

## Decarbonisation of Heat Service Service Brochure & Research Highlights



### About LCP Delta



## Our mission is to enable a better, faster energy transition for all

Founded in 2004 and based across the UK, France, Norway, the Netherlands and beyond, LCP Delta provide data-driven research, consultancy, technology products and training services to companies investing in and navigating the energy transition.

We are a diverse team from a variety of backgrounds including engineers, data analysts, environmentalists and more.

LCP Delta is a mission driven organisation - all of us want to make a difference to the energy transition and accelerate the path to a low carbon future.

The energy market is becoming increasingly complex. As consumers become more empowered and as energy systems around the world decarbonise, there is a need to understand both the generation and demand side to effectively navigate the rapid changes occurring.

We know it's a complicated topic, and we're here to help.

Andy Bradly, Partner, LCP Delta

LCP Delta was formed through the merger of Delta-EE and LCP Energy to bring together deep generation and consumer-side expertise, to provide our clients with a single partner to help them on their journey and provide them with a 360° view across the energy spectrum.





Andy Bradley Partner andy.bradley@lcp.com



Jon Slowe Partner jon.slowe@lcp.com







#### LCP Delta provides the best advice, support and tools to enable the energy sector to drive the energy transition



#### **Subscription research services**

Our portfolio of subscription research services offer in-depth insights across the energy transition landscape. We have been undertaking primary research with organisations active in the energy transition since 2004 – we have an unparalleled international network of contacts we can draw on. Each service focuses on a particular aspect of the energy transition.

#### Market and strategic advisory consulting

We provide support across the full energy value chain with bespoke research, insight, forecasts and advice tailored to them. Our consultancy offerings draws on expertise and data from across LCP Delta, from strategic market entry analysis through to detailed half-hourly revenue forecasting.



#### We support our clients in four ways



#### **Technology & data**

Data integration and analysis is at the heart of the energy transition. However, sourcing and navigating complex, wide-ranging datasets is challenging. At LCP Delta, we combine and curate proprietary and public datasets to provide you with a single source of truth across the energy spectrum and make this data interactive using our cutting-edge technology.

#### Training

Our training helps professionals quickly develop their new energy knowledge, accelerating their impact for organisations who want to capture opportunities. We provide meaningful, concise and easy to understand short courses.





#### Subscription Research Services

Use a combination of our subscription research services, bespoke consultancy projects and training services to gather the information you need to ensure your business's success in the energy transition.





### LCP Delta Heat Research Services Team

Our team works together to deliver all of LCP Delta's heat research services



*Klara Ottosson* Heating Business Research Manager



*Thomas Barquin* Decarbonisation of Heat Research Manager



*Zoltan Karpathy* Heat Research Services Consultant



*Guillermo Yañez* Heat Research Associate Consultant



*Oismita Mitra* Heat Research Analyst



*Steven Ashurst* Head of Heat Research



Team members have a strong breadth of knowledge on the topic of heat decarbonisation, as well as individual knowledge and skills specialisms linked to the different research services.

We publish well in advance of 30 deliverables and updates each year, with subscribers receiving a minimum of 1 new item per service per month.



#### The Heating Transition

The transition from 'old heat' to 'new heat' is disrupting the market. We see six key ways this is happening. LCP Delta's research enables clients to capture the opportunities in this transition.



#### Who Does Our Heat Research Help?

The research supports a wide range of stakeholders across the heating sector & wider energy industry. It supports people making decisions on design, development, investment and deployment.

#### Supporting these roles:

- Strategy
- Innovation
- Propositions
- Marketing
- Market Intelligence
- Solutions Development
- Product Management
- Portfolio Planning
- Research & Development
- Policy Advocacy



#### In these types of organisations:



**I CP**Delta



## Core Research Topics and Themes

Decarbonisation of Heat Service





### Decarbonisation of Heat Service: Example Questions

Market research and analysis exploring the opportunities for low carbon heating in Europe and its interface with electricity markets.



How are markets for low carbon heating evolving, and what is the outlook across Europe and other key international markets?

technology sales and market forecasts for heat pumps, electric heating, and high efficiency gas



How is heat decarbonisation policy influencing low carbon heating market opportunities, today and in the future?

