gridX

HEAT PUMP REPORT 2025

Heat pump report 2025

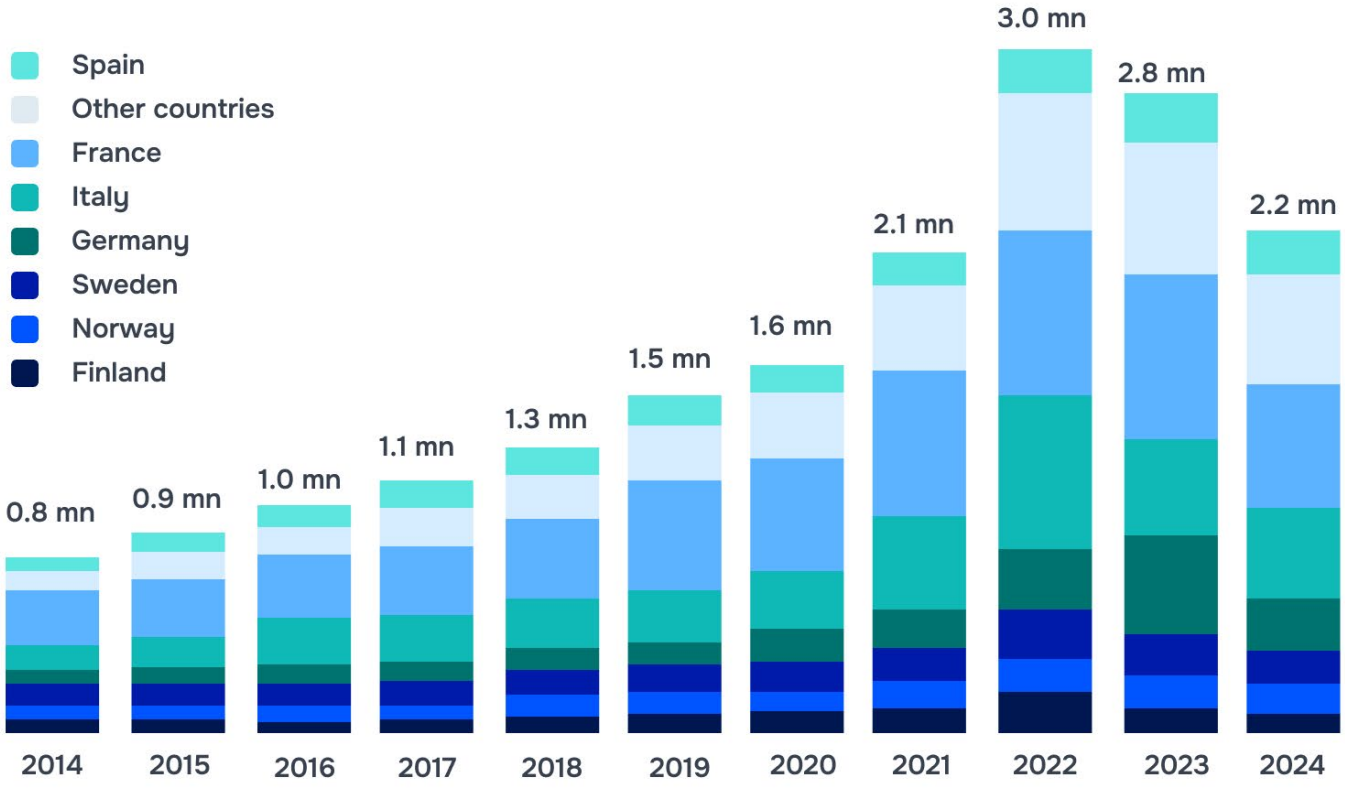
This report explores the current state of the European heat pump market and shows how advanced energy management can unlock the full value of heat pumps – for households, businesses and the grid.

Heat pump boom cools, but long-term goal holds

Policy chaos and economic strain hit European heat pump demand

In 2024, Europe's heat pump market experienced a sharp downturn, marking its first significant setback after years of steady growth. Sales across 14 key countries, which account for roughly 90% of the European market, fell by an average of 22% compared to 2023.[1] Germany and France saw the most dramatic drops, with unit sales plunging nearly half (down 48% in Germany and 39% in France). By the end of 2024, the number of installed heat pumps in European buildings rose to around 26 million, up from 23.96 million in 2023.[2] While the installed base has continued to grow, the pace clearly slowed in 2024, with nearly all markets seeing fewer new additions. The UK was the only country to register modest growth.[3]

