Buildings and Cooling Pavilion

Global Alliance for Buildings and Construction | Cool Coalition

DAIKIN

Decarbonizing Buildings through Energy-Efficient HVAC Solutions

Yuki Ohtsuka
CSR & Global Environment Center
Daikin Industries, LTD.

(as of March 2025)

Company Name	Daikin Industries, Ltd.
Founded	October 25, 1924, in Osaka, Japan Founder: Akira Yamada
Established	February 11, 1934
No. of Group Employees	103,544
Head Office	Osaka, Japan
No. of Group Companies	350 Consolidated Subsidiaries（31 in Japan、319 overseas）

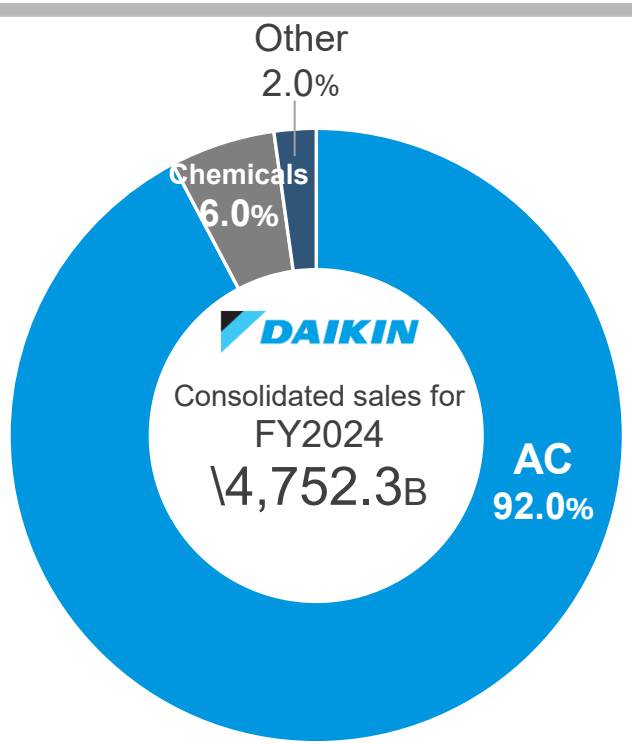
Daikin Industries Business Overview

Air Conditioning

Residential

Commercial

After Sales Service



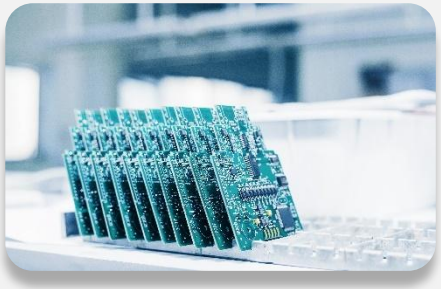
Other Businesses

Oil Hydraulic Equipment

Oxygen Concentrators

Chemicals

Refrigerant



Semiconductor Applications

Automotive Applications

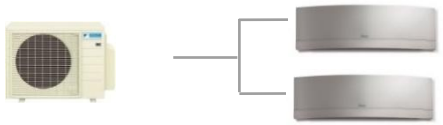
Daikin's Air Conditioners and Heat Pumps Product Lineup

Air Conditioners (AC) and Heat Pumps (HP) solutions are realized with an extensive lineup for all types of needs including those for energy-savings, the environment, ventilation, comfort, peace-of-mind, safety, and health.

Residential AC

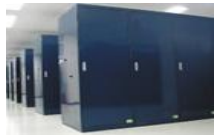
Room Air Conditioners

Housing/Multi-Split Air Conditioners

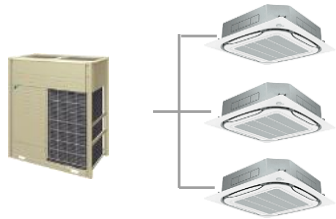


Unitary Air Conditioners

Control/Maintenance Systems



VRV Systems



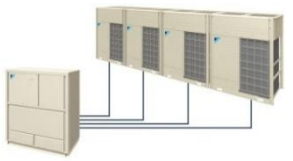
Ventilators

ACs for Facilities and Factories

Applied ACs

Centrifugal Chillers

Chillers



Air Handling Units

Fan Coil Units

Air Purifiers

Heating/ Water Heaters

ACs for Small Shops and Offices

Rooftops

Residential → Commercial → Industrial

Main Global Production Bases for AC&HP – Localization –

Production bases have been established worldwide at more than 90 locations* in 28 countries for localized production.
We operate our business in over 170 countries.

