

***GAS HEAT PUMPS  
WORKSHOP***

***AI SIN-TECNOCASA***  
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***Saint-Denis /Paris***  
***01<sup>th</sup> & 02<sup>th</sup> December 2011***

# ***LIST OF TOPICS***

**AI SIN**



- **Companies profile**
- **State of the Art: Japan vs Europe**
- **GHP line up**
- **Specifications & Advantages**
- **Applications**
- **Conclusions**

# **TECNOCASA**

## ***Company profile***

**AISIN**



**1978** Company established:

Involved on promotion and development of high efficiency and enviromentally friendly products (alternative energies: solar, wood, air conditioner)

**2000** Agreement with AISIN for European distribution:

Tecnocasa appointed Exclusive European importer and distributor of the AISIN Gas Heat Pump (GHP) and Micro-cogenerator (MCHP)

**2001** Research and development of AWS YOSHI to be combined to the GHP, and **First** installation in Europe.

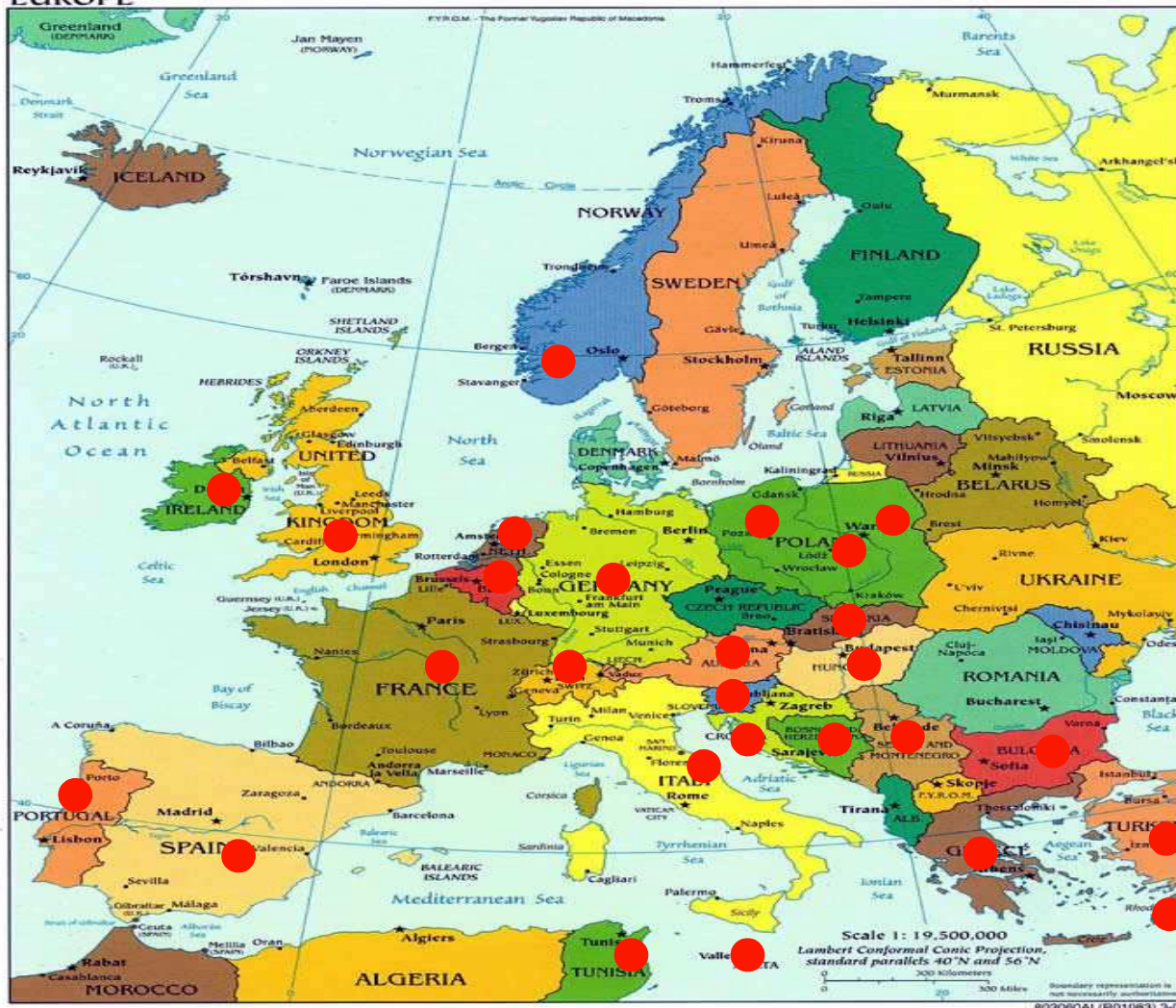
**2010** More than 2.000 GHP and MCHP sold throughout Europe.