2014 to 2024 heat pump sales in key European countries

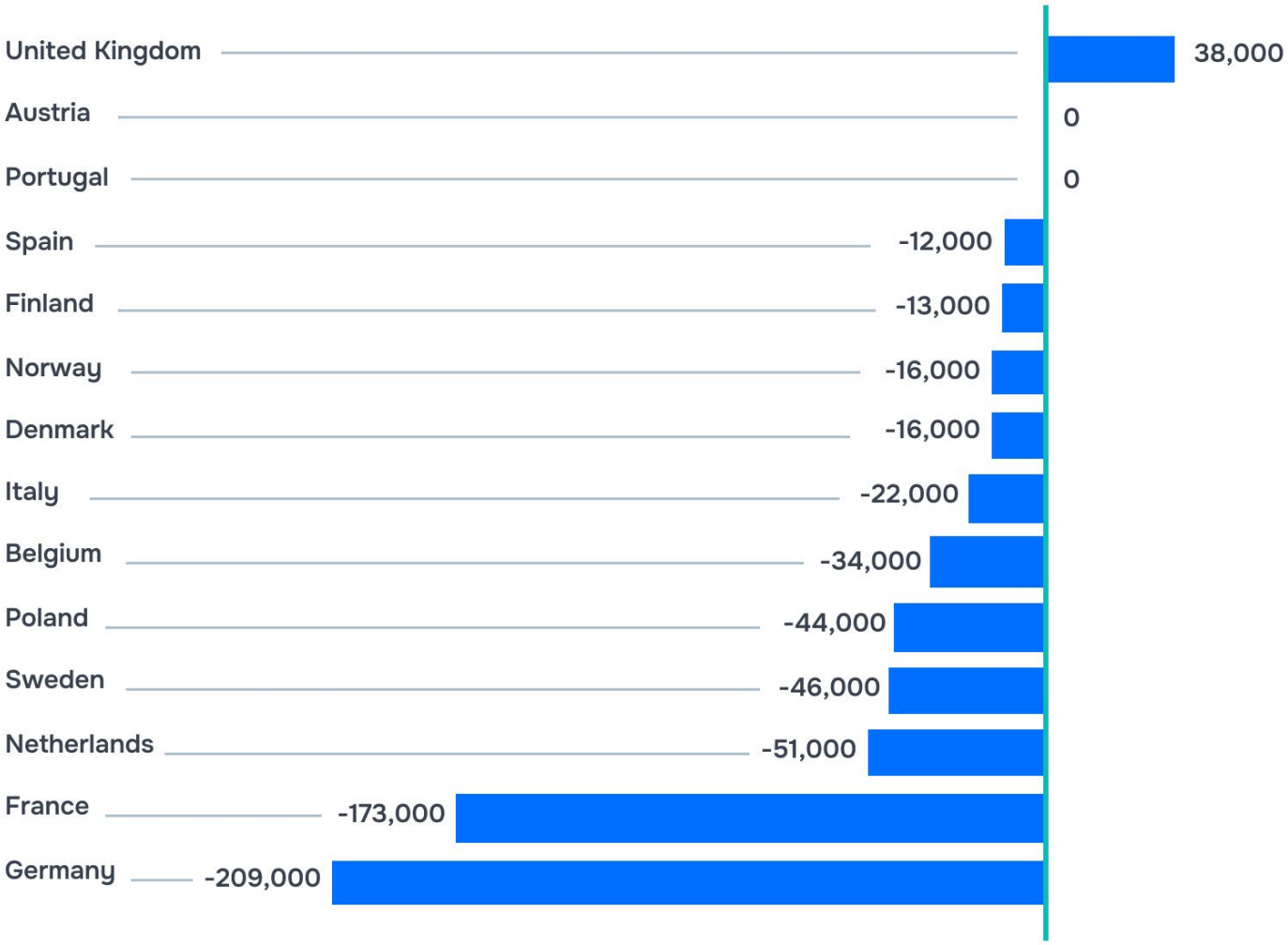


Source: 1

The 2024 dip in heat pump sales was driven by a host of challenges: regulatory uncertainty, delayed subsidy rollouts, abrupt policy shifts, unfavorable electricity–gas price ratios, inflation, high interest rates and a slowdown in construction. All combined, this dampened consumer demand and confidence. In several major markets, policy U-turns and funding delays eroded public trust just as higher running costs and economic headwinds bit into household budgets. The result was a palpable cooling of what had been one of Europe's fastest-growing clean energy industries.[4]

