



# Briefing on Sustainability

Heat Pump Heating in Europe for Accelerating  
the Realization of Carbon Neutrality

Daikin Industries, Ltd.  
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# Presenters

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# Today's Briefing Agenda

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## Heat Pump Heating in Europe for Accelerating the Realization of Carbon Neutrality

I . Daikin Initiatives for Carbon Neutrality

II . Medium- to Long-Term Business Growth and Resolution of Social Issues

III . Daikin Europe's Heat Pump Business

# I . Daikin Initiatives for Carbon Neutrality



1. Our Environmental Contribution and Heat Pump Heating Adoption
2. Trending toward Global Adoption of Heat Pumps

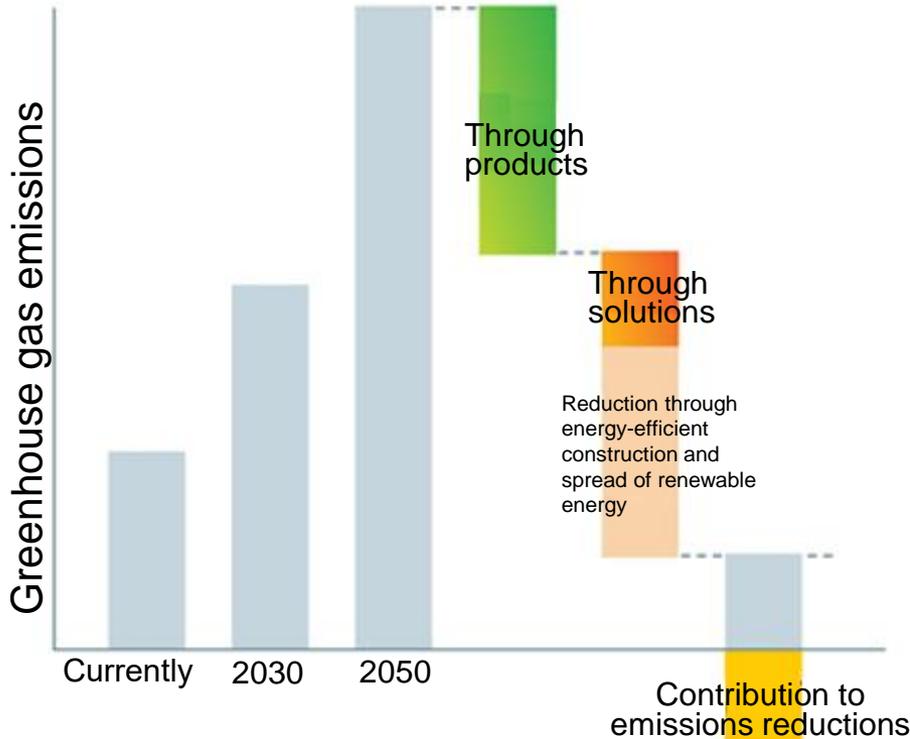
# 1. Our Environmental Contribution and Heat Pump Heating Adoption



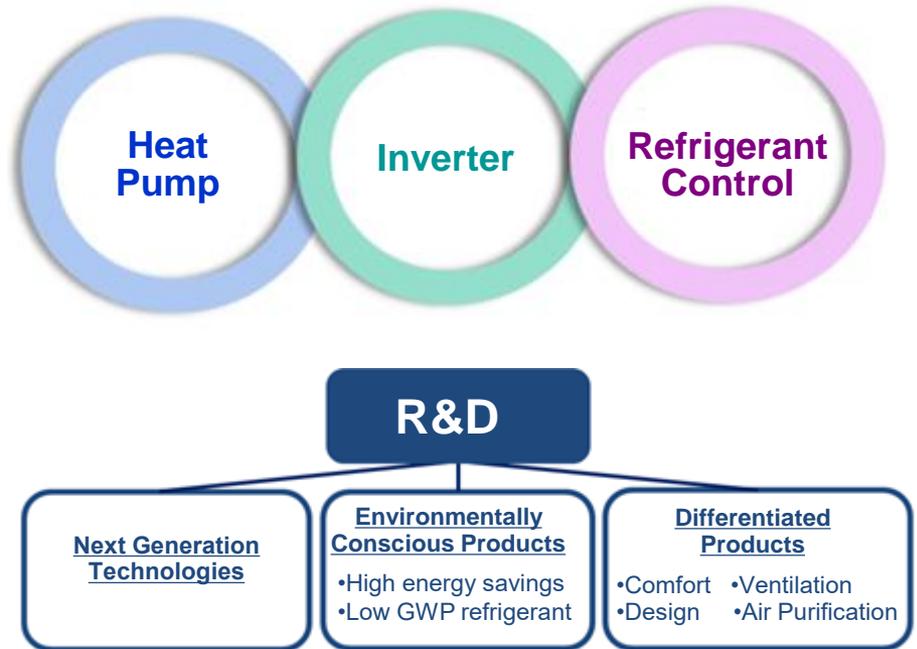
# Daikin Group “Environmental Vision 2050”

- ❑ We announced **Environmental Vision 2050** in 2018 as a declaration for our aim of **net zero greenhouse gas emissions from our business activities, products, and services** and have unequivocally committed ourselves to **carbon neutrality**.
- ❑ Having further refined our three environmental technologies of **inverters, heat pumps, and fluorochemicals (refrigerants)**, we are promoting the mainstream use of environmentally conscious products and solutions related to construction as a contribution to the reduction of CO2 emissions outside the company.

### Daikin Environmental Vision 2050



### Daikin Three Core Environmental Technologies



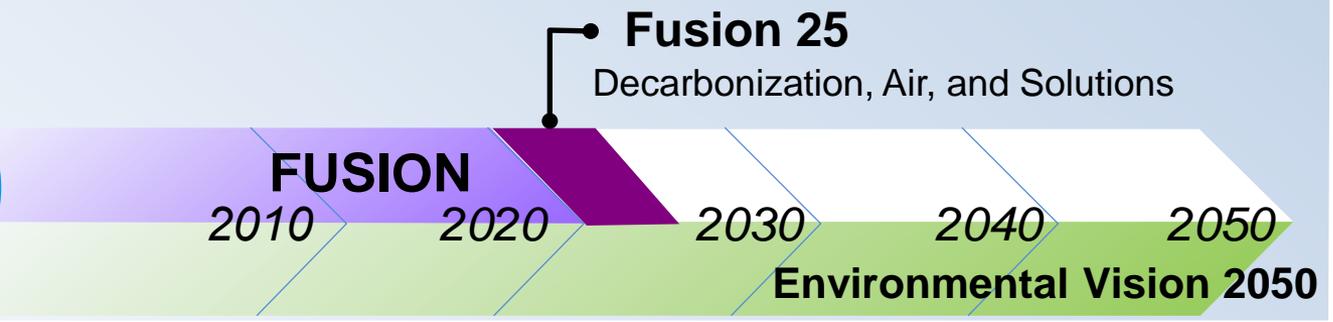
# Strategic Management Plan “Fusion 25” of the Daikin Group

- ❑ Environmental Vision 2050 is **incorporated in the FUSION strategic management plans** along with specific measures to achieve targets.
- ❑ In the strategic management plan **Fusion 25**, “**Challenge to achieve carbon neutrality**” is one of the growth strategies, and “**shift from combustion type to heat pump type space and water heating**” is an important issue.

ダイキンがめざす価値創造

環境負荷を低減しながら、人と空間を健康で快適にする新しい価値を提供します。

Value Creation for the Earth	Value Creation for Cities	Value Creation for People
<p>事業活動全体を通じて環境負荷を低減し、気候変動の抑制に貢献する</p> <ul style="list-style-type: none"> <li>●製品の環境性能をさらに高める</li> <li>●効率的に資源を利用する</li> <li>●森林を保全し、森林が持つ機能を維持する</li> </ul>	<p>都市化によって生じるエネルギー関連課題を解決し、持続可能な都市づくりに貢献する</p> <ul style="list-style-type: none"> <li>●ビル全体・都市全体でエネルギーを効率的に利用する</li> <li>●循環型社会システムを構築する</li> <li>●新たなエネルギーを創る</li> </ul>	<p>空気の可能性を追求し、人々の健康で快適な生活に貢献する</p> <ul style="list-style-type: none"> <li>●安全・安心な空気環境を提供する</li> <li>●室内環境を改善し、健康で快適な暮らしを支える</li> <li>●生産性を向上させ経済発展に貢献する</li> </ul>
		
<p>7 環境負荷低減</p> <p>13 環境負荷低減</p> <ul style="list-style-type: none"> <li>●インバータ機の普及などエネルギーの効率向上</li> <li>●低温暖化冷媒の開発・普及</li> <li>●ヒートポンプ暖房・給湯の普及</li> <li>●再生可能エネルギーの活用と普及</li> </ul>	<p>9 エネルギー効率向上</p> <p>11 エネルギー効率向上</p> <ul style="list-style-type: none"> <li>●ZEB（ネット・ゼロ・エネルギー・ビル）への取り組み</li> <li>●エネルギーマネジメントやデマンドレスポンスの推進</li> </ul>	<p>3 健康・安全</p> <p>11 健康・安全</p> <p>12 健康・安全</p> <ul style="list-style-type: none"> <li>●熱中症や感染症の予防</li> <li>●大気汚染対策</li> <li>●人々の健康や心身に対する空気・空間の価値を創出</li> <li>●暑さ・寒さからの解放などによる生産性向上への貢献</li> </ul>
<p>12 資源循環</p> <ul style="list-style-type: none"> <li>●生産時の省エネ、リサイクル、省資源化への取り組み</li> <li>●市場での冷媒転換や回収・再生・破壊</li> </ul>		



