State-of the Art Logistics Center with Natural Refrigerants

Japanese Consumers' Co-operative Union (JCCU)

4 th FEB 2014

Katsuyoshi Nihei

CO·OP

About us

- We are Japanese Consumer Co-operatives funded and managed by members.

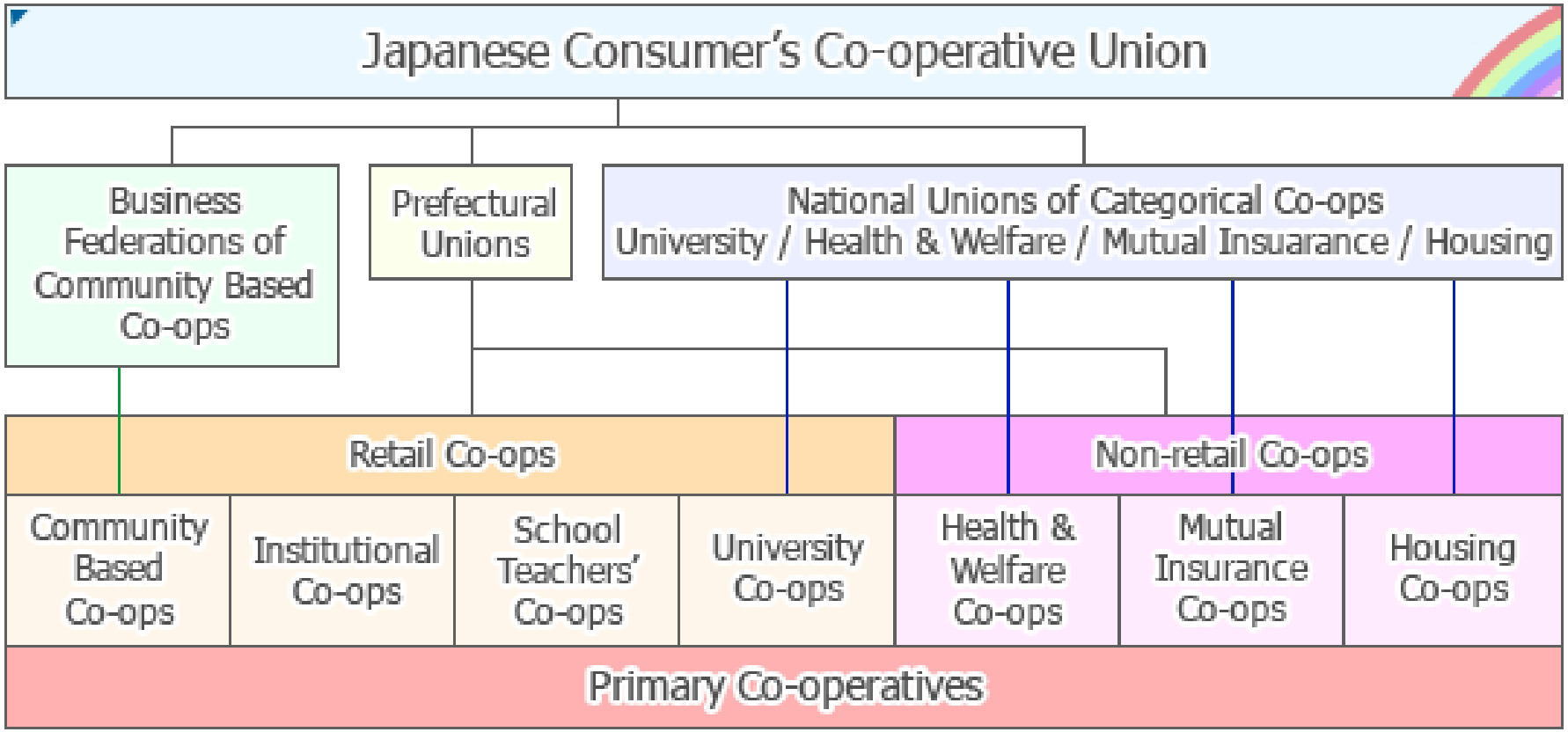
- At present, co-operative membership stands at over 27 million nationwide, and the total business turnover of co-operative operations have exceeded 3.3 trillion JPY. (As of the end of 2012)

Company Profile of JCCU 2012-2013

President: Asada Katsumi
Founded: March, 1951
Location: Shibuya-Ku,Tokyo, Japan
Turnover: 376 billion JPY (2012FY)
Employees: 1,356 (2012FY) Number of full time Employees
consumers: 343 consumers' cooperatives join it

CO-OP is the biggest consumers' network in Japan

JCCU and its member co-ops organize and manage operations separately and independently and are not affiliated at headquarters and branches.