Market slowdown in all but one country

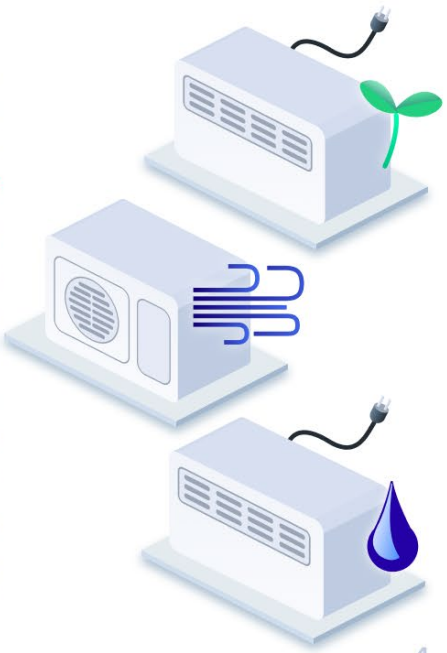
Heat pump market shift from 2023 to 2024



Source: 1

UK leads the way in 2024 heat pump growth amid European policy and economic challenges

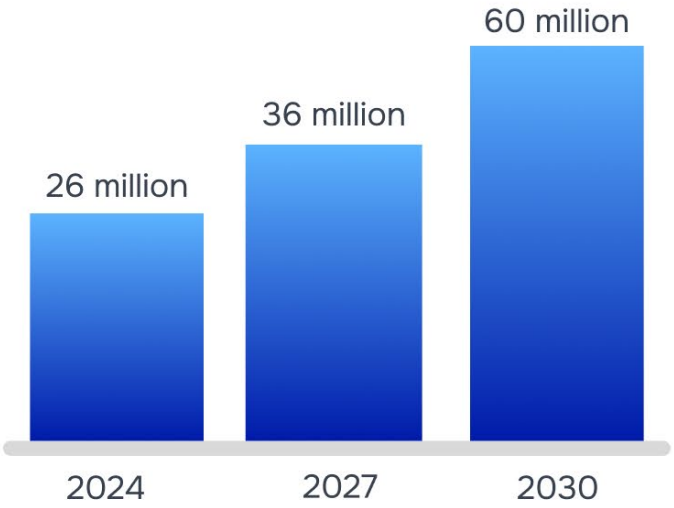
The UK was the lone standout market in 2024, with a record 98,469 heat pumps sold.[2] Driven by government grants and subsidies, such as £7,500 for air/ground-source heat pumps under the Boiler Upgrade Scheme (BUS), this marked a 63% increase from 2023.[5] Meanwhile, other European markets faced mixed results. Austria saw stable sales with around 50,000 units sold, yet showed no growth from the previous year. Belgium experienced a sharp 50% decline due to high power costs, continuing the slump from 2023. Finland's market dropped by 13.7% due to a slowdown in construction, while France saw a 39% drop, calling for more stable support. Germany faced a significant 46% decline in sales, primarily due to policy uncertainty. The Netherlands experienced a 27% decrease after a subsidy-driven boom in 2023. Italy saw a slight 3%–5% dip, with about 394,000 units sold, and Spain dropped 5.5%, illustrating resilience compared to other countries.[1]



Europe's clean heating goals remain on track despite 2024 dip

Despite 2024's market dip, heat pumps remain central to Europe's long-term goals for decarbonization, energy security and affordability. EU policy continues to support the sector's growth: under the REPowerEU plan, the European Commission calls for 10 million new heat pump installations by 2027, with 50–60 million units in operation by 2030.[6] Achieving these targets would significantly cut emissions, reduce reliance on imported gas and shield consumers from volatile fossil fuel prices – key steps toward meeting climate goals and strengthening energy independence.[7]

European heat pump installations



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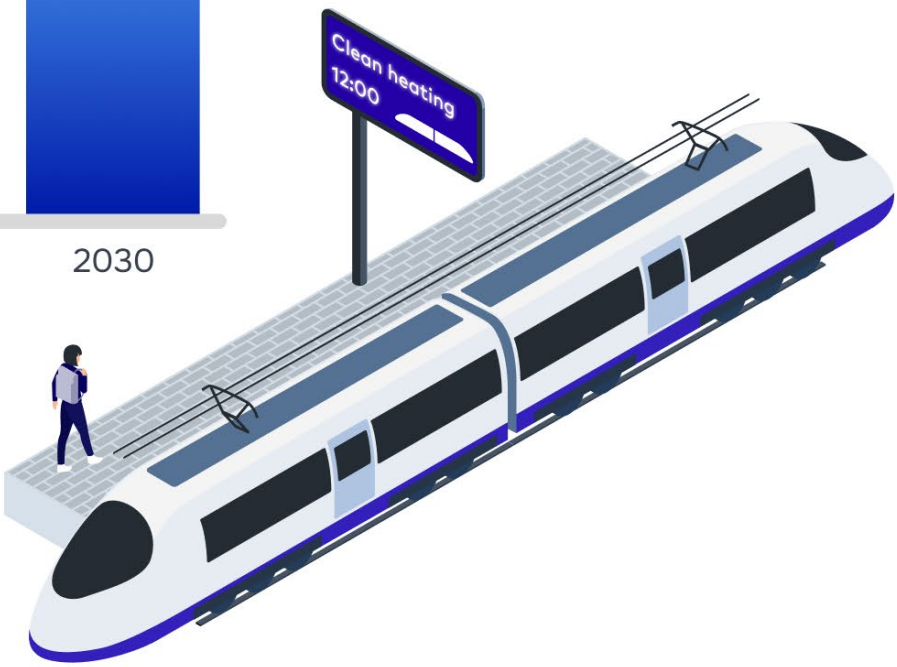