European and national policy and regulation analysis

What low carbon heating products should be targeted at which end-use sectors and why?

building stock, technoeconomic analysis, functionality, refrigerants, customer attitudes

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How can electric heating solutions capture value in demand response and flexibility markets?

flexibility market analysis, technology functionality, smart electric heating value propositions



Where do hydrogen and other low carbon gases fit in – where and when? National and regional strategies, economic analysis, product development, field trial projects

#### Helping subscribers to:

- Navigate the evolving heating market and identify opportunities for low carbon heating solutions in the short- to medium-term.
- Keep on top of policy and regulation developments affecting your business.
- Make strategic decisions about your product portfolio, and research and development priorities.
- Determine key end-user segments and make decisions about targeting customers.
- Identify emerging value streams for low carbon heating and be positioned to capture longer-term value.



## What Decarbonisation of Heat Service Subscribers Get

Subscribers have access to a range of research and personal support

#### **IN-DEPTH REPORTS**



Thoroughly researched reports on major markets, topics and technologies based on primary interviews and analysis

#### "VIEWPOINTS"



Shorter, reactive analysis of major developments arising in the heating sector, from an expert point of view

#### **DATABASES & DATA SETS**



Historic & forecast sales data, pricing and cost data, company data, policy data, proposition data, customer data...

#### **MODELLING & ANALYSIS**



Techno-economic analysis and forecasted uptake of heating products & propositions, carbon savings

#### **AD-HOC EXPERT SUPPORT**



Bespoke support from our expert team of Analysts – timely and insightful responses to your specific questions about heat

#### **NEW ENERGY SUMMIT**



Priority access to industry events that LCP Delta hosts



#### *Live & Upcoming Deliverables (April)* Decarbonisation of Heat Service Programme FY2024/2025\*

		Q1	Q2	Q3	Q4
***		United Kingdom	France	Poland	Spain
-	Country reports & forecasts	Netherlands	Italy	Czechia (NEW)	TBC (AT, IE, RO, HU)
<b>*</b> 5 <b>*</b> 5				Nordics	
		EU vs. Asia (vs US) HPs report (New)	Heat Pump tariffs report (update)	Mid-year state of the heating market (New)	<pre>'Supply chain' report (new)</pre>
$\frown$		H2 heating project case	Biomethane: how large can its	Decarbonisation of Heat: 2024	Boiler retrofit restrictions: The last stand for standalone
	In-depth reports & topical items	studies (New)	role become in residential	Roundup & 2025 Predictions	boilers? (Update)
	a topical nome	TDHP market report (Update)	nearing: (Opdate)	E-heat Map Report (Update)	
				Hydrogen boilers report (update)	
$\bigcirc$	Databases &	European Heating Market Landscape Database (Update)	Residential Heating Appliance Forecast Dashboard (New)	H2 for Heating Projects (update)	Residential Heating Appliance Forecast Dashboard (New)
	Resources	Residential Heating Appliance Forecast Dashboard (New)	Decarbonisation of Heat Regulations database (Update)	Residential Heating Appliance Forecast Dashboard (New)	Decarbonisation of Heat Regulations database (Update)
		Low-GWP Heat Pump Database (Update)	Electrification of Heat Map Database (update)		

\* Proposed research programme. We aim to be flexible and responsive to changes in the market, so the above is liable to evolve throughout the year.



## Deliverables Archive

Decarbonisation of Heat Service Brochure

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## Decarbonisation of Heat Service deliverables

In-depth reports



REPORT

DATA	
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COUNTRY REPORT

VIDEO

VIEWPOINT

- Electrification of Heat Map: Where are the best opportunities for electric heating across the 32 countries in Europe? 100 page report (+ data)
  - In depth reports exploring the opportunities for electric and high efficiency gas heating in Europe's key markets: France, Germany, Italy, Netherlands, UK, Spain, Poland, Belgium 30-40 page reports (+ data)
- Hydrogen boilers: How far have they come, and where are they going?
- Impact of the energy price crisis on the heating market outlook 50+ page report
- Multi family homes the next segment for heat pumps to conquer? 40 page report
- Hybrid heat pumps in Europe How long is the window of opportunity? 40+ page report
- Has the time come for thermally-driven heat pumps?
- High Temperature Heat Pumps: A threat to gas boiler retrofits?
- Air/Air Heat Pumps: Characterising the European Residential Market 40 page report

