Heat pumps – key technology to achieving Europe’s energy and climate goals: 2017 Market development and outlook

Thomas Nowak
Secretary General EHPA
thomas.nowak@ehpa.org
+49 176 6320 1140
twitter: ehpabrussels
Your presenter this afternoon

- Thomas Nowak
- Secretary General of EHPA
- Background in Economics, business administration & IT
- Strong believer in 100% RES
- Owner of a house with a heat pump, photovoltaic panels and a ventilation system
European Heat Pump Association (EHPA)

• 123 members from 22 countries (status 10/2018)
  – Heat pump manufacturers
  – Component manufacturers
  – National associations
  – Consultants
  – Research & test institutes

• EU-wide representative of heat pump industry

• Registered in Brussels

EHPA represents the majority of players in the EU heat pump industry!
Talking about heat pumps in Europe means ...

- Heating
- Cooling
- Hot water

- For all cold, average, warm climates

- Residential
- Commercial
- Industrial applications

- Alone or in combination (hybrid)
HP always provide **heating** and **cooling** in parallel

20-33%

Auxiliary energy
electricity/gas
can be RES, too

Air
Water
Ground

**Ambient**
energy
cold

Discharge to
Environment
(air/water)

OR

Use in
buildings
processes

66-80%

Discharge or use

**Recovered**
energy

**Heat pump**

**Energy source** ➔ This side is **cooled**

**Energy sink** ➔ This side is **heated**
Is it a heatpump? Is it an air conditioner? Is it a dehumidifier? Is it a hot water generator?

Integration of services based on the refrigerant cycle
Heat pumps balance a “high-RES-electricity grid“

Source: SMA
Is it a heatpump? Is it an air conditioner? Is it a dehumidifier? Is it a hot water generator? Or is it a electric grid stabilizer?

- heating
- Hot water
- refrigeration
- cooling
- dehumidification

Integration of services based on the refrigerant cycle

Demand side flexibility

Climate

Warm

colder
Market growth ‘05 – ’17 | HP stock\textsuperscript{2017}: 10.6 mill. installed

Heat pumps – key technology to achieving Europe’s energy and climate goals | Thomas Nowak | 18.10.18
Growth of sanitary hot water heat pumps | 2017: 873k open the floor for HP deployment

Heat pumps – key technology to achieving Europe's energy and climate goals | Thomas Nowak | 18.10.18
HP sales in 2017 per type

- Reversible air-air w/heating
- Reversible other
- Sanitary hot water
- Exhaust air
- H-ground/water
- H-air/water

Stats.ehpa.org

Heat pumps – key technology to achieving Europe’s energy and climate goals | Thomas Nowak | 18.10.18
The EU leaderboard of annual HP sales 2017

Huge untapped potential in large heating and cooling markets ...

EU total: 1.1m
Heat pump benefits 2017
Based on 10.6 million heat pumps installed

Renewable energy
116 TWh

Final energy savings
148 TWh

CO₂ savings
29.8 Mt

Clean air
No PM at point of operation

Demand response potential
Up to 3.2 TWh
### Units sold per 1000 households in 2017

<table>
<thead>
<tr>
<th>Country</th>
<th>Units Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>34.3</td>
</tr>
<tr>
<td>EE</td>
<td>29.3</td>
</tr>
<tr>
<td>FI</td>
<td>23.7</td>
</tr>
<tr>
<td>SE</td>
<td>22.7</td>
</tr>
<tr>
<td>DK</td>
<td>18.5</td>
</tr>
<tr>
<td>CH</td>
<td>8.6</td>
</tr>
<tr>
<td>FR</td>
<td>8.5</td>
</tr>
<tr>
<td>IT</td>
<td>6.9</td>
</tr>
<tr>
<td>AT</td>
<td>6.9</td>
</tr>
<tr>
<td>ES</td>
<td>5.8</td>
</tr>
<tr>
<td>PT</td>
<td>3.5</td>
</tr>
<tr>
<td>CZ</td>
<td>3.4</td>
</tr>
<tr>
<td>IE</td>
<td>2.9</td>
</tr>
<tr>
<td>BE</td>
<td>2.8</td>
</tr>
<tr>
<td>NL</td>
<td>2.7</td>
</tr>
<tr>
<td>DE</td>
<td>2.3</td>
</tr>
<tr>
<td>PL</td>
<td>1.9</td>
</tr>
<tr>
<td>SK</td>
<td>1.5</td>
</tr>
<tr>
<td>LT</td>
<td>1.3</td>
</tr>
<tr>
<td>UK</td>
<td>0.65</td>
</tr>
<tr>
<td>HU</td>
<td>0.19</td>
</tr>
</tbody>
</table>

**Huge untapped potential for HP in the rest of Europe**
If Norway was everywhere...

- Potential of an increase in sales by factor 5 to 6
- Is the value chain ready?
RES in heating and cooling (based on Eurostat Shares)

http://ec.europa.eu/eurostat/de/web/energy/data/shares
Heat pumps in the EU boiler market

Boiler data from BRG Building solutions

5.6 million boilers

- 962,000 heating heat pumps (17%)

7.8 million sanitary hot water

- 138,000 dedicated hot water heat pumps (1.7%)

➔ Use of fossil energy for heating dominates in Europe!

➔ If Europe (and the world) wants to decarbonise, heat pumps are a perfect option
New 2030 political targets

<table>
<thead>
<tr>
<th>Renewable energy (binding)</th>
<th>Energy performance of buildings</th>
<th>Energy Efficiency (indicative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32%</td>
<td>• „buildings as active nodes in the energy grid“</td>
<td></td>
</tr>
<tr>
<td>+1.3pp</td>
<td>• Requests MS to set up a long term renovation strategy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>To be achieved with renewable and waste energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>32.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual decrease of final energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-1.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New primary energy factor: 2.1</td>
<td></td>
</tr>
</tbody>
</table>

➡️ Implementation will benefit heat pump technology
Regulation on energy union governance

Recital 3: „The EU should prepare the shift to a highly energy efficient and fully renewables–based energy system at the latest by 2050 and cover 5 key dimensions: energy security, internal energy market, energy efficiency, decarbonisation and research/innovation/competitiveness”
Whats stopping us?
Energy price ratios across Europe
European energy taxation does not help

Difference of taxation in eurocent

Positive values = tax burden on electricity is higher
Fossil fuel subsidies still exist in Europe

- **CAN Europe**\textsubscript{2017}: 122 billion € / year (in 14 EU countries)
- **IEA**\textsubscript{2013}: fossil fuel consumption subsidies USD 548 billion
- **OECD**\textsubscript{2013} estimates total fossil fuel support
  - at USD 160-200 billion/year for OECD and BRIICS states
  - 39 billion for EU member states
HP challenge: What if Norway was really everywhere? Is the HP value chain ready for a mass market?

• Solutions for the renovation sector, multi-family buildings, industrial applications, district energy
• Solutions for sector coupling and demand side flexibility
• Manufacturing capacity and availability of components (including F-gas)?
• Knowledgeable planners and architects?
• Installation capacity?
• Building codes?
• Financing and business models
A 100% renewable society is possible – by 2050

Join us at www.decarbheat.eu