



# Introduction of Natural Refrigerant in Panasonic

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# AGENDA

- 1. Usage of Natural Refrigerants in Panasonic**
- 2. Introduction of CO<sub>2</sub> Refrigeration system for Retail store**
- 3. Future Plan**

# Natural Refrigerant in Panasonic / Home Appliance

Heat pump water heater

Refrigerator

2001~

2002~



CO2

HC

refrigerant

Home  
Appliance

# Natural Refrigerant in Panasonic / Commercial use

Absorption Chiller

Beverage Cooler

Vending machine

Retail Store System

1971~

2004\*~

2007~

2010~



H2O

HC\*/CO2

CO2

refrigerant

\*HC introduced for Vending machine since 2004

Commercial Use

# Natural Refrigerant in Panasonic/ For Air-conditioning

## Absorption chiller for large space



ARK-HILLS, Tokyo



Tokyo Dome, Tokyo



Commercial Use

# Natural Refrigerant in Panasonic/ For Refrigeration

## CO2 refrigeration for retail store

Commercial Use



Max Value, Funabashi Chiba



Lawson, Ebina Kanagawa

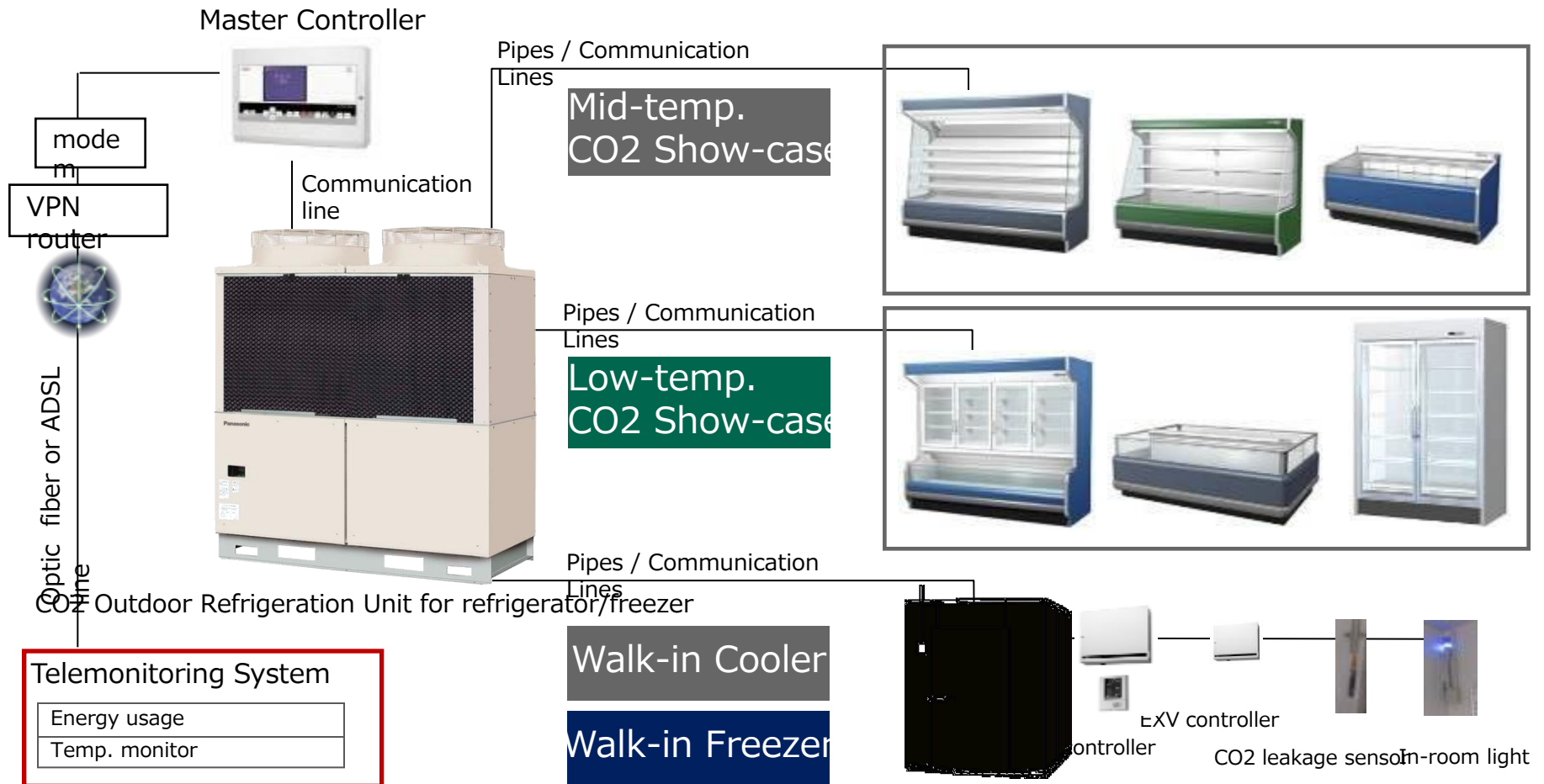


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# CO<sub>2</sub> (R744) Refrigeration for Retail Store