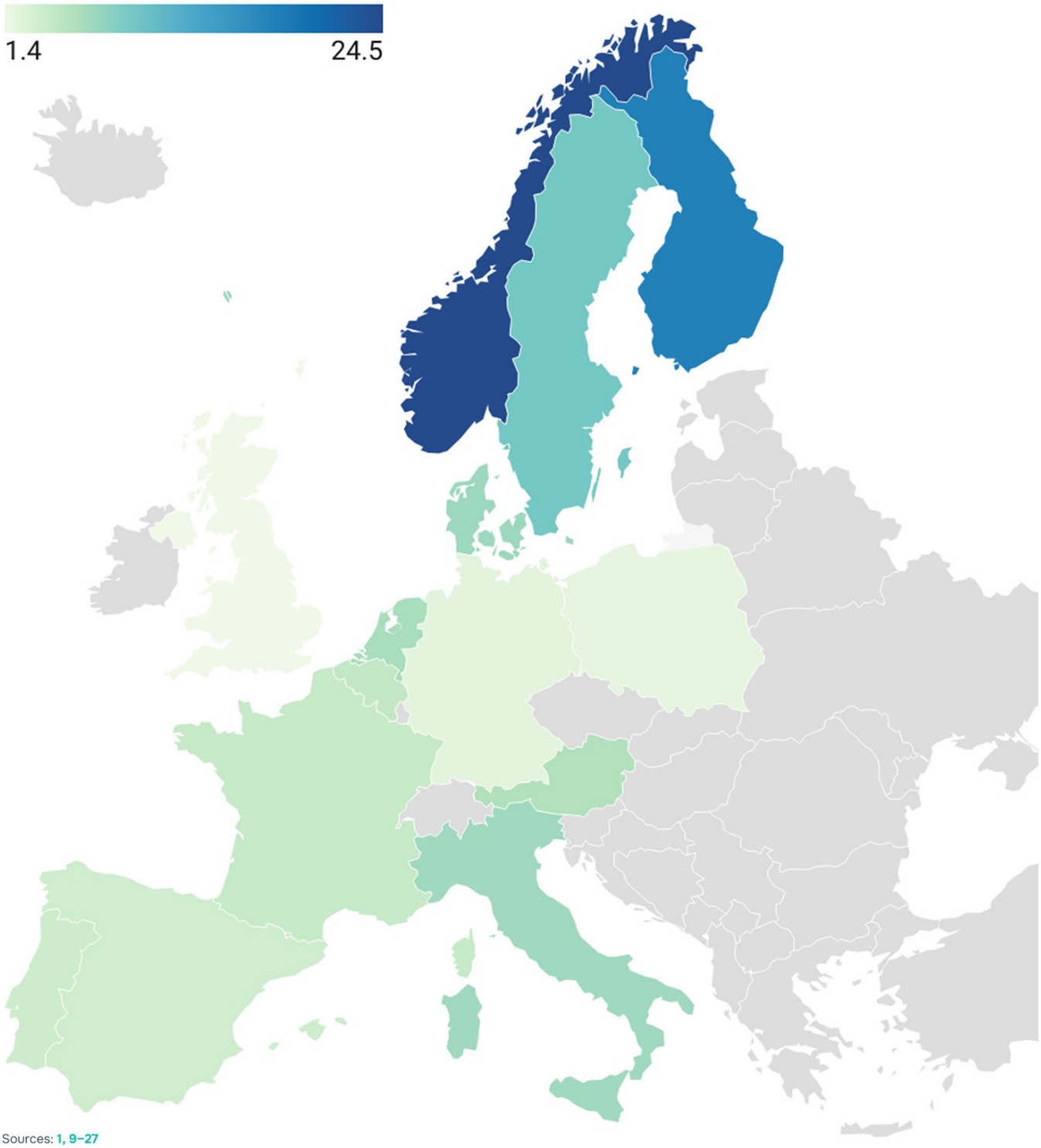
Crucially, industry experts view 2024 not as a setback, but as a market correction following two exceptional years of growth. The overall trajectory of Europe's heating market transformation remains on track. With clearer regulations, stable incentives and improving economic conditions, heat pump adoption is expected to rebound, keeping Europe aligned with its clean heating goals. The 2024 dip should be seen only as a hurdle, not a stop to the strong momentum behind the heat pump transition.[7, 8]

"After crisis-driven spikes and funding-related fluctuations in the recent past, the German heat pump market is now stabilizing. Despite a drop in sales in 2024, the market appears to be returning to more sustainable levels, similar to those seen before the recent volatility. Early signs of steady growth are emerging, suggesting a healthier trajectory moving forward."