# TECNOCASA

## European distributors

**AISIN**

EUROPE

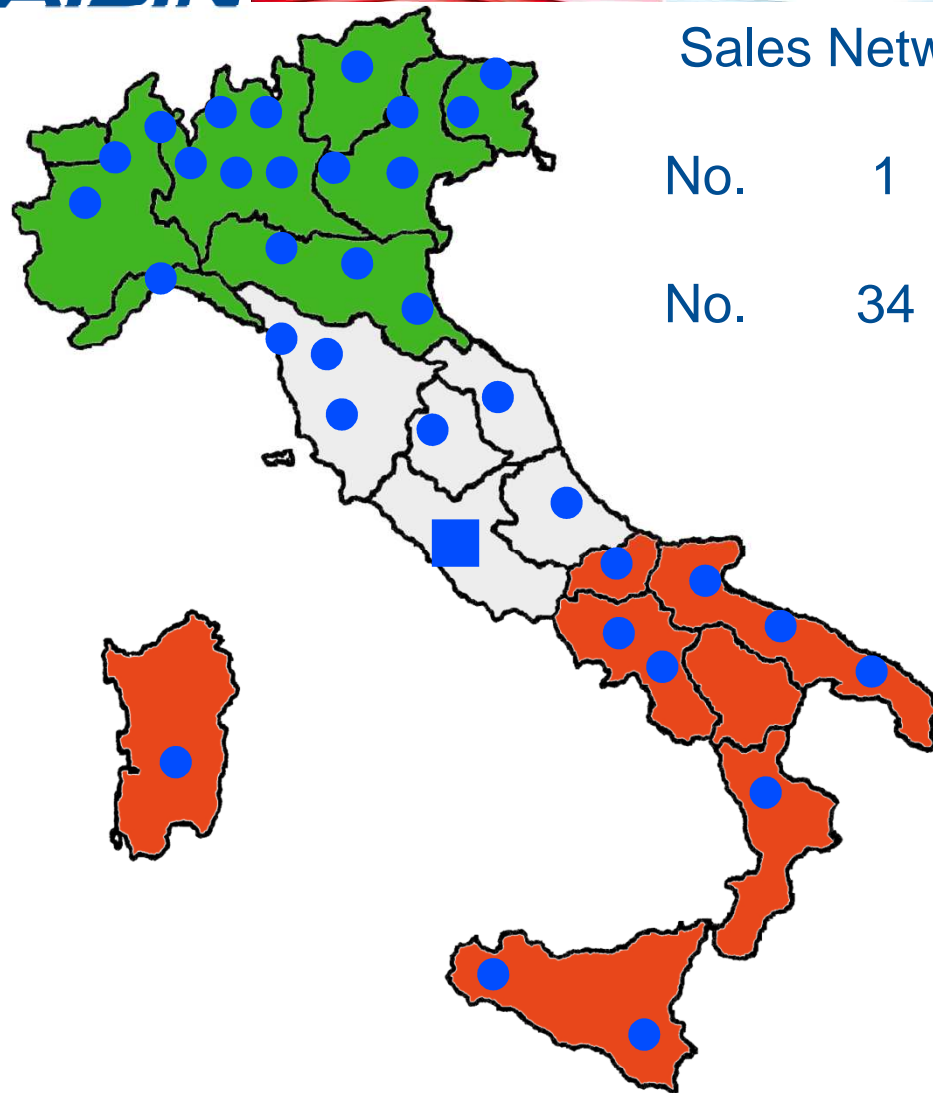


**N°26**  
**DISTRIBUTORS/DEALERS**

# **TECNOCASA**

## ***Italian sales network***

**AISIN**



Sales Network (updated 2010):