COOP / TOSU Cold Distribution Center
Total floor space : 18,908㎡
Completed Nov,2009
CO-OP

Introduction facilities list

Products	Class/degC	Capacity (kW)	Rated Power (kW)	Set
NH3/CO2	F Class /-25	85	45	12
NH3/Brine	C Class /+5	160	90	3
NH3/Brine	C Class /+5	115	55	1
CO2 Heat Pump	Floor Heating	Heating 36 Cooling 12	25	2
Dedicated HVAC (CO2 Heat Pump)	Loading Area	–	25	2
Thermo Shutter	Loading Area & F Class	–	–	16

Industrial Natural Refrigeration System

NH3/CO2 Unit

-25deg Cold storage

NH3/Brine Unit

+5deg Cold storage

ONOMICHI Cold Logistics Center

Total floor space : 18,118㎡

Completed May, 2012

24-Hour operation logistics center demonstrating both ”safety” and “energy efficiency”

2012 Japan Prestressed Concrete Institute Awards

CO·OP

Our Concept

1: Adoption of High Efficiency Lighting

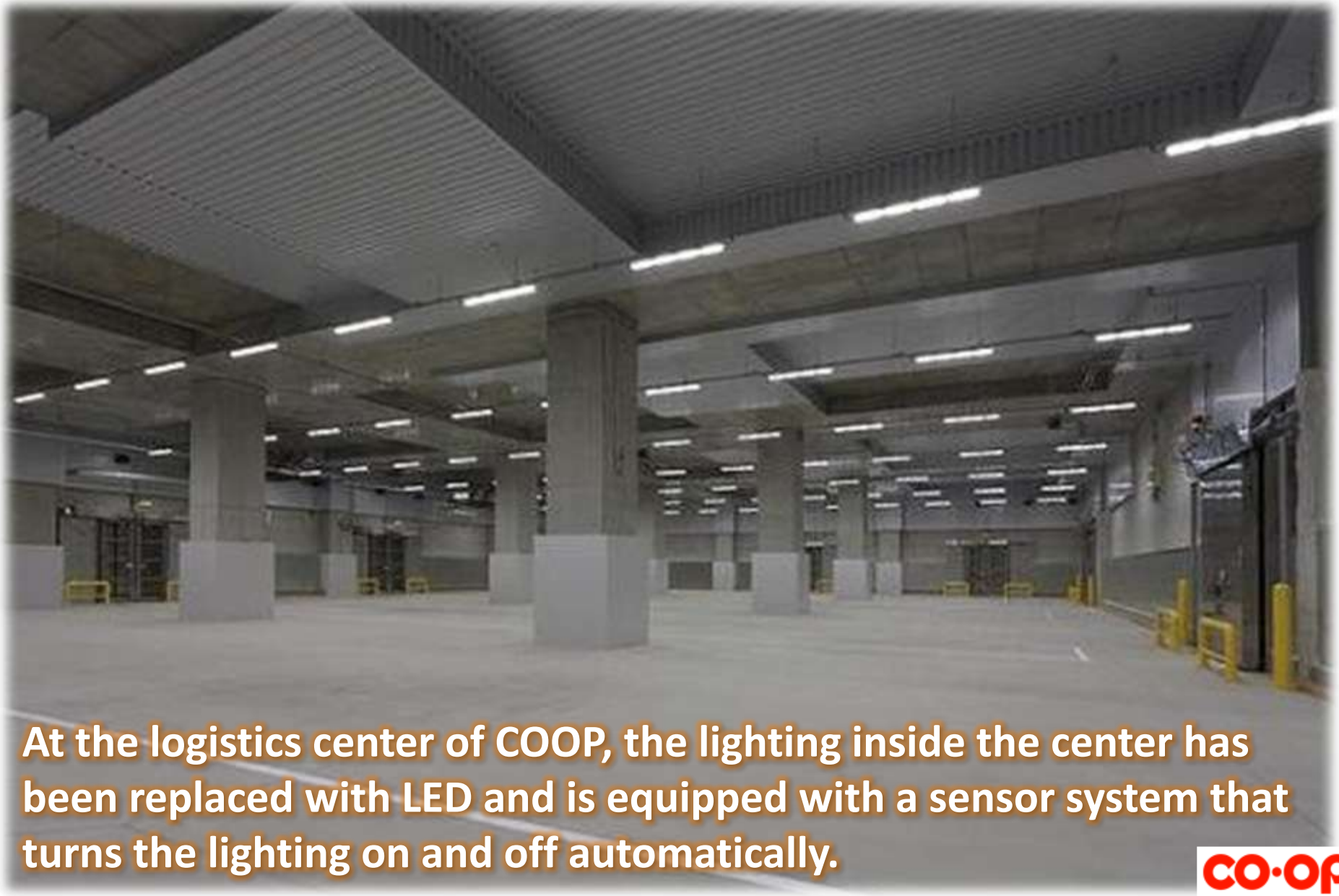
2: High Efficient Natural Refrigerant System

