

2nd Delta-ee Heat Pumps & Utilities Roundtable

In association with the European Heat Pump Association

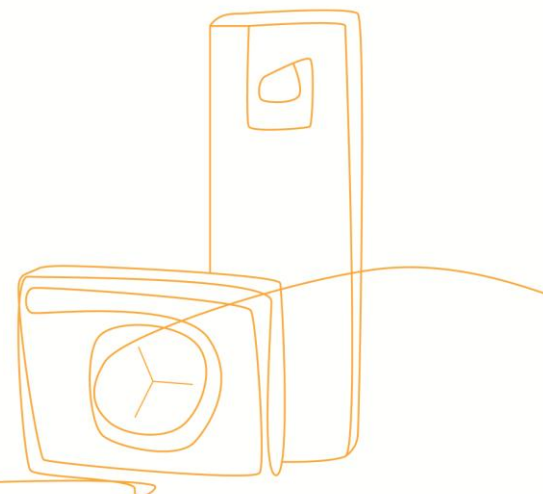
Summary and Highlights

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40 delegates from Europe's leading utilities, major heat pump manufacturers, and selected key stakeholders, met to explore how the heat pump market will develop and how synergies would evolve with energy markets.

Key topics included smart heat pumps; growing interest from utilities in flexibility and the customer side of the meter; and opportunities from hybrid heat pumps. In this document we summarise some of the highlights.



Organisations attending included:

- ▶ AIT Deutschland
- ▶ BDR Thermea
- ▶ Bosch
- ▶ British Gas
- ▶ CAREL
- ▶ Daikin
- ▶ Du Pont de Nemours (Deutschland) GmbH
- ▶ DuPont Fluorochemicals
- ▶ E.ON New Build & Technology
- ▶ E.ON New Build & Technology
- ▶ EDF
- ▶ EDF Energy
- ▶ EDF Energy
- ▶ EHPA
- ▶ EHPA
- ▶ Energy Technologies Institute
- ▶ Enexis B.V.
- ▶ Eurelectric
- ▶ FG Arbonia-Forster-Holding AG
- ▶ Fortum Power & Heat
- ▶ Fraunhofer Institute
- ▶ GDF Suez
- ▶ GDF Suez
- ▶ Groupe Atlantic
- ▶ Insero Energy
- ▶ Laborelec / GDF Suez
- ▶ Marcogaz
- ▶ Netinium
- ▶ NIBE
- ▶ Panasonic
- ▶ Sanden
- ▶ Saunier Duval
- ▶ Technolution
- ▶ Thermolift
- ▶ Vaillant
- ▶ Yanmar

Delta-ee's Heat Pump Research Service

Our heat pump expertise addresses technology development, policy impact and customer insight, for both residential and commercial scale heat pumps. We assist our clients in understanding how heat pump markets develop, how to capture the market opportunities, and what emerging business models can support this growth. Our heat pump research and consulting capability includes:

- ▶ Analysis of the potential for emerging heat pump technologies including smart heat pumps, gas heat pumps and hybrid heat pumps
- ▶ Market analysis and forecasts for major and emerging European and global heat pump markets
- ▶ Analysis of the impact of policy – both national incentives and regulations, and major EU-Level policy drivers

Annual subscription to the Service is £8,500. Proceedings from the Roundtable are also available for purchase.

For further information contact Lindsay Sugden (Research Manager – Heat Pumps), lindsay.sugden@delta-ee.com, +44 (0)131 625 1006.