No.	1	Distributor	■
No.	34	Sales Agencies:	●



# ***AISIN***

## ***Company profile: the TOYOTA Group***

**AISIN**



# ***AISIN***

## ***Company profile***

**AISIN**



**Second biggest company  
 of the TOYOTA group**

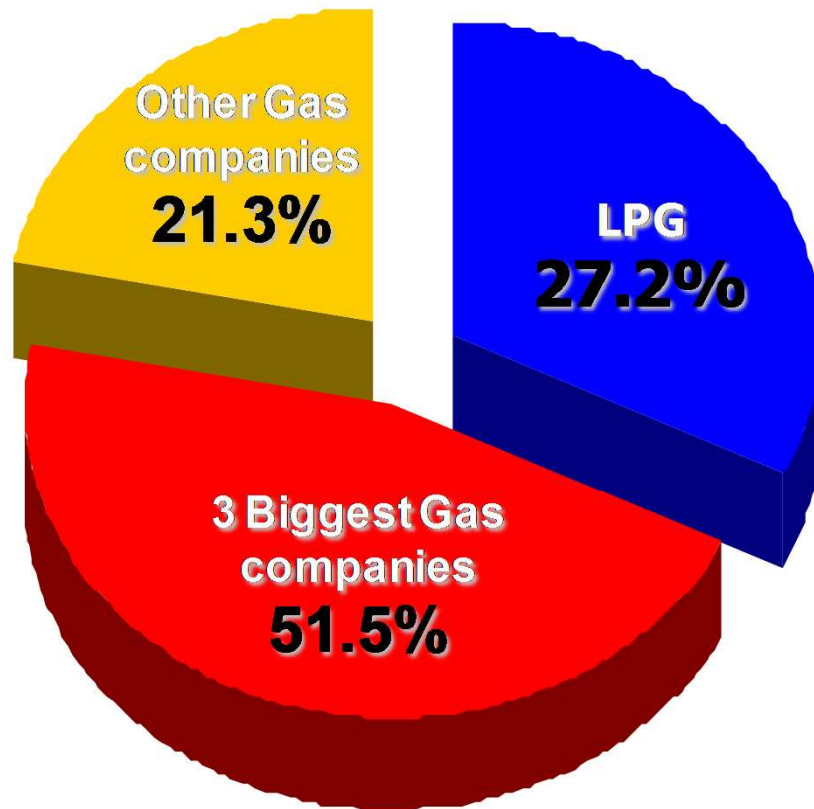
**Manufacturing of high-tech automotive  
 related components**

