



HEAT
4U



Under the EU's Seventh Framework Programme for Research



A Gas Absorption Heat Pump for existing residential buildings HEAT4U preliminary achievements

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Gas Innovations Inspiring Clean Energy



GDF SUEZ

BY PEOPLE FOR PEOPLE

Summary

■ A new GAHP within the European HEAT4U Project

- Principle of a GAHP
- HEAT4U project

■ Focus on the field test results

- Five field tests representative of different climates and typical installations for existing dwellings
- Performances analysis

■ Conclusions



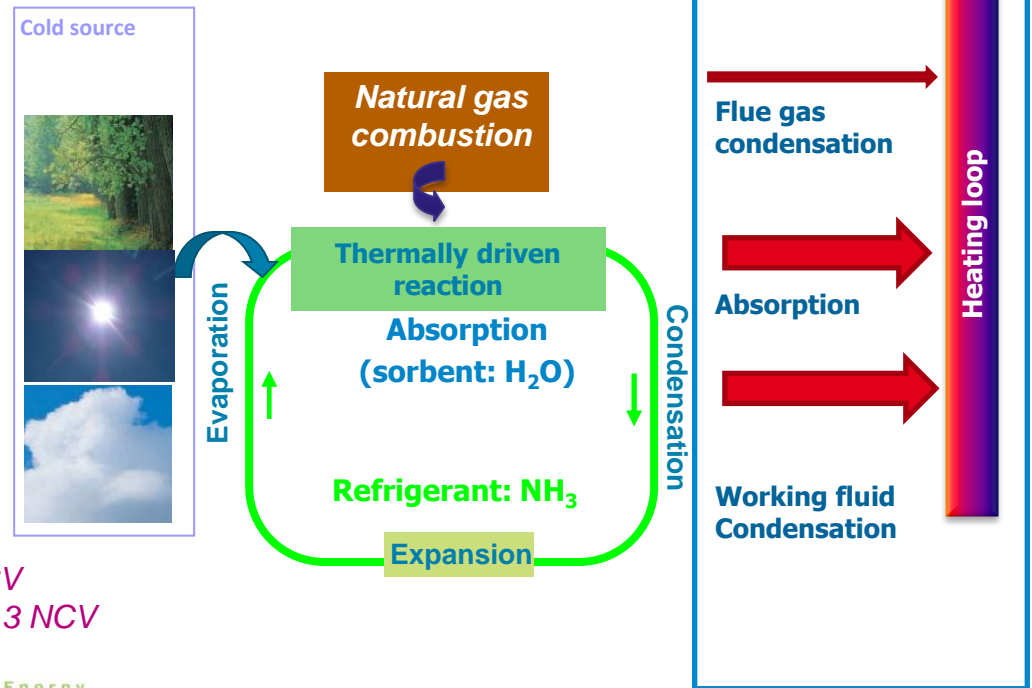
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A new GAHP within the European HEAT4U Project

- A thermally driven HEAT pump
- GAHP are available for collective dwellings
- The aim of HEAT4U is to develop a version for houses



Nominal efficiency (GUE A7/W50): ~1,5 NCV
 Seasonal efficiency measured (SGUE) : ~1,3 NCV
 depending on field conditions



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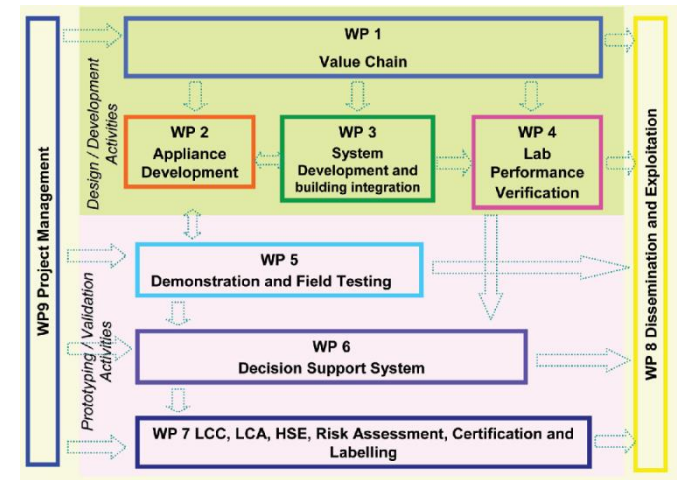
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A new GAHP within the European HEAT4U Project

- Development of an appliance with specifications suitable for the residential market (10 – 25 kW)
- Integration of the technology in existing heating and DHW architectures
- Development of a decision support system, enabling the assessment of the expected performance in different building operating conditions
- Field test assessment of the technology in 5 real buildings and dissemination activity to promote the awareness of the benefits of the GAHP technology