*including bases for filters and refrigeration

Europe

Daikin Europe N.V. (Belgium;1972)
- Commercial ACs, Heating products

Daikin Industries Czech Republic (2003)
- Residential ACs

Daikin Applied Europe S.p.A. (Italy; acquired in 2007)
- Screw and Centrifugal Chillers

Daikin Turkey (2011)
- Residential ACs, Heaters

Daikin Manufacturing Germany(acquired in 2008)
- Heaters

Daikin Manufacturing Poland(2024)
- Heaters

India

Daikin Airconditioning India (2009)
- Residential and Commercial ACs

Asia

Daikin Industries (Thailand) (1990)
- Residential and Commercial ACs

Daikin Malaysia Sdn. Bhd. (Acquired in 2007)
- Residential ACs, Commercial ACs

Daikin Air Conditioning Vietnam (2018)
- Residential ACs

Daikin Industries Indonesia(2024)
- Residential ACs

Japan

Shiga Plant (Kusatsu, Shiga: 1970)
- Residential ACs

Sakai Plant (Sakai, Osaka: 1937)
- Commercial ACs

China

Daikin Air-Conditioning (Shanghai) (1995)
- Commercial ACs, Heat Exchangers, Air Cooled Chillers

Daikin Air-conditioning (Suzhou) (2011)
- Residential and Commercial ACs

McQuay (Wuhan; acquired in 2007)
- Water Cooled Chillers, Centrifugal Chillers

McQuay(Shenzhen; acquired in 2007)
- Air Cooled Chillers, Fan Coil Units

Daikin Air-Conditioning (Huizhou) (2024)
- Residential ACs

U.S.

Daikin Applied Americas INC. (Staunton, VA; acquired in 2007)
- Large Screw Chillers, Centrifugal Chillers

Daikin Comfort Technologies North America, Inc (Houston, TX; acquired in 2012)
- Residential Unitary Systems, Gas Furnaces, Commercial ACs

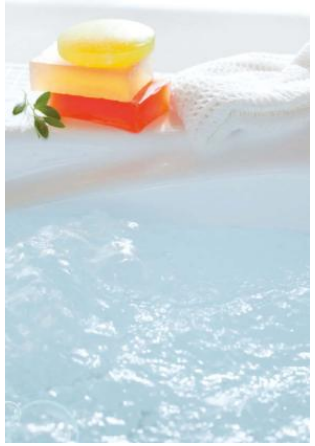
South America

Daikin Ar Condicionado Amazonas Ltda (2012)
- Residential and Commercial ACs

Daikin Manufacturing Mexico(2024)
- Residential, Commercial Acs, Air Cooled Chillers

Bringing the benefits of AC & HP to more people

Healthy and safe living



Boosting productivity and economic growth

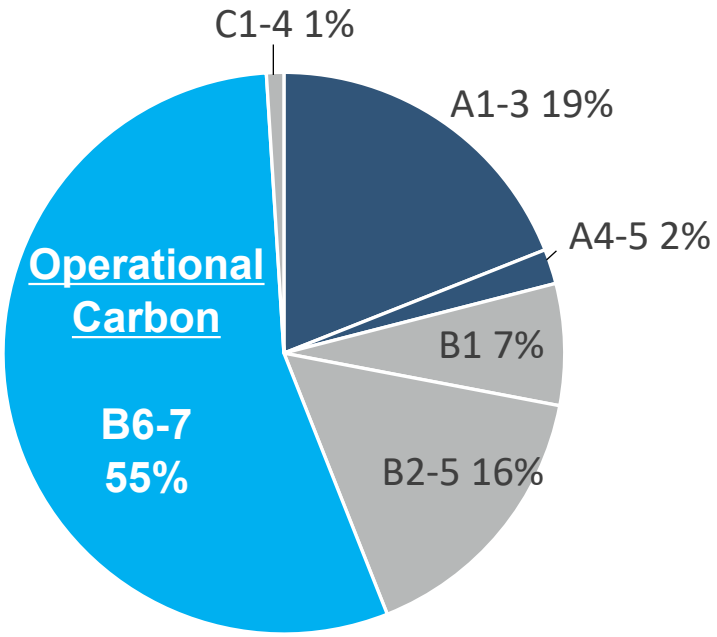
Adaptation to climate change

Air conditioning as a social infrastructures

Lee Kuan Yew, Singapore's founding prime minister, once said
"Air conditioning was a most important invention for us, perhaps one of the signal inventions of history. It changed the nature of civilization by making development possible in the tropics."

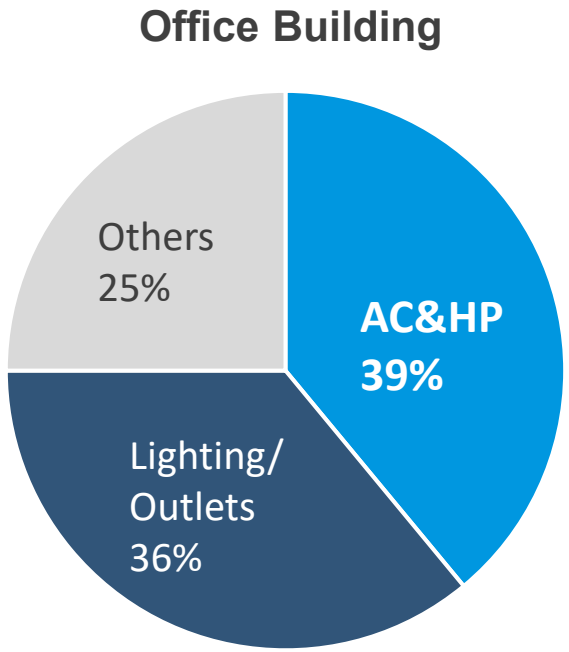
Further Energy Efficiency for Building Decarbonization