**11 production plants - 74.447 employees -  
 154 offices all over the world**

# ***GHP JAPANESE MARKET***

## ***2001 – 2010 sales***

**AI SIN**



**Around 328.000  
UNITS SOLD**

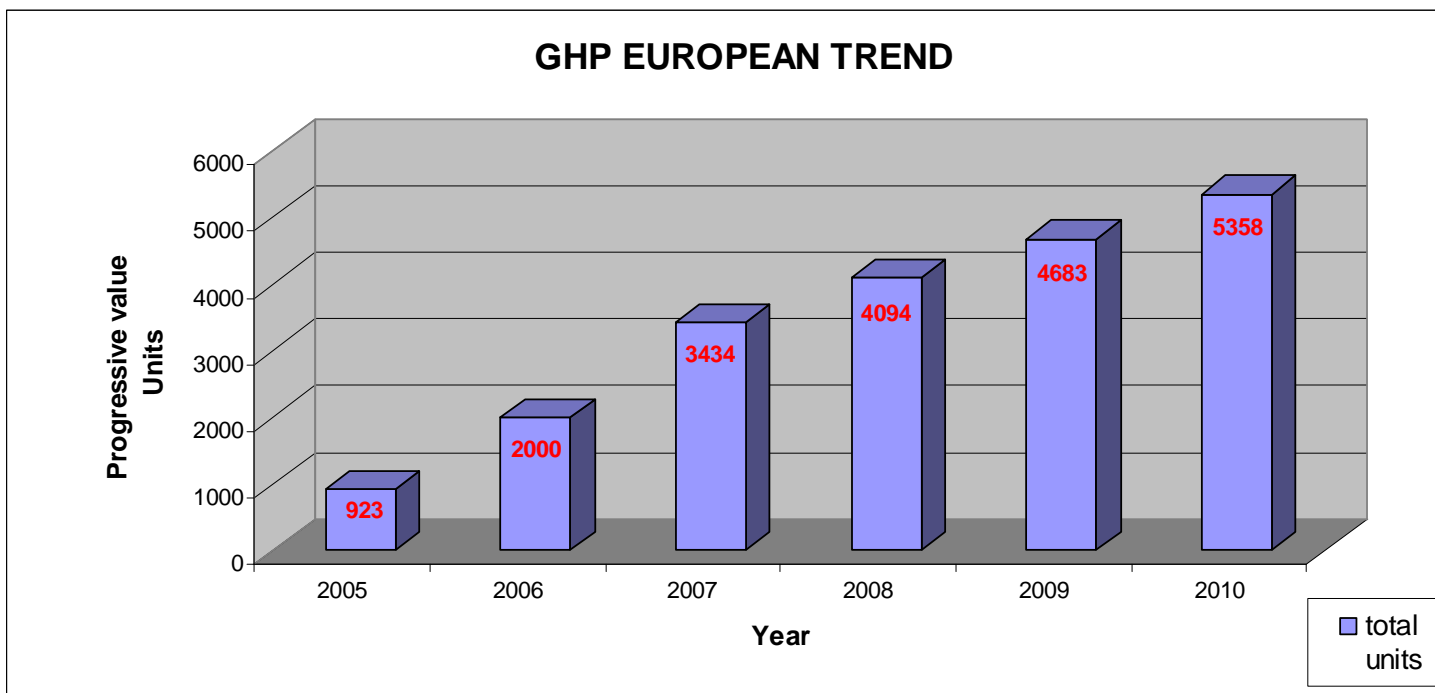
Main sales channels in Japan  
are the NATURAL GAS and LPG  
companies

Source: GHP consortium

# ***GHP EUROPEAN MARKET***

## ***2005 – 2010 European sales***

**AI SIN**



**TOTAL  
UNITS SOLD  
Around 5.358**

# ***GHP*** ***Line up***

**AISIN**

**GHP**



<b>Model</b>	<b>8HP</b>	<b>10HP</b>	<b>13HP</b>	<b>16HP</b>	<b>20HP</b>	<b>25HP</b>
<b>Cooling capacity kW</b>	<b>22.4</b>	<b>28</b>	<b>35.5</b>	<b>45</b>	<b>56</b>	<b>71</b>
<b>Heating capacity kW</b>	<b>26.5</b>	<b>33.5</b>	<b>42.5</b>	<b>53</b>	<b>67</b>	<b>84</b>

# ***PERFORMANCES***

**AI SIN**



## **COOLING**

***GUE = 1.28 cooling capacity***

***GUE = 0.48 heat recovery***

***GUE<sub>T</sub> = 1.76***

## **HEATING**

***GUE = 1.48 heating capacity***

***GUE = 0.15 heat recovery***

***GUE<sub>T</sub> = 1.63***

***Average values referred respectively at 35° C and 7° C***

# **GHP**

## ***Specifications***

**AISIN**

- **VAPOUR COMPRESSION HEAT PUMP**

- Volume Variable Refrigerant
- Specifically engine designed
- Silent functioning