Delta-ee Research Services

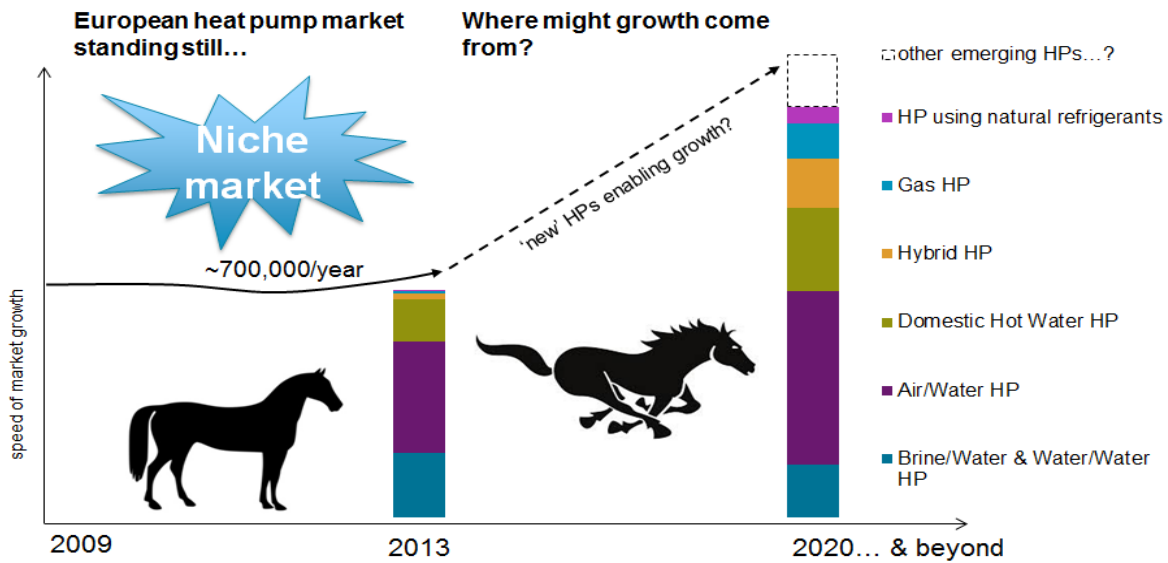
High quality information, insight and support from sector experts

- ▶ The Microgen Insight Service
- ▶ Micro-CHP Research Service
- ▶ Heat Pump Research Service
- ▶ Pathways Tool & Roadmap Service
- ▶ Distributed Power Service
- ▶ Connected Homes Service

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Session 1: Market context and outlook for heat pumps

Lindsay Sugden, Heat Pump Research Manager at **Delta-ee**, set out the current status and future outlook for European heat pump markets. She identified how the overall market for hydronic heat pumps has struggled to grow significantly in recent years, in contrast to the strong growth from domestic hot water (DHW) heat pumps. It is these emerging solutions such as DHW and hybrids, which in her view, offer potential to be future growth engines for the industry.



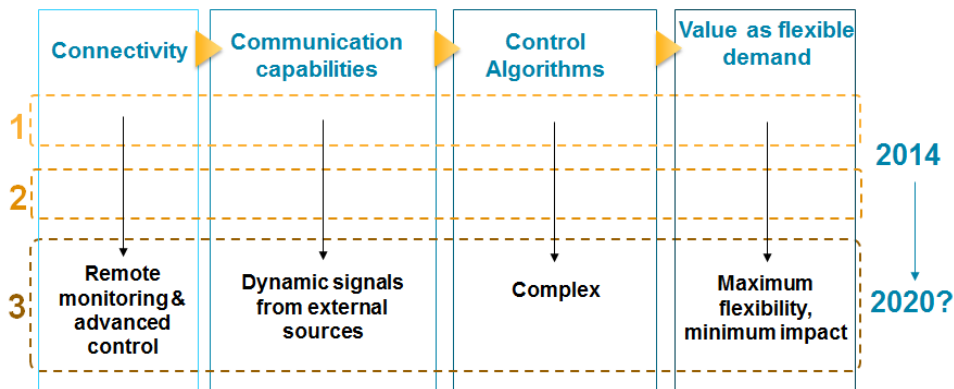
Thomas Nowak, Secretary General of the **European Heat Pump Association** then introduced the key issues and perspectives from the heat pump industry, examining the role of heat pumps to meet 2020 targets and Europe’s longer term energy goals. He also presented his “wish list” to the industry, comprising:

- ▶ Building trust in the fact that heat pump products work (and ensuring they do)
- ▶ Reaching the heat pump industry for the mass market – service offerings, lower total cost of ownership, and compact and integrated units

Koen Noyens from **EURELECTRIC** explained how the European power sector is undergoing one of the most profound changes in its history, with the core business of utilities shrinking. He highlighted, however, opportunities for utilities to innovate and grow their businesses around new customer service offering, with ‘flexibility’ a key part of this opportunities. Heat pumps, in his opinion, have a key role to play in this new potential future for utilities.

Session 2: Smart heat pumps: do we need to wait for smart grids?