Markus. A.W. Hoehner
Founder &
Managing Director
EUPD Research

Current status

Heat pump sales in 2024 per 1,000 inhabitants



Sources: 1, 9–27

As with most clean energy technology, the Nordics were well ahead of the curve in 2024. Oil heating bans, carbon taxation, government subsidies, strong quality standards and favorable building characteristics, such as good insulation, all contributed to their positive edge. Norway led with 24.5 units sold per 1,000 people, followed by Finland (17.8) and Sweden (9.1). Southern and western European countries showed moderate uptake, with Italy (6.6), the Netherlands (6) and Denmark (6.8) in the middle range. Germany (2.3), the UK (1.4) and Poland (2.1) were still far behind, underlining the stark contrast in heat pump adoption across Europe.

Reasons for hope

The 2024 European heat pump market was heavily influenced by the balance between supportive government policies and significant economic barriers. Countries with clear, stable incentives – such as the UK – saw strong growth. Others faced challenges such as policy instability, high electricity prices and economic uncertainty, which hindered consumer adoption.

Country	Barriers and policies	Incentives and subsidies
Austria 	Up to 100% subsidies sparked interest, but slow payouts delayed installations.	Federal grants cover up to 75% of heat pump costs – with full coverage for low-income households – focusing on oil and gas boiler replacements.
Belgium 	Policy U-turns and 4x electricity-gas price gap eroded consumer confidence.	Regional grants range from €3,000 to €6,400 and a federal VAT was slashed from 21% to 6%.
Denmark 	Heat pump sales slump as gas remains cheap, and costs deter buyers.	Residents get DKK 17,000–27,000 (~€2,440–€3,930) for replacing oil/gas boilers, with funding secured through 2026.
Finland 	Rebates offered support, but high rates and a housing slump hit demand.	Up to €2.3 billion supports renewable energy and heat pumps, mainly through industrial decarbonization and strategic sector incentives.
France 	Stop-start subsidies and poor electricity-gas price ratio stalled uptake.	Grants start at €4,000 under Coup de pouce chauffage, rising to €5,000 for solar/geothermal combos; a new ecological bonus was added in 2024.
Germany 	Policy limbo and weak awareness held back adoption despite generous support.	BEG covers 30%–65% of heat pump costs depending on income and system type, with a new Heating Exchange Bonus launched in 2024.

Sources: 1, 8–18

Country	Barriers and policies	Incentives and subsidies
Italy 	Superbonus expiry and tax uncertainty triggered rush, then a demand dropped.	Bonus Casa offers a 50% tax deduction for home retrofits, but uncertainty around 2025 policy may lower it to 36%.
The Netherlands 	Subsidy cut warnings drove late buying, then demand cooled across sectors.	Target is 1 million hybrid heat pumps by 2030. ISDE subsidy ranges from €1,950–€5,100 per system, with €150 million/year in funding.
Norway 	Low electricity prices and subsidies weakened the case for new installations.	Enova, Norway's state climate agency, offers small grants (NOK 5,000–10,000/€420–€840) for energy upgrades, while the electricity price cap lowers running costs.
Poland 	Fraud, halted grants and costly power wrecked market trust until late 2024.	Clean Air Programme offers up to 100% subsidy for low-income households.
Portugal 	Mild climate and weak incentives made heat pumps a low priority.	Strategic sector incentives offer up to 35% subsidy (max €350 million) for clean tech investments (open until the end of 2025).
Spain 	Support held steady, but slow renovations and economic strain limited growth.	Regional grants cover up to 30% of installation costs (~€2,000–€5,000) and national tax deductions offer 20%–60% for energy upgrades.
Sweden 	High interest rates and stock surplus hit sales in an already saturated market.	The ROT scheme gives a 30% deduction on labor (up to SEK 50,000 (€4,440)/year/person); no direct grants, but green loan and VAT proposals are in discussion.
United Kingdom 	Strong incentives and installer growth, but scale still falls short of targets.	The Boiler Upgrade Scheme offers £7,500 for air/ground-source heat pumps (≤45 kWth), with 0% VAT and funding extended through 2027.

