Greenhouse gas emissions must be reduced by 45% by 2030 compared with their 2010 level to limit global warming to 1.5°C.

1Intergovernmental Panel on Climate Change (IPCC), October 8, 2018
HEATING SYSTEMS: A MAJOR DRIVER OF ENERGY TRANSITION

≈ 50% of European boilers are older than 25 years\textsuperscript{1}

Home heating accounts for
≈ 25% of worldwide energy consumption\textsuperscript{2}

\textsuperscript{1}2016 European Commission Report (An EU Strategy on Heating and Cooling)
\textsuperscript{2}Data from International Energy Agency - https://iea.org/renewables2018/heat
BOOSTHEAT
BE PART OF THE GAS VECTOR

8 Years
OF RESEARCH & DEVELOPMENT

7 Families
OF PATENTS

KEY PARTNERS
- Supported by well known partners

FINANCE
€81 million
raised since foundation in 2011

Supported by well known partners:
- HOLDI GAZ
- FLUXYS
- GRDF
- Butagaz
- dalkia GROUPE EDF
- innogy e.on
- NGTC
- neea
- GTI TECHNOLOGY INSTITUTE
BOOSTHEAT
KEY FIGURES

❖ Set up: 2011

❖ Activity: R744 CO₂ Gas heat pump manufacturer

❖ Installations (2021): +70 (France, Germany, Sw)

❖ Sales (2019): 400 units during 3 months

❖ Employees (2021): 50

❖ Implantation: Lyon (France)

❖ High efficiency: 188% in aerothermal application (A7)
  229% in geothermal application (W10)
BOOSTHEAT’S TECHNOLOGY
TECHNOLOGY BREAKTHROUGH FOR HEATING

With its thermal compression, BOOSTHEAT sets a new standard for heat pumps.
COMPRESSION THERMIQUE BY BOOSTHEAT

OPTIMIZATION

Gas combustion activates the thermal compression to power a heap pump cycle.

ADVANTAGES

PERFORMANCE
Engine and compressor in one product

RELIABILITY
No oil, Very low wear, No maintenance

ENV. IMPACT
Natural coolant R744 (CO₂)
GWP = 1
# BOOSTHEAT TECHNOLOGY COMPARISON

<table>
<thead>
<tr>
<th></th>
<th>Electric HP</th>
<th>Absorption HP</th>
<th>Boostheat Thermal compression HP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compression activation</strong></td>
<td>Electric engine</td>
<td>Physical reaction</td>
<td>External temperature only</td>
</tr>
<tr>
<td><strong>Maturity</strong></td>
<td>Old with big volumes</td>
<td>Old with small volumes</td>
<td>New with demonstrations</td>
</tr>
<tr>
<td><strong>Env. impact</strong></td>
<td>HFCs</td>
<td>Ammoniac</td>
<td>Weight</td>
</tr>
<tr>
<td><strong>Inertia</strong></td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>
BOOSTHEAT’S UNIQUE PRODUCT
2020: NEW OPTIMIZATION CYCLE OF THE HP

Thermal power immediately available for heating and DHW
### Seasonal Gas Utilization Efficiency for Water 35°C (95°F)

<table>
<thead>
<tr>
<th>Ext. Temp. °C</th>
<th>Heating Curve °C/°F</th>
<th>Heat Output kW</th>
<th>Heat Output HP kW</th>
<th>Gas Input HP kW</th>
<th>GUE HP %</th>
<th>Heat Output Boiler kW</th>
<th>Gas Input Boiler kW</th>
<th>GUE Boiler %</th>
<th>GUE BH20 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10</td>
<td>35 / 28</td>
<td>20</td>
<td>6.49</td>
<td>4.42</td>
<td>147%</td>
<td>13.5</td>
<td>12.9</td>
<td>104%</td>
<td>115%</td>
</tr>
<tr>
<td>-7</td>
<td>34 / 27</td>
<td>17.7</td>
<td>7.46</td>
<td>4.49</td>
<td>153%</td>
<td>10.2</td>
<td>9.72</td>
<td>105%</td>
<td>121%</td>
</tr>
<tr>
<td>2</td>
<td>30 / 25</td>
<td>10.8</td>
<td>10.4</td>
<td>6.09</td>
<td>170%</td>
<td>0.40</td>
<td>0.37</td>
<td>108%</td>
<td>167%</td>
</tr>
<tr>
<td>7</td>
<td>27 / 23</td>
<td>6.9</td>
<td>6.92</td>
<td>3.60</td>
<td>193%</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>193%</td>
</tr>
<tr>
<td>12</td>
<td>24 / 21</td>
<td>3.1</td>
<td>3.08</td>
<td>1.96</td>
<td>157%</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>157%</td>
</tr>
</tbody>
</table>

**Seasonal Gas Utilization Efficiency (SGUE)**: 159%

---

### Seasonal Gas Utilization Efficiency for Water 55°C (131°F)

<table>
<thead>
<tr>
<th>Ext. Temp. °C</th>
<th>Heating Curve °C/°F</th>
<th>Heat Output kW</th>
<th>Heat Output HP kW</th>
<th>Gas Input HP kW</th>
<th>GUE HP %</th>
<th>Heat Output Boiler kW</th>
<th>Gas Input Boiler kW</th>
<th>GUE Boiler %</th>
<th>GUE BH20 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10</td>
<td>55 / 41</td>
<td>20</td>
<td>7.25</td>
<td>6.39</td>
<td>113%</td>
<td>12.8</td>
<td>12.9</td>
<td>99%</td>
<td>104%</td>
</tr>
<tr>
<td>-7</td>
<td>52 / 39</td>
<td>17.7</td>
<td>7.43</td>
<td>6.04</td>
<td>123%</td>
<td>10.3</td>
<td>10.3</td>
<td>100%</td>
<td>109%</td>
</tr>
<tr>
<td>2</td>
<td>42 / 33</td>
<td>10.8</td>
<td>7.98</td>
<td>5.25</td>
<td>152%</td>
<td>2.79</td>
<td>2.69</td>
<td>104%</td>
<td>136%</td>
</tr>
<tr>
<td>7</td>
<td>36 / 29</td>
<td>6.9</td>
<td>6.87</td>
<td>4.15</td>
<td>166%</td>
<td>0.049</td>
<td>0.047</td>
<td>105%</td>
<td>165%</td>
</tr>
<tr>
<td>12</td>
<td>30 / 25</td>
<td>3.1</td>
<td>3.08</td>
<td>2.37</td>
<td>130%</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>130%</td>
</tr>
</tbody>
</table>

**Seasonal Gas Utilization Efficiency**: 135%
READY TO PRODUCE FOR EUROPE

Operational manufacturing facility with annual production capacity of up to 20,000 HP units
BOOSTHEAT SITUATION

A FIRST SUCCESS WITH THE COMMERCIAL LAUNCH WITH CRITICAL PARTNERS AND SKILLED PARTNERS IN THE EUROPEAN HEATING MARKET FIELD

- **400** orders during 3 months only
- **100** installers « ready to install »
- **+70** installations monitored by BOOSTHEAT and partners
- **6** strong collaborations with important technological institutes
THANK YOU
FOR YOUR TIME

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