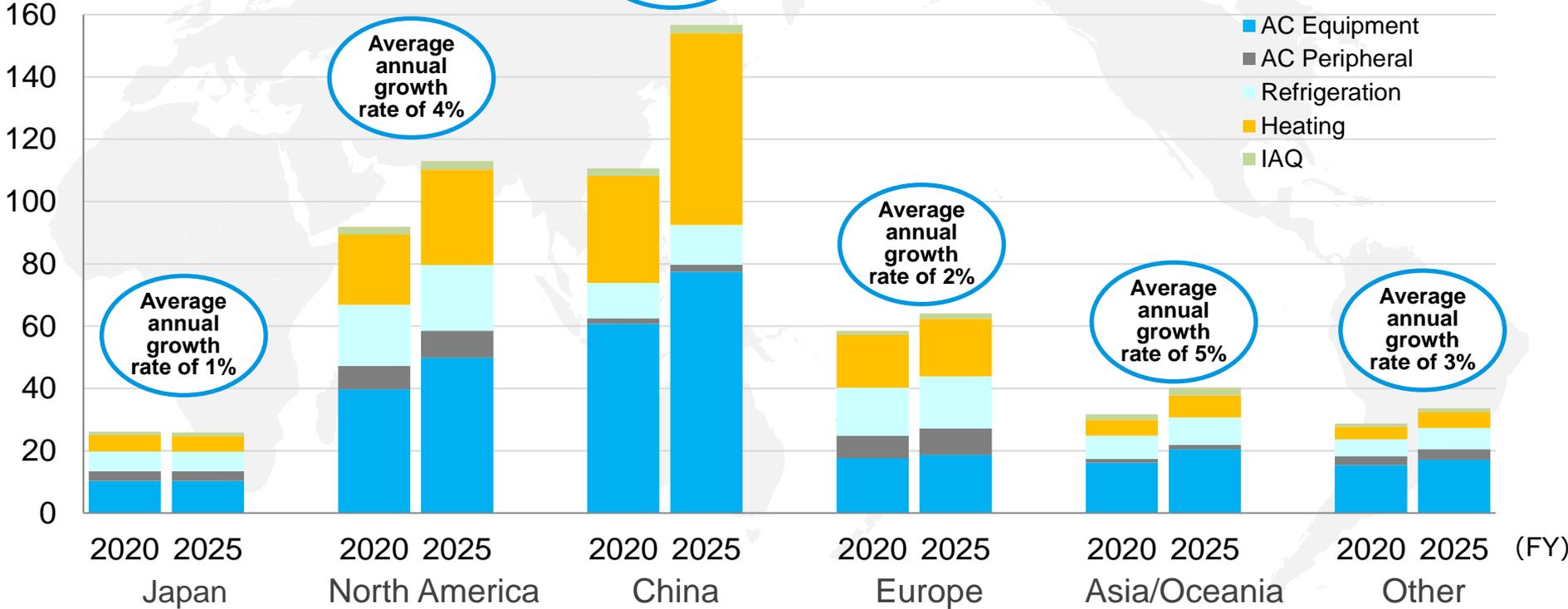
# Size and Share of the Space and Water Heating in the Global AC Market

- ❑ The size of the global HVAC&R market is expected to expand from ¥34 trillion (2020 actual) to ¥43 trillion (2025 forecast).
- ❑ Of this, the space and water heating market will account for approximately 30% of the total in FY2025 (approximately 25% in FY2020). However, heat pump air conditioners and VRF included in air conditioning equipment are not counted as space and water heating.

[Market size by region (Daikin estimate)]

(100 billion yen)

※HVAC&R = AC equipment, AC peripheral services, controls, refrigeration, space and water heating, and IAQ  
 ※Estimated by Daikin based on the "Global HVAC&R Market Forecast"



# Major Heating Methods in the World and Heat Source Replacement

\*Calculated by Daikin based on IEA data

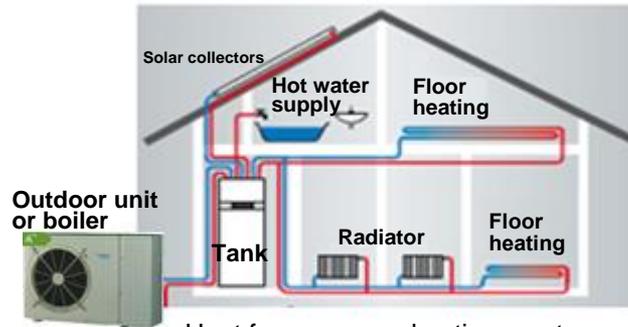
- ❑ In the global heating market by heat source, **combustion heating accounts for ¥3 trillion**, electrical heating for ¥0.9 trillion yen, and **heat pump heating for ¥1.2 trillion**.\*
- ❑ **In Europe, combustion type heating is mainstream** and is performed by burning fuel such as gas or oil in a boiler to heat water that is circulated through panels in each room. While it has the merits of low initial costs and dependable operation at low outdoor temperatures, it **emits a large amount of CO2** and has a high environmental impact. Conversely, **heat pump heating emits less CO2 and conserves energy**.
- ❑ Heat pump heating is expected to gradually replace combustion heating in the future. (See below)

North America: **Warm air type** Central AC



Heat from gas combustion creates **warm air** that is **conveyed by ducts** to each room

Europe: **Warm water type** Central AC



Heat from gas combustion creates **warm water** that is **supplied by radiators, etc.**, to each room

Japan: Individual AC



Gas furnace



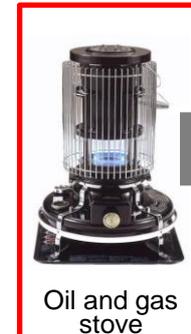
Heat pump unitary



Boiler water heater



H/P water heater



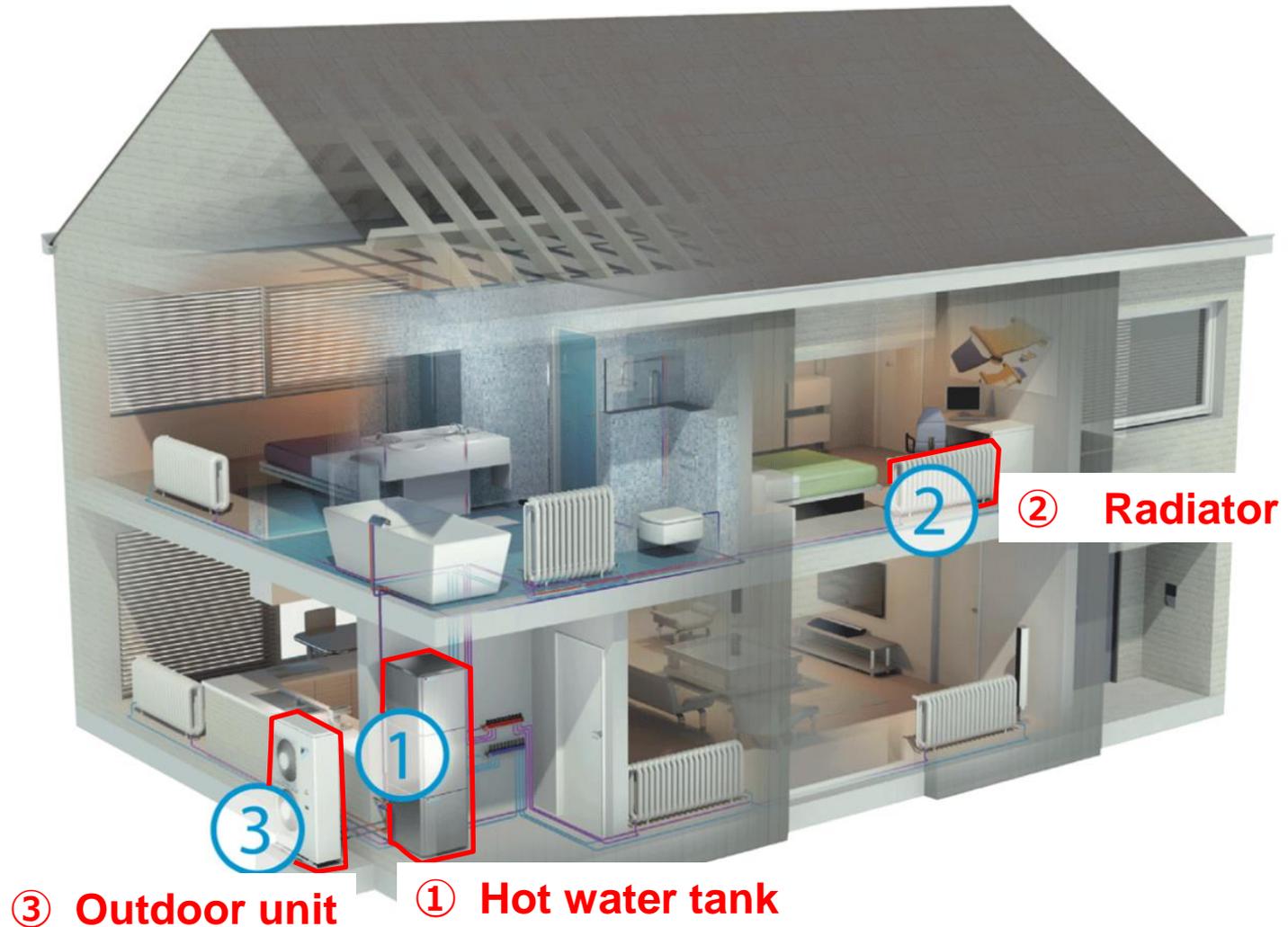
Oil and gas stove



H/P air conditioner

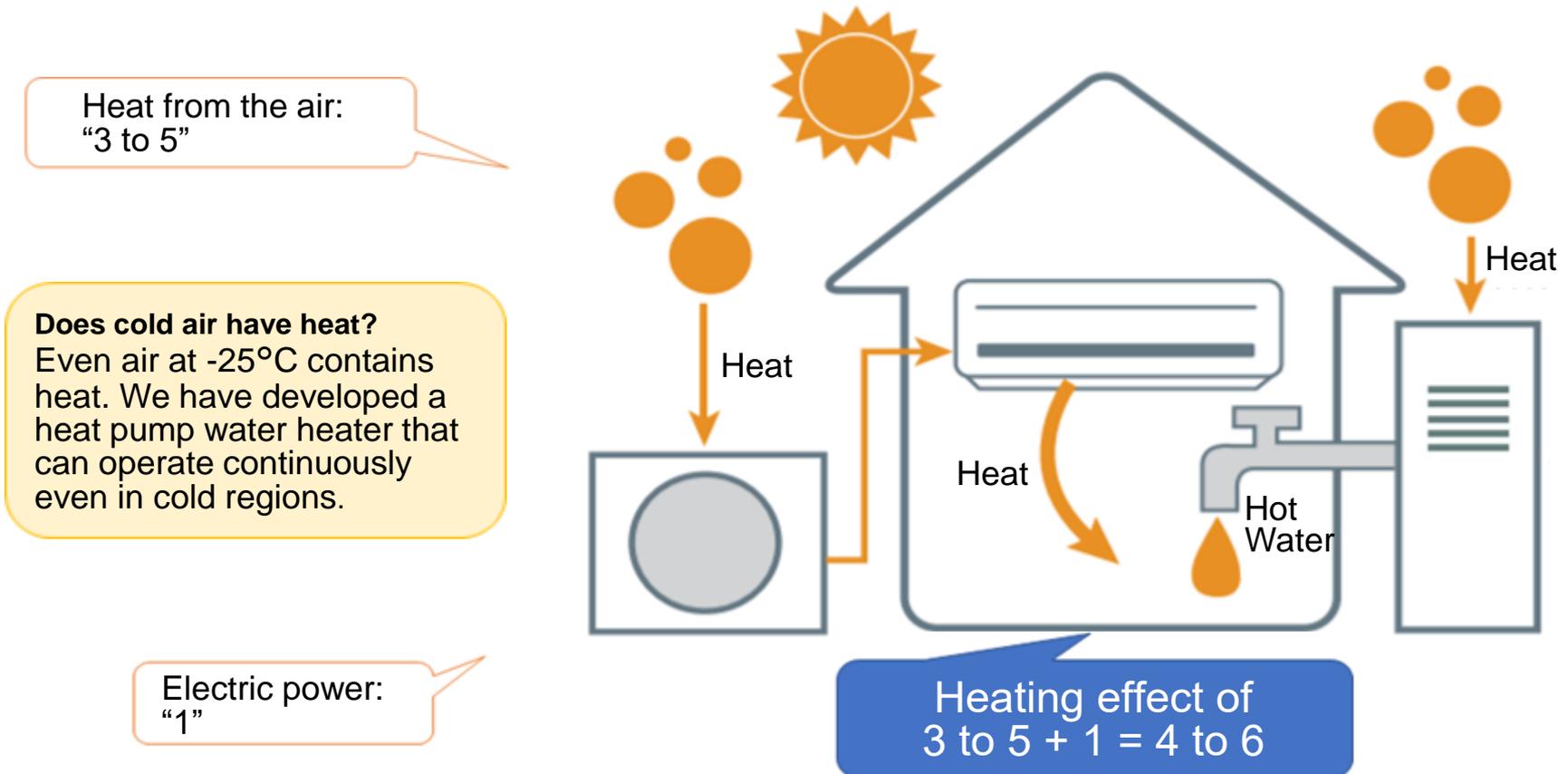
# Heat Pump Heating in Europe

- Example of the Daikin air-to-water heat pump system “Altherma”