Sources: 1, 5, 9, 19–27

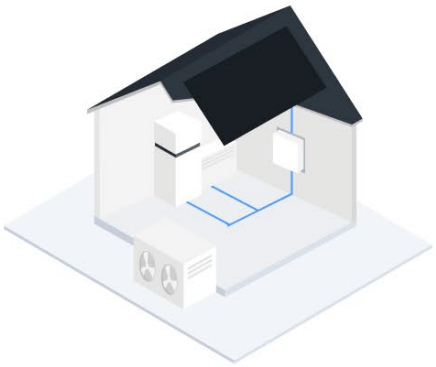
How an advanced HEMS maximizes a heat pump's full value

With Europe's heat pump growth expected to continue – driven by climate targets, policy support and the long-term need to decarbonize heat – the time to manage these devices intelligently is now.

Without smart control, heat pumps become inflexible, high-load devices. Paired with a home energy management system (HEMS), they become cost-saving, grid-supportive assets. And while a basic HEMS offers simple scheduling, advanced systems go further – responding to external signals, coordinating with other assets and future-proofing products and business models.

Heat pump + basic HEMS

A basic HEMS allows for foundational control, like setting heating schedules, adjusting room temperatures and viewing consumption data. This enables some local optimization, such as avoiding consumption during peak periods. However, the system operates in isolation, limiting flexibility and savings by ignoring other devices and external signals.[28]



Heat pump + assets + advanced HEMS

Pairing a heat pump with assets like a PV, EV charger and battery, and managing them with an advanced HEMS, turns the home and assets into a smart, flexible energy system. The HEMS responds to dynamic tariffs, PV forecasts and DSO signals, optimizing costs and grid congestion without sacrificing comfort.[29]

Example features include:

- Load shifting based on electricity price fluctuations
- PV surplus usage for pre-heating and curtailment mitigation
- Coordination between all assets to balance loads and maximize self-consumption
- Participation in flexibility markets and virtual power plants

Integrating time of use tariffs & §14a EnWG

An advanced HEMS can incorporate new regulatory and market frameworks, further rewarding flexibility. Time of use (ToU) tariffs allow households to operate their systems when electricity is cheapest. Germany's Paragraph 14a enables grid operators to temporarily curtail flexible loads like heat pumps and EV chargers in exchange for lower grid fees. An advanced HEMS facilitates these adjustments without compromising comfort, transforming compliance into a cost-saving opportunity.[30]

Seamless, smart heat pump integration with gridX

gridX enables heat pumps to become fully controllable, grid-responsive assets – helping OEMs offer more value to customers, support regulatory compliance and stay competitive in a rapidly digitalizing energy market.

Core heat pump interfaces

To simplify integration and accelerate time to market, gridX actively supports two key interfaces out of the box:

SG Ready (Smart Grid Ready)

Supported via direct integration or through an I/O extender, this allows for basic load shifting using predefined control signals.

EEBUS

A powerful, manufacturer-independent communication protocol for advanced, bidirectional coordination. gridX maintains and updates this interface directly, enabling seamless integration into home energy management systems.

> "The true value of heat pumps is realized when they operate in harmony with the energy system, both within buildings and in interaction with the smart grid and energy markets. EEBUS provides the standardized framework needed for this seamless, secure and manufacturer-independent communication."

Annike Abromeit
Innovation & Communication Manager
EEBUS

Interfaces in practice: Shelly

Shelly is a hardware manufacturer offering relay devices that can transmit SG Ready control signals – ideal for retrofitting legacy heat pumps without digital interfaces. gridX supports Shelly relays as a practical way to enable basic smart control in the field.

Get ‘Ready for gridX’

Ready for gridX – Fast and future-proof EMS compatibility

Guarantee seamless interoperability and advanced optimization of your heat pumps, both now and in the future, by certifying them as ‘Ready for gridX’. This partnership gives OEMs access to gridX’s self-service toolkit for fast, scalable deployment, enabling wide compatibility, quicker market entry and a clear commercial edge.

READY FOR gridX

Key benefits

- **Fast and flexible integration**
- **Future-proof and compliant**
- **Boost your business**
- **Scalable**
- **Reduce cost and effort**
- **High customer satisfaction**

Four steps to become Ready for gridX

1. Get access to our developer community and the Ready for gridX specification.

2. Create the Ready for gridX configuration YAML according to the specification and get instant test results with our tooling.

