

FIRST REVIEW MEETING

HEAT4U PROJECT

July 19th 2013
Paris, GDF SUEZ

Gas Absorption Heat Pump solution
for existing residential buildings



Under the EU's Seventh Framework Programme for Research



The Consortium

Project
Coordinator



Project
Partner



The Advisory
Committee



First Review Meeting – 19th July 2013

WP 7

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Sergio Segreto (DAPP)



FIRST REVIEW MEETING HEAT4U PROJECT

**Gas Absorption Heat Pump solution
for existing residential buildings**

Alessandro Bozzolo, Project Manager

D'APPOLONIA



RINA
GROUP

Achievement of WP 7

Task 7.1 "Geographical Benchmark"

Task 7.2 "Risk Assessment during Manufacturing, Installation and Operation of GAHP system"

Task 7.3 "Life Cycle Analysis and Life Cycle Cost Analysis"

Task 7.4 "Development of Labelling and Certification Elements"

MONTHS		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36			
WP	TASK	YEAR 1												YEAR 2												YEAR 3														
WP7	LCC, LCA, HSE, Risk Assessment, Certification and Labelling																																							
7	Task 7.1: Geographical Benchmark																																							
7	Task 7.2: Risk assessment during manufacturing, installation and operation of GAHP system																																							
7	Task 7.3: Life Cycle Analysis and Life Cycle Cost analysis																																							
7	Task 7.4: Development of Labelling and Certification Elements																																							
	Milestones																																							MS4

**WP7 Start Date
Month 6**

**First Reporting Period
Month 18**

**WP7 End Date
Month 36**



FIRST REVIEW MEETING HEAT4U PROJECT

**Gas Absorption Heat Pump solution
for existing residential buildings**

Alessandro Bozzolo, Project Manager



RINA
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WP 7 - Task 7.1

OBJECTIVE

To understand the **geographical differences** in the rationale approach to the space heating systems as basis for the development of exploitation routes and business models

FOCUS

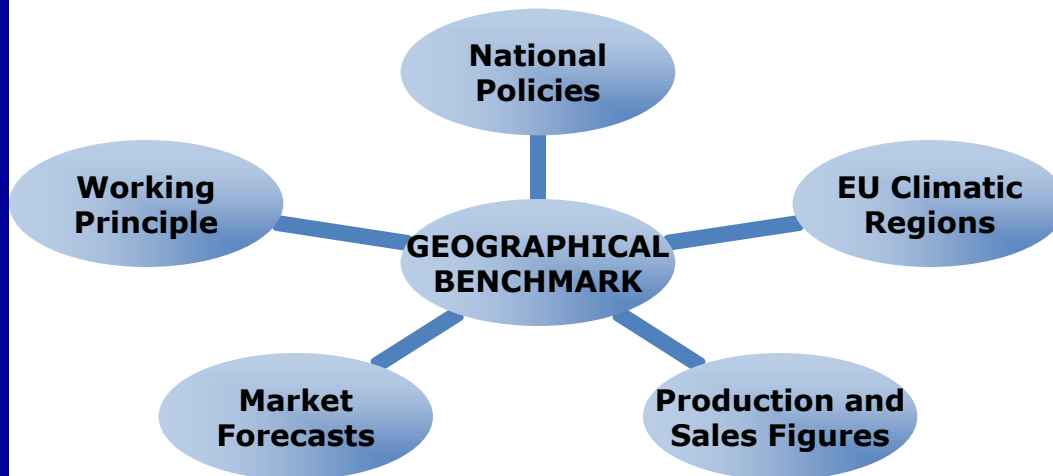
- Central heating systems supplying both **space heating and domestic hot water** (DHW)
- European residential sector constituted by **single-family** and **multi-family** housing units (4-50 kWth)