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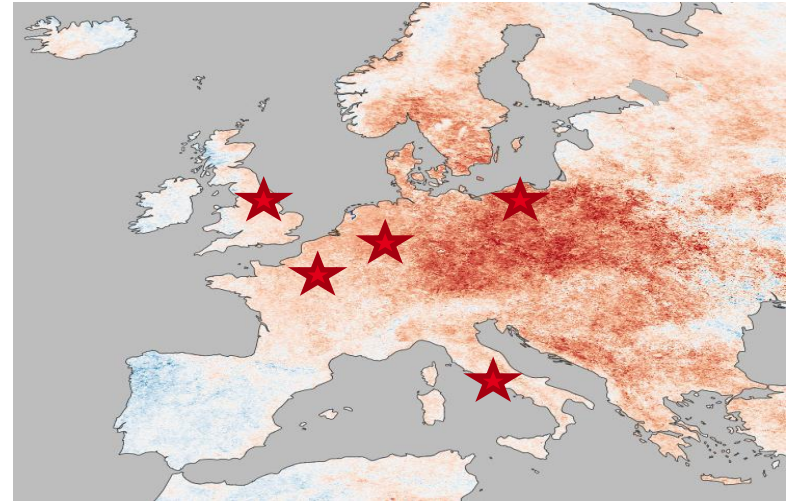


WP 5 : Five field tests in European houses

■ Objective :

- To measure the performance in real conditions
- To demonstrate the reliability
- To obtain field efficiencies in heating and domestic hot water modes for typical installations in existing houses over Europe
- To estimate the energy saving compared to the old installation
- To obtain first feedbacks from installers and inhabitants
- To suggest optimization in control, installation...

■ 5 sites representative of different climates and typical installations for existing dwellings



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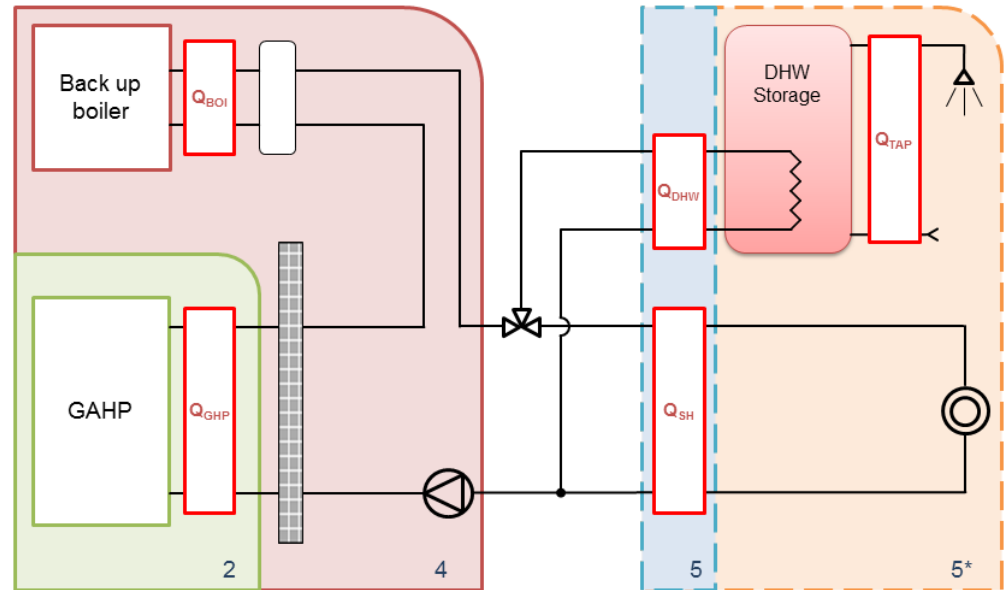


The measurement scheme is common to the 5 tests

- A common measurement protocol to the five field tests, in order to measure efficiency at different boundaries (The back-up boiler is only used in Poland)

The French installation

France



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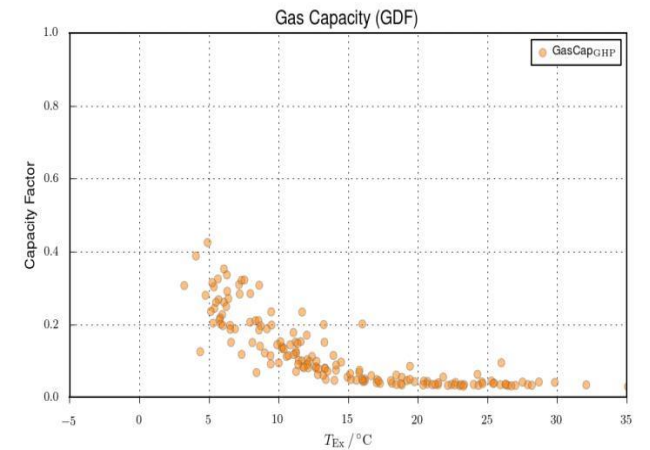
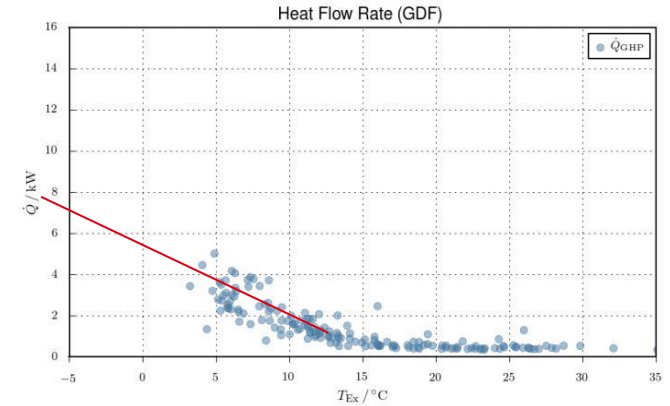
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The field tests have been impacted by several events