- **FLEXIBILITY**

- Type: DX or AIR WATER SYSTEM
- Centralized Management
- Replacement in the existing installations

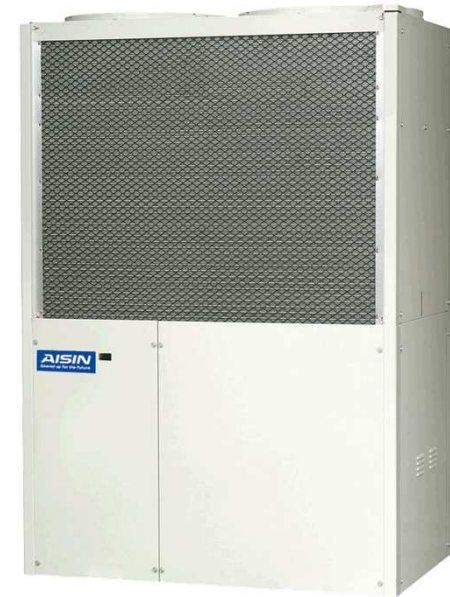
# **GHP**

## **Specifications**

**AISIN**

- **HIGH EFFICIENCY & ENVIRONMENTALLY FRIENDLY**

- Engine heat recovering
- Rational use of primary energy and Low emissions (CO<sub>2</sub>)
- Low running and maintenance costs



- **HIGH RELIABILITY**

- Engine developed by R&D Toyota
- Ordinary maintenance every 10.000 running hours
- engine life more than 40.000 hours