3: Dedicated HVAC System

4: Floor Heating System

5: Photovoltaic Power Generation System

1:Adoption of High efficiency Lighting



At the logistics center of COOP, the lighting inside the center has been replaced with LED and is equipped with a sensor system that turns the lighting on and off automatically.

Introduction facilities list

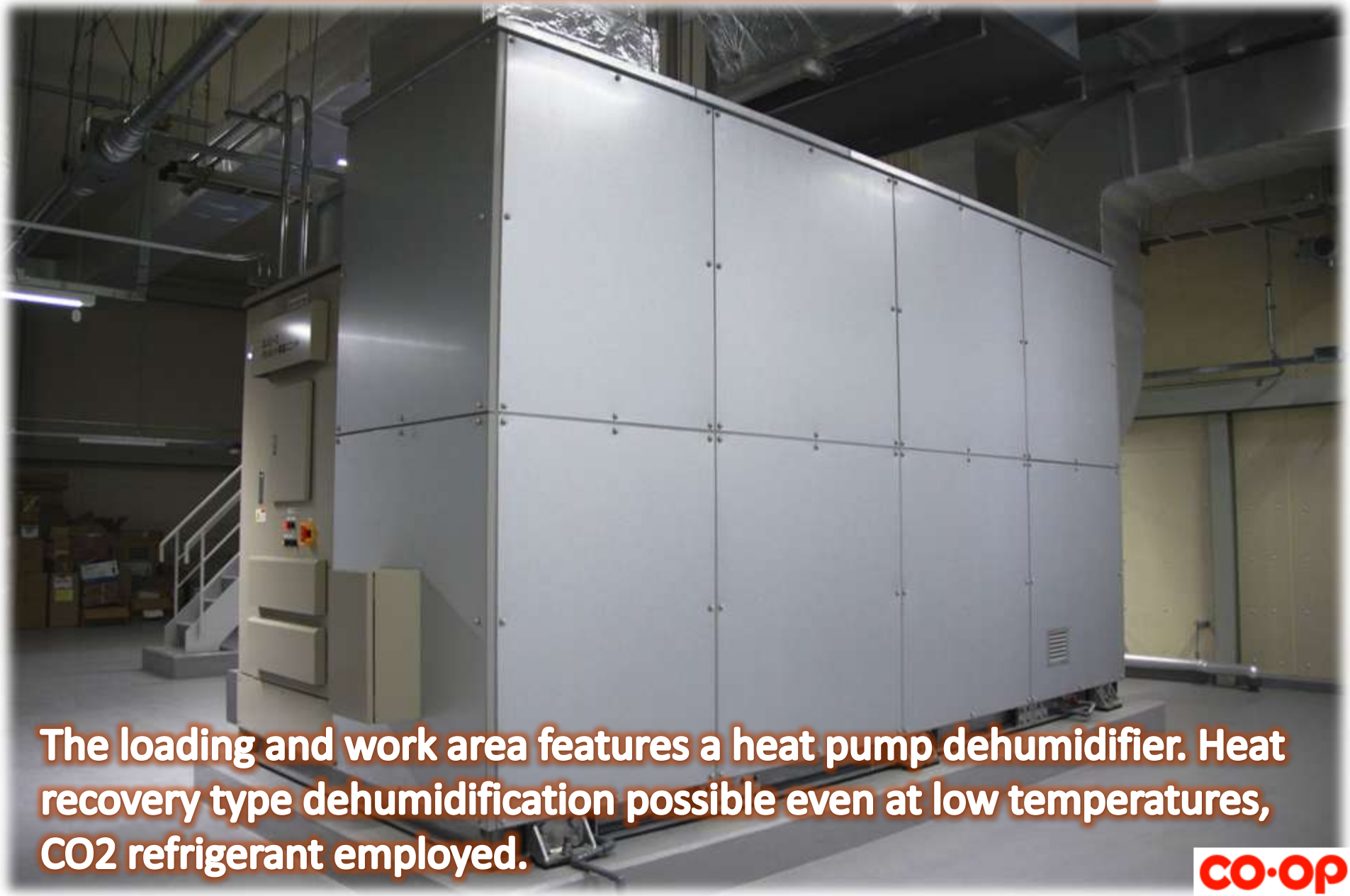
Products	Class/degC	Capacity (kW)	Rated Power (kW)	Set
NH3/CO2 Unit	F Class /-25	170	45×2 (1)	2
NH3/CO2 Unit	C Class /+5	215	65	4
CO2 Heat Pump	Floor Heating	Heating 36 cooling 12	25	2
Dedicate HVAC (CO2 Heat Pump)	Loading Area	—	25	2
Thermo Shutter	Loading Area & F Class	—	—	14