3. Equip your product with Ready for gridX specification and profit from immediate compatibility.

4. Keep your configuration easily up to date when releasing firmware updates.

Value stacking: From heavy load to strategic asset

Heat pumps are one of the most powerful flexible loads in a modern home – and when combined with a HEMS, they transform into an intelligent energy asset. With gridX's XENON platform, they can be made more flexible and can be dynamically stacked across multiple use cases to unlock maximum value for users, the grid and OEMs.

Layered value

Self-sufficiency and ToU optimization

Shift heat pump loads to periods of PV surplus or low-cost electricity to increase self-consumption and reduce bills – without sacrificing comfort.

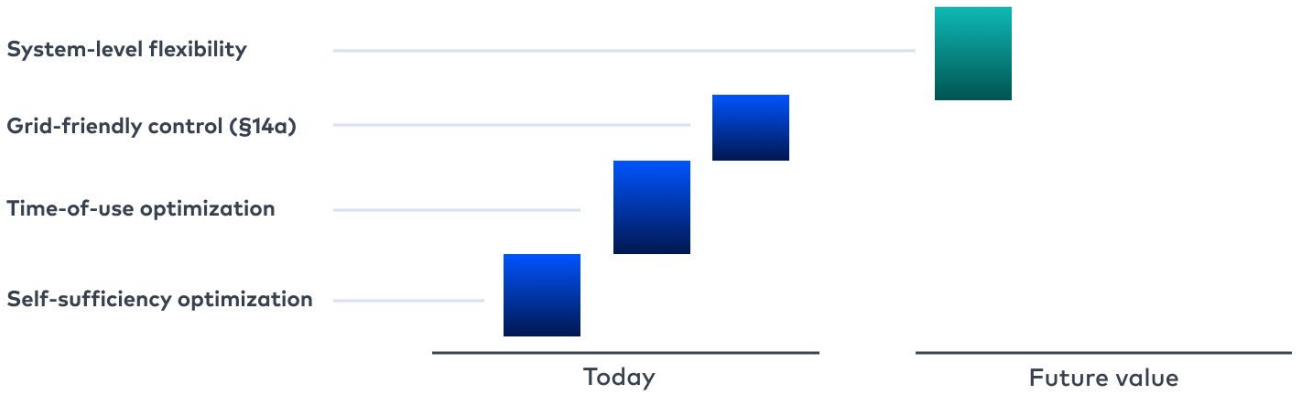
Market and grid signal response (e.g., §14a)

In addition to reacting to electricity prices, the heat pump can also react in real time to DSO signals (e.g., Germany's §14a EnWG) to lower costs even further and optimize carbon performance throughout the day.

System-level flexibilty

Enable participation in virtual power plants, turning aggregated flexibility into new revenue streams by participating in grid services and electricity markets, such as intraday.

Value stacking unleashes a heat pump's full potential



Powered by XENON

XENON empowers heat pump operators to scale from basic control to full value stacking – starting with local optimization and expanding to grid-interactive, revenue-generating use cases as markets evolve.

Key features include:

- Native support for SG Ready and EEBUS interfaces
- Full coordination with PV, EVs and batteries
- Forecast-based pre-heating and load shifting
- Seamless integration into flexibility markets

Heat pump optimization can lower heating costs by up to €830 per year

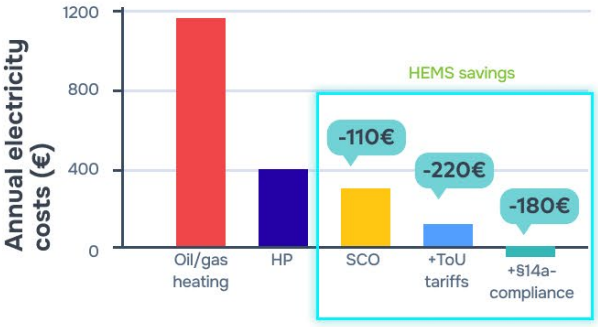
Heat pump + photovoltaic (PV) system + HEMS

gridX conducted a simulation with RWTH Aachen University to calculate the average annual savings of German households via intelligent heat pump optimization in the home. Below is a breakdown of the savings potential.