# ***GHP TYPE OF SYSTEMS***

**AI SIN**



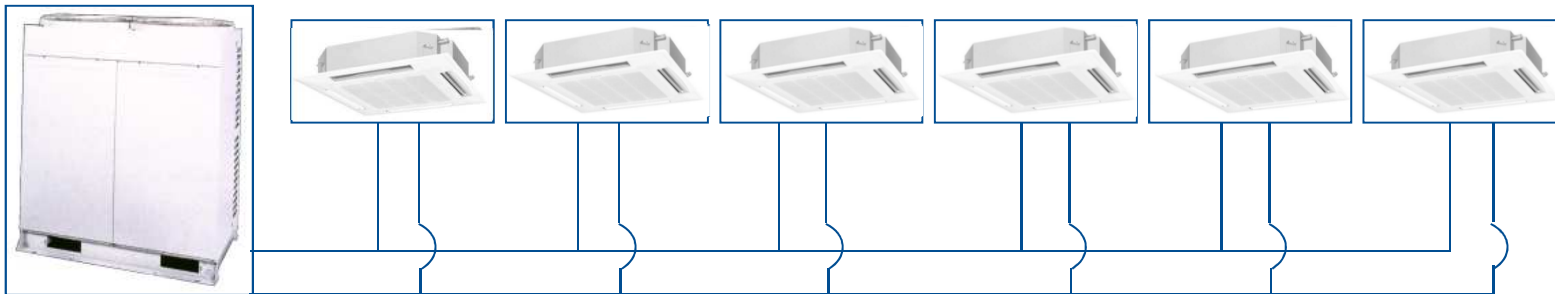
**DIRECT EXPANSIONS**

**AIR WATER SYSTEM**

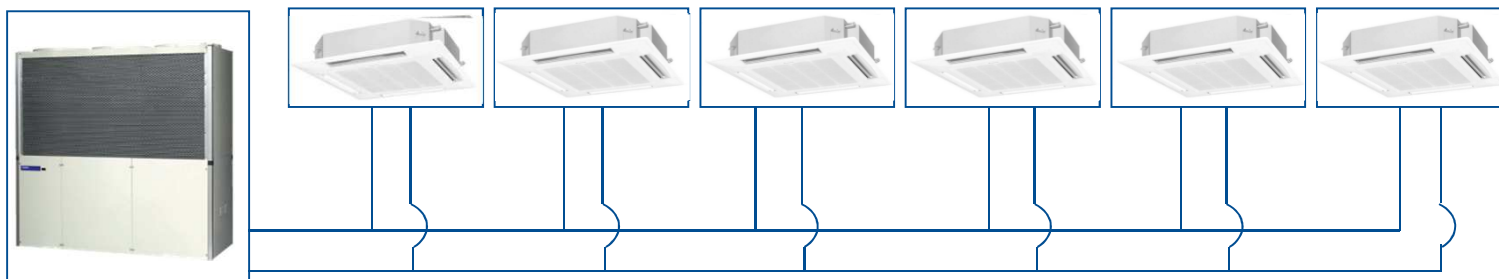
# ***GHP DIRECT EXPANSION Layout***

**AISIN**

## **Electric Heat Pump EHP**



## **Gas Heat Pump GHP**



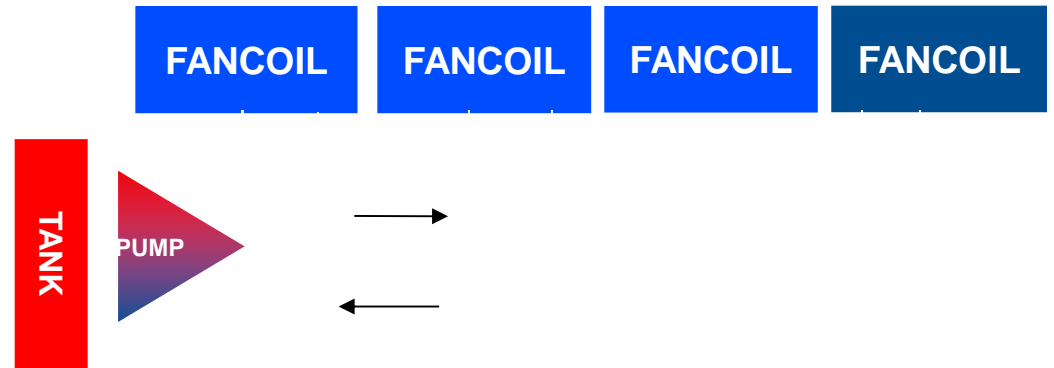
# GHP and AWS Layout

**AISIN**

**Boiler**

**+**

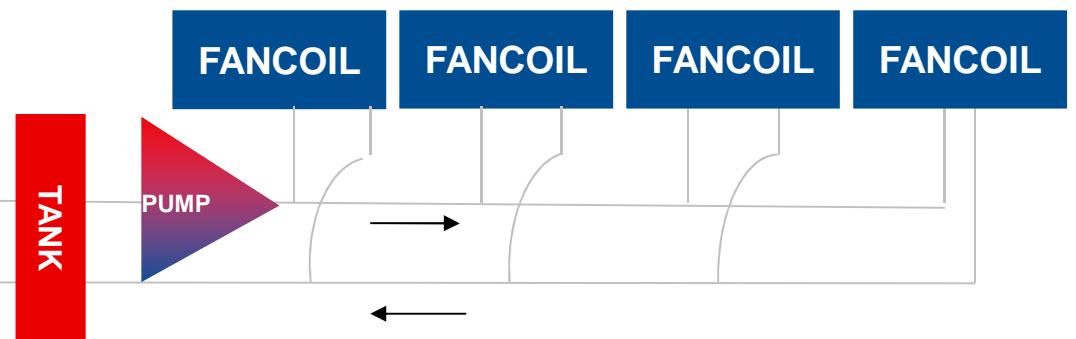
**Chiller**



**GHP  
AISIN**

**+**

**AWS  
YOSHI**



