Briefing on Sustainability

Daikin and SDGs

Daikin Industries, Ltd.
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Speakers

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Corporate Planning Department
Content of Past Briefing on Sustainability

[First] Daikin CSR Activities
① Efforts to Reduce the Environmental Impact of Air Conditioning
   (Promotion of inverters and R32)
② Providing Value for Human Health and Comfort and Developing Human Resources
   (Support for the development of engineers, etc.)

[Second] Daikin from the ESG perspective
① E: Contribution to Mitigation of Global Warming
   -Environmental Vision 2050
② S: Improvement of Human Resource Value
   -Global Human Resource Development
③ G: Our Governance
Today’s Topics

[Third] Daikin and SDGs
"Sustainable Development Goals Daikin is Contributing to through Its Business"

① Promotion of Environmentally Conscious Products Utilizing Core Technologies
② Provision of Energy Service Solutions
③ Responding to Air Needs
International Frameworks for Taking on Society's Challenges on a Global Scale

Society's Challenges with the highest risk

- Intensifying climate change
- Increase and concentration of demand for electricity and other energy forms
- Intensifying atmospheric pollution
- Insufficient human resources supporting sustainable development
- Deforestation and forest degradation

International Frameