

FROST & SULLIVAN

THE THREE PILLARS OF SUSTAINABLE BUILDINGS: MARKET DIRECTIONS & FUTURE TRENDS

Decarbonization, Digital Buildings, and Water Resilience are Redrawing Where Value Sits

Presented by:
Jonathan Robinson, Frost & Sullivan

HOW THE MARKET IS CHANGING

From Buying Equipment to Buying Assured Building Performance

YESTERDAY	TODAY	THE STORY BEHIND THE SHIFT
Equipment replacement	**Performance outcomes**	Demand shifted from replacing failed equipment to assuring comfort, energy and cost.
Individual systems	**Connected systems**	Heating, water and air systems are now specified and managed as one.
Capex focus	**Lifecycle value**	Decisions are judged on total cost across asset life, not install price.
Manual operations	**Data led optimisation**	Operation has moved from manual adjustment to continuous, data-led control.

THE 3 PILLARS TODAY AND TOMORROW

1 Decarbonization

HVAC with less energy, with heat pumps as Europe's fastest lever.

2 Digital buildings

BIM and digital twins run the asset; AI makes it self-optimising.

3 Water and resources

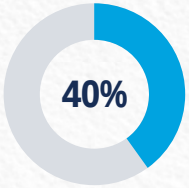
Smart metering manages scarce supply; sensors expose leakage live.

Key message: The market has moved from selling equipment to guaranteeing how a building performs, so value now sits in data, controls, and service rather than the hardware itself.

Source: Frost & Sullivan

PILLAR #1—DECARBONIZATION AND ENERGY TRANSFORMATION

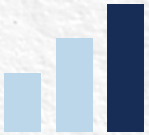
HVAC Must Deliver More Comfort With Less Energy



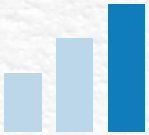
of energy
is used by buildings; HVAC consumes half of it



$57.1B
Europe HVAC revenue, 2026



global HVAC revenue CAGR
2025 to 2031
7.0%



ventilation CAGR
the fastest segment
7.3%

THE PRESSURE ON EQUIPMENT

Efficiency rules tighten
Carbon mandates push low emission heat generation, with the strongest impact from year three.

Electrified heat, efficient cooling
Heat pumps replace fossil systems while cooling already carries 56% of 2026 revenue.

Cost and skills slow the shift
Upfront capex, lifecycle spend and an ageing installer base limit retrofit speed.

WHAT IoT ADDS TO HVAC

Connected equipment
Sensors stream live data from heat pumps, chillers and air handling units.

Predictive intelligence
Cloud and AI models flag faults early and tune energy use continuously.

Performance made visible
Dashboards and alerts turn energy targets into daily operating decisions.

Key message: Decarbonization is no longer about replacing equipment. It is about running buildings to a measurable energy outcome, and IoT makes that outcome visible.

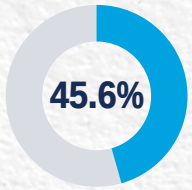
Source: Frost & Sullivan

PILLAR #1—DECARBONIZATION AND ENERGY TRANSFORMATION

Residential Heat Pumps are Europe's Fastest Moving Decarbonization Lever

3.0M
Europe heat pump units sold, 2026

5.9M
Europe heat pump units by 2035, 7.9% CAGR



Europe revenue share of global heat pump, 2035



$51.9B
Europe heat pump revenue, 2035

WHAT IS MOVING THE MARKET

1. **Policy sets the floor**
   REPowerEU, the revised EPBD and F-gas rules pull demand; ETS2 prices fossil heating from 2027.
2. **The dip is over**
   Sales fell to 2.4M in 2024, then recovered to 2.8M in 2025 as Germany approved 288,000 subsidies, up 91%.
3. **Running cost decides adoption**
   Heat pumps become cheaper to run than gas once the electricity to gas price ratio falls below 2:1.

WHERE GROWTH SPLITS BY MARKET

New growth engines, France still largest
Germany, Italy and the UK add the most new demand to 2035.