# Heat Pump Technology Praised for Helping the “Transition from Fossil Fuels”

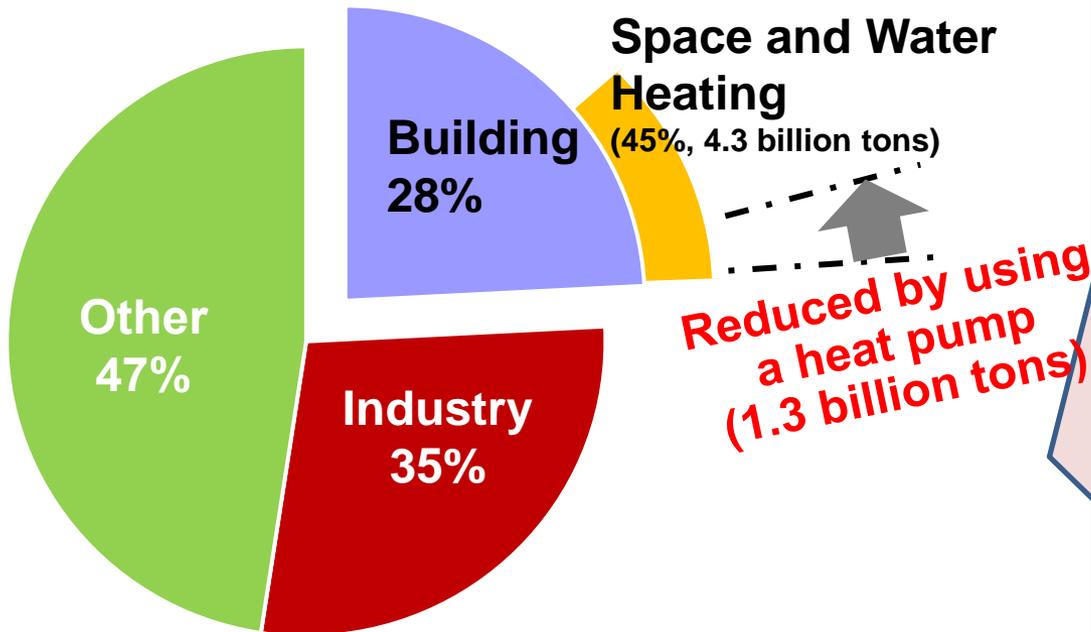
- ❑ A heat pump is a technology that collects heat from the air, condenses it with a compressor, and conveys it indoors. Instead of "creating" heat, it **"collects and transports" the heat already in the air**, and thereby saves energy. The heat in the air originates from the radiant heat of the sun, so it is a **renewable energy source**.
- ❑ In Europe, heat from the air **is recognized as a renewable energy source** under the Renewable Energy Use Promotion Directive 2009/28/EC (currently Renewable Energy Directive 2018/2001/EU).
- ❑ In the future, the **electricity that is used will also be decarbonized**, and **further CO2 reductions** can be expected.



# Impact of Heat Pump Heating Worldwide

- ❑ Based on the IEA report, **replacing 30% of the global heating market** with heat pump heating would reduce the **world's CO2 emissions about 4%**, which would be equivalent to nearly **1.3 billion tons of emissions**.
- ❑ This is equal the emissions of **560 million average automobiles**, or **15.6 times the absorption of forests in Japan**.  
(\*This assumes that the electric power of the heat pump is produced entirely from renewable energy.)

## Global CO2 Emissions 34 Billion Tons



**Automobile (Company A 2-liter type) equal to 560 million cars**

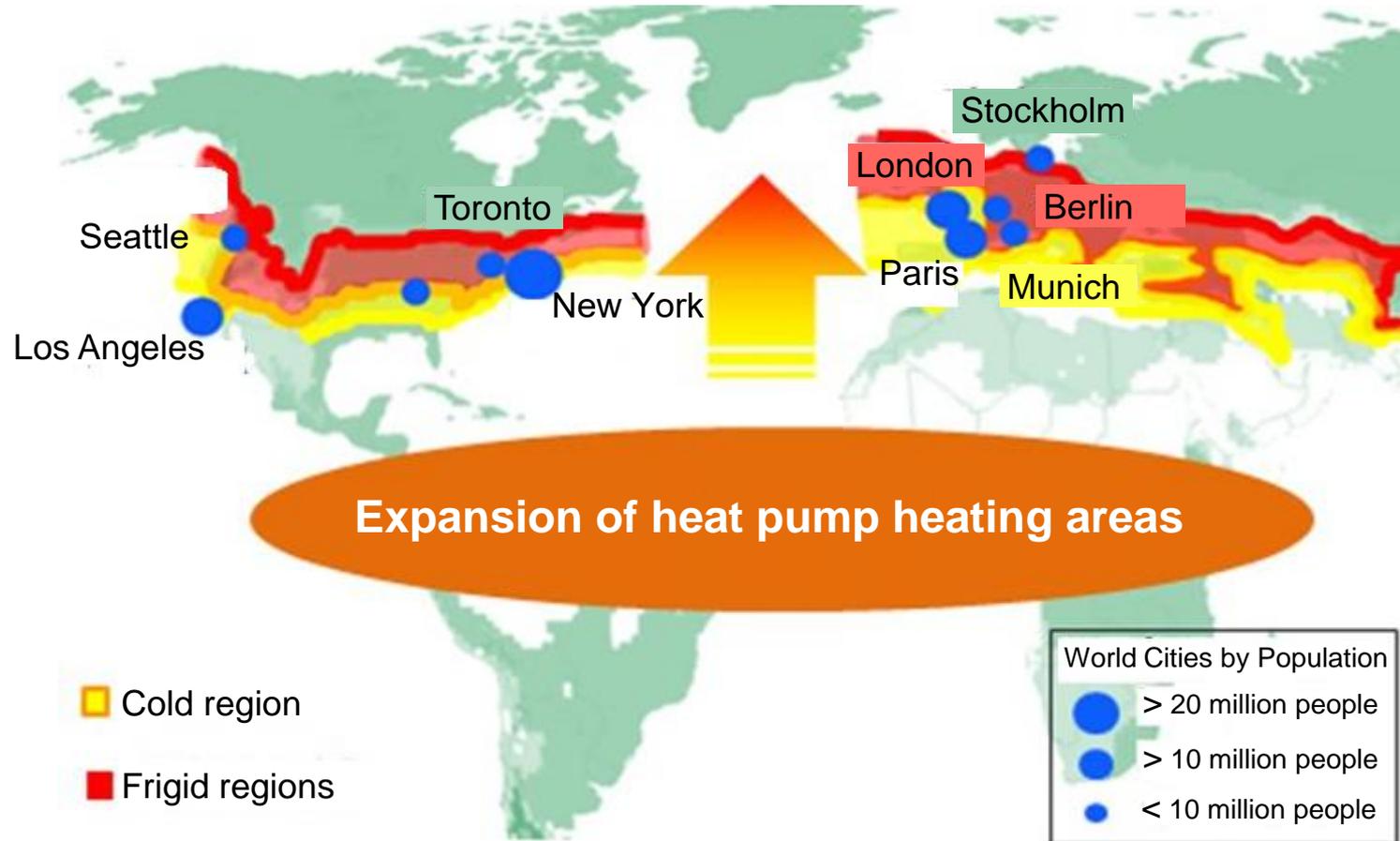


**Forest (Forestry Agency, cedar equivalent) Equal to 15.6 times the amount absorbed by forests in Japan**



# Contribution of Heat Pump Heating to Reducing Environmental Impact Started in Europe and Spread Globally

- ❑ Business growth is focused on the **European market**, where the shift from combustion heating to heat pump heating is most apparent. Our experience in the European market is being applied horizontally to global heating markets as part of our contribution to **reducing the global environmental impact**.
- ❑ We will use our technological capabilities to develop products that can ensure operation performance even in **frigid regions** and expand the areas that can be heated by heat pumps.



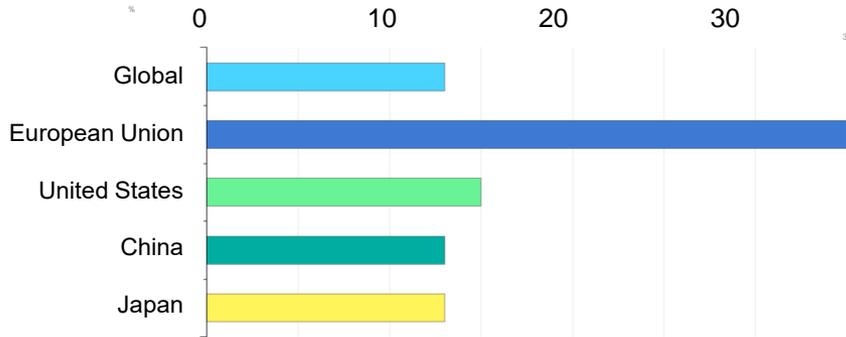
## 2. Trending toward Global Adoption of Heat Pumps



# Situation for the Mainstream Adoption of Heat Pumps

- Heat pump demand is increasing due to the decarbonization policies of countries around the world. **The number of heat pumps sold in 2021 was a record high.** In the European Union (EU), demand increased 35% year-on-year to 2.2 million units, whereas demand was 15% in the United States, 13% in Japan, and the demand in China for air-sourced heat pumps increased 13%.

Growth rate of heat pump sales by region (2021 vs. 2020)



- However, heat pumps currently only **account for about 10% of the world's heating needs for buildings.**

The IEA is promoting energy conservation in buildings toward net-zero energy consumption in 2050 and is **recommending 50% diffusion for heat pumps.**

Source: IEA, etc.