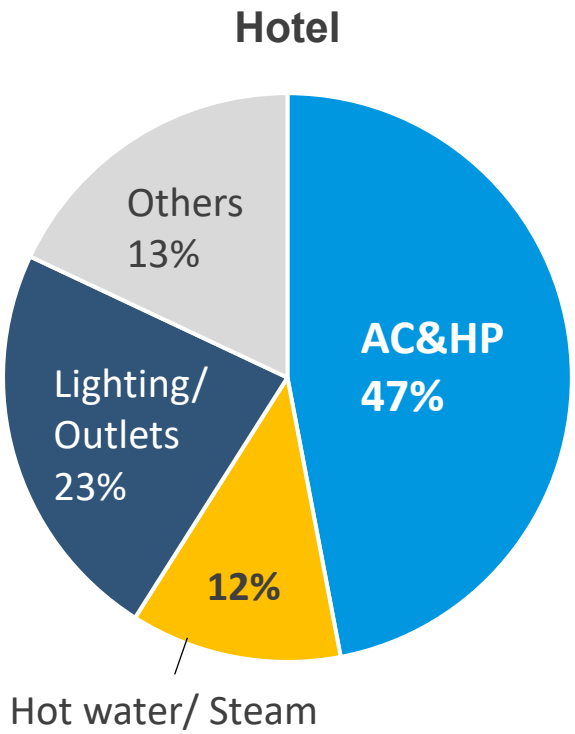
Whole Life Carbon, New Buildings Average Case Study by J-CAT in Japan



Operational carbon accounts for over 50%.

Breakdown of energy consumption by use (example in Japan)





➡ **Improving energy efficiency is a key for the building decarbonization.**

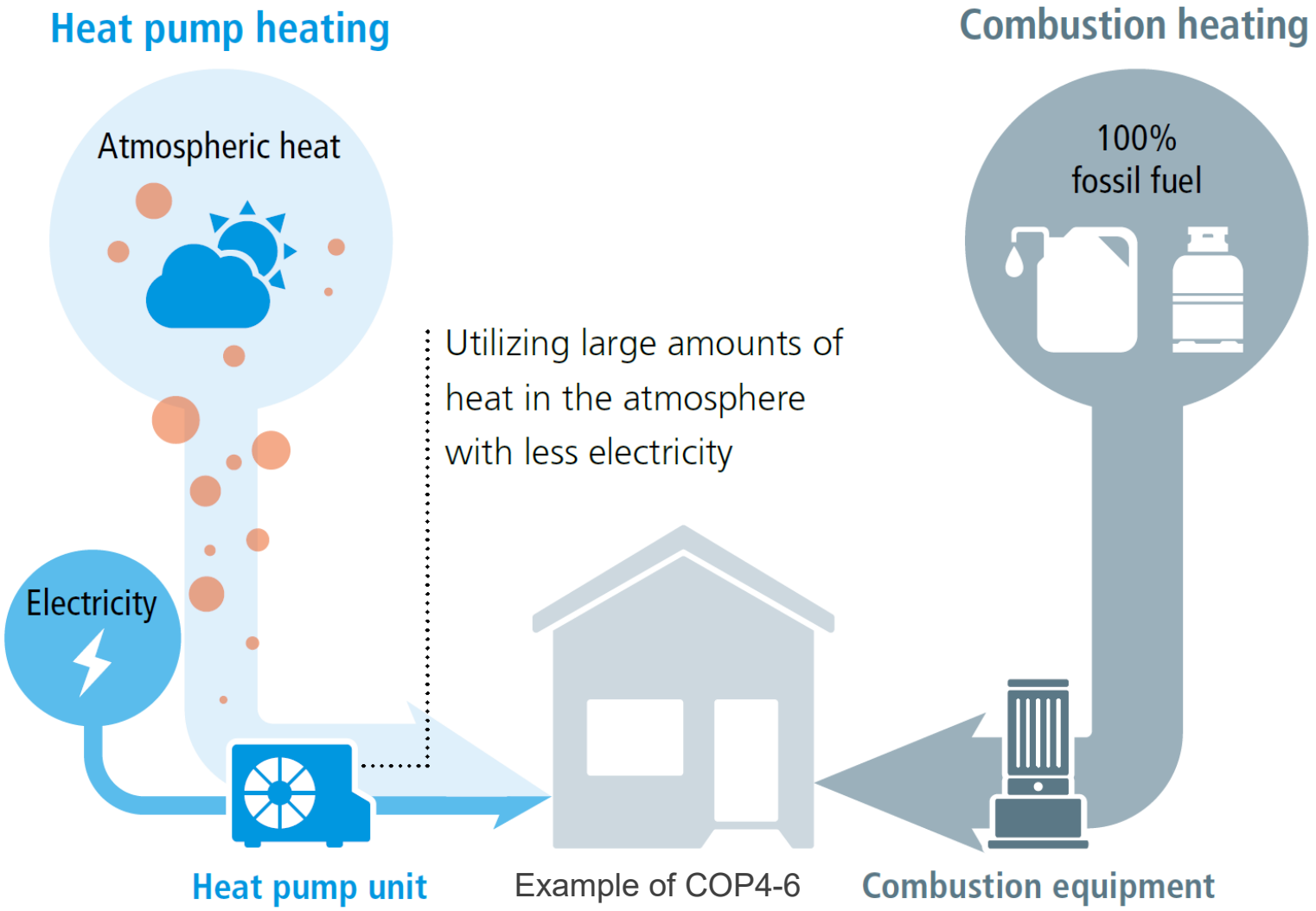
https://www.ibecs.or.jp/zero-carbon_building/files/continue_lectures_2405-2408_3_1st.pdf
Graph created by Daikin