# ***GHP and AWS***

## ***AWS: Hydraulic circuit, controls and securities***

**AISIN**

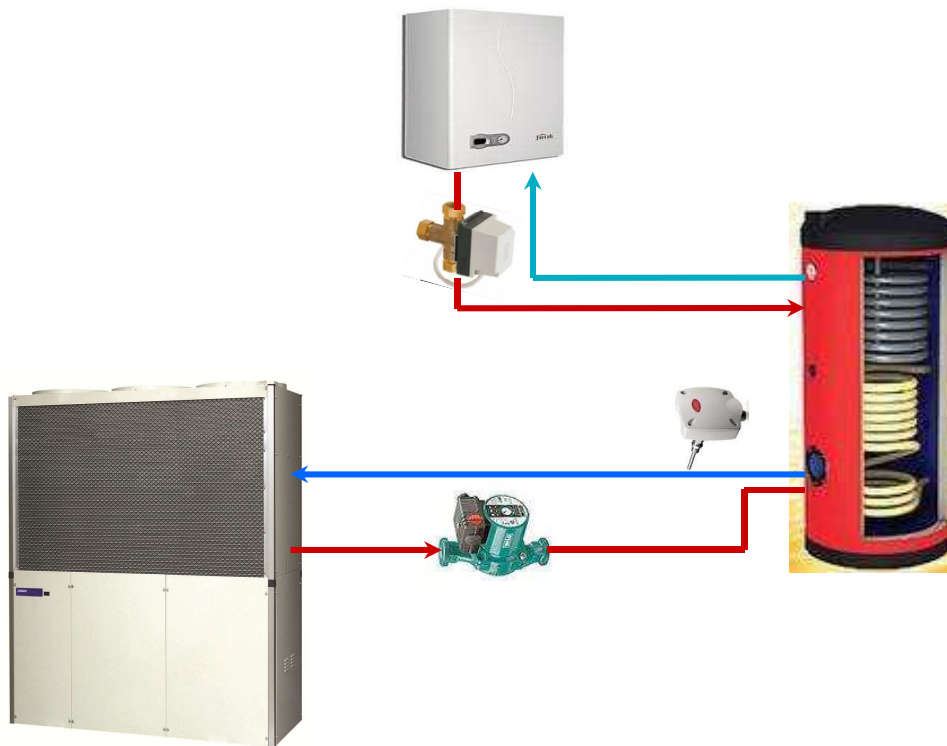
- Built in water pump
- EEV (electronic expansion valve)
- Built in weekly timer
- Gateway Modbus RTU included
- Remote temperature control (0-10V)
- Differencial pressure switch
- Antifreezing Thermostat
- Flow switch
- Y filter included



# ***GHP*** ***Domestic hot water kit***

**AISIN**

## **DOMESTIC HOT WATER FREE PRODUCTION**



**Ex: GHP = 25HP**

- Max capacity\* = 25 kW
- Qty production = 600 l/h
- Equivalent to 28 m<sup>2</sup> of solar panel