Nordics turn to replacement
Sweden, Finland and Norway shift to replacement cycles, with Norway past 2 million installed units.

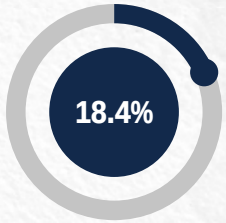
Delivery capacity is the constraint
Upfront install cost and a shortage of trained installers slow retrofit delivery.

Key message: Europe is the world's most policy driven heat pump market, and growth to 2035 now depends on retrofit delivery, running cost economics and installer capacity.

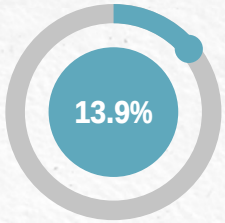
PILLAR #2—DIGITAL BUILDINGS

Digital Twin, BIM, and Smart Building Solutions are Becoming Core of Intelligent Infrastructure

DIGITAL TWIN AND BIM

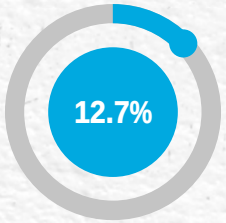


Global CAGR (2025–2031)
$14.7B in 2026 to $33.8B in 2031

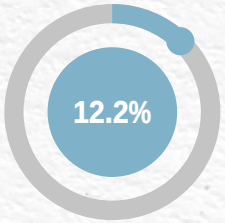


Europe CAGR (2025–2031)
$4.0B in 2026 to $7.6B in 2031

SMART BUILDING SOLUTIONS



Global CAGR (2025– 2031)
$22.4B in 2026 to $41.1B by 2031



Europe CAGR (2025–2031)
$6.3B in 2026 to $11.5B in 2031

Twins outgrow BIM

Europe's BIM base is already mature, so growth now shifts to twins: 23% of regional revenue in 2026, 30% by 2031.

Mandates pull demand

EU BIM Task Group rules and public project mandates make BIM standard for public works.

How they connect

- ✓ BIM builds the structured data model during design and construction.
- ✓ The digital twin keeps that model live after handover, updated by real building data.
- ✓ Smart building platforms use it to run energy, comfort and maintenance, and send performance data back to correct the model.

Buildings gain an AI layer

IoT sensors and cloud AI move facility teams from reactive repair to predictive operations.

Barriers still bite

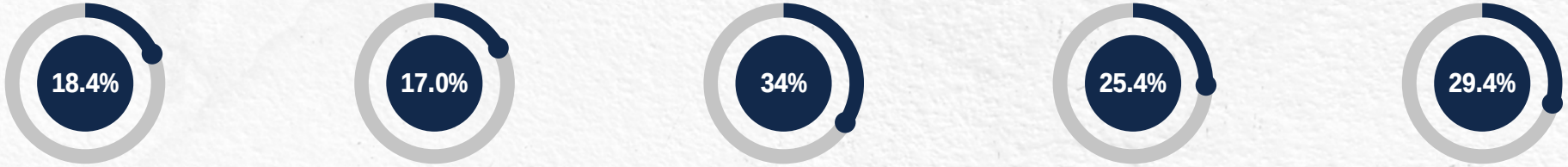
Capital cost, missing standards and weak interoperability hold back smaller firms.

Key message: Building systems are no longer separate assets. They are becoming connected operational platforms.

PILLAR #2—DIGITAL BUILDINGS

AI is the Backbone, Turning Buildings Into Self-Optimizing, Decision-Making Systems

AI SOLUTIONS IN BUILDINGS



Global CAGR (2025–2031)
$40.1B in 2026 to $94.5B in 2031

Europe CAGR (2025–2031)
$14.7B in 2026 to $32.1B in 2031

Europe share of global AI in buildings, 2031

CAGR (2025–2031)
Fastest growing application, simulation and modeling

CAGR (2025–2031)
Fastest growing vertical, AI in data centers

WHAT AI IS DOING IN BUILDINGS

Agentic AI takes over building control

Edge native agents adjust airflow, predict faults and self optimize commercial HVAC without operator input.