Lindsay Sugden, Heat Pumps Research Manager at **Delta-ee**, introduced the session by providing an overview of the smart heat pump space, including Delta-ee’s framework for smart heat pumps, below.



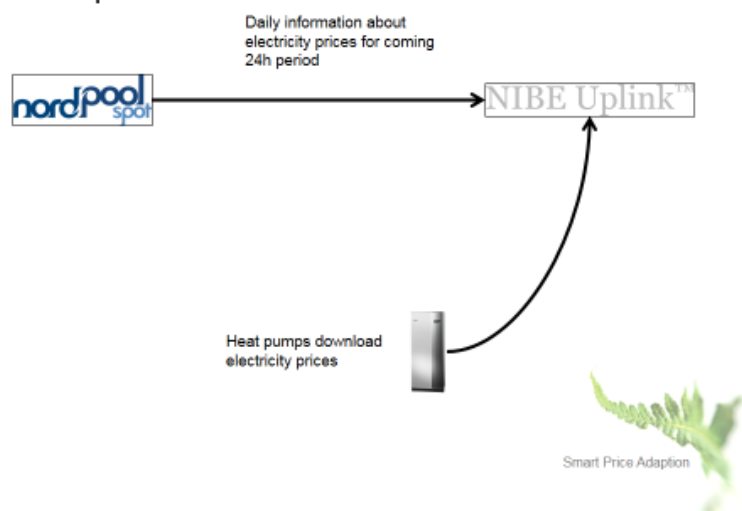
Peter Jovic from **NIBE** presented NIBE's new smart heat pump operation, taking advantage of hourly residential electricity prices now available in Sweden (on the right).

He explained how they've seen this reduce bills by >25%, and how their system could also, in the future, connect to other household appliances.

This connectivity also gives them a wealth of operational data.

Martijn van Huijkelom, Innovator at **Enexis**, a Dutch distribution network operator, explained how they are using smart heat pumps in one of their innovation projects. In a trial of 38 homes, heat pumps and other technologies will be used alongside time of use tariffs – the goal being to reduce peak electricity demand in a way that saves customers money and maintains their comfort levels.

Concept



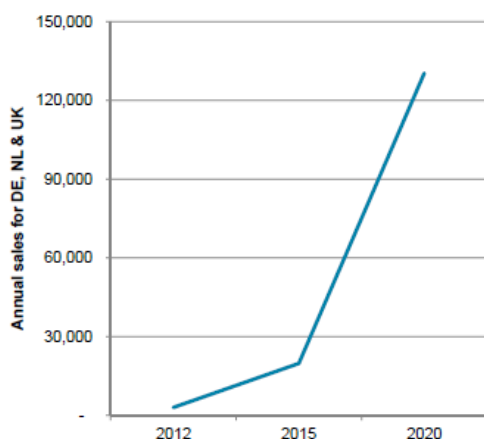
View from delegates and the discussion...

- ▶ *Half of delegates thought 20% or more heat pumps would be operated in a smart manner by 2020 (i.e. their operation is influenced or controlled for the wider benefit of the electricity system).*
- ▶ *When asked about how much the smart operation of heat pumps would reduce customers' energy bills, there was a wide range of responses, though the most popular answer was by 5-10%. It was clear from the discussion that delegates thought bringing such value to the customer would be critical, but that there are uncertainties about how to quantify this, and it will of course vary significantly in different markets.*
- ▶ *From the discussion it was evident that there will be several approaches from manufacturers to smart heat pumps in the future – from automated response to flexible tariffs as in NIBE's presentation, to heat pumps which respond to direct utility control signals.*
- ▶ *Utilities – and particularly DNOs – are taking a real interest in heat pumps as a tool for peak shifting, and there are many demonstration projects testing what is possible, similar to the project presented by Enexis. There was optimism in the room that the synergies between heat pumps and utilities could translate into drivers for the heat pump market.*

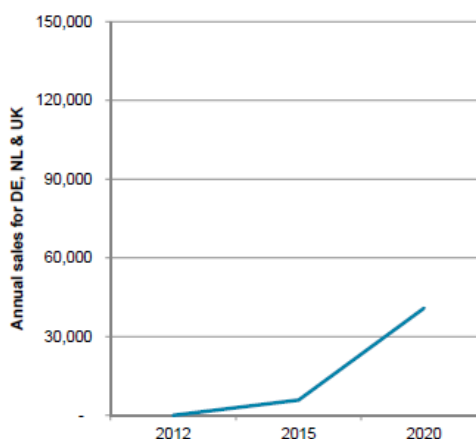
Session 3: Heat pump based hybrid solutions – creating new opportunities?

