ATMO ASIA sphere
technology & innovation
natural refrigerants
3-5 February 2014, Tokyo

Heat Recovery from Apartment Buildings with Transcritical CO_2 Heat Pump

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bravida JAC AB

ALFA LAVAL

– a global company

- 3489 M€ order intake 2012
- >16000 employees
- 37 Production units*
- 102 Service centres
- Sales companies in 55 countries
- Other sales representation in 45 countries

* Plus a number of minor production and assembling units

– a global company

bravida JAC AB

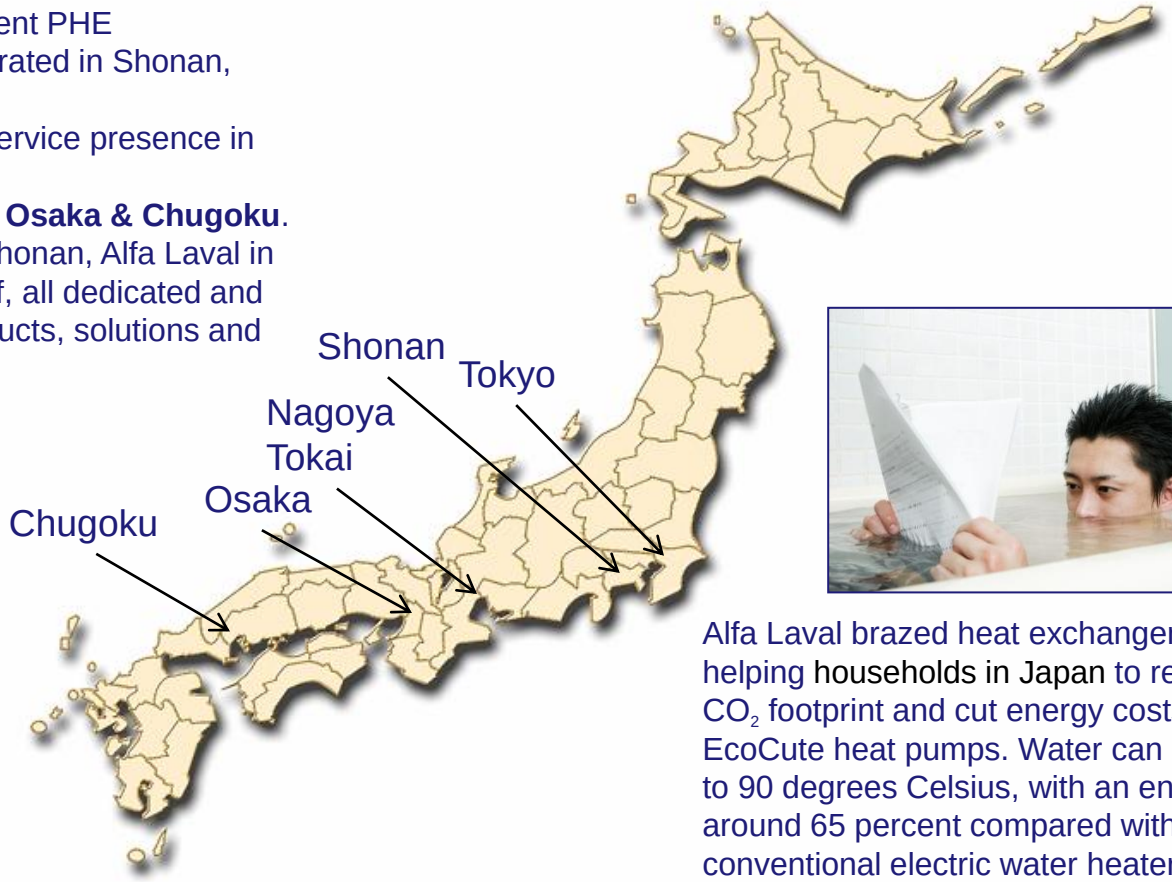
Alfa Laval aims at creating better everyday conditions for people by providing highly efficient and environmentally responsible solutions for water supply, energy production and food.