https://www.env.go.jp/earth/zeb/detail/04.html
Graph created by Daikin

Energy Efficiency: Easy to implement, powerful in effect solution

Heat Pumps

Mechanisms of Heat Pump heating and combustion heating



Energy Efficiency: Easy to implement, powerful in effect solution

Heat Pumps

1. More efficient than fossil fuel boiler/furnace and electric heater

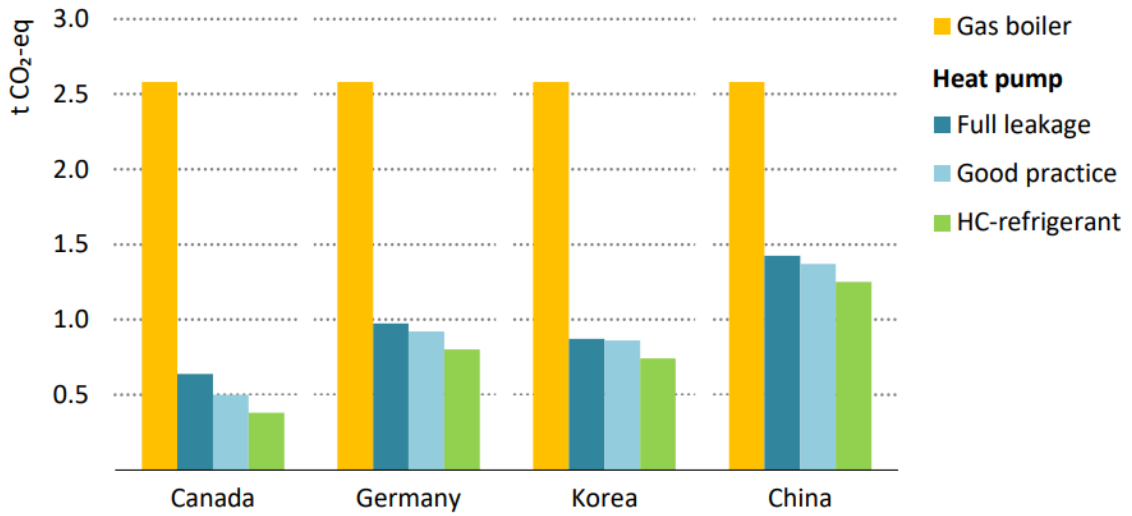
Minimum seasonal space heating energy efficiency of air heating products by EU Ecodesign

Product group	Minimum seasonal space heating energy efficiency
Warm air heaters using electricity	31%
Warm air heaters using fuels	78%
Air-to-air heat pumps	**137%** More Energy Efficient

*Efficiency comparison in terms of primary energy
With 100 units of primary energy input, the heat pump produces 137 units of heat

2. Significant emissions reduction with lower electricity emission intensity

Total lifetime GHG emissions per MWh of annual useful heat output for gas boiler and heat pump