- In 2020, heat pump sales totaled 117 million units, and the IEA predicts that the heat pump market will **exceed 600 million units in 2030.**

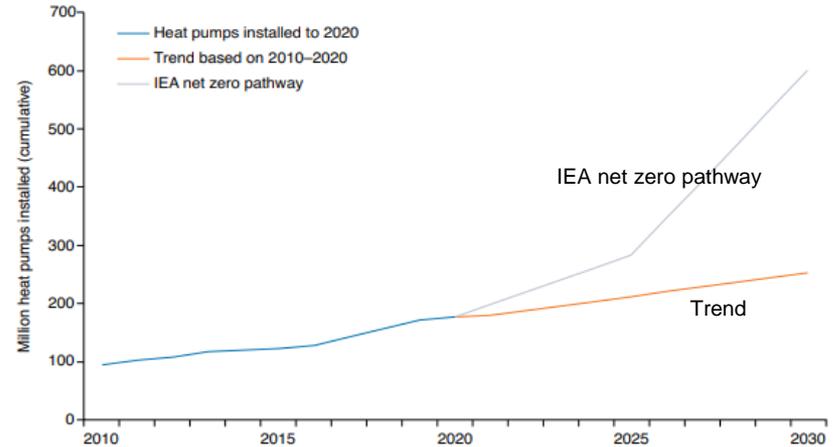
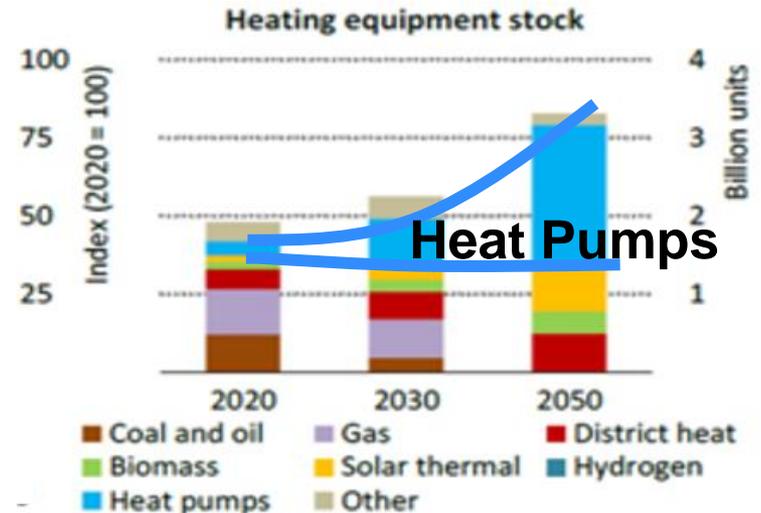


Fig. 1 | Global historic heat pump sales and IEA net zero 2050 pathway. Global stock of heat pumps

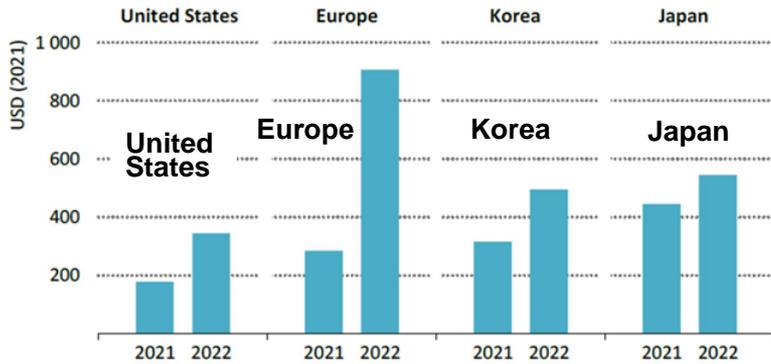
## Proliferation of Heat Pumps toward Net Zero in 2050



# Economic Benefits of Heat Pumps Multiply As Natural Gas Prices Soar

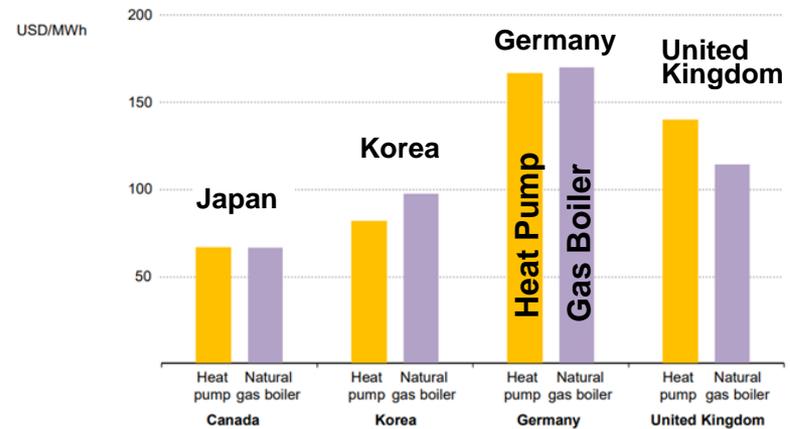
- ❑ In the past, the initial cost deterred widespread adoption of heat pumps. However, soaring natural gas prices from the situation in Ukraine have increased the appeal of lower fuel and electricity costs of heat pumps since the total cost of ownership, including initial and operating costs, is now nearly the same (IEA).
- ❑ An additional advantage of heat pumps is the effect of demand response (IEA). In Japan, the demand effect for water heaters alone is estimated to have a demand effect of about 10 power plants (Daikin).

**Savings in operating costs (fuel and electricity costs) after switching from a gas boiler to a heat pump**

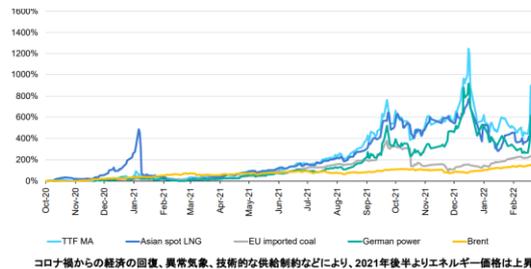


While higher initial investment have slowed sales, adoption of heat pumps has risen on the appeal of having higher energy efficiency than gas boilers that results in lower fuel and electricity costs.

**Total cost comparison (initial and operating costs) of gas boiler and heat pump (2021)**



**Reference: Soaring Energy Prices (Oct 2021-April 2022)**



Source: IEA, etc.

# Market Situation for Heat Pumps (North America)

## ❑ Electrification promotion under the Inflation Reduction Act (2022)

- The U.S. government will reduce its fiscal deficit in 2022-2031 while making the largest investment (\$369 billion) in energy security and climate change through \$36.5 billion in tax deductions for “buildings” and \$8.8 billion in refunds.
- Tax deductions **total \$12.5 billion for energy-saving equipment such as heat pumps with rebates of more than \$8,000 each.**

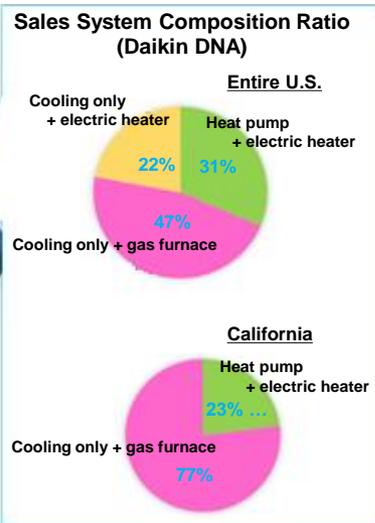
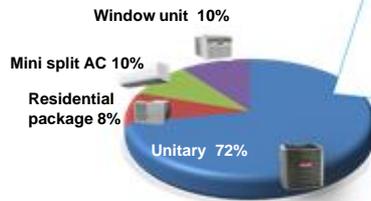
## ❑ Electrification promotion under the Defense Production Act (2022)

Although the total investment amount is modest at \$500 million, some of the funds will be used to encourage the U.S. manufacture of heat pumps and their parts, boost employment by increasing U.S. production, and promote widespread adoption of heat pump by providing support targeting low-wage earners.

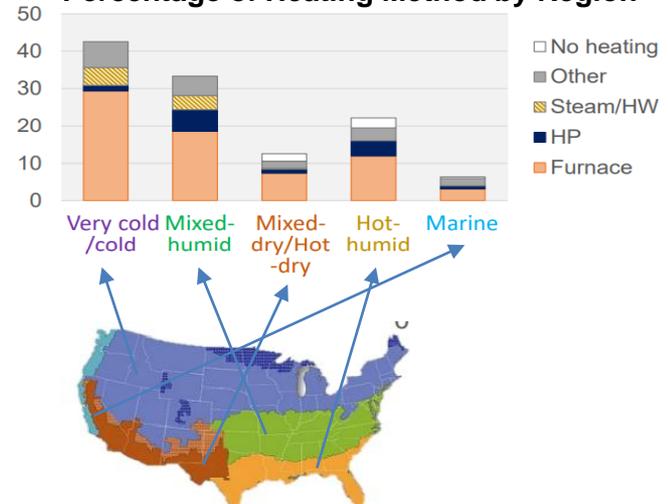
## ❑ Duct-type unitary units account for about 70% of sales in the North American residential air conditioning market against 30% sales for heat pumps

Of these, heat pump heating is mainly used in cases where there is no natural gas infrastructure. Furnaces such as for gas heating are also used in the relatively warm southern regions.

Breakdown of the North American Residential AC Equipment Market



Percentage of Heating Method by Region

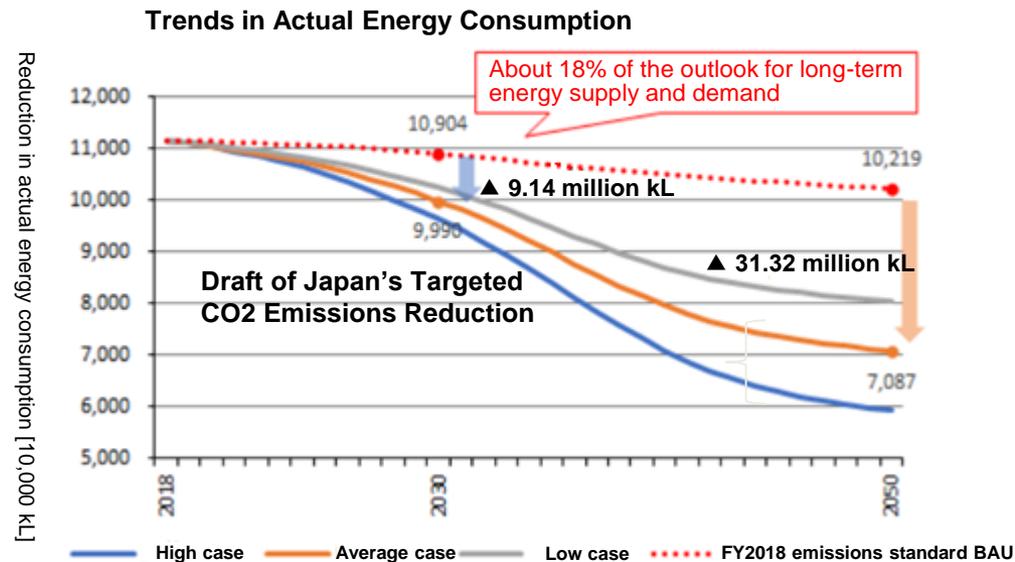


# Market Situation for Heat Pumps (Japan)

- ❑ The Japanese government is promoting industrial heat pumps and residential heat pump water heaters as part of its mixed energy policy.
- ❑ The Heat Pump & Thermal Storage Technology Center of Japan estimates that this will have a CO2 reduction effect of 12% by 2030 and 14% by 2050, which are the reduction targets for Japan.
- ❑ For residential, an 8.5% CO2 emissions reduction is possible by replacing heat pump water heaters and heating equipment in cold regions with heat pumps.