Modern German building

Save ~€510 annually with HEMS

- Annual heat pump consumption: 2,600 kWh
- Vitocal 250-A (air to water) 7.2 kWp heat pump
- PV: 9 kWp
- Built in 2016
- Underfloor heating 35°C
- House size: 187m²



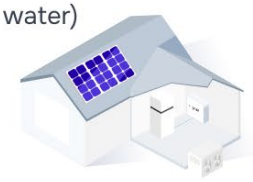
Earn money from your heat pump

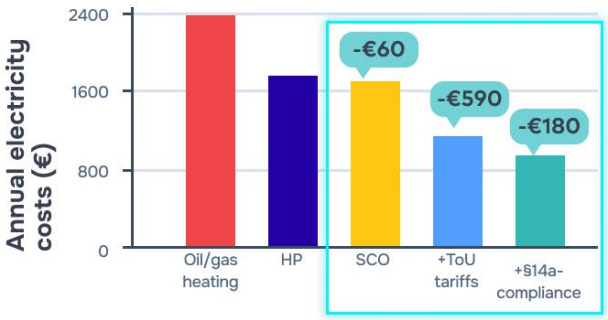
Self-consumption optimization, dynamic ToU tariff optimization and compliance to Paragraph 14a in Germany can save modern households over €500 annually. With average prices (taken from 2023) and sunshine, this could even mean that households earn €80 a year with a smart heating setup.

Old German building

Save ~€830 annually with HEMS

- Annual heat pump consumption: 7,600 kWh
- Vitocal 250-A (air to water) 21.1 kWp heat pump
- PV: 12.5 kWp
- Built in 1970
- Radiators 55°C
- House size: 173m²





Reduce heating costs by 60%

Switching from an oil or gas-based heater to a heat pump and leveraging advanced optimization can reduce annual heating costs of old German households by €1,390. A HEMS with dynamic tariffs is responsible for €830 of these savings, a strong argument for smart optimization of electric heating.

HP = Heat pump; SCO = Self-consumption optimization; ToU = time of use
Fixed retail electricity price = 40c/kWh; Dynamic electricity price = 20c/kWh + EPEX 2023; Feed-in = 8c/kWh

Heat pumps are flexible assets with huge savings potential, but this has remained largely untapped due to the complexity of optimization. A holistic home energy management system featuring self-consumption optimization, dynamic ToU tariff optimization and compliance to Paragraph 14a EnWG reduces annual heating costs by €500-€830. While a large portion of these savings (43%-71%) is from dynamic tariffs, self-consumption optimization is a critical foundation as it manages price risks and provides customers peace of mind.

"Heat pumps, particularly their intelligent optimization within smart homes, are a key lever to the energy transition. While heat pump control is complex, tapping into this allows prosumers to slash their electricity bills, while playing a crucial role in the heating transition. It's our job to help them understand these massive benefits."

Baptiste Feron
Head of Energy Management
gridX

HEMS heats up savings and value

Enthusiasm for heat pumps is strong, but recent market slowdowns show that widespread adoption is still a work in progress. Challenges like installation, cost and public perception persist, and overcoming them requires a united effort across the ecosystem. When combined with an advanced HEMS like XENON, heat pumps gain the flexibility needed to maximize their full potential, clear these hurdles and promote greater savings, self-sufficiency and grid support.

With a heat pump + XENON you get...

More assets. More value.

When paired with other small-scale energy assets, a heat pump becomes part of a powerful ecosystem that helps save money without sacrificing comfort in the household. With Ready for gridX, heat pumps are seamlessly integrated into this system, unlocking full EMS compatibility and accelerating market readiness.

More features. More savings.

In a renewables-driven grid, flexibility is no longer optional – it's essential. A heat pump combined with a HEMS and other energy assets doesn't just reduce grid strain; it also delivers real economic benefits. As the simulation with RWTH Aachen demonstrated, intelligent integration with gridX's platform can save households up to €830 per year, all while supporting faster, more stable renewable scaling.

More scaling. More resilience.

Each new, controllable device amplifies the value of a smart HEMS. Starting with a heat pump builds the foundation for a home with fully flexible energy. With modular integration and evolving features, this setup is future-proof and ready to adapt to new technologies, market changes and regulations for years to come.

"As grids become more dynamic and decentralized, intelligent heat pump control is not a nice-to-have – it's a grid necessity. Our platform helps ensure these devices become active participants in the energy system, not passive loads. This reduces costs for consumers and supports the grid."

Tobias Mitter
CTO & Managing Director
gridX

The way forward for clean heating

To ensure that the growing number of heat pumps helps, rather than hinders, grid stability, a successful heating transition needs smart integration. Fast, future-proof compatibility with energy management systems is the key to clean heating and affordable, scalable climate action. With the right digital infrastructure, heat pumps can drive decarbonization without driving up costs, and support a clean energy future.

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gridX

The energy management system powering our clean energy future.

About us

50+

Supported OEMs

Integrate energy devices from over 50 different manufacturers.

~170,000

Assets connected

An EMS built for future-proof scalability and adaptability.

99.95%

Guaranteed uptime

Industry-leading security and availability.

200+

Talented team members

Passionate and knowledgable experts who Get. Shit. Done.

XENON: Your EMS for guaranteed success.

Want to become a gridX partner?
Scan the QR code to learn more or get in touch!