(1) Multi-type unit

2:High Efficient Natural Refrigerant System

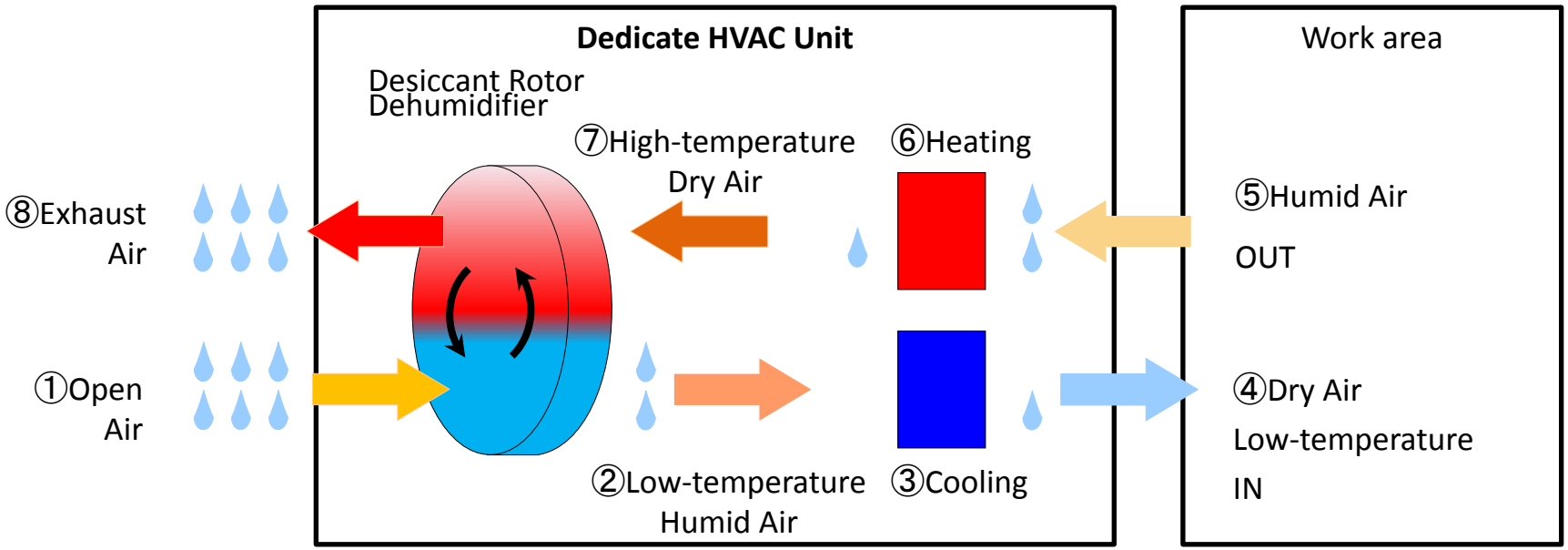
2:High Efficiency Natural Refrigerant system