## 2021 CO2 Reduction Effect of Heat Pumps (Heat Pump & Thermal Storage Technology Center)

- Effect on reducing actual energy consumption (2018 BAU standard: average case)  
FY2030: ▲ 9.14 million kL; FY2050: ▲ 31.32 million kL
- Greenhouse gas emissions reduction effect (FY2018 emissions standard: average case)  
FY2030: - ▲ 7.54 million tCO2; FY2050: ▲ 36.99 million tCO2
- Effect on reducing actual energy consumption (2018 BAU standard)



Source: Heat Pump & Thermal Storage Technology Center of Japan, etc.

## II . Medium- to Long-Term Business Growth and Resolution of Social Issues



- Review of the First Year of Fusion 25 and Current Situation
- Response to Latest Changes in the External Environment and the Latter-Half 3-Year Plan

# 1. Review of the First Year of Fusion 25 and Current Situation

	FY2020	FY2021	FY2025 Targets
Net sales	¥ 2.49 trillion	¥ 3.11 trillion	More than ¥ 3.6 trillion
Reduction rate of actual greenhouse gas emissions* (Based on 2019, compared to BAU)	7%	10%	More than 30%

※ Actual greenhouse gas emissions = Greenhouse gas emissions over the product lifecycle - Contribution to reducing greenhouse gas emissions

## 1) Reductions during manufacturing (development/production processes)

### Reduce HFC/PFC emissions in development/production processes

- ✓ Make efforts to achieve a carbon neutral factory
  - Zero-emission factory measures underway for the Rinkai No. 1 Factory at the Sakai Plant
- ✓ Greenhouse gas emissions in FY2021: 1.16 million t-CO<sub>2</sub> (36% reduction compared to FY2015)
  - Achieve FY2025 target of 1.2 million t-CO<sub>2</sub> ahead of schedule (34% reduction compared to FY2015)

## 2) Reduced power consumption during product use

### Accelerate global promotion of inverters to lead competitors with environmentally conscious products (energy-saving equipment)

- ✓ RA inverter conditioners: 75% in 2019 ➡ 79% in 2021 (Target: 98% in 2025)  
Inverter products in North America: 10% in 2019 ➡ 15% in 2021 (Target: 30% in 2025)
  - Inverter AC units are approximately 50% more energy efficient than non-inverter units

# 1. Review of the First Year of Fusion 25 and Current Situation

## 3) Expansion of the Heat Pump Space/Water Heater Business

**Position Europe and North America as top priority regions and accelerate conversion of combustion type space and water heaters to heat pumps.**

- ✓ Net sales ¥130.6 billion in FY2020 ➔ ¥190 billion in FY2021
  - Achievement of FY2023 sales target of ¥204 billion in Fusion 25 is projected one year ahead of schedule
- ✓ Europe: Sales expansion have been driven by subsidies for heat pumps and tightening of regulations for combustion equipment
  - Establishment of a new plant for heat pump heaters in Poland in 2024
- ✓ North America: Accelerate sales of inverter heat pump unitary (expand sales of strategic product FIT)



## 4) Refrigerant initiatives supporting the AC business

**Promote various measures to reduce greenhouse gas emissions caused by refrigerants and lead in the environment, society, and industry**

- ✓ Promotion of global conversion to R32
  - R32 ratio for RA: 83% in 2019 ➔ 91% in 2021 (target: 95% in 2025)
  - Leverage tighter HFC regulations and promote shift to R32 in North America, where efforts are behind other regions
    - First sales of RA using R32 in North America in December 2021
- ✓ Creation of refrigerant eco-cycle (recovery, reclamation, and destruction)
  - Europe: Development of VRV L $\infty$ P using reclaimed R410A, strengthening refrigerant reclamation business in Germany (started in 2020)
- ✓ Development of low GWP refrigerant
  - Refrigerant development for EV air conditioning (2027 target for commercialization)
- ✓ Development of new systems and equipment using low GWP refrigerants

# 1. Review of the First Year of Fusion 25 and Current Situation

## Future Initiatives (Contribution to Future Emissions Reductions)

### 5) Challenge to Create New Environment - Related Business

#### Challenge themes that can be expected to expand the market and contribute to CO2 reductions

- ✓ Smart cities: Participate in projects in various regions worldwide including Asia, Europe, and Japan
- ✓ Energy creation: Expand lineup of micro-hydroelectric power generation

##### ■ Smart city project in Singapore



##### ■ Micro-hydroelectric power generation (DK-Power)



### 6) Technology Development to Realize a Carbon Neutral Society

#### Research and obtain leading-edge technologies for CO2 separation, recovery, and reuse

- ✓ Explore technologies for ambient temperature decomposition, direct recovery, and reuse of CO2 (collaborative innovation with Doshisha University)
- ✓ Establish a hypothesis for a net zero CO2 emissions society (collaborative innovation with the University of Tokyo)



## 2. Response to Latest Changes in the External Environment and the Latter-Half 3-Year Plan

**The global trend toward carbon neutrality is accelerating with greater momentum than when the original plan for Fusion 25 was formulated.**

### (1) International agreement

- At **COP27** in November last year, countries agreed to a change from the conventional 2°C target (carbon neutrality by 2070) to the **1.5°C target (carbon neutrality by 2050)**.
- **More than 150 countries have committed to carbon neutrality.**
- Many countries have **raised their CO2 reduction targets for 2030.**

### (2) Acceleration of trend toward H/P adoption by each country

- Europe:** Soaring energy costs due to the Ukrainian war and **cutbacks of Russian natural gas are speeding up the shift to heat pumps from natural gas.** The number of countries with a new gas boiler ban and/or fast-tracking and strengthening existing bans are increasing.
- N. America:** **Along with a ban on new construction for natural gas in environmentally advanced states,** subsidies have expanded the spread of H/P equipment.
- Japan:** Soaring energy prices have stimulated interest in decarbonization, mainly among government agencies and major companies. **In 2025, a new energy-saving standard for water heaters was enacted** making high efficiency mandatory for both combustion type and electric type heaters.
- China:** **Government is leading electrification and energy conservation efforts** toward a peak out of CO2 emissions in 2030.

### (3) Acceleration of trend toward carbon neutrality by private companies

- **An increasing number of machinery manufacturers have committed to zero CO2 emissions** from their factories and offices.

In the **Fusion 25 latter-half 3-year plan scheduled for announcement in June,** we will **specify and accelerate carbon neutrality initiatives,** such as our heat pump space/water heater business, as we continue to reduce CO2 emissions.

### III . Daikin Europe's Heat Pump Business



1. European Heat Pump Heating Market
2. Technology and Product Strategy for Heat Pump Heating
3. Business Strategy for Future Growth

# 1. European Heat Pump Heating Market



# Background of the Heat Pump Market Expansion

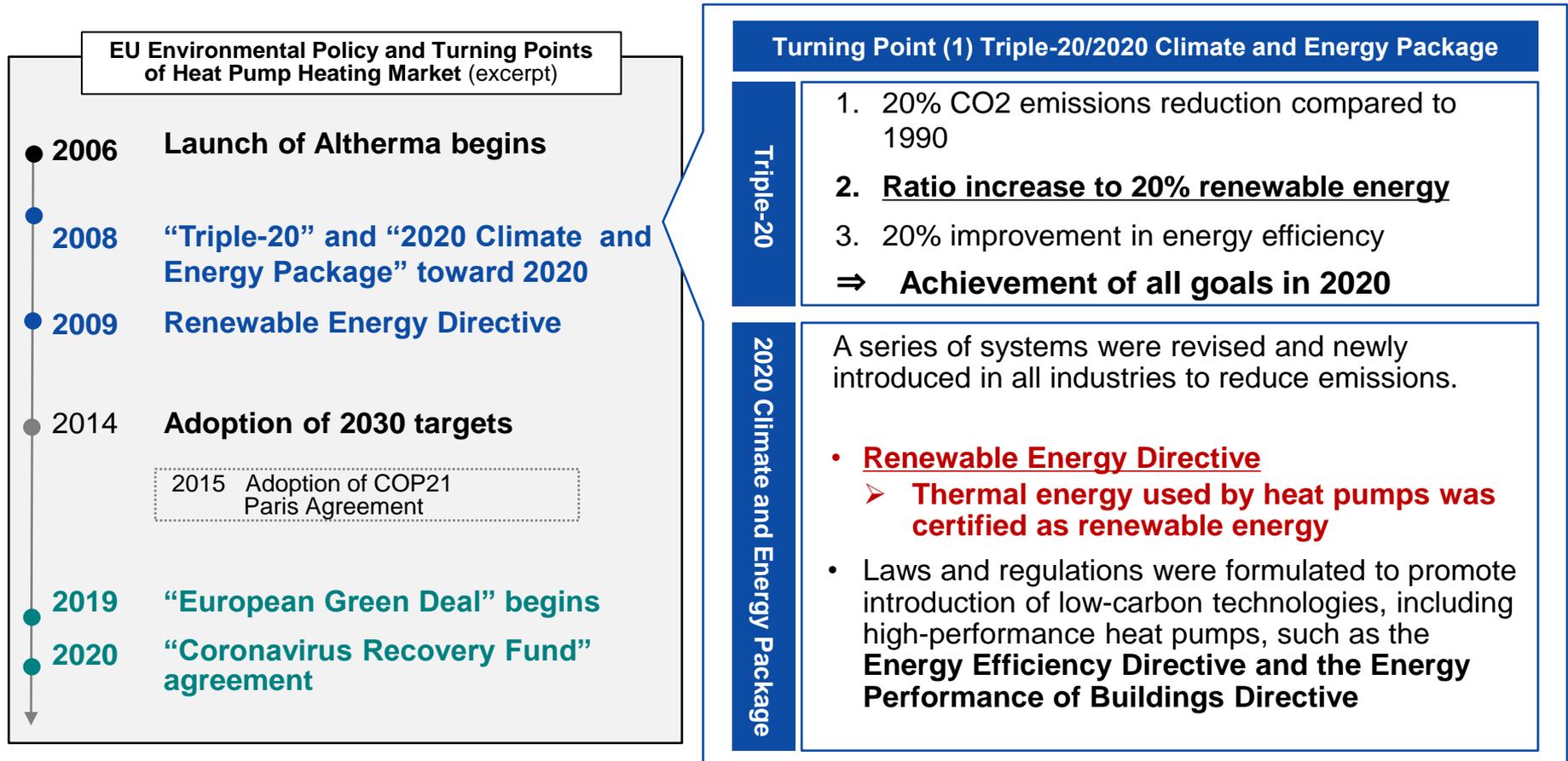
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## Environmental Policies in Europe Affecting the World

