Renewables, Energy efficiency and low carbon energy

Impact of DryFiciency for industrial strategy and policy

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Photo credits: Danfoss
The European Heat Pump Association aisbl / founded 2000

146 Members
- Heat pump manufacturers
- Component manufacturers
- National associations
- Consultants
- Research & test institutes

22 countries represented

International cooperation
- CECA, IEA, IEA HPC, IRENA, HPCJ

Vision
In a fully decarbonised Europe, heat-pump technologies are the number one heating and cooling solution, being a core enabler for a renewable, sustainable and smart energy system.
Heat pump benefits 2020
Based on 14.8 million heat pumps installed

Thermal capacity
120 GW

Useful energy
250 TWh

Renewable energy
159 TWh

Fossil final energy savings
203 TWh

CO₂ savings
40.6 Mt

Clean air
No PM at point of operation

Auxiliary energy

If auxiliary energy is green, heat pumps provide 100% green heat

Demand response potential
Up to 3.4 TWh

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Heat pump manufacturing happens across Europe

- 165+ manufacturing sites
- SME based
- Often located in rural/remote areas
- Turnover of 8.2 billion €
Employment impact of heat pumps (89 784 FTE)

- Heat pump manufacturing: 37% (33k jobs)
- Installing of HP: 29.5% (26k jobs)
- Component manufacturing: 18.5% (17k jobs)
- Service and Maintenance: 15% (14k jobs)
Market growth ‘10 – ’20 | HP stock\(^{2020}\): 14.8 mill. installed

EU-28 building stock: 115 – 120 mill. buildings
Industrial HP?
Numbers not integrated with the rest of statistics

<table>
<thead>
<tr>
<th>Power Range</th>
<th>Number</th>
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</thead>
<tbody>
<tr>
<td>Air to Air</td>
<td>12081</td>
</tr>
<tr>
<td>Air to Water</td>
<td>3555</td>
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<tr>
<td>Brine to Water</td>
<td>1207</td>
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<td>Water to Air</td>
<td>1</td>
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<tr>
<td>Water to Water</td>
<td>942</td>
</tr>
<tr>
<td>Grand Total</td>
<td>17786</td>
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</tbody>
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energy demand for heating residential buildings in Europe

2 625 TWh\textsubscript{2015} 


energy demand for industry in Europe

2 950 TWh\textsubscript{2015/2019} 
1958 TWh for heat 
724 TWh for HP (37%)

Market share development:
HP in total heater sales

What about industry?

HP share ➔ 50% before 2035?
RES in heating and cooling (Eurostat Shares)

1st RES D
+4,2pp
2nd RES D

< 1pp annual increase of renewable share
## EU Energy systems integration strategy

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 15 mio office &amp; commercial buildings</td>
<td>65%</td>
<td></td>
</tr>
<tr>
<td>15 mio residential single family units</td>
<td>90 mio</td>
<td>40%</td>
</tr>
<tr>
<td>15 mio residential multi family units</td>
<td>42 mio</td>
<td></td>
</tr>
<tr>
<td>+ industry</td>
<td>approx. 200 TWh</td>
<td>0,1 mio</td>
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</tbody>
</table>

*todays HP stock x 4*
By 2050, over 85% of buildings are zero-carbon-ready, reducing average useful heating intensity by 75%, with heat pumps meeting over half of heating needs.

For industrial heat pumps: +500 MW per months until '50
Large Heat Pumps: An industry for an industry, in industry for an industrialised Europe

By closing energy cycles, using excess energy of one service as the resource of another and/or using renewable sources, heat pumps help position the industry at the heart of the EU energy transition and the decarbonisation of industrial processes.
Heat pumps in industrial applications (and district systems) means „closing energy cycles“

- Include renewable energy
- Make use of waste heat
Waste heat and process heat – a comparison

Heat pumps do the lifting

Barriers to wider use of large heat pumps

• Energy price ratio: gas/electricity
• Process industry requests for short ROI
• Competition from existing heat sources
• Possible feed-in temperature from HP too low
• Integration of HP in existing process difficult/expensive
• Doubts with regards to security and reliability
• Limited knowledge on the match between HP and process demands with key decision makers
What do we need?

Industry is ready, but...

- Do we have enough planners?
- Do we have enough engineers?
- Is financing a problem?
- R&D
  - Institutions
  - Scientists
  - Programs/projects

Policy has recognized, but ...

- Electricity taxation
- CO₂ price signal
- Fossil fuel subsidies
- **Industrial subsidies**

➡️ An industrialisation opportunity