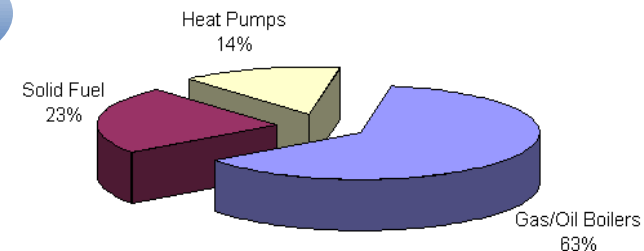
WP 7 - Task 7.1

CURRENT STATE / RESULTS

- A deep investigation has been conducted based on relevant information from EU stakeholders and associations (e.g., EHPA, COGEN, ESTIF), market reports and national policies
- Actual share of technologies and prospected scenarios in the short and long terms are derived per country and climatic region



EU27 (2010) - Central Heating Systems in Cold Climate Countries
[% EU Share based on units/k habitants]



WP 7 - Task 7.2

OBJECTIVE

To benchmark the intrinsic safety of a process / operation against its expected performance, allowing, at the same time, a quantifiable assessment of expected issues towards human health and safety.

FOCUS

- Identify the possible hazards (e.g. related to presence of harmful agents or to hazardous operations)
- Estimate the consequences of an accidental event
- Evaluate the harmful effects on people considering:
 - The actual quantities
 - The vulnerability of exposed "targets" (e.g. presence of people indoor/outdoor, proximity, duration of exposure, etc.)
- Evaluate the risk level of GAHP use in domestic market, and benchmark it against standard values.

WP 7 - Task 7.2

CURRENT STATE / RESULTS

- GAHP Technology was exhaustively explained (for the purpose of RA) and site visits to the production units were carried out. ROBUR provided all necessary information to start the RA activities.
- The methodological approach which will be followed to identify and address any potential concern related to human health and safety during the life cycle of the system has been prepared and it is circulating for comments
- The Verification of applicability of consequence modelling with "traditional" tools is undergoing
- The verification of the Vulnerability aspects was addressed and currently is undergoing a Fine-tuning of ad-hoc models for vulnerability calculation, also based on different exposure times and quantities.

WP 7 - Task 7.2

FURTHER STEPS / PLANNED ACTIVITIES

- Finalize the methodological approach with technical partner's comments and the modelling of vulnerability and release calculations
- Start performing analysis and calculate the consequences and effect, then estimate the impact on each vulnerable target also based on different exposure times and proximity of targets.
- Compare these results with the (parallel) series of Field-Tests carried out to aid and validate the analytical modelling
- Calculate and Assess the Risk and benchmark it against applicable criteria
- Define, based on the above, the risk level of GAHP use in domestic market
- **Deliverable by M24**

WP 7 - Task 7.3

OBJECTIVE

To assess the **energetic and environmental impact of the cradle-to-grave life of one 18 kWth GAHP** according to the ISO 14040:2006 and ISO 14044:2006