- ❑ The policies of environmentally advanced cities in the EU and North America have an international impact on global environmental policy. **In particular, the EU leads the world in the introduction of environmental regulations having a global impact.**
- ❑ Even after the spread of COVID-19, the stance of advocating a “green recovery” to **achieve both economic growth and climate change countermeasures has not changed.**
- ❑ In Europe, where demand for heating is substantial and reliance on the combustion of fossil fuels is significant, **the shift to heat pump space and water heating will greatly contribute to decarbonization. Heat pumps are regarded as a "renewable energy technology," similar to solar power generation and wind power generation. For this reason, the EU and its member states have enacted measures for promoting heat pumps and providing incentives for their adoption.**
- ❑ The recent **Ukrainian crisis has further accelerated the movement to break free from natural gas dependence by replacing combustion type heating with heat pump technology.**

# Turning Point (1) Triple-20/2020 Climate and Energy Package

- ❑ In 2008, the EU introduced the 2020 target "Triple-20" and the "2020 Climate and Energy Package" to achieve it.
- ❑ **Daikin began sales of Altherma in 2006. Capitalizing on the tailwind of heat pumps being recognized as "renewable energy technology," similar to solar power generation and wind power generation, the company set forth with its heat pump heating business.**



(Source: EU Commission)

# Turning Point (2) European Green Deal/Coronavirus Recovery Fund

- ❑ The European Green Deal, which is the most important policy of the current EU administration, is backed by the Coronavirus Recovery Fund and is expected to further accelerate decarbonization by responding to the challenges of financial and social structural transformation in climate change policies.
- ❑ The EU will need extensive financial resources to achieve 2030 housing sector targets, and **legal system improvements to focus environmental investment on the housing sector.**

## EU Environmental Policy and Turning Points of Heat Pump Heating Market (excerpt)

2006	Sales of Altherma begin
2008	“Triple-20” and “2020 Climate and Energy Package” toward 2020
2009	Renewable Energy Directive
2014	Adoption of 2030 targets
2015	Adoption of COP21 Paris Agreement
2019	European Green Deal begins
2020	Coronavirus Recovery Fund agreement

## Turning Point (2) European Green Deal/Coronavirus Recovery Fund

### Targets

#### European Climate Law

Targets were raised for 2030 (40%→55%) for “Climate [carbon] neutrality by 2050”

### Finance Policy

#### European Green Deal Investment Plan

In the 10 years from 2021 to 2030, **public and private sectors will attract more than €1 trillion (approx. ¥140 trillion) in environmental investment.**

EU budget + EU-ETS of more than €570 billion (about ¥80 trillion)  
 EU/Member State Joint Fund of more than €110 billion (approximately ¥15 trillion)  
 Financial institutions in each country, private investment/lending, Just-transition fund  
 More than €420 billion (¥60 trillion)

### Specific Measures

**Fit for 55** (policy review to achieve the 2030 target) (excerpt)  
 Legislation such as the Renewable Energy Directive, Energy Efficiency Directive, and Building Energy Performance Directive are being updated to promote the introduction of low-carbon technologies, including high-performance heat pumps.

Policies in many fields, including environmental pollution measures, are under consideration.

# European Market Changes after the Ukraine Crisis - RePowerEU

- ❑ **RePowerEU was newly announced in May last year** in the heightened awareness for energy security prompted by the war in the Ukraine. **In Fit for 55** (policy review to achieve 2030 targets), **all targets, including those for energy efficiency and renewable energy, were upwardly revised even further, and measures to curb electricity prices are being implemented in the EU and other countries.**
- ❑ **Heat pumps have attracted attention for their independence from Russian gas.**
- ❑ Heat pump demand rose among end users along with demand for space and water heating.

## Summary of RePowerEU (excerpt)

Acceleration of transition to clean energy	<p><b>Revised target for heat pumps (total introduction of approx. 10 million units over the next five years)</b></p> <p><b>Raise targets for Renewable Energy Directive higher</b></p> <p>Promote wind and solar power generation</p>
Promotion of energy savings	<p><b>Raise Energy Efficiency Directive targets higher</b></p>
Diversification of energy supply	<p>Review of green hydrogen and biomethane targets and coordinate and manage energy imports by member countries</p>
Additional investment	<p><b>€210 billion (approximately ¥29 trillion) is required by 2027, and €300 billion (approximately ¥42 trillion) is required by 2030.</b></p> <p>Utilization of the Recovery Fund, EU-ETS, EU/Member State Level Financial Measures, Private Investment</p>

(Source: EU Commission)

**Due to soaring renewable energy prices driven by fossil fuels, member countries agreed to set a profit ceiling on electric power companies and redistribute surplus earnings to offset higher electricity prices.** From the standpoint of fairness, a portion of profits will be temporarily collected from companies that sell and use fossil fuels and will be redistributed to compensate for electricity prices.



Source: European Council  
<https://www.consilium.europa.eu/en/press/press-releases/2022/10/06/council-formally-adopts-emergency-measures-to-reduce-energy-prices/>

# Incentives for Introducing Heat Pump Heating by Country

Countries are offering incentives to upgrade to heat pumps in order to achieve energy-saving and renewable energy rate targets.

## United Kingdom

A subsidy of £5,000 is provided for energy saving retrofits (which is equivalent to about 30% of the costs for the heat pump equipment and installation).

Refund method: The installer applies for the subsidy on behalf of the user. The user is issued an invoice with the subsidy amount deducted from the price paid to the installer.

## Germany

Since 2020, a 25% subsidy has been provided for equipment and building materials including heat pump and installation costs for energy-saving renovations to buildings. An additional 10 points are added for replacements from oil boilers.

An additional bonus of 5 points is provided for heat pumps with natural refrigerants from January 1, 2023.

Refund method: A subsidy is transferred to the end user after equipment installation and submission of the receipt issued by the installer.

## France

When upgrading from a combustion boiler to a heat pump, a tax refund between 30% to 70% of equipment and installation costs are provided depending on income.

An additional tax refund of €1,000 has been provided since April 2022.

Refund method: Payment is reimbursed to the user by electronic transfer to the designated account.

## Italy

For energy-saving renovations, equipment and installation costs are 100-110% tax deductible.

This deduction rate changes in stages with the deduction for detached houses reduced to 90% from January 23, 2023, and will be eliminated at the end of December 2023. The deduction for multiple-dwelling complexes is 90% for 2023, 70% for 2024, and 65% for 2025 and will end at the end of December 2025.

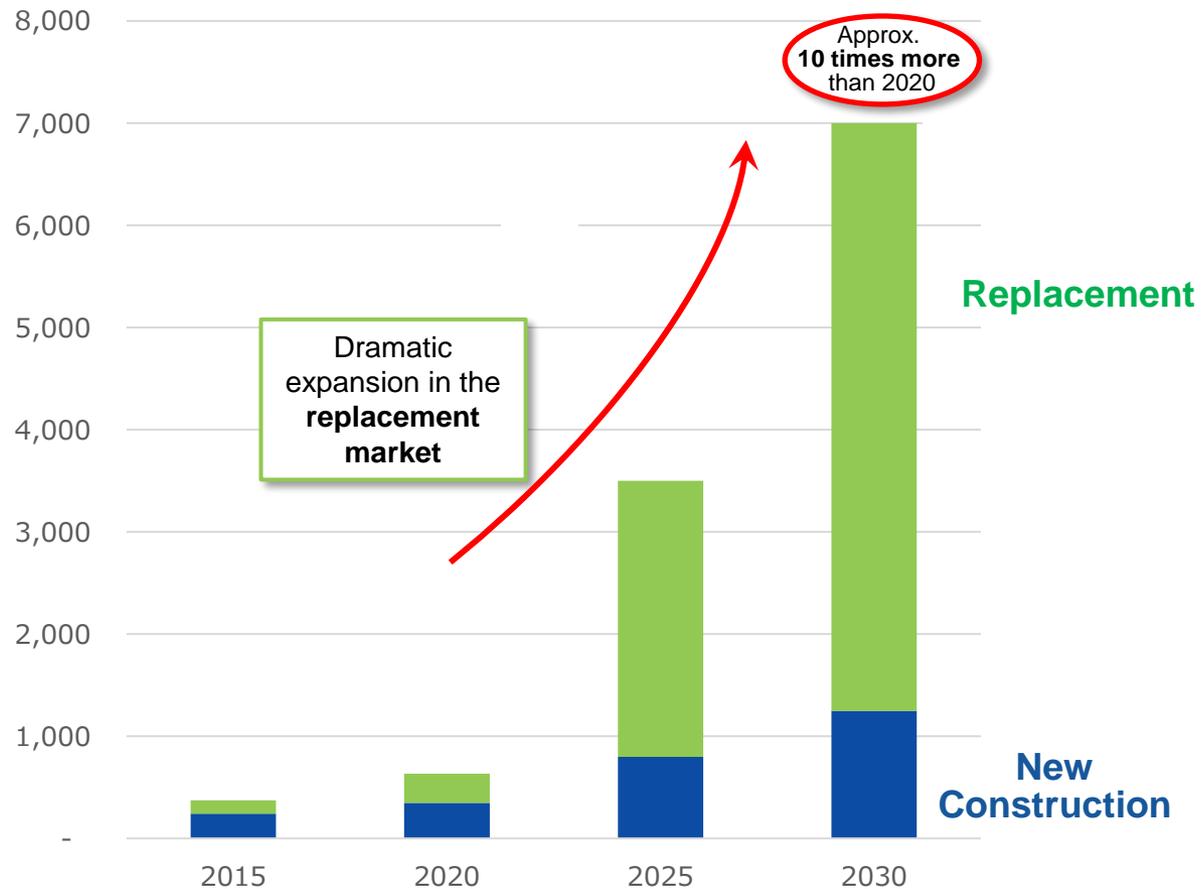
Refund method: Subsidy is reimbursed in the form of an income tax deduction.

## Examples of Incentives in Major Countries

(Daikin research)

# European Environmental Policies Spur Heat Pump Market Expansion

- ❑ Whereas use of heat pumps for heating has progressed because of CO2 emission regulations for new homes, **demand in the future for heat pumps is expanding not only for new homes but also for replacements in home renovations that are increasing because of greater incentives.**
- ❑ European environmental policies have caused expectations for a **sales volume increase in the heat pump heating market in 2030 of more than 10 times compared to 2020, accounting for more than half of the heating market.**



European Residential Heat Pump Heating Market Trends (1,000 Units)  
(Daikin estimate)

## 2. Technology and Product Strategy for Heat Pump Heating

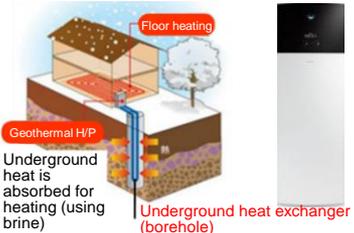


# Parent Function Responsible for Heating R&D of the Daikin Group

- ❑ In **Europe, combustion heating**, which heats water by burning fuel such as gas or oil in a boiler and circulates the hot water through panels in each room, **is mainstream**. In the future, it will gradually be replaced with heat pump heating.
- ❑ Europe is a large heating market with each region having a variety of needs. Therefore, Daikin Europe's EMEA Development Center serves as the **global parent function responsible for the heating research and development of the Daikin Group**.
- ❑ It quickly identifies the regulatory trends in Europe, one of the world's most environmentally advanced regions, and acts as a receiver for determining development policies for the Daikin Group as a whole.