3:Dedicated HVAC Unit



The loading and work area features a heat pump dehumidifier. Heat recovery type dehumidification possible even at low temperatures, CO2 refrigerant employed.

3:Dedicated HVAC Unit



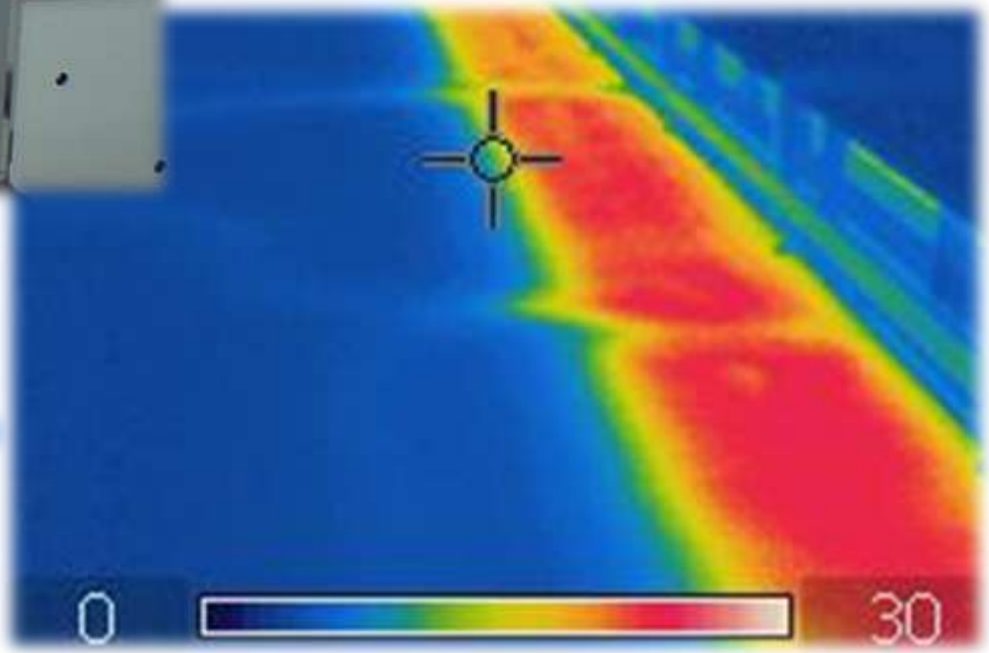
4:Floor Heating System

4:Floor Heating System

Work space

Floor Heating area

Floor Heating



Thermography

5: Photovoltaic Power Generation System

In addition to the renewal of the cooling system, photovoltaic panels totaling 613kW were installed on the entire roof, for renewable energy use.

Photovoltaic Power Generation System

City, Prefecture	Center Name	Power generation (kW)
Noda ,Chiba	Noda Distribution Center	350.0
Ono,Hyougo	Ono Dry Center	494.0
Onomichi,Hiroshima	Onomichi Cold Logistics Center	613.0
Onomichi,Hiroshima	Onomichi Dry Logistics Center	493.5
Tosu,Saga	Tosu Dry Distribution Center	497.0
Tosu,Saga	Tosu Cold Distribution Center	497.0
Sasaguri,Fukuoka	Sasaguri Cold Storage Center	1067.5
	Total	4012.0

Photovoltaic power generation totaling 4 MW.
This is equivalent to the annual electricity consumption of approximately 1000 households.