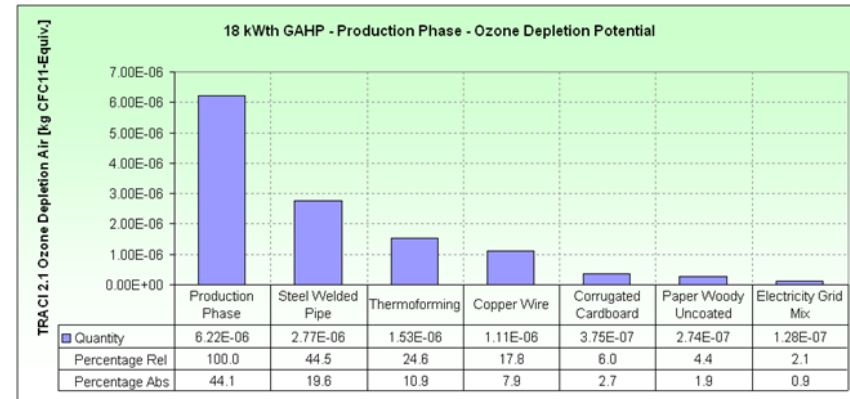
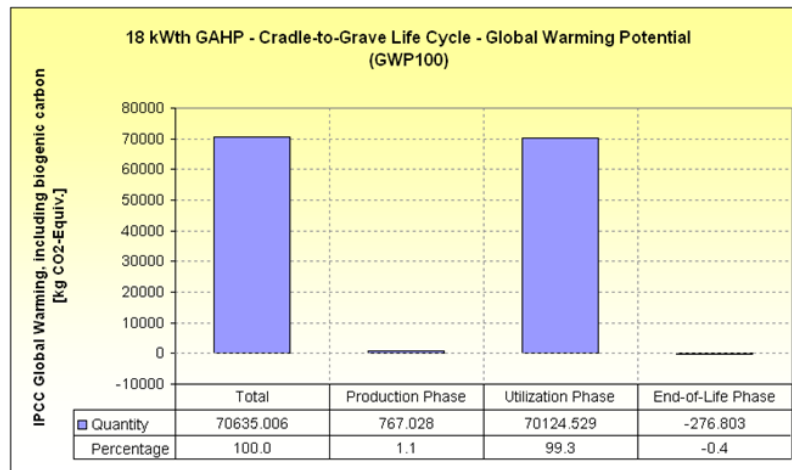
FOCUS

- Estimating the **relevance of the use phase** of the GAHP against its cradle-to-grave life in terms of energetic and environmental burdens
- Highlighting the eventual presence of **hot spots in the product value chain** for instance responsible of high levels of hazardous emissions or too energy demanding

WP 7 - Task 7.3

CURRENT STATE / RESULTS

- Assessment based on relevant **inputs from Partners**
- Diagrams of relevant **Impact Categories**
- **Utilization Phase** contributes the most to the potential impact of the product
- Contribution of the **processes in the production phase** to relevant Impact Categories



WP 7 - Task 7.3

FURTHER STEPS / PLANNED ACTIVITIES

- 2nd iteration with improved **accuracy** of data
- New LCA to **compare the energetic and environmental impact of selected competing technologies**. The technologies under comparison will be:
 - ✓ Air-Water Gas Absorption Heat Pump
 - ✓ Air-Water Electrical Heat Pump
 - ✓ Condensing Gas-fired Boiler coupled to Solar Thermal Collectors
- LCC to **compare the Capital Expenditure (CAPEX) and Operating Expenditure (OPEX) costs of the GAHP** from the users' point of view **against selected competing technologies**
- **Deliverable by M34**

WP 7 - Task 7.4

OBJECTIVE

To support the **certification and homologation of the 18 kWth GAHP** developed in the project

FOCUS

- **European requirements** directly applicable to GAHP products
- **European standards and incentive programs** that could be indirectly affected by the penetration of the GAHP technology into the EU markets
- **National requirements** directly applicable to GAHP products

WP 7 - Task 7.4

CURRENT STATE / RESULTS

- Considering the **European directives**, within the framework of *Energy related Products* (ErPs) the **approach for certification** is based on **two different levels** which are being deeply studied

Eco Design Directive



Minimum energy efficiency requirements for ErPs

Energy Labelling Directive



Product efficiency calculation with respect to primary energy

- The **harmonization process** imposed by new regulations **between ErP directives** and **current standards for absorption equipment** (EN 12309) is being also considered

WP 7 - Task 7.4

FURTHER STEPS / PLANNED ACTIVITIES

- In order to support the **penetration into the differentiated European markets, GAHP systems certification will be in accordance with national standards** and incentive programs of the countries where the commercial exploitation is foreseen (*examples are listed below*)

Italy: EN 11300 and
Conto Energia

Germany: BAFA, EnEV

France: Thermal
Regulation (RT2012)

UK: Renewable Heating
Incentives (RHI)

- **Deliverable by M30**