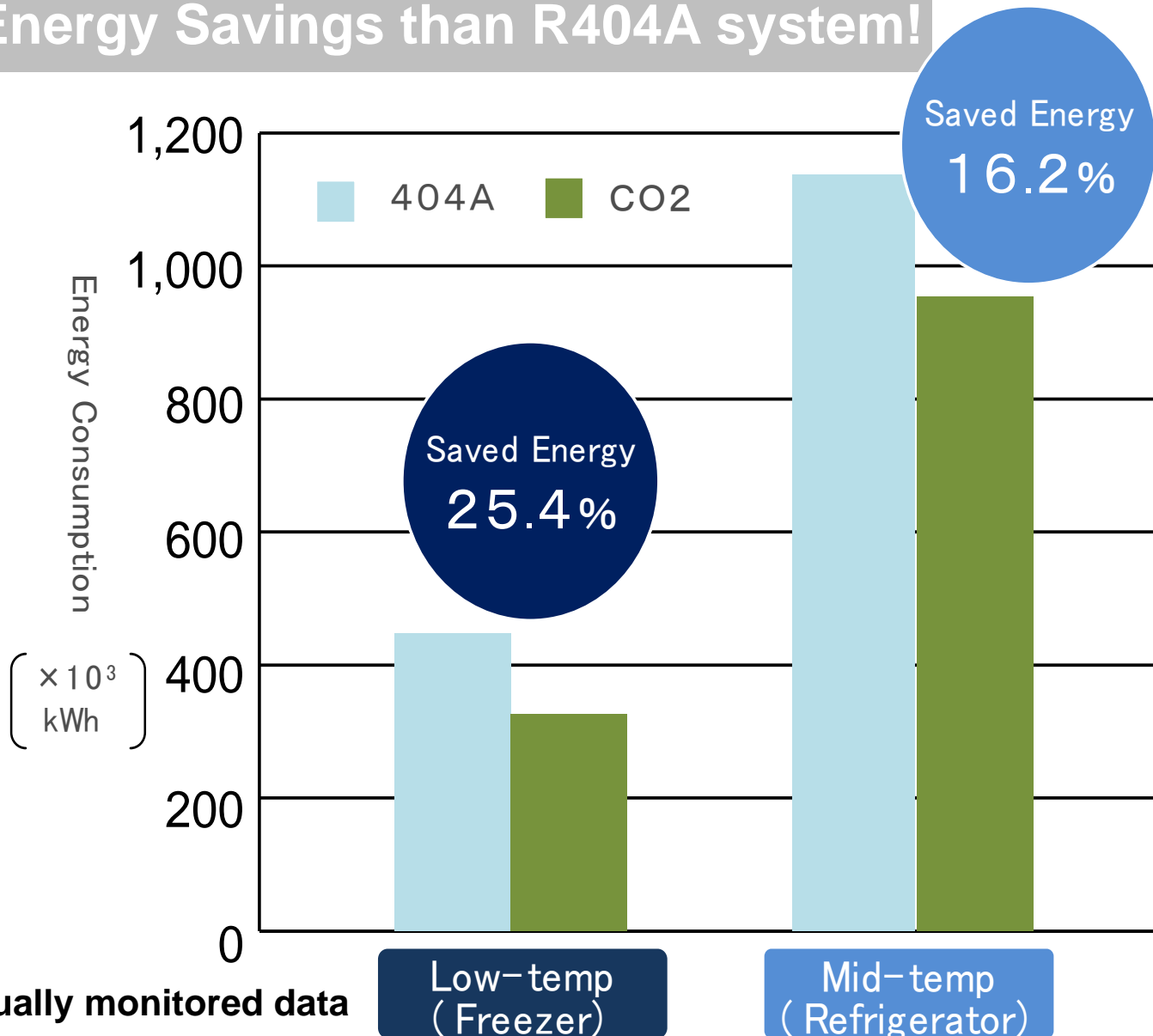
## CO<sub>2</sub> Refrigeration System





# Additional Benefit of using CO2 refrigerant system

Better Energy Savings than R404A system!