## [Heating Types and Features for Europe]

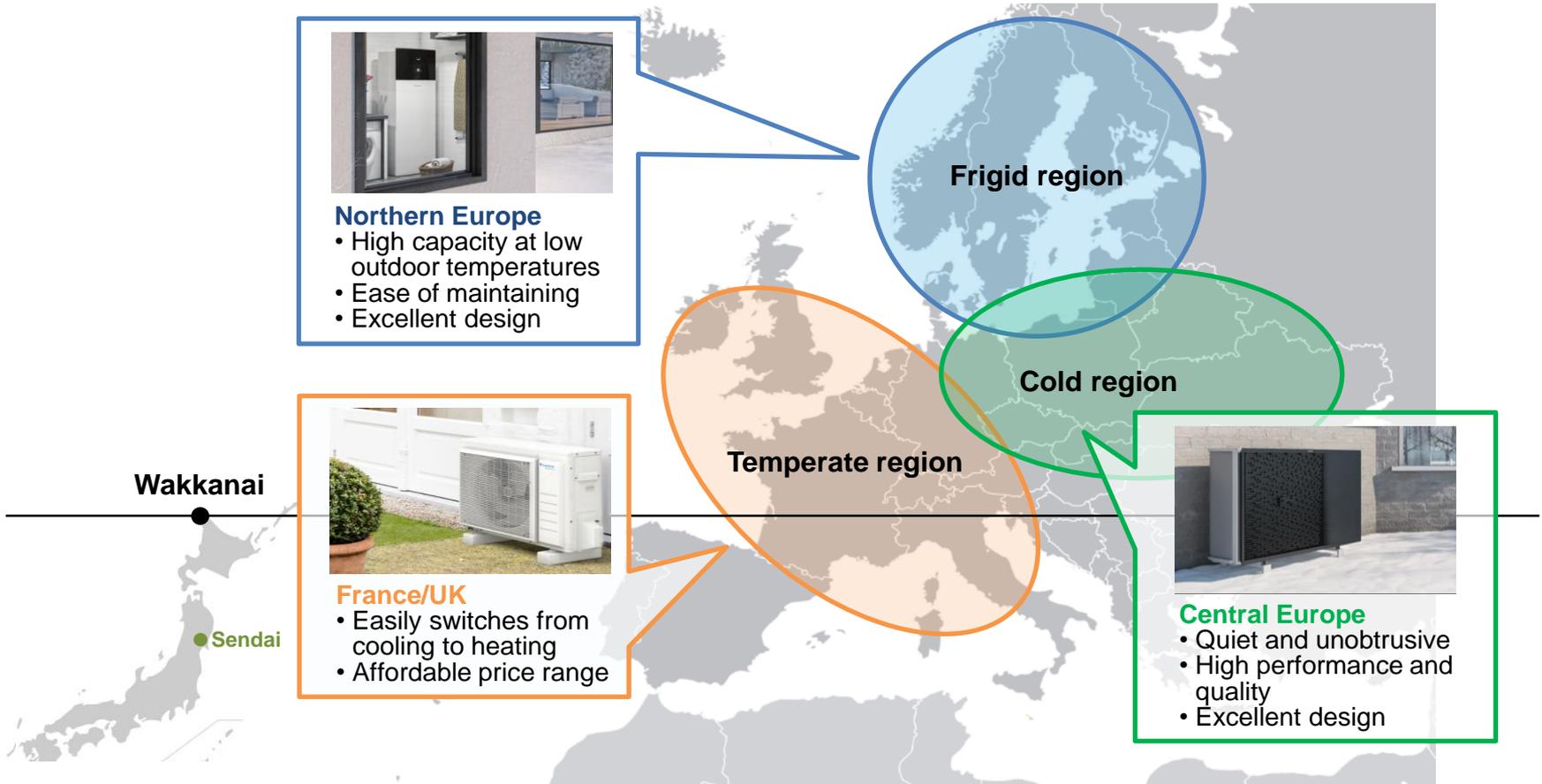
(※Market scale in FY2021)

System	Combustion Type		Heat Pump Type			
Heat Source	Fossil fuel combustion heat	Hybrid combustion heat + outdoor air heat	Outdoor air heat			Underground heat
Market Scale	€7,000 million	€400 million	€3,500 million			€750 million
Product Image			Floor standing Integrated hot water tank 	Wall mounted 	Outdoor integrated 	 Geothermal H/P Underground heat is absorbed for heating (using brine) Underground heat exchanger (borehole)
Features	<ul style="list-style-type: none"> <li>• Inexpensive equipment</li> <li>• Utility costs are high</li> <li>• Chimney required</li> <li>• Gas supply equipment/Oil tank required</li> <li>• Annual inspection required</li> </ul>	<ul style="list-style-type: none"> <li>• Dual combustion and heat pump type</li> <li>• Heat source purchase High price</li> <li>• Utility bills can be kept low</li> </ul>	<ul style="list-style-type: none"> <li>• Like room air conditioners, it is a heat pump system that draws heat from the outdoor air through refrigerant.</li> <li>• It is very efficient because it can obtain 5 units of thermal energy from 1 unit of electrical energy.</li> </ul> ※Combustion type heaters and electric heaters (fan heaters, etc.) can only obtain less than 1 unit of heat energy from 1 unit of energy.			<ul style="list-style-type: none"> <li>• A hole (borehole) is drilled in the ground to draw heat from the ground instead of outside air.</li> <li>• Heat that is greater than the outdoor air temperature can be obtained even in the middle of winter.</li> </ul>
Market	All Europe	Netherlands, Italy	France, Germany	France, Italy	UK, Germany	Northern Europe, Germany

# Heat Pump Heating Lineup Corresponding to Region

- ❑ Western Europe (France, UK, etc.) is located further north than the Hokkaido city of Wakkanai in Japan, but it has the same temperature environment as Sendai because the westerlies bring the warmth of a warm current (the North Atlantic Current). Central Europe is inland and not affected by oceanic currents, so it has a cold climate that corresponding to its latitude.
- ❑ Daikin has differentiated products that meet the needs and environmental regulations of each country and a product lineup that surpasses that of other companies.

## Product Lineup Meeting Various Demands of Each Country and Region

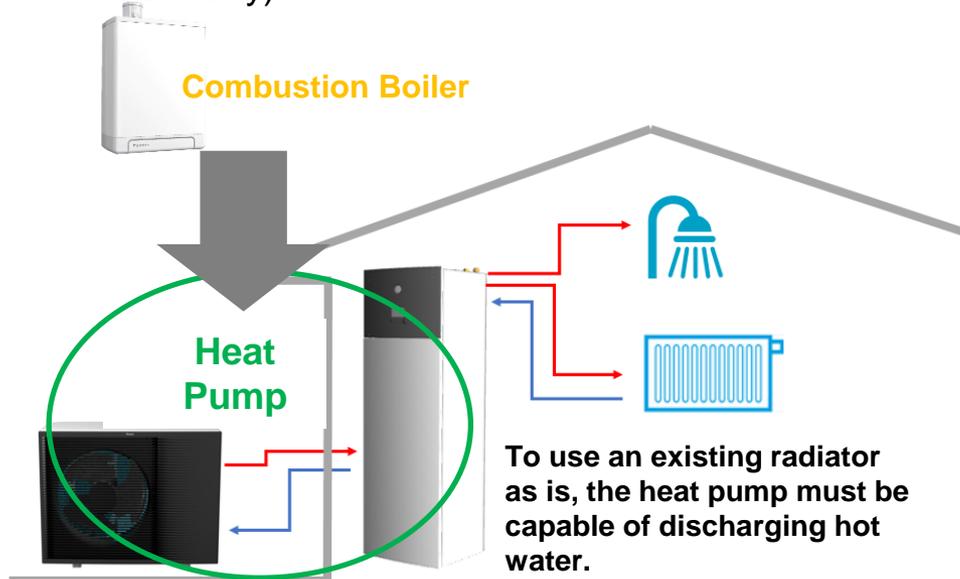


# Daikin Heat Pump Technology Easily Replaces Combustion Heating

- The EU aims to improve the performance (by reducing CO2 emissions) of 35 million buildings by 2030.
- Current combustion boilers warm rooms by circulating hot water of about 65°C through a radiator. When upgrading from a combustion boiler to heat pump heating and using the existing radiator as is, the heat pump also needs to generate hot water of 65°C or higher.
- When hot water cannot be produced, major home renovations will be needed such as replacing radiators and piping.

## Daikin Altherma Flagship Model (Daikin Altherma 3 H HT)

- ❑ Our heat pump can produce hot water at -15°C to 70°C on its own (without using the electric heater function and is the only one of its kind in the industry)
- ❑ It is the only product in the industry that can replace a combustion boiler as it is without needing a home renovation.
- ❑ Attention was given to the type of **design** and **quiet operation** demanded in cold region markets (mainly in Germany).



# Enhancing Capabilities for the Expanding Heat Pump Heating Market

- ❑ To further enhance our technological development capabilities, we are investing 140 million euros / approximately ¥20 billion to establish a new base in Ghent, Belgium, in 2024.
- ❑ In addition to **creating synergies through joint research with Ghent University**, which has one of the world's leading mechanical engineering doctorate programs, we are leveraging the geographical advantage of an international research and development center, public research institutes, high-tech companies, and more than 100 companies. In this way, we aim to strengthen our **ability to compile the latest technological information**.
- ❑ It will lead to the recruitment of **excellent global human resources** since Ghent is a place where international human resources gather.



Image of the new R&D center

## Features of the EMEA Development Centre in Ghent

- Located on the campus of Ghent University, which is a Belgium's university with the highest of standards
- Boasts a testing facility with 22 test rooms and an office building with 14 floors
- Merges R&D in Ostend and Ghent and will employ 400 new employees

### 3. Business Strategy for Future Growth



# Heat Pump Heating Business for Solving Social Issues in Europe

- ❑ Through our heat pump heating business, we at Daikin take on the challenge of creating new value that aims to provide **benefits from a three-way perspective** that includes not only our own company but also our users and the environment.
- ❑ Currently Daikin is working toward solutions relating to the energy crisis that Europe is facing and the challenges of achieving carbon neutrality. As Europe continues to ween itself from natural gas, replacement of combustion heating with heat pump heating equipment is rapidly progressing.
- ❑ Our company sells heat pump heating equipment at a price corresponding to its value and have increased profits through business development that connects with users such as installation and services. We recognize that heat pump heating is an attractive business with the **potential to expand the industry scope**, such as suppliers and installation business partners. As energy prices soar, heat pump heating reduce the **burden of heating costs** for users. Moreover, replacing conventional combustion heating with heat pumps contributes to the environment by **reducing CO2 emissions**.
- ❑ As a leading company, we will create industries where companies can generate profits, create many jobs, invest in product technology and development, and provide innovative products and services to enrich the lives of users and contribute to the environment.