Focus in refrigeration

- Energy efficiency
- Heat recovery
- Natural refrigerants
  - CO_2, NH_3 and HC
- Complete product range

Alfa Laval in Japan

Alfa Laval, a global company, established itself in Japan in 1930. The first local production of HSS commenced in 1962 and the current PHE manufacturing facility was inaugurated in Shonan, south of Tokyo, in 1970.
Alfa Laval in Japan has sales & service presence in multiple geographical locations:
Tokyo, Shonan, Nagoya, Tokai, Osaka & Chugoku.
Including the Operations site in Shonan, Alfa Laval in Japan employs a total of 270 staff, all dedicated and proud to provide world class products, solutions and service to our customers



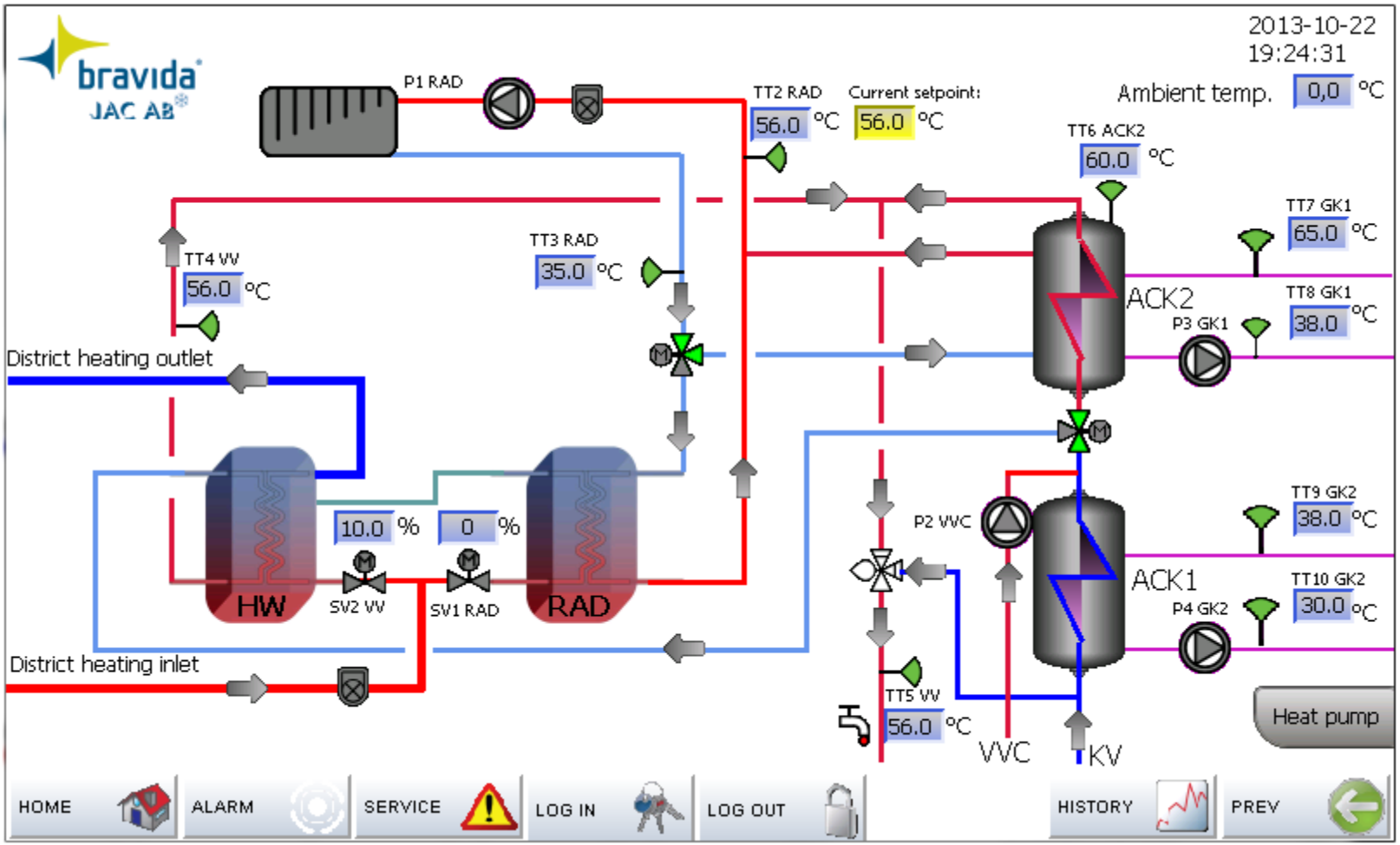
Alfa Laval brazed heat exchangers are helping households in Japan to reduce their CO_2 footprint and cut energy costs by use in EcoCute heat pumps. Water can be heated to 90 degrees Celsius, with an energy saving around 65 percent compared with conventional electric water heaters