## Decarbonisation of Heat Service deliverables

Databases



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DATA		

COUNTRY REPORT

VIDEO

VIEWPOINT

- Heat Pump Forecasts Dashboard: This interactive database contains LCP Delta current estimates of sales of heat pumps from 2018 to 2022, and forecasts to 2030 (2035 for Germany).
- Electrification of Heat Map Database: Data supporting our analysis of the electrification of heat opportunities across 32 European markets. Includes housing stock, heating market, flexibility market, policy, customers and economics
- H2 for Heating Projects: This database gives you a complete oversight over hydrogen for heat activities in Europe and the rest of the world, to inform your hydrogen strategies.
- **Decarbonisation of Heat Regulations:** key regulations, taxes, subsidies and standards affecting electrically-driven and high efficiency gas heating technologies in Europe, both for new build and retrofit.
- Low-GWP Residential Heat Pump Manufacturers Database: overview of residential heat pump manufacturers using low-GWP refrigerants (less than 750) for their air-water and/or air-air heat pump models.
- **Hybrid Heat Pumps Product Database:** An extensive exercise aimed at characterising hybrid heat pump products in Europe. It contains a list of more than 100 products, with key information on product design, configuration and specifications.
- European Heating Market Landscape: Detailed residential heating market statistics for 17 countries in Europe from 2015 onwards.



## Decarbonisation of Heat Service deliverables

Short reports and viewpoints

REPORT

DATA

COUNTRY REPORT

VIDEO

VIEWPOINT

- Heat in Europe: 2023 highlights and 2024 predictions
- Heat Pump Tariffs: A trump card to turn the tide for heat pump adoption?
- The updated German Heating Law (GEG): Key changes and potential impact on gas heating
- Boiler retrofit restrictions: The last stand for standalone boilers?
- The Expansion of the European Heat Pump Production Capacity
- Supply chain crisis what does it mean for the EU heating sector?
- What is the potential for reducing the installed cost of a heat pump?
- Refrigerants round-up: How long is the window of opportunity for R32 and will propane be the refrigerant of the future? (updated regularly)
- What is the customer appeal for gas hybrids?
- UK consultation on improving boiler standards and efficiency what does it mean for stakeholders?



## Research Extracts



## Heat Pump Forecast Dashboard Decarbonisation of Heat Service







## <sup>+</sup>LCPDelta

## Heat Pump Forecasts Database

This interactive database contains LCP Delta current estimates of sales of heat pumps from 2018 to 2023, and forecasts to 2030\*:

- By countries: Germany, France, UK, Italy, the Netherlands, Spain, Poland, Belgium, Sweden, Finland, and Norway;
- By technologies: air-water heat pumps, ground source heat pumps, air-air heat pumps, hybrid heat pumps and domestic hot water heat pumps;
- By building segment: new-build and retrofit (segmentation not available for Sweden, Finland, and Norway)

\*Data for Germany is available to 2035. To view this, change the 'Year' filters on the left side of each page.

Contact: Thomas Barquin, Electrification of Heat Service Manager (Email: thomas.barquin@lcp.com)



Year overview Sales by Country Sales by Technology Sales by Building Segment Sales of DHW Heat Pumps Data table Disclaimer



## Germany: Opportunities for the Electrification of Heat Decarbonisation of Heat Service



FEBRUARY 2024



# *Executive summary (1/5): Key opportunities for electrification of heat in Germany*

Under the new regulatory framework, heat pumps and district heating are favoured compared to other technologies – still a mix of opportunities are present going forward.

#### New build:

- Since 2022, HPs represent more than 50% of heating systems installed in NB and are positioned to be the dominant technology from 2024 onwards. The remaining shares of gas condensing boilers installed in NB (~15% in 2022) will gradually shift towards HPs, and a small portion to district heating.
- Main opportunity is for monobloc outside-air heat pump, of less than 8 kW capacity and increasingly using propane as refrigerant. Typically installed in single and-twofamily homes, which account for 80% of the total number or new homes completed every year (average 2014-2022).
- Small opportunity for A/A HP + DHW HP, but they will remain less desirable than hydronic systems.

