply System*

CO₂

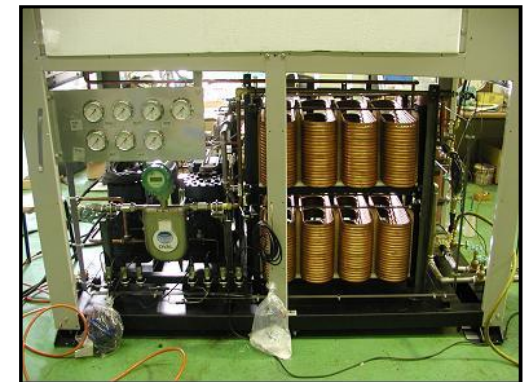
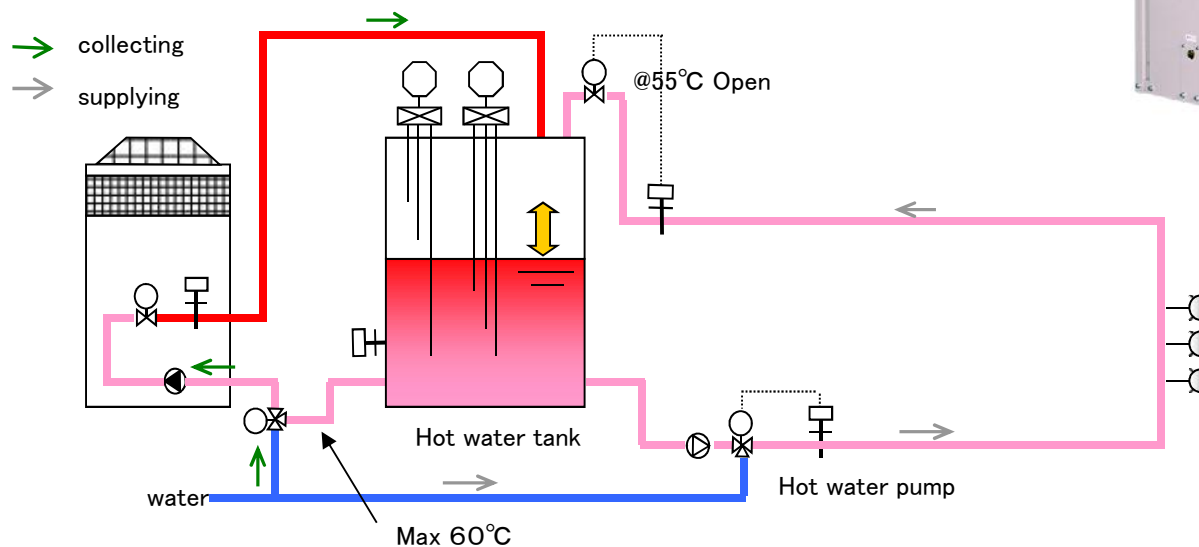


| Item | Performance | |
|---------------------|--|-----------|
| Ice making capacity | 350kW | |
| Hot water capacity | 600kW | 85°C、55°C |
| Brake Power | 240kW | |
| C O P | Combined Heating & Cooling above 4.0 (at 3600rpm) | |
| Dimension | W=2,700mm, L=4,900mm, L=3,100mm | |

CO₂ Heat Pump Hot Water Supply Unit

CO₂

| Heating | Model | Motor | COP | Remarks |
|---------|----------|-----------|------|------------------|
| 60kW | 2HT × 4P | 25kW × 4P | >3.0 | Water 9°C → 90°C |



C2HT : CO₂ Compressor

for CO₂ Heat Pump System

Specifications



| | | |
|-----------------------------|-------------------|------------|
| Model | | C2HT |
| Bore x Stroke | mm | 45x45 |
| Number of Cylinder | | 2 |
| Head cover cooling | | Air cooled |
| Speed | rpm | 900-1,800 |
| Motor (Semi-hermetic) | kW | 25 |
| Swept volume(@1,450rpm) | m ³ /h | 12.5 |
| Capacity control | % | 100 |
| Flange size (suc/dis) | mm | 25/20 |
| Net weight | kg | 410 |
| Design pressure (H/L) | bar | 150/80 |
| Max suction pressure | bar | 70 |
| Max discharge pressure | bar | 120 |
| Differential pressure (D-S) | bar | 100 |

Thank you very much for
your Attention.



NATURE IS WHAT WE DESIGN FOR