Case Story Lund

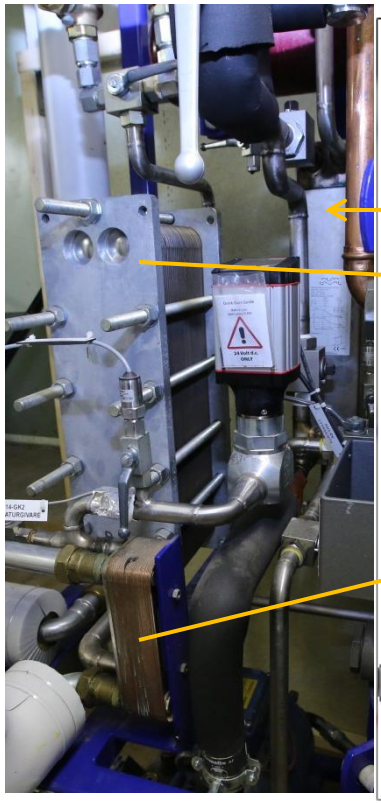
- Driver: Community board decision to reduce carbon footprint and heating cost
- Solution: Inspired by Japanese EcoCute heat pump
- Transcritical CO2 heat pump for heat recovery from exhaust air to:
  - Heating
  - Domestic hot water
- 24 Apartment buildings with more than 400 apartments in total
- Capacity: 54 to 68 kW per building