Conversational AI closes the skills gap

Natural language tools let lean facility teams run fault detection and root cause analysis without deep expertise.

AI energy management turns cost into savings

Rising power prices push AI home energy systems; Smappee reports about 800 euros of average annual household savings.

WHO IS SETTING THE PACE

Building and HVAC leaders

Trane ARIA, Carrier Tell Me More, Honeywell Forge Cognition and Siemens Comfort AI run autonomous agents at scale.

Home and energy platforms

Schneider Electric Wiser Home AI, ABB ReliaHome and EcoFlow Oasis bring AI energy control into solar and EV households.

Construction and design platforms

Autodesk Construction IQ, Procore Helix, Nemetschek BAU assistant and Bentley iTwin unify BIM, IoT and scheduling data.

Key message: Competitive advantage is shifting to companies that embed AI in equipment and deliver building performance as a service.

PILLAR #3—WATER AND RESOURCE MANAGEMENT

Smart Water Metering Turns Scarce Water Into Measured, Manageable Supply

EUROPE SMART WATER METERING REVENUE BY VALUE CHAIN SEGMENT, 2030

65%
Smart meter sales

9%
Network services

19%
Data, analytics and billing

7%
Design and delivery

EUROPE MARKET REVENUE and METER SHIPMENTS



Europe smart water meter shipments hold at about **12.8 million** units in 2026 and **12.7 million** in 2030, so revenue growth comes from networks, data and services, not from more meters.

WHAT IS SHAPING THE EUROPEAN MARKET

Scarcity and regulation drive adoption
High water stress and a strong regulatory push for digital water accelerate the move from AMR to AMI.

Static meters and public LPWAN
Static meters replace mechanical units, with NB IoT and LoRaWAN the dominant networks and dual mode modules rising.

Country hotspots and companies to watch
Germany grows fastest while France and the UK run large rollouts. Itron, Kamstrup, SUEZ, Vodafone and Orange lead.

Key message: Water stress and regulation are pushing Europe to digitalise its water networks, and the industry opportunity now sits in the intelligence layer of connectivity, data and services.

Source: Frost & Sullivan

PILLAR #3—WATER AND RESOURCE MANAGEMENT

Water Monitoring Sensors Expose Leakage, Contamination Risk, and Network Losses in Real Time

EUROPE SMART REAL-TIME WATER MONITORING SENSOR REVENUE BY SEGMENT, 2032

46%
Water quantity measurement

28%
Software and data analytics

26%
Water quality monitoring

8.6%
CAGR, 2025 to 2032

EUROPE SENSOR MARKET REVENUE



Europe operates 4.3 million km of water pipes and 30,354 treatment plants serving more than 440 million people, so smart water monitoring and sensing is the only practical way to see network performance.

WHAT IS SHAPING THE EUROPEAN MARKET

Regulation sets the measurement bar
Water Framework Directive targets for 2027 and tighter wastewater rules force continuous quality and loss monitoring.

Value moves to data and outcomes
Interoperability and data as a service are each $100M to $500M opportunities by 2032, with digital twins emerging behind them.

A crowded field with clear leaders
More than 100 suppliers compete, yet the top ten hold 55% of revenue, led by Hach, Endress and Hauser, Xylem, and Badger Meter.

Key message: Europe cannot manage the water it cannot see, and real time sensing is fast becoming the measurement layer that water regulation, network performance and investment decisions all depend on.

Source: Frost & Sullivan

INVESTMENT IS CONVERGING, DELIVERY STAYS LOCAL

Regional Momentum Will Help Shape the Next Phase of Europe's Building Transition

EUROPE WIDE DIRECTION

01 Regional priorities mirror Europe-wide agenda: decarbonisation, energy efficiency and water security.

02 Local conditions set different paths, from heat pump retrofit in the north to cooling and water scarcity in the south.

03 Scaling across borders: heat pumps, AI building management and smart water monitoring.

04 Next two to five years: suppliers, designers, installers, owners and policymakers move from pilots to standard practice.