The second COOP Plaza Building

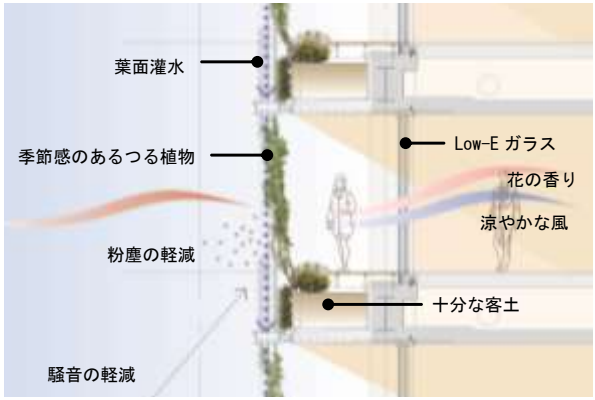
Project: The second COOP Plaza building
Location: Shibuya-ku, Tokyo
Application: Office building
Total floor space: 7,437m^2

To promote saving energy improvement projects (Ministry of Land, Infrastructure, Transport, and tourism)

The second COOP Plaza Building System

① Green blind & Balcony &Low-E

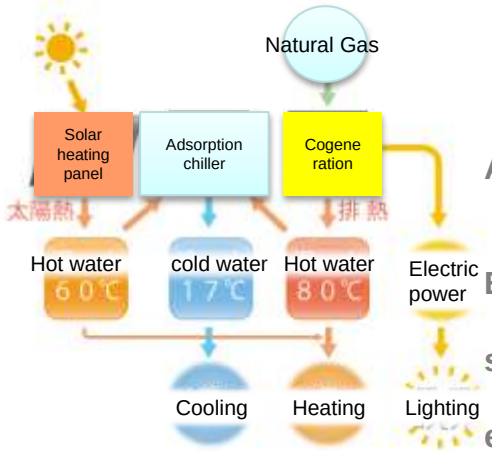
Build green blinds by using vines



Solar radiation cover・
Adiabatic effect・
Transpiration cooling effect of leaf surface irrigation
Contribute to intellectual productivity and well-being

② New Air Conditioning System

Solar heat and waste heat from cogeneration builds an ultrahigh efficiency heat source.

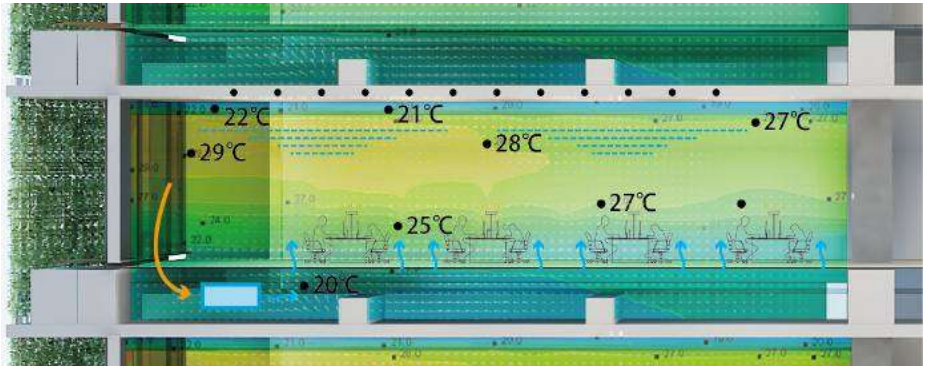


Adsorption chiller ⇒Energy saving

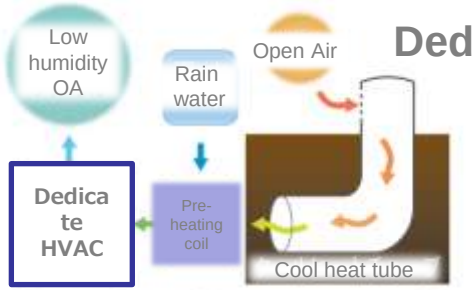
Electric power ⇒ Electric power is supplied to lighting and an electric socket.