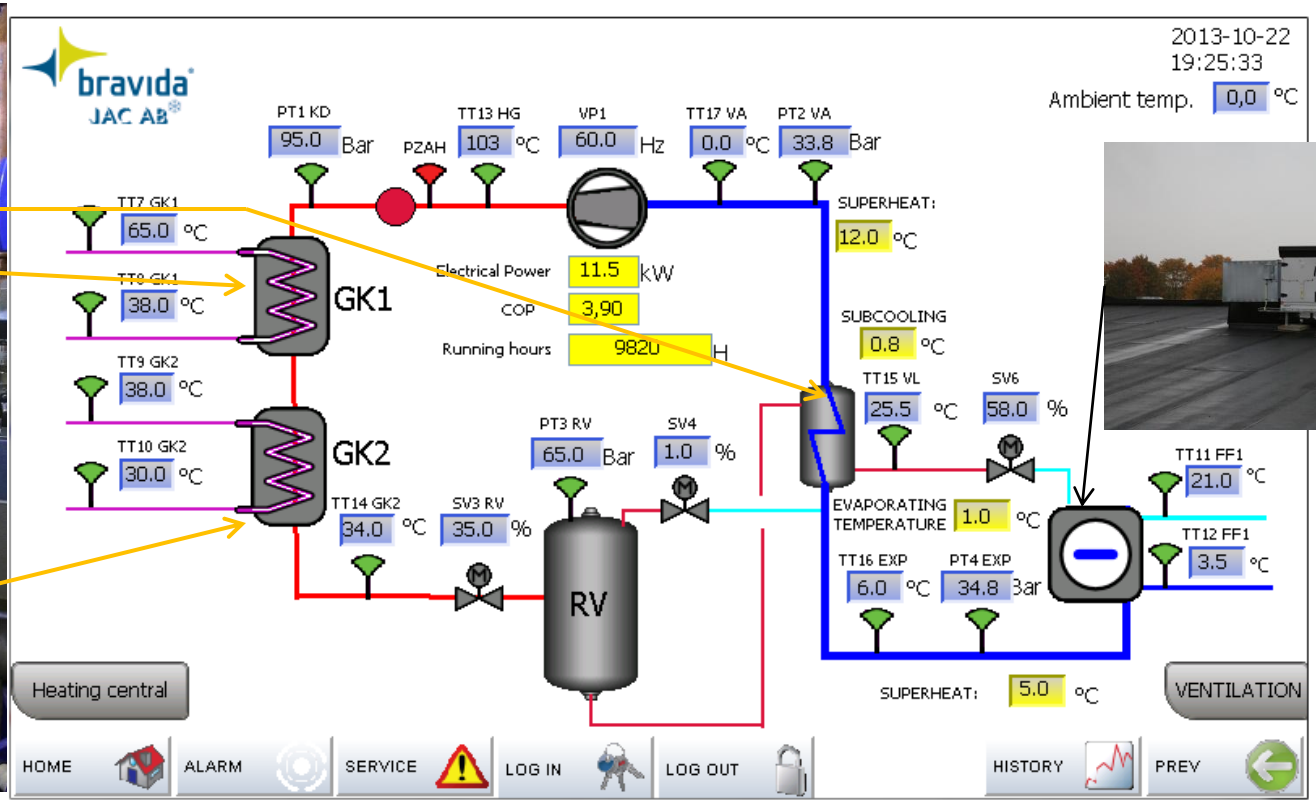
Heat Pump Installation

Heating and tap water system



The heat pump





The heat recovery units

Alfa Laval BHE portfolio for transcritical CO_2

Gas Cooler 1
68 kW AXP52-80M 3- pass
54 kW AXP52-70M 3- pass

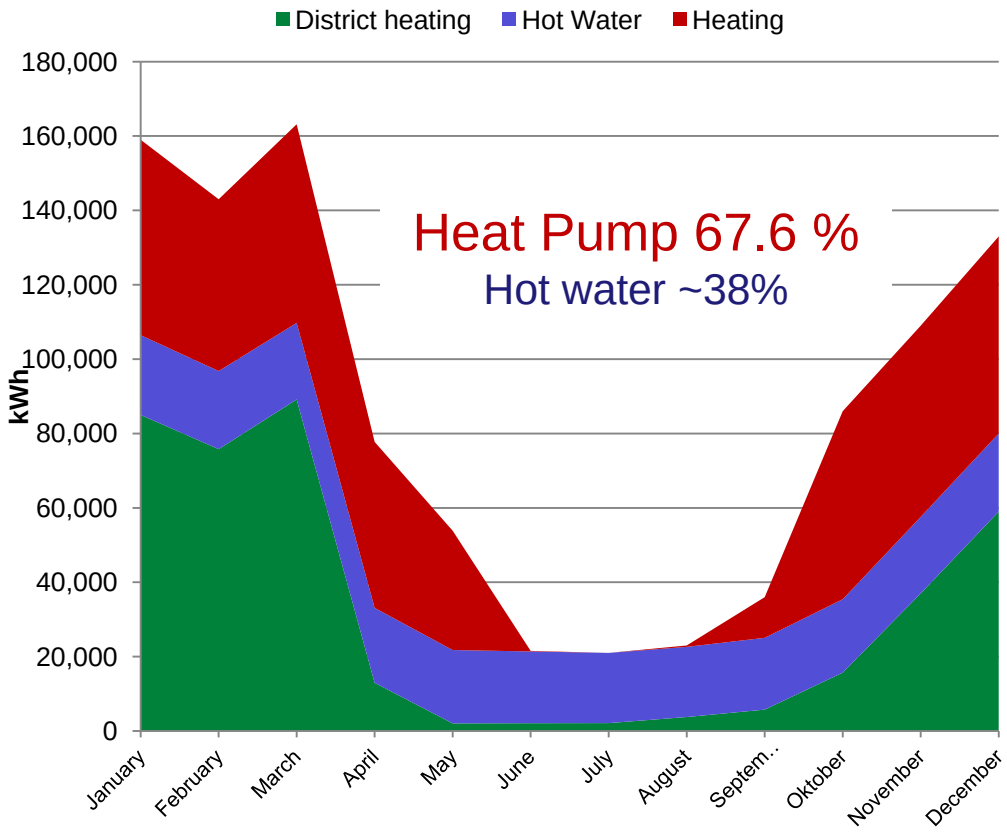
Subcooler
CBXP52-24L

Gas cooler 2
AXP14-40H

AXP10 **AXP14** **CBXP27** **CBXP52** **AXP27** **AXP52**

Heat recovery

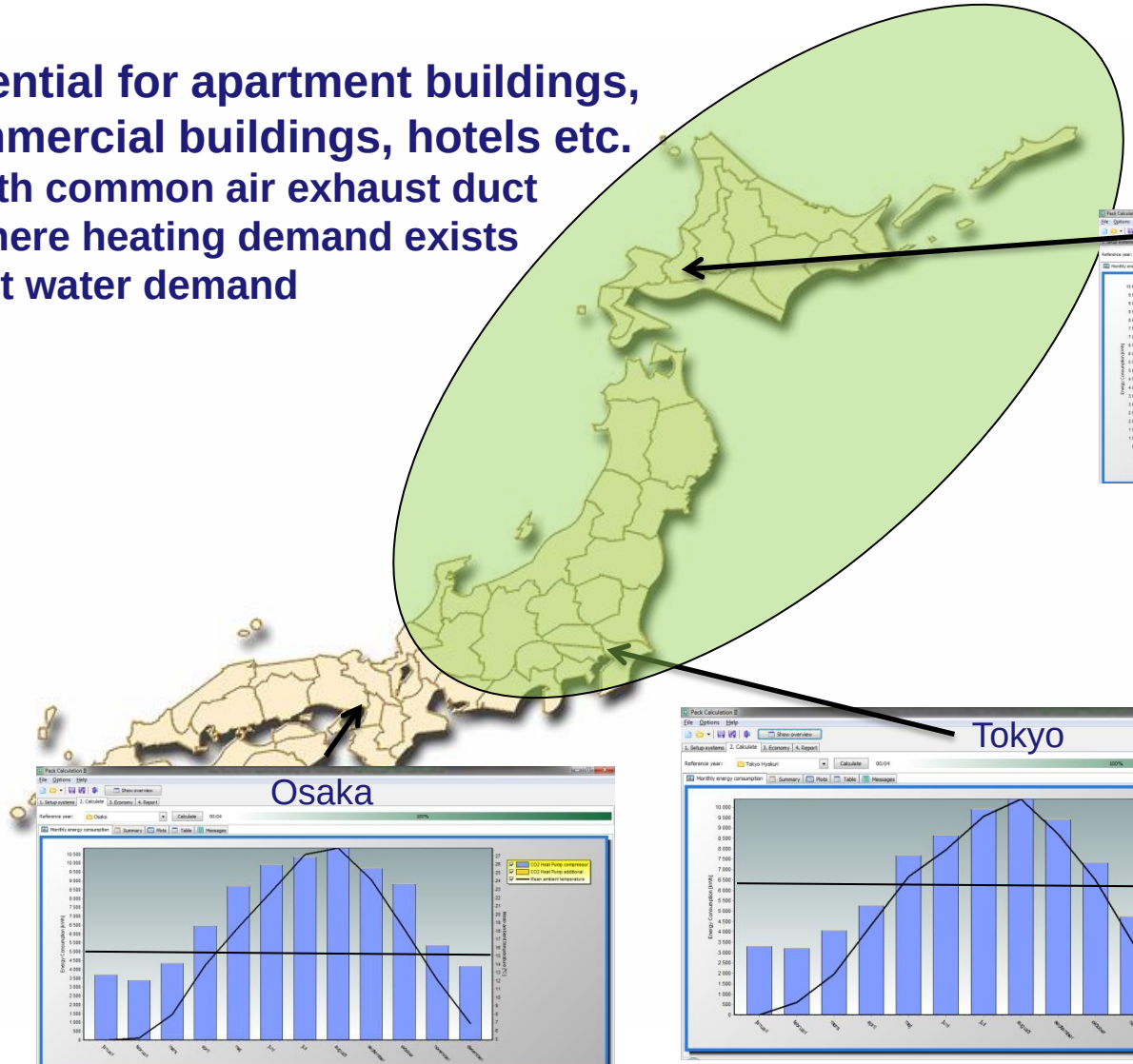
- Annual energy consumption per building is approx. 1.030.000 kWh
- Totally about 25 GWh
- Annual heat from HP is about 67.6 % or 17 GWh whereas ~38% or 6.5 GWh is for hot water.
- Energy recovered from exhaust air is about 50% or 12.5 GWh
- Total annual savings are about 1.1 M€
- Pay-off is estimated to approx. 5 years



Potential use..

Potential for apartment buildings, commercial buildings, hotels etc.

- **With common air exhaust duct**
- **Where heating demand exists**
- **Hot water demand**



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Thank you very much!