Lukas Bergmann, Heat Pump Analyst at **Delta-ee**, provided an introduction to the session – painting a picture of the growing number of hybrids on the European market, and providing, below, a scenario for how hybrids (and gas driven heat pumps) may grow across three European markets to 2020.

Hybrid Heat Pump Uptake



Gas Heat Pump Uptake



Source: Delta-ee Roadmap Service reports for Germany, Netherlands and the UK

François Bruggemans of Daikin

introduced Daikin's new hybrid product (on the right), explaining how this had been developed to target the gas boiler replacement market.

He explained the control strategy of their product and how it could be optimised for running cost, carbon, or primary energy savings.



Christer Bergerland of utility company **Fortum** explained their

“Fiksu” product – not a heat pump product, but a “dual fuel” offering with automatic switching of heating between electric and oil depending on the hourly electricity price. He placed this in the context of Fortum’s new product launches for its residential customers, moving from “awareness” (such as in-home displays) through to “control” (such as the Fiksu product) and towards “independence” (for example a solar package).

Pascal Dalicieux of **EDF R&D** in France, presented analysis of different operating modes of hybrids that they had carried out. In field trials, also backed up by wider modelling, they compared two approaches to control – one based on primary energy savings, the other based on the energy bill. Overall, they found that control based on the energy bill appears to be the better control strategy.

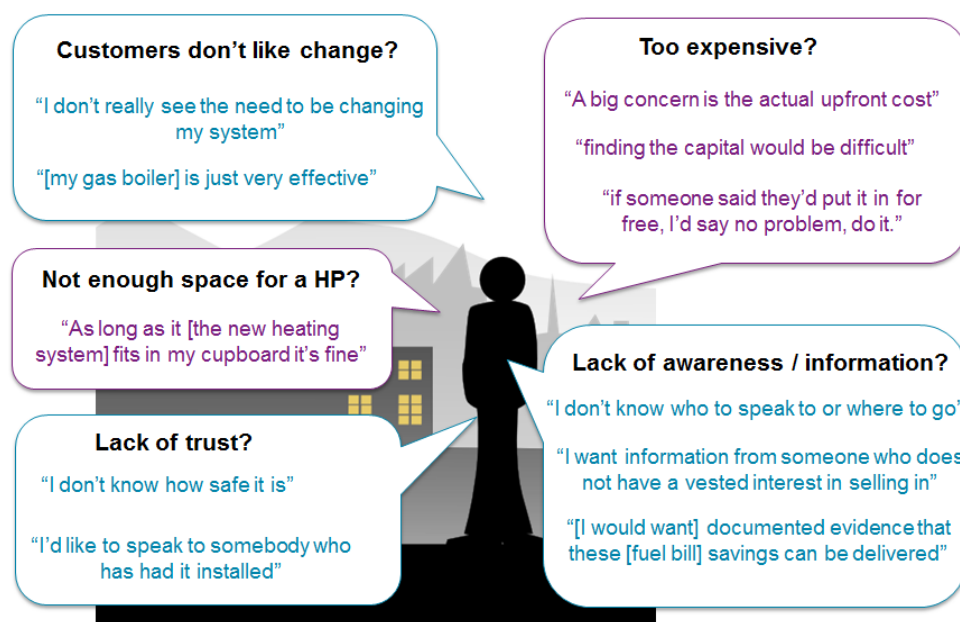
View from delegates and the discussion...

- ▶ Delegates had a range of views on the likely take up of hybrids across Europe by 2020 – with opinion spread across the 10 – 100k, 100 – 250k, and >250k / year ranges
- ▶ On gas heat pumps, the majority of delegates thought annual 2020 sales would lie in the 10 – 100k range.