#### Retrofit:

- Large installed park of oil boilers creates opportunity for A/W and ground-source heat pumps, especially in southern regions where they are more commonly found.
- Sizeable opportunity for hybrid heat pumps will emerge, for both add-ons and packaged. They comply with GEG requirements and are economically competitive against oil boilers.
- Due to an unfavourable regulatory framework, high energy prices, and a lack of financial incentives, opportunities for high efficiency gas technologies such as thermally-driven heat pumps, fuel cells and m-CHP will be limited if not inexistent.
- Limited opportunity for A/A heat pumps used for primary heating although in rising demand for cooling.
- GEG compliant list of technologies places full-electric heat pumps and district heating as the easiest ways to comply with the regulation.





# Executive summary (3/5) Battlegrounds for low carbon heating appliances in the 2020s & beyond

Homes with natural gas and oil/LPG boilers represent the largest retrofit opportunity for the heat pumps



N.B. Wood or other solid fuel stove or A/A HP for primary space heating means there is no central heating Source: <u>E-Heat Map Database</u>, <u>Destatis</u>

\*2022 last year with official statistics available. 2023 to be updated once official statistics become available.



## Biomethane – how large can its role become in residential heating? Decarbonisation of Heat Service

**DECEMBER 2023** 



## Potential for biomethane in residential heating

Current biomethane production and injection into the gas grid in key European countries



For more detailed information visit the Low Carbon Gases Policy and Strategy Database under the Gas Heating Service



# Hydrogen boilers: How far have they come, and where are they going? Decarbonisation of Heat Service

**MARCH 2023** 



## How ready are hydrogen-ready boilers?

Radiator of proof: Status compared to 18 months ago

Progress has been made in several development areas:

- The leading players have solidified their commitment, e.g. by presenting dedicated production lines for H<sub>2</sub> boilers.
- Trials to date have made successful use of existing infrastructure within the buildings, challenging some of the key opposing arguments regarding hydrogen use in existing buildings.
- But, cost of H<sub>2</sub> technology has increased as a result of the supply chain issues that have impacted the whole heating industry.
- And, it is becoming clearer which markets will and won't support the use of H<sub>2</sub> in buildings. On the whole, positive and negative policy developments probably cancel each other out.

Key: change per metric in last ~1.5 years



Overall **positive** development Overall **negative** development



Opportunities for Electrification of Heat in Germany

## Who is developing which type of appliance?



The leading boiler OEMs have varying approaches to their development



Opportunities for Electrification of Heat in Germany

## **LCP**Delta

30TH DEC 2022 2ND EDITION

## *European E-Heat Map* Assessing the outlook for electrification of heating and hot water in Europe - 2022



## *Contents*

#### **Executive Summary** 05 Introduction 11 E-Heat Map Purpose and Approach Scope Scoring System Assessing the opportunity by factor 16 16 20 39 44 **Building suitability** Addressable market DSF value potential -Consumer pull 46 Policy drive Assessing the opportunity by region <u>48</u> <u>49</u> <u>51</u> <u>53</u> South-East Europe Eastern Europe South-West Europe -<u>55</u> North-West Europe Nordics and Baltics 56



#### Annex - Glossary & Acronyms

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## European summary: Opportunity for electrification of heat

Electric hot water solutions stand out as the biggest opportunity today by number of units – but huge future value lies in the expanding heat pump market, and in the increased value of flexibility throughout the 2020s





\* But orders of magnitude growth expected. See LCP Delta Flexible Residential Electric Heating Database for more info.

## Key battlegrounds for electrification in the European Market



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#### <sup>+</sup>LCPDelta

#### Page description: Data collection

Date:01/11/2022

By: Thomas Barquin, Alexandra Mostovaya-Urushadze, Nishanth Srinivasa

<b>LCP</b> Delta											Building	g stock																				
	Dwelling	gs					Ag	e					Туре		Existing qu	building ality	New bu	uild rates	Dwellings by tenu	re	Climatic	conditions	Energy cor	nsumption	n		Fi	inal consum	ption for he	eating (TWh)		
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Decarbonisation of Heat Service Brochure



1. High level stats: One country									
Country	Austria								
Total dwellings	4,937,000								
GDP (per capita)	36,920								
Overall customer pull for low carbon solutions	High								
Level of ambition for decarbonisation of heat through electrification (relative to e.g. greening gas and expansion of heat networks)	Medium								
Spark spread	3.3								
Most common heating option	0								
Market share (installed base) of most common heating option	33%								





#### Contact us



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## <sup>+</sup>LCPDelta

#### About LCP Delta

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