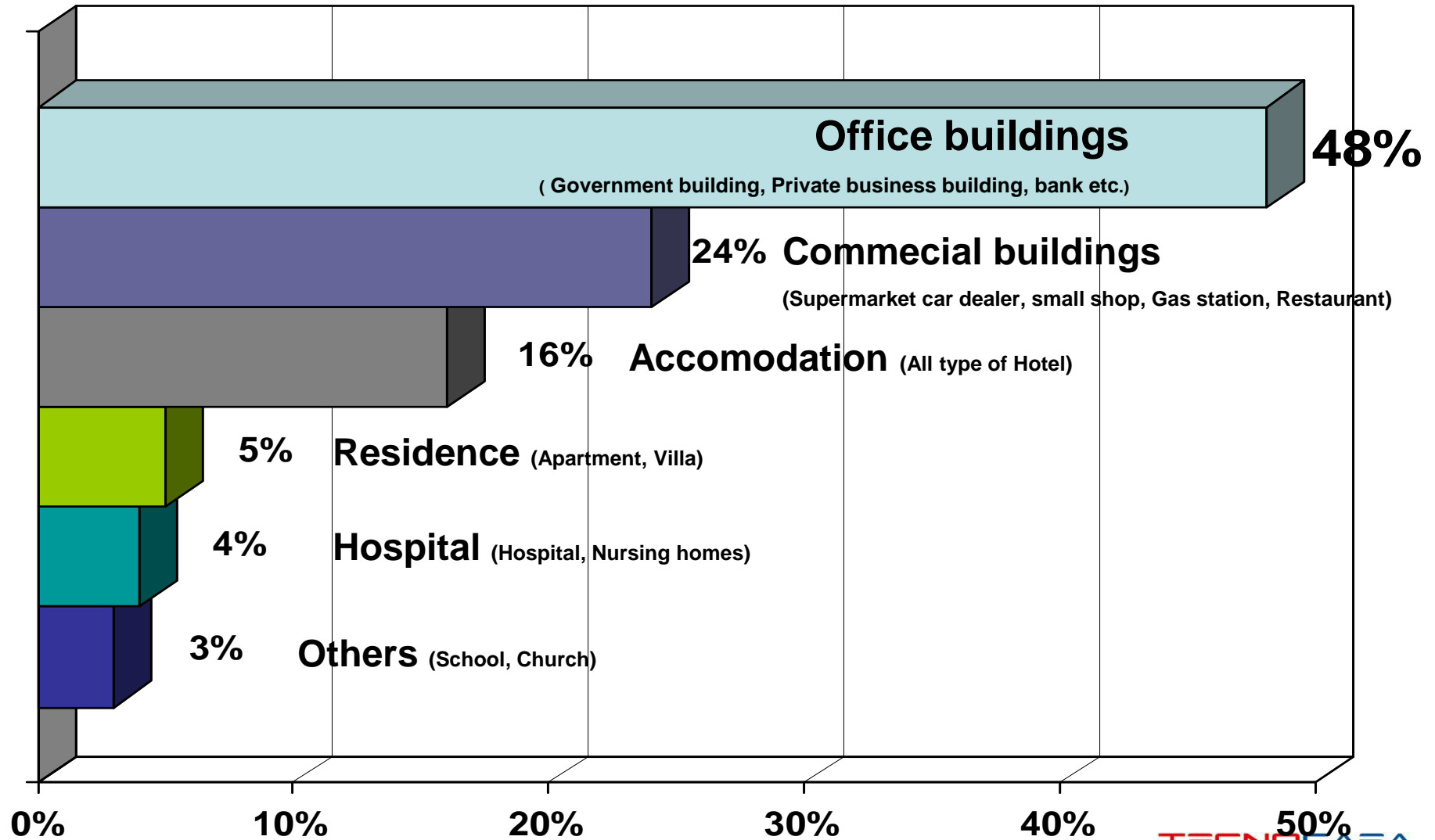


\* Cooling condition T outside 35° C

# EUROPEAN MARKET

## Type of applications

AI SIN



# INSTALLATION

**Government office: 4 GHPs + AWS (224kW)**

**AISIN**



- Commissioning Date:  
30 September 2002
- Running hours:  
from 34.000 to 41.000
- Running costs reduced:  
40%  
(Data provided by the customer)
- CO<sub>2</sub> reduction(estimated):  
377 t

# INSTALLATION

**GERMANY – Gas Company: 1 x GHP Dx (56kW)**

**AININ**



- Commissioning Date:  
26 September 2003
- Running hours:  
More than 62.000
- Maintenance:
  - Exhaust gas heat exchanger replacement
  - Muffler replacement

# ***CONCLUSIONS***

**AI SIN**



- GHP technology is ready to be fully accepted by the market:
  - flexible
  - high performances and reliability
  - cost and energy saving
  - environmentally friendly
- GHP is suitable for providing heating and cooling in any type of Building, and to increase its class efficiency.

## HOWEVER

- Not enough knowledge of the GHP technology (engineer, installer, customers)

# ***ACTIONS***



- More information on the technology through: exhibitions, meetings, workshops and specialized magazines.
- More synergy and cooperation with the Gas Companies who could supply Natural gas especially in summer by using an high efficiency technology and environmentally friendly.

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