- ▶ *There was recognition that there will be a role for heat pump solutions which are not purely electric – both hybrids and gas heat pumps offer new opportunities for heat pumps in market sectors where electric heat pumps have faced challenges (e.g. on the gas grid), and have a lower impact on the future distribution grid than a full electrification of heat.*
- ▶ *The long-term potential for hybrids to be used in a smart way was discussed as a strong potential future hybrid market driver – and a reason for utility interest in hybrids. There is potential to operate hybrids in a similar way to Fortum's dual fuel oil / electric offering today, switching between heat pump and boiler in response to dynamic signals (rather than only in response to fixed prices as with existing hybrids).*

Session 4: A focus on the customer – gaining their confidence

Lindsay Sugden presented quotes from Delta-ee's primary market research with customers, highlighting the concerns that some customers have in investing in a heat pump.



Source: Delta-ee Microgen Insight Service – primary customer research

Steen Kramer Jensen from Danish company **Insero Energy** presented their approach to heat contracting with heat pumps. In this model, which Insero is trialling, customers pay a reduced upfront cost of the indoor-part of their heat pump system, with Insero paying for the rest of the system. This is then recovered through a long-term heat supply contract. Technical risk is taken by Insero, as they purchase the electricity for the heat pump and provide the maintenance.

Georges Khoury of heat pump manufacturer **Sanden Manufacturing Europe**, and **Corrine Sannier** of French heating & heat pump manufacturer **Atlantic** joined the panel discussion to provide their manufacturer perspectives on building heat pump market confidence. **Stephen Worrall** of **E.ON** also joined to share his experiences of working on customer engagement in microgeneration.

Panel session highlights

- ▶ *There was much discussion around the concept of alternative business models such as that presented by Insero Energy, and the potential for such models in other markets. Upfront*

cost and lack of trust in the technology are two of the biggest barriers to heat pump market uptake in many European markets, so using such models to overcome these barriers could open up vast opportunities.

- ▶ Atlantic and Sanden both referred to the low confidence levels still prevalent amongst many end-users and installers in the French heat pump market, and the challenges they as manufacturers face to overcome this when they do not deal directly with the end-users themselves.
- ▶ There was discussion around the on-going work to develop quality standards for products and installation both in the French market context and European wide – there was general consensus in the discussion that this type of quality assurance was critical for promoting confidence throughout the sector.
- ▶ Delegates thought that utilities would have small, but growing roles to play in offering heat pumps to customers. Estimating what proportion of heat pump sales would be made by energy suppliers, the most popular response were 5% and 10%.

Presentations from the Roundtable

These are available to all Delta-ee Heat Pump Research Service subscribers on the Delta-ee website (and also to all attendees at the Roundtable).

They are available for purchase for other organisations.

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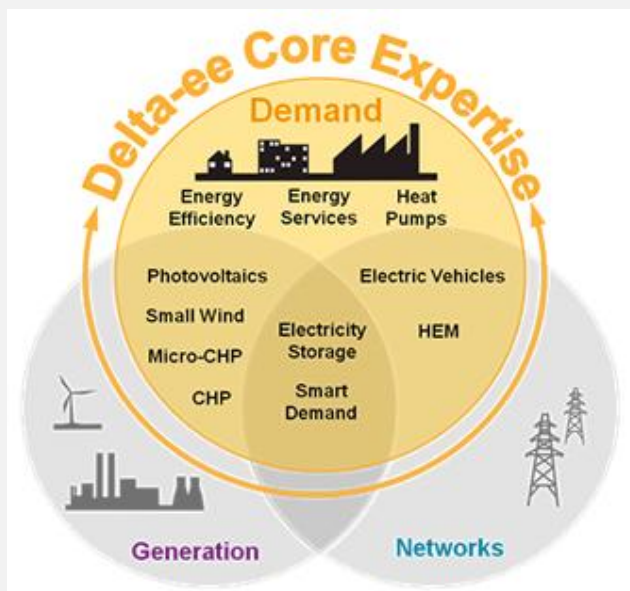
About Delta Energy & Environment

Delta-ee is an energy consultancy specialising in the technologies, market and policies on the 'customer side of the meter'. Our clients comprise:

- ▶ Energy companies
- ▶ Manufacturers
- ▶ Finance sector
- ▶ Policy makers

Delta-ee provides commercial, tactical and strategic support and advice to clients.

We offer clients tailored confidential consultancy project support and subscription-based research services.



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