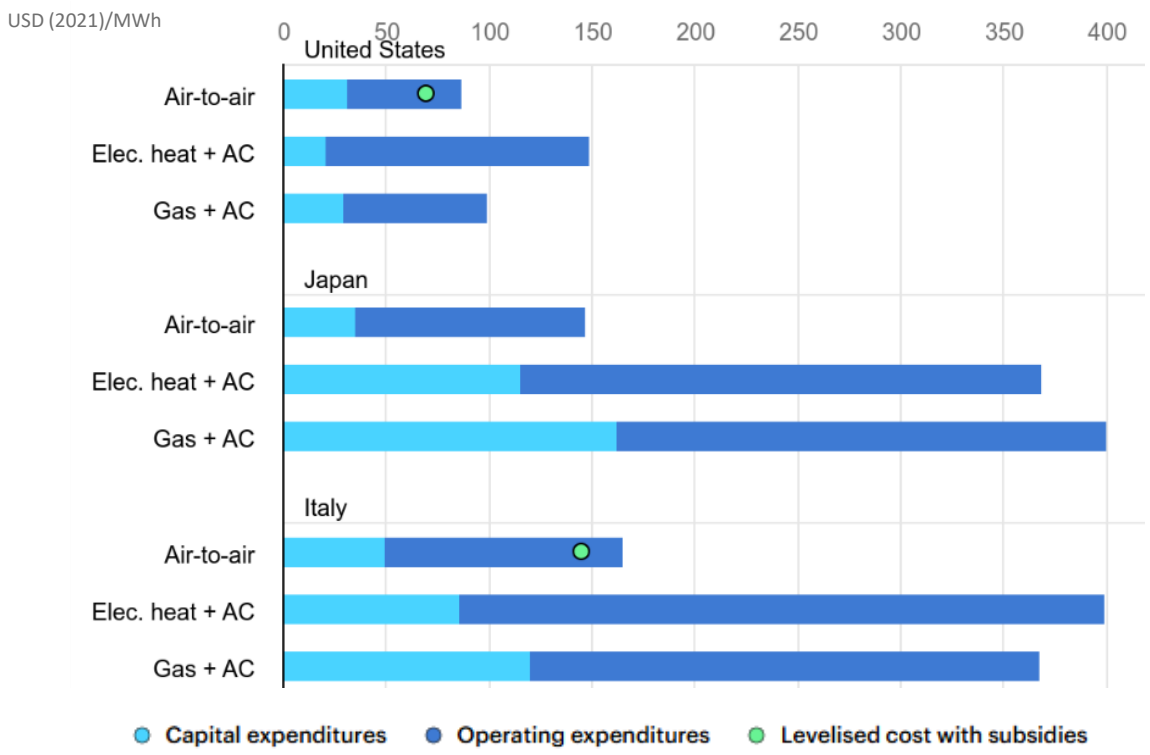


Source: IEA report "The Future of Heat Pumps"

Energy Efficiency: Easy to implement, powerful in effect solution

Heat Pumps

3. Affordable solution thanks to lower operating costs in some leading heating markets



Reversible AC allows for both cooling and heating.

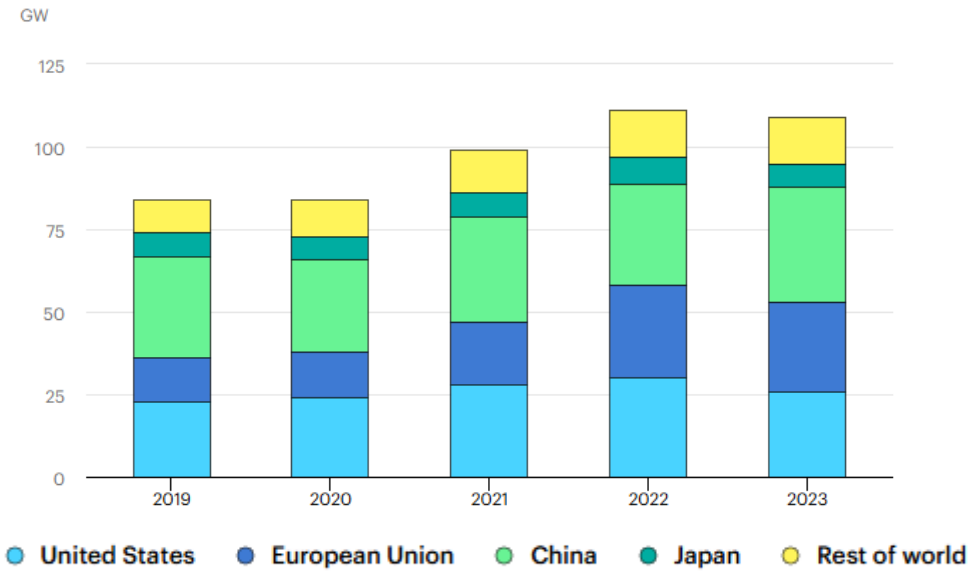
https://www.iea.org/data-and-statistics/

Energy Efficiency: Easy to implement, powerful in effect solution

Heat Pumps

Market Situation

HP market is stagnant, and further acceleration is needed for the building decarbonization.



Towards further accelerating adoption of HP

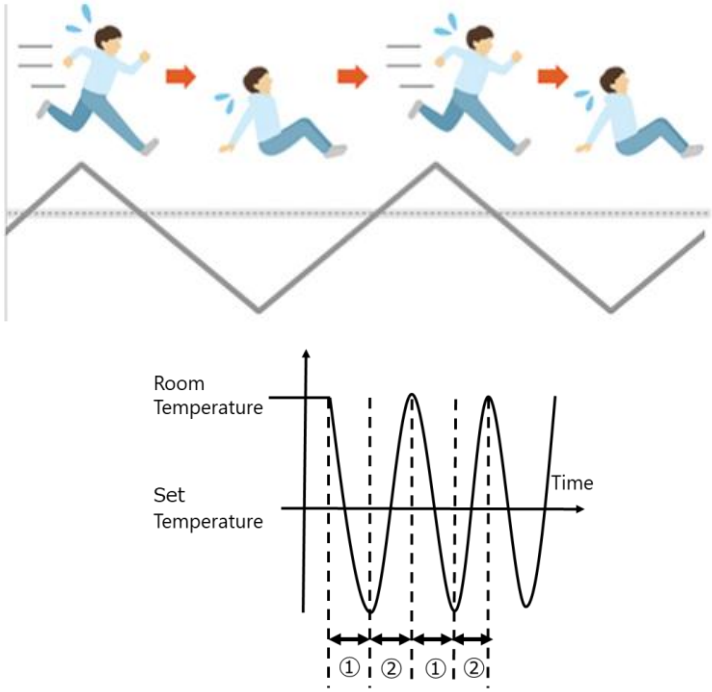
- ✓ Narrowing the electricity-gas price gap
- ✓ Utilization of energy efficiency regulation / building code to spread energy efficient solution and reduce inefficient equipment, including a fair comparison of HP with gas boiler/furnace and electric heater
- ✓ Public financial support to reduce initial cost (e.g. Tax incentives, Subsidies)
- ✓ Effective use of affordable and energy efficient reversible air-to-air heat pumps