WHAT SETS THE REGION APART

What Europe has in common

Regulation led demand: EPBD, F-gas rules, ETS2 from 2027 and the Water Framework Directive.

What makes the region unique

An ageing building stock and 4.3 million km of water pipes that need renovation, not new build.

Where the region may lead

Industrial heat pumps, digital twins and real time water monitoring.

Where it may lag

Installation cost, installer shortages and weak interoperability slow adoption.

Key opportunities for suppliers

Retrofit ready equipment, data services and performance guarantees, not hardware alone.

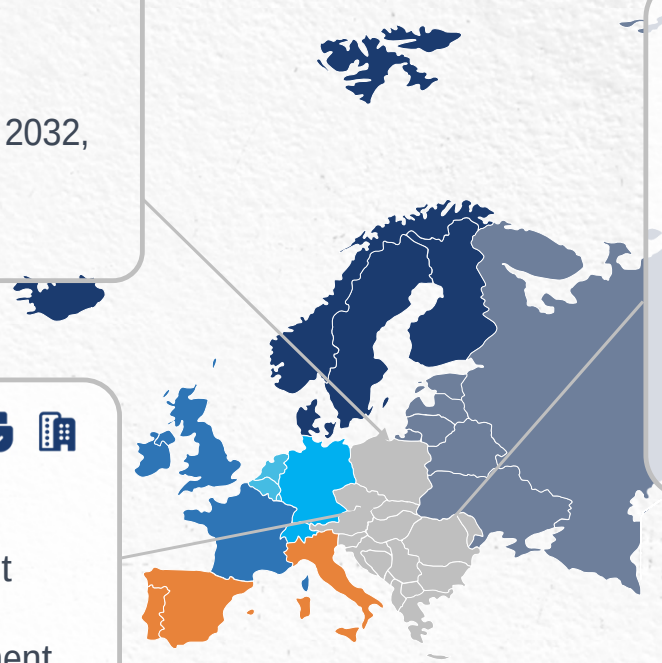
A COMMON DIRECTION, DIFFERENT PACE OF INVESTMENT

Poland

- HP – 72k (2025) -> 180k (2035)
- Smart water metering – 27% -> 66% by 2032, investment focused on cities

Central Europe

- HP – Czech: 57k (2025) -> 85k (2035)
- HP – Austria: 46k (2025) -> 90k (2035)
- EU funds drive modernisation of district heating networks.
- Retrofit of ageing prefabricated apartment blocks is the leading demand driver.
- Austria smart water – 29% -> 77% - rest of region reaching around ~60%



South-East Europe

- EU funds drive modernisation of district heating networks.
- Smart water metering – approx. 25% (2025) reaching approx. 50% (2035)
- High water network losses make metering and leak detection urgent.
- Installer capacity and skills remain the main constraint on delivery.

Decarbonisation
Digital buildings
Water and resources

Note: Each icon marks the region's leading pillar; the other pillars remain relevant

Source: Frost & Sullivan

FINAL THOUGHTS

One Shift, Three Pillars, and Delivery Stays Local

SHIFT	**From equipment to assured performance** Buyers no longer purchase machines. They purchase comfort, energy use and uptime, so suppliers compete on guarantees and service.	**Outcomes, not hardware**
P1	**Decarbonisation sets the pace** Buildings use 40 percent of Europe's energy and HVAC takes half of it, making heat pumps the fastest moving lever from 3.0 to 5.9 million units by 2035.	**$57.1B Europe HVAC, 2026**
P2	**Buildings turn into data assets** BIM, digital twins and AI move assets from scheduled maintenance to self optimising operation, with software carrying more of the value.	**AI in Europe buildings: $14.7B to $32.1B by 2031**
P3	**Water joins the energy agenda** Smart metering and real time sensors expose leakage and network losses, and spending shifts toward data, analytics and network services.	**4.3 million km of pipes to renew**
LOCAL	**One direction, local delivery** EPBD, F-gas rules and ETS2 create common demand across Europe, while regional starting points, funding and installer capacity set the pace.	**ETS2 applies from 2027**



THANK YOU

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