The second COOP Plaza Building System

③ Floor and ceiling slab radiant air conditioning system



④ Dedicated HVAC & efficient use of heat and rainwater. & Cool heat tube



Dedicated HVAC System

Latent heat・Sensible heat Separation processing

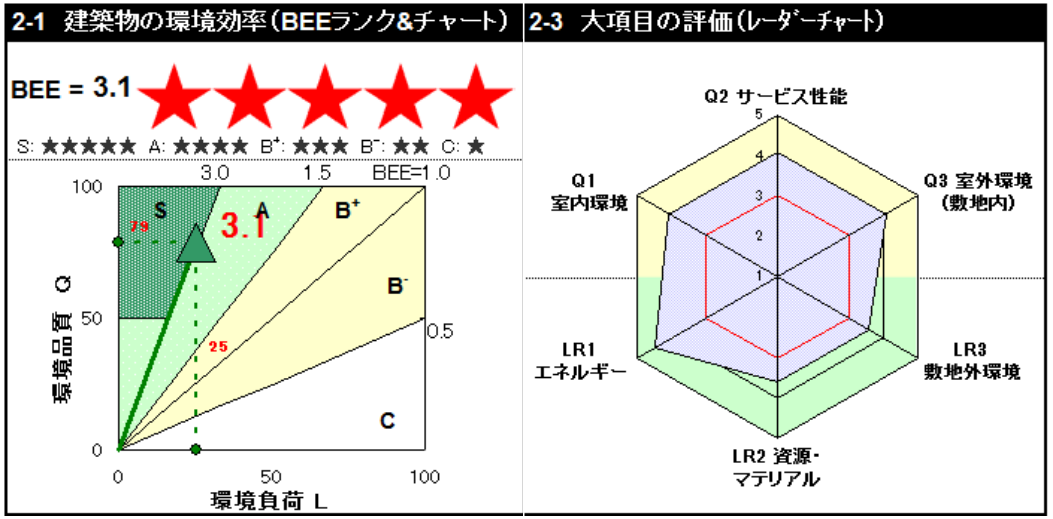
⇒ Adsorption chiller system

Natural energy
Air pre-cooling and Preheat.
⇒ Low-temperature hot water is used in the chiller system.

Environmental performance and reduce CO2 emissions

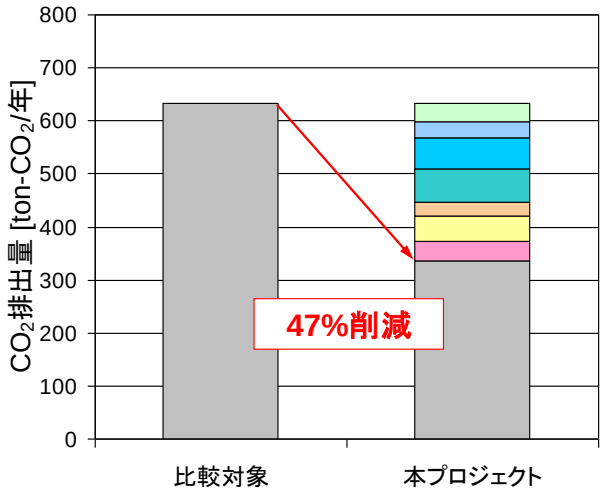
■ CASBEE

“S” Rank
（BEE＝3.1）



■ Reduce CO2 emissions

298.5 ton-CO_2/year＝47 % Reduction



提案項目
① グリーンブラインド＆バルコニー＆Low-E ～新しいワークプレースに貢献する壁面緑化スキンシステム～
② 吸着式冷凍機＆太陽熱＆コージェネ ～自然エネルギーをベースとした超高効率熱源システム～
③ 天井スラブ放射空調＆床吹出空調 ～ペリメータアイル/リバーススラブから生まれた天井スラブ放射空調システム～
④ デシカント外調機＆井水・雨水熱利用＆クールヒートチューブ ～自然エネルギーベース熱源を支える外気供給システム～
⑤ 自然換気＆蒸散冷却＆ダイレクトナイトパージ ～外気供給・空調システムと連動した自然換気・ナイトパージシステム～
⑥ タスク＆アンビエント照明 ～リバーススラブを活かしたタスク＆アンビエント一体型照明システム～
⑦ BEMS＆省CO2インフォメーションシステム ～システムの運転最適化・省エネ計画の立案による省CO2効果～

Thank You
for Your Attention