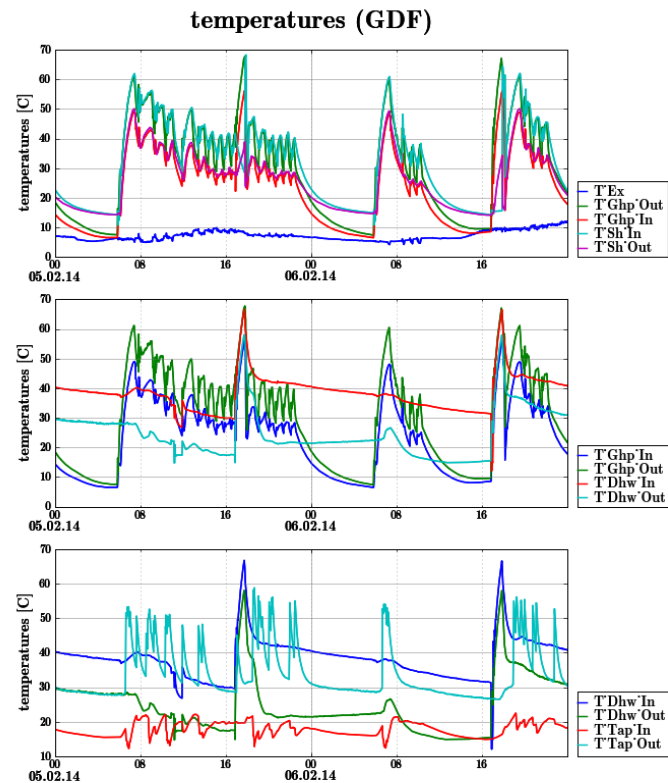
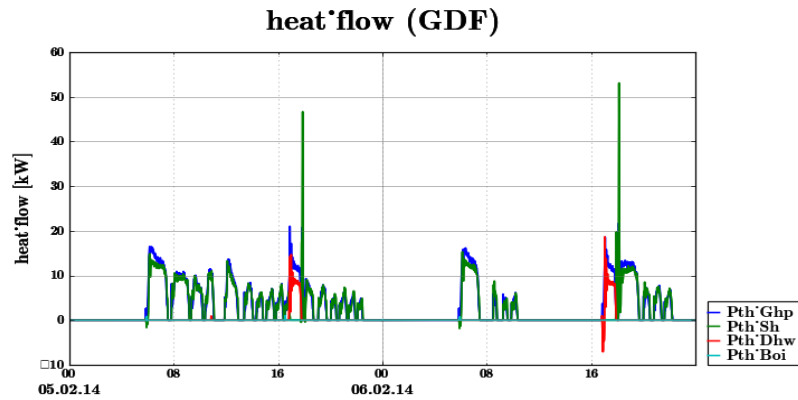
- Because of several events, the field tests have started later than planned
- Heating load have been over-estimated
- The climate have been particularly warm this winter : temperatures 5°C higher than normal seasonal temperatures
- The consequence is that the GAHP has run far from the maximum capacity that it is able to produce



Example of daily results in France

- Despite the low load, the efficiency is good, and comparable at different days

Date / occupation during day	Feb 5th / Yes	Feb 6th / No
Outdoor temperature : Text (°C)	7,0	7,3
Gas capacity (%)	27,9	18,6
GAHP outlet temperature : T GAHP out (°C)	44,4	45,5
Thermal capacity : GAHP (kW)	3,23	1,94
GUE2 (NCV)	1,19	1,17
GUE2 sh (NCV)	1,22	1,23



The efficiencies measured proves the interest of the technology

- Good performances even if the loads are low :
 - In heating mode, the daily efficiencies (GUE) measured are between 1,22 and 1,50 on net calorific value (NCV)
 - In heating+domestic hot water production (DHW) : GUE between 1,11 and 1,38 NCV
 - For domestic hot water production : up to 1,27 NCV
- The energy saving can be estimated to 30% compared to a condensing boiler, and more compared to an older solution



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An accomplished development of a reliable system

- A retrofit application, without any emission system modification
- A reliable technology, able to cover all the heating and DHW needs for average and warm European climate of typical existing houses
- The comfort of the inhabitants has been respected, and the noise level is low
- Some optimizations have been proposed :
 - On the control (to avoid heat loss for DHW in the summer)
 - To avoid heat loss in the hydraulics

→The HEAT4U project enable to obtain an accomplished system



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Thank you for your attention