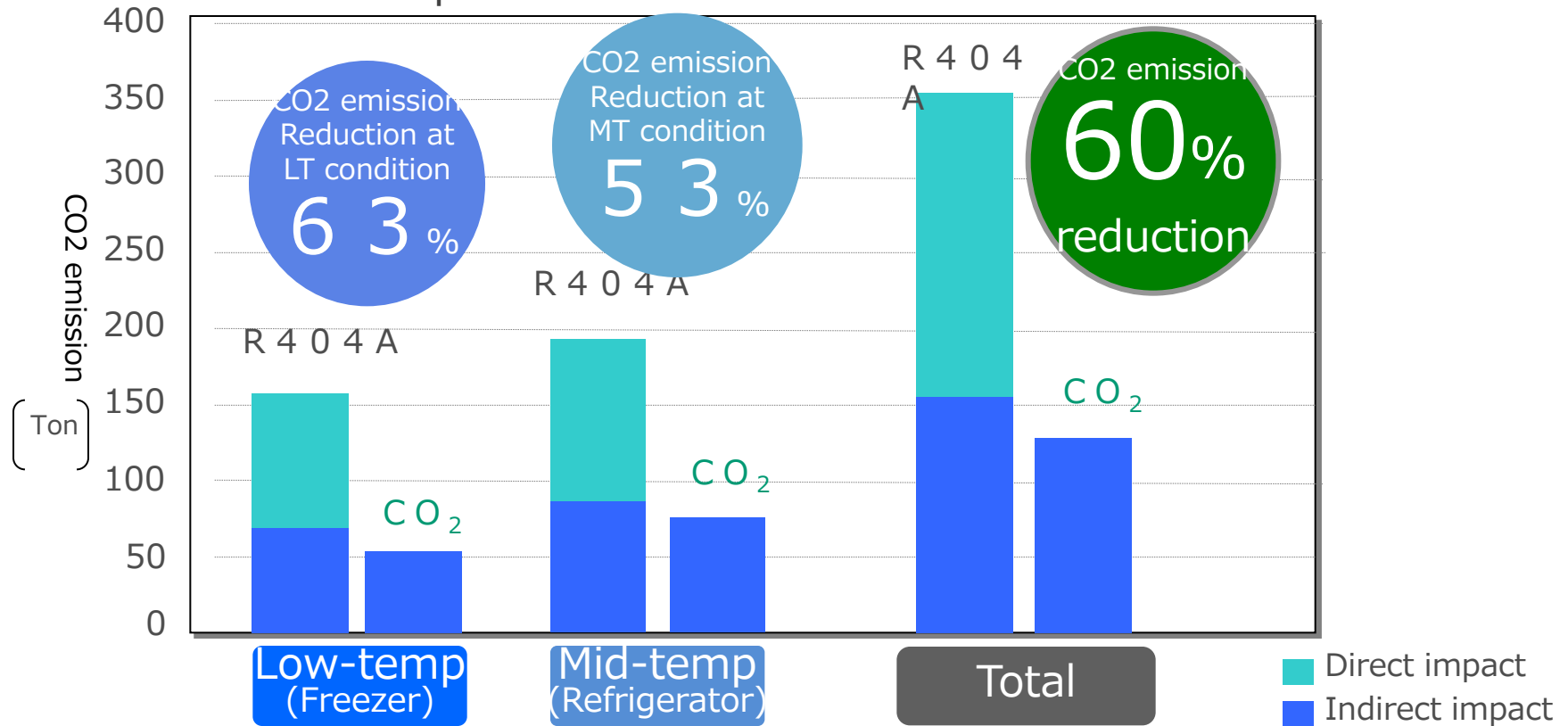


based on actually monitored data

# impact on Global Warming by refrigerant is almost 『z Annual CO2 emission was reduced by 60%

※Direct impact : Global warming impact by refrigerant leakage

## Comparison of R404A Inverter unit and CO2 unit



【Condition for calculation】  
 Store space : 1200m<sup>2</sup>, Refrigeration Unit capacity: 90kW. R404A : Inverter multi-unit. "Direct impact" corresponds to GWP weighted refrigerant leakage from pipes.  
 Refrigerant Leakage rate : 16%(quoted from METI report "review of refrigerant leakage during operation of HVAC&R equipments" issued 7<sup>th</sup> March 2009.)

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# Future Plan

How we can contribute to the world with natural refrigerants





**ATMO**  
**sphere**

technology & innovation

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**natural refrigerants**

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**3-5 February 2014, Tokyo**

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Thank you very much!