Sources：https://www.iea.org/energy-system/buildings/heat-pumps

Energy Efficiency: Easy to implement, powerful in effect solution

Inverter AC & HP - How Inverter AC works? -

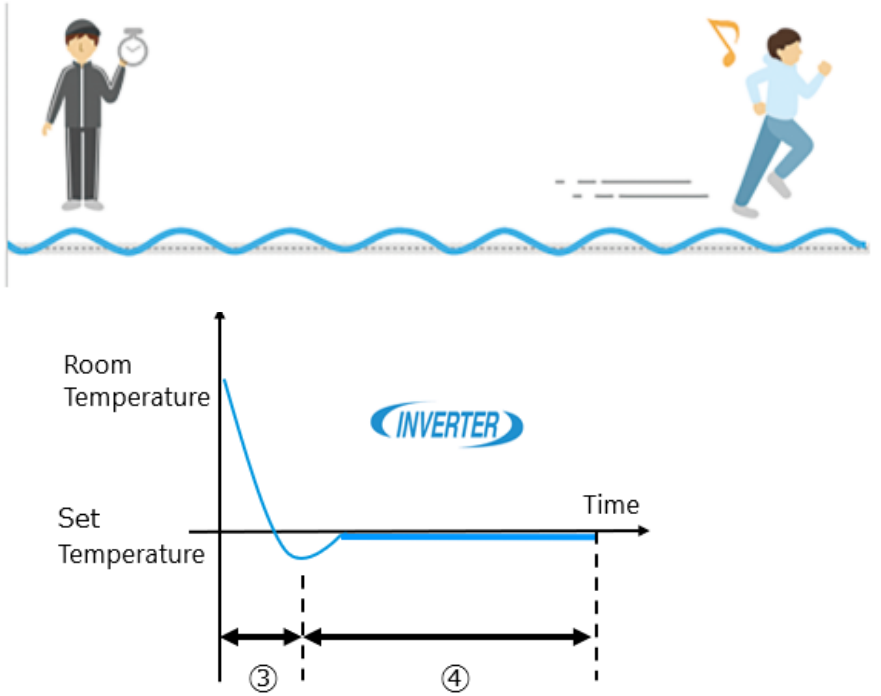
Non-Inverter



①Turn the motor on
②Turn the motor off

vs

Inverter



③Raise motor speed
④Continuous adjustment of capacity

➡ **High energy efficiency thanks to less energy loss when starting and stopping**

Energy Efficiency: Easy to implement, powerful in effect solution

Inverter AC & HP
How energy efficient is it?

Comparison demo test of Inverter vs Non in some countries

Result: 35% - 64% energy savings

Brazil

City	FLORIANÓPOLIS	SÃO CAETANO	RIO DE JANEIRO
Energy Saving Rate	58%	65%	59%

* The test and data analysis was conducted by universities in Brazil under JICA support program.

Mexico

City	Cancun	Mexico City	Guadalajara	Mexicali	Monterrey
Energy Saving Rate	61%	64%	64%	56%	47%

* The test and data analysis was conducted by national institutions under JICA support program.

Jeddah, Saudi Arabia

* High ambient

Energy Saving Rate 44%

* The test was conducted by MRI and Daikin under the cooperation of SASO and METI. The data was analyzed by a national institution in KSA.