→ For this reason, **it is important to formulate rules that create a win-win-win system for companies, users, and the environment.**

# Policy Proposals with Industry Cooperation for Resolution of Social Issues

- ❑ Daikin **provides information and policy recommendations to the EU and member countries in cooperation with industry groups** based on the technological capabilities of Japan and the business results cultivated over many years throughout Europe.
- ❑ As a result, heat pumps were recognized as renewable energy technology, and the market expanded.
- ❑ **As a leader in the European heat pump heating market, we will continue to work in cooperation to further contribute to decarbonization, which is being accelerated by the European Green Deal and RePowerEU.**



A senior manager from the Daikin Europe Heating Business Division serves as a board member of the European Heating Industry.



The Environmental Research Centre participates in activities aimed at creating standards for product performance evaluation and unifying building performance evaluations.

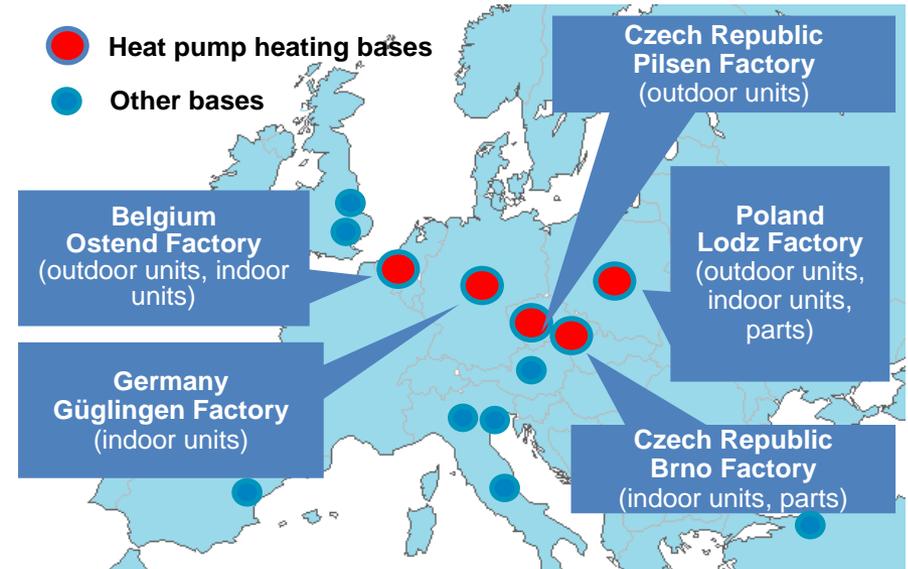


# Boosting Product Capacity to Expand the Heat Pump Business

- ❑ **New heat pump heating plant will start operation in Lodz, Poland, in July 2024**
  - Establishment of a 300-million-euro factory in Lodz, Poland
  - Manufacture of outdoor units, indoor units, and related parts for heat pump heating as Daikin's first plant dedicated to heating equipment
  - Investment equaling approximately 42 billion yen for the largest scale of production for Daikin Europe
- ❑ **Production capacity is increasing at existing plants**
  - Expansion of outdoor unit production lines at the **Belgian factory** in April 2022 and summer 2023
  - Establishment of a new building at the **German factory** with two indoor unit production lines being added in 2023 and another one in 2024
  - Establishment of a 3rd **factory in Brno, Czech Republic**, to start production of heat pump heating indoor units in July 2024

⇒ Based on its **market localization strategy**, Daikin produces 100% of heat pump heating products for Europe in Europe.

Demand in the European heat pump market is expected to expand from 1 million units in 2021 to 3 million units in 2025, and Daikin will achieve a **production volume of more than 400%, far exceeding market growth.**



Daikin Europe AC Production Bases

# Analog Strengths of the Dealer Network with Digital Marketing Strategies

- ❑ We have built a **B2B2C business model** that **uses our unique digital lead management** to provide promising leads to the dealer network, which is a strength of the Daikin Europe Group.
  - Develop pre-sales (brand recognition, purchase consideration/purchase) using unique digital tools
  - Accelerate development of offline customer contact points and hands-on showrooms
  - Build a professional store network that covers the region

## Showrooms with operational equipment

Showrooms based on the concept of "Offline Experience - Proposal - Contract Agreement" are being developed at sales companies in European countries.

### Daikin Airconditioning Central Europe



The manufacturer positions itself closer to the end user and establishes company as a premium brand. Together with easing the burden on partner dealers, experiences are incorporated throughout the customer journey.



Digital tools, including apps are used to give a realistic image of the experience after delivery.

### Daikin Airconditioning Portugal



### Daikin Airconditioning Spain



### Daikin Airconditioning UK

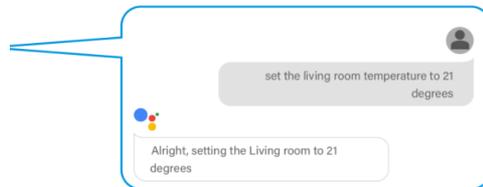
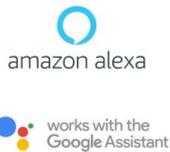


# Analog Strengths of the Dealer Network with Digital Marketing Strategies

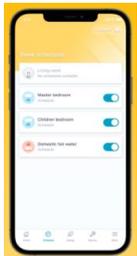
- Our **control system** keeps us connected to users even after the sale of product.
  - The Onecta app enables users to set operational schedules and monitor energy use for residential products such as Daikin Altherma.
  - The Daikin Cloud Service provides predictive maintenance services to monitor energy consumption of multiple buildings through remote monitoring while prevent breakdowns.



## Voice control



## Time scheduling



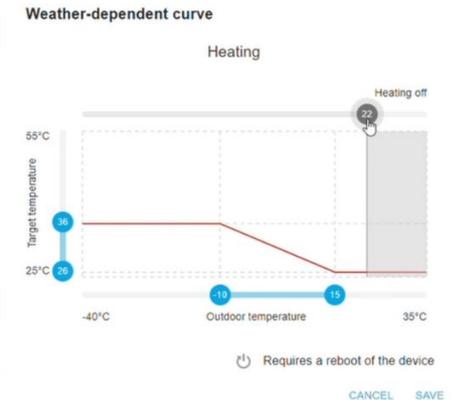
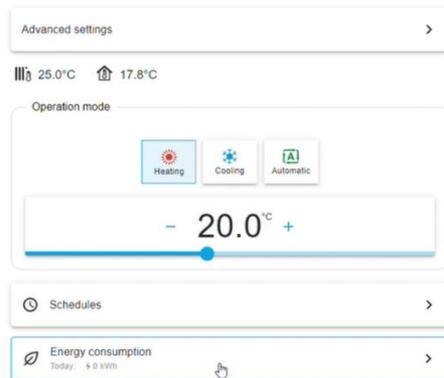
## Individual rooms



Onecta app



- Space heating/cooling
- Main zone & Additional zone (LWT = Living Water Temperature)
- Domestic hot water
- Room (RT = ambient room temperature)
- Installer - Error handling



Daikin Cloud service

# Technical and Service Support for Installers and Dealers

The heating market is still centered on combustion heating, and support is needed for the new, unfamiliar technology.

## Technical and service support for installers and dealers

### ❑ Installer support and technician training

- Bolster training system and facilities
- Provide equipment selection and calculation tools for the complex incentives of each country

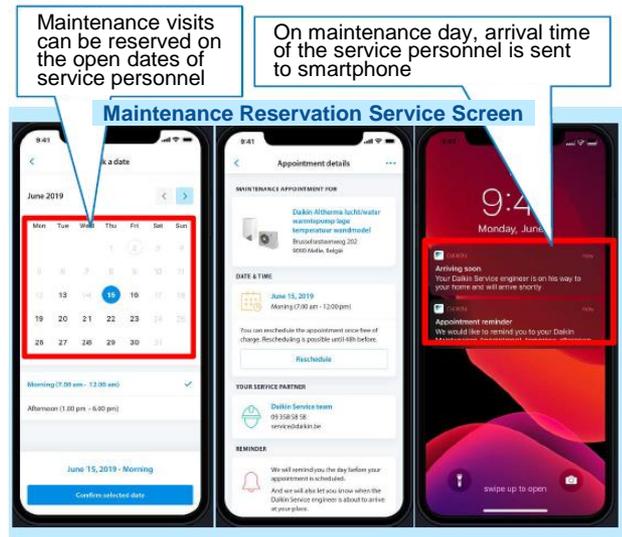
### ❑ Online support system

- Support throughout the product life cycle via the platform "Stand By Me" that connects equipment, end users, dealers, and Daikin

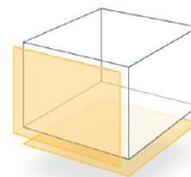


Users can easily conclude extended warranties and maintenance contracts by credit card payment

Dealers can use the technical assistant function to reduce the hassle of on-site equipment selection, estimates, installation, and repairs

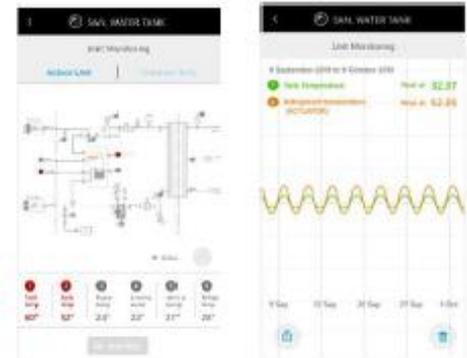


### Usability diagnosis of existing radiator



Wall A	4.00 x 2.60 m	<input checked="" type="checkbox"/> Outdoor wall
Wall B	4.00 x 2.60 m	<input type="checkbox"/> Internal wall
Wall C	4.00 x 2.60 m	<input type="checkbox"/> Internal wall
Wall D	4.00 x 2.60 m	<input type="checkbox"/> Internal wall
Ceiling	4.00 x 4.00 m	<input type="checkbox"/> Internal
Floor	4.00 x 4.00 m	<input checked="" type="checkbox"/> Ground floor

### Remote monitoring



# Further Growth and Social Contribution via the Heat Pump Heating Business

- ❑ The global trend toward realization of **carbon neutrality** is shifting into high gear, and heat pumps are attracting increasingly greater attention as an environmental technology.
- ❑ In 2023, Daikin Europe **celebrates its 50th anniversary** of production start at its Ostend plant in Belgium. In addition to its commercial and residential air conditioning businesses that have supported corporate growth, there is an **opportunity to expand the heat pump heating business as a new business pillar**. As an industry leader, we at Daikin believe that it is our mission to **reduce CO2 emissions and contribute to the environment** through the promotion of widespread adoption of heat pump space and water heating even as we work to expand our business.
- ❑ Daikin Europe has cultivated excellent heat pump technologies and products as a **dedicated air conditioning manufacturer**. Additionally, with a base of sales companies in Europe, the Middle East, and Africa, it has a **strong business foundation that includes a network of dealers** established in each region. Moreover, in cooperation with industry associations, it has built a network of contacts through its advocacy activities for the EU and member countries.
- ❑ Because of these strengths, we believe that Daikin Europe can **quickly and thoroughly implement** specific actions to strengthen R&D, manufacturing, sales, and after sales service capabilities and establish an overwhelming **No. 1 position in the European heat pump heating market**.



### Notes on forecast

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