DOMESTIC HOT WATER
HEAT PUMPS

TASK 1:
MARKET OVERVIEW

FRENCH REPORT

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2016
CONTENTS

- Main regulation / incentives scheme
  - RT2012
  - CITE

- Hot Water Systems in France
  - Domestic Hot Water Use
  - Stock 2014
  - Penetration rates per building type

- Heat Pump Water Heaters in France
  - French Market 2015
  - Market trends
  - Available products
  - Main brands in France
RT 2012 in residential new buildings

- Average coefficient of surface consumption:
  \[ \text{Cep}_\text{max} = 50 \text{kWh}_{\text{pe}}/m^2/a \]

- 5 kWh\(_{\text{pe}}/m^2/a\) produced by renewables for houses
MAIN REGULATIONS / INCENTIVES

Crédit d’Impôt « Transition Énergétique »

- Tax credit scheme for retrofit of, among others, hot water systems in existing buildings (owned for 2 years or more)

- Tax credit of 30% of the capital cost for HPWHs if their performances are higher than minimum values

<table>
<thead>
<tr>
<th>Load Profile</th>
<th>Minimum PE Performance (EN16147)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>95%</td>
</tr>
<tr>
<td>L</td>
<td>100%</td>
</tr>
<tr>
<td>XL</td>
<td>110%</td>
</tr>
</tbody>
</table>
HOT WATER SYSTEMS IN FRANCE

Domestic Hot Water Use

Average of 57 l/pers/day

But a lot of disparities!

<table>
<thead>
<tr>
<th>Nb of persons in the dwelling</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nb of sites</td>
<td>16</td>
<td>45</td>
<td>28</td>
<td>50</td>
<td>17</td>
</tr>
<tr>
<td>Average consumption per person (l/day)</td>
<td>95 ±30</td>
<td>65 ±25</td>
<td>50 ±20</td>
<td>45 ±20</td>
<td>45 ±20</td>
</tr>
<tr>
<td>Average consumption per dwelling (l/day)</td>
<td>95 ±30</td>
<td>125 ±50</td>
<td>155±50</td>
<td>175±70</td>
<td>220±105</td>
</tr>
</tbody>
</table>
HOT WATER SYSTEMS IN FRANCE
Stock 2014

French stock of hot water systems in 2014

- HP WATER HEATERS: 0.23
- THERMAL SOLAR WATER HEATERS: 1.6
- GAS WATER HEATERS: 1.25
- OIL BOILERS: 3.25
- GAS BOILERS: 12.55
- ELECTRICAL WATER HEATERS: 15.6

in million units
HOT WATER SYSTEMS IN FRANCE
Penetration rates per building type

Existing collective housing

- Electrical Water Heaters: 49%
- Oil boilers: 4%
- Gas water heaters + gas boilers: 7%
- Thermal solar water heaters: 0%
- HP water heaters: 39%
- Double-service HP: 0%
- Heat network: 1%
HOT WATER SYSTEMS IN FRANCE
Penetration rates per building type

New Individual Houses

- HP Water Heaters: 63%
- Double-service HP: 14%
- Solar Water Heaters: 17%
- Gas boilers: 3%
- Hybrid HP: 2%
- Others: 1%
### HOT WATER SYSTEMS IN FRANCE
#### Penetration rates per building type

#### NEW BUILT INDIVIDUAL HOUSES

<table>
<thead>
<tr>
<th>Hot Water System</th>
<th>Gas Boiler</th>
<th>Hybrid HP</th>
<th>A/W HP</th>
<th>A/A HP</th>
<th>Wood Stove</th>
<th>Elec. heating</th>
<th>WHOLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP Water Heaters</td>
<td>60</td>
<td>43</td>
<td>84</td>
<td>91</td>
<td>74</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Double-service HP</td>
<td></td>
<td>54</td>
<td>8</td>
<td></td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar Water Heaters</td>
<td>33</td>
<td>3</td>
<td>8</td>
<td>9</td>
<td>26</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Gas boilers</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Hybrid HP</td>
<td></td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
HPWHs IN FRANCE
French Market 2015

New / Existing Housing Distribution

<table>
<thead>
<tr>
<th>Year</th>
<th>New Individual Houses</th>
<th>Existing Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>38.0%</td>
<td>62.0%</td>
</tr>
<tr>
<td>2014</td>
<td>62.5%</td>
<td>37.5%</td>
</tr>
<tr>
<td>2015</td>
<td>60.0%</td>
<td>40.0%</td>
</tr>
</tbody>
</table>

New Individual Houses | Existing Housing
HPWHs IN FRANCE
French Market 2015

SALES DISTRIBUTION PER COLD SOURCE

**Sales Distribution in 2012**
- Ambient air: 9%
- Outside air (duct): 3%
- Outside air (split): 22%
- Exhaust air: 55%
- Others: 11%

**Sales Distribution in 2015**
- Ambient air: 10%
- Outside air (duct): 3%
- Outside air (split): 29%
- Exhaust air: 21%
- Others: 37%
HPWHs IN FRANCE
Market Trends

NEW INDIVIDUAL HOUSES

• Evolution of HPWHs depends on the rebound of building sector;
• Good increase of the building sector in the 1st semester of 2016;
• Expectations of 60-65000 units sold in 2020 in new individual houses (vs about 45-50000 in 2015)

EXISTING BUILDINGS

Evolution of HPWHs depends on:
• the retrofit of electrical water heaters (1.3 million per year)
• the subsidies scheme CITE
Price of a HPWH in France: between 2500 and 3500 € ATI, installed
AMBIENT AIR PRODUCTS
79 certified products

REFRIGERANT FLUID AMBIENT AIR

R134a 100%

Condenser type ambient air

External 22%

Wrap-around 78%

COP DISTRIBUTION AMBIENT AIR

Mean: 2.520127
St. Dev: 0.219155

OUP at 7°C (EN 16147)
HPWHs IN FRANCE
Certified Products

OUTSIDE AIR PRODUCTS
248 certified products

REFRIGERANT FLUID EXTERNAL AIR

CONDENSER TYPE EXTERNAL AIR

COP DISTRIBUTION EXTERNAL AIR

Mean: 2.78915
St. Dev: 0.295141
HPWHs IN FRANCE
Certified Products

EXHAUST AIR PRODUCTS
22 certified products

Refrigerant fluid exhaust air
- R744 29%
- R134a 71%

Condenser type exhaust air
- External 33%
- Wrap around 59%
- Other 8%

COP DISTRIBUTION EXHAUST AIR
Mean: 2.792222
St. Dev: 0.299769
HPWHs IN FRANCE
Main Brands

- Groupe Atlantic: 40 à 50%
- Ariston Thermo Group: ± 15%
- BDR Thermae: ± 12%
- Groupe Muller: ± 10%
- Aldes: ± 5%
- Bosch Thermotechnik: ± 4%
- Vaillant Group: ± 3%
- Autres: ± 7%

Total: 100%
THANK YOU FOR YOUR ATTENTION