Dubai, UAE

* High ambient

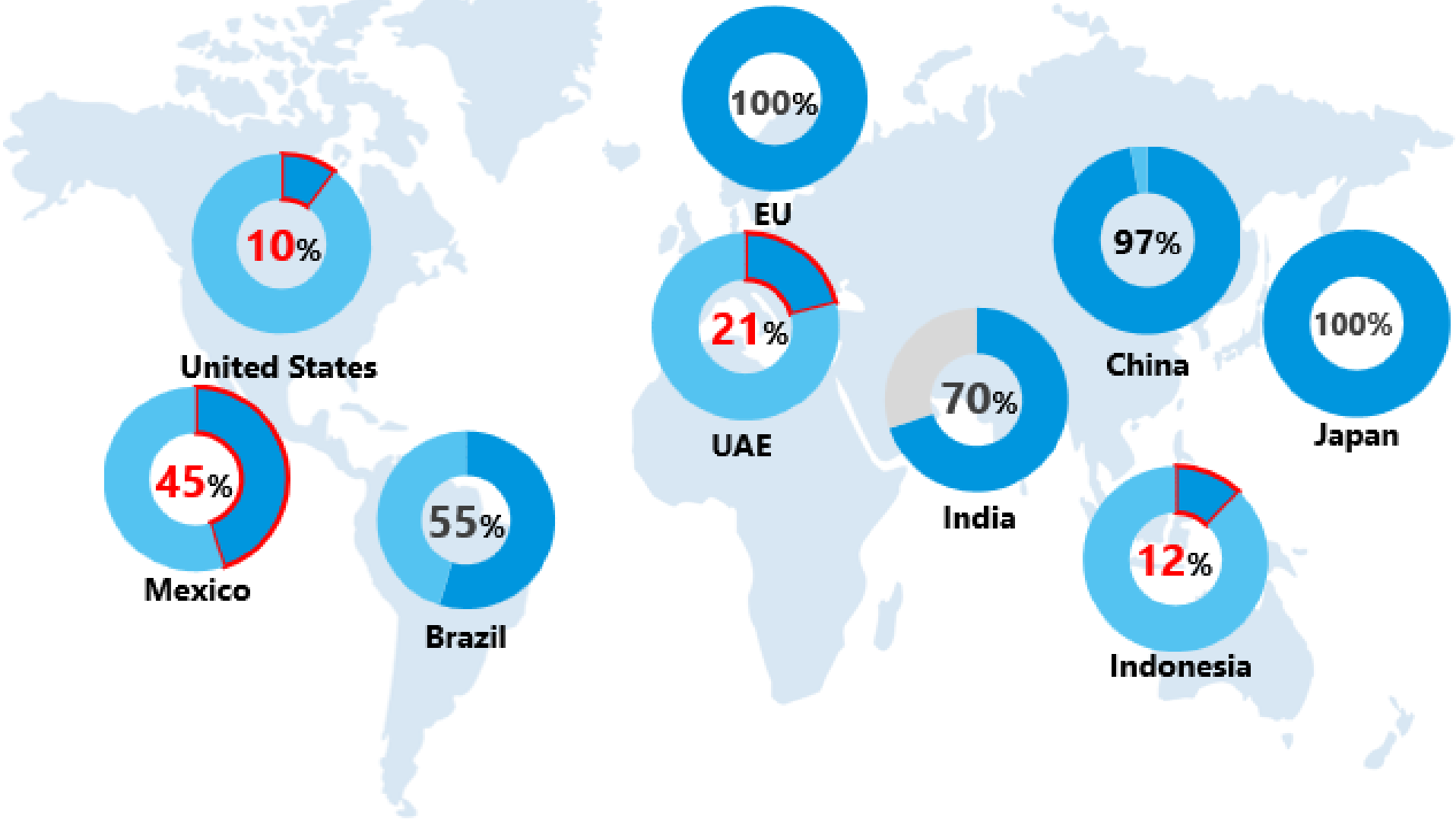
Energy Saving Rate 35%

* The test was conducted MRI and Daikin under the cooperation of METI. The data was analyzed by a university in UAE.

Energy Efficiency: Easy to implement, powerful in effect solution

Inverter AC & HP

Inverter AC Penetration (Residential)



Sources：BSRIA World Air Conditioning Overview 2023

Energy Efficiency: Easy to implement, powerful in effect solution

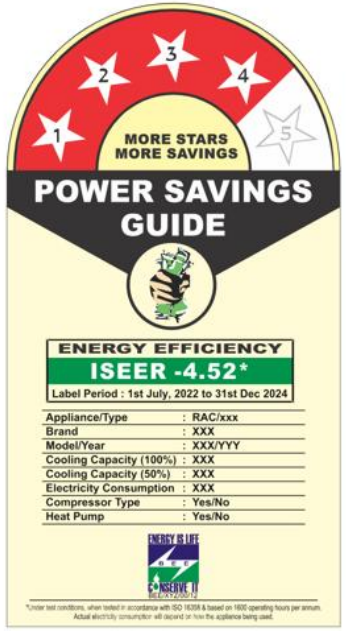
Inverter AC & HP

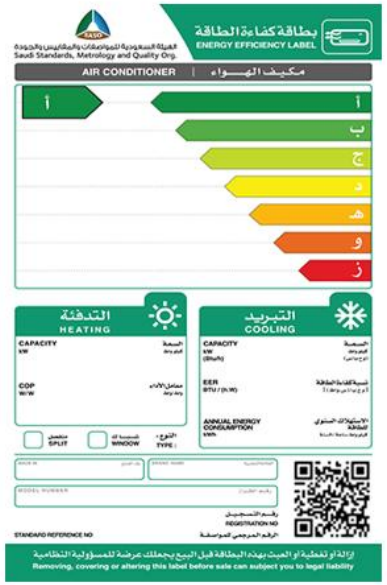
Key for spread use of energy efficient Inverter AC

1. **Use seasonal performance evaluation standard** (CSPF, SEER, APF etc.) to evaluate AC's performance under conditions closer to actual usage.
   * Whole life carbon calculation also needs to consider seasonal air conditioning load.

2. **Establish labeling program to guide consumers to choose energy efficient AC.**

3. **Regularly review MEPS to raise energy efficiency of the market.**



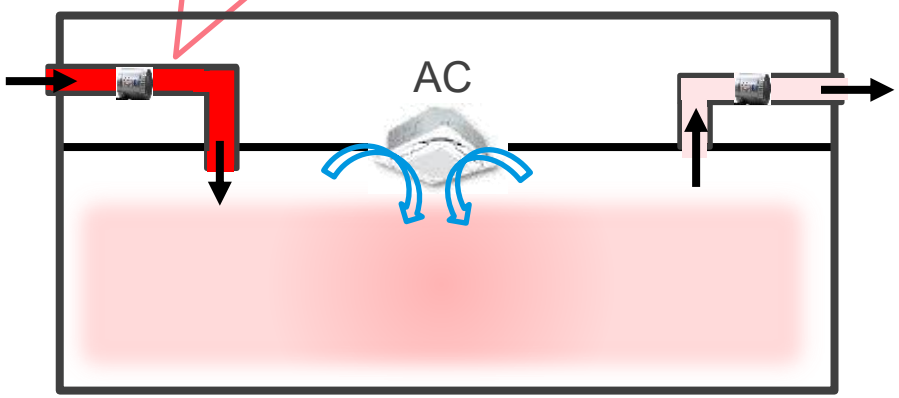


Energy Recovery Ventilation

- ventilate the space without letting the heat escape, leading to energy saving in AC

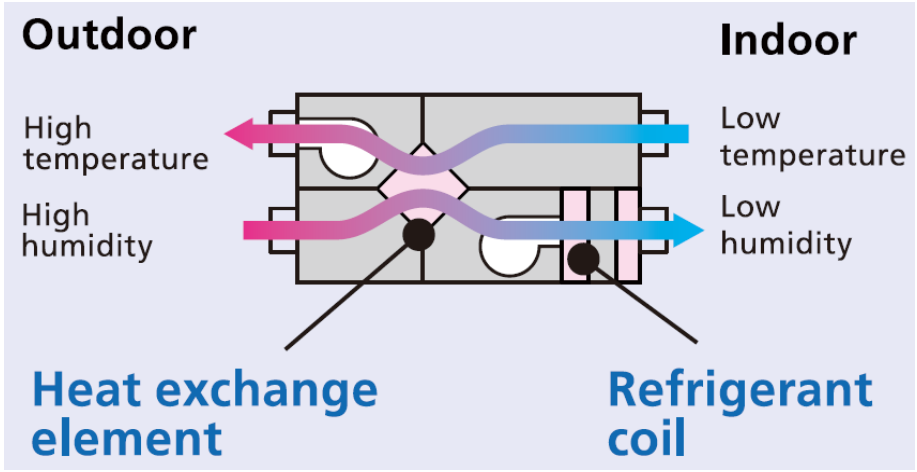
Normal ventilation

Hot, humid air flows in from outside, increasing the heat load.

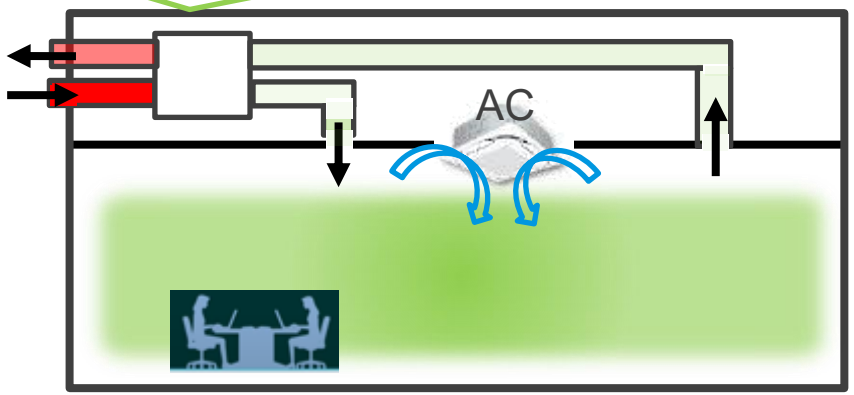


Energy recovery ventilation

How it works?



The heat and moisture of the air exhausted from the room and the air taken in from outside are modulated through the heat exchange element, reducing the load on air conditioning.



DAIKIN in COP30 Buildings and Cooling Pavilion

Session 1 : HVAC solutions as effective measures in the Transition to Zero-emission Buildings

Focus on the reduction of whole-life carbon through HVAC technology with emphasis on reducing operational carbon which accounts for a large portion of building emissions. Discuss the legal frameworks and measures needed to facilitate a successful shift toward low-carbon products. Aim to provide participants with valuable insights to help them develop well-balanced decarbonization strategies by exploring effective approaches to achieving Zero-emission buildings.

Session 2 : How can heat pumps as clean heating be new normal sooner?

Share best practices from various countries and discuss the policies needed to promote the adoption of heat pumps, aiming to accelerate building decarbonization through the electrification of heating and hot water.

Session 3 : Achieving Sustainable Comfort: Balancing Efficiency and Well-being

Explain air conditioning and ventilation technologies that can reduce energy consumption of HVAC systems while maintaining human comfort, which is essential for building decarbonization.

As we are attending COP30, we’re happy to support any session planning efforts — please feel free to get in touch if you're interested!
We’re looking forward to seeing you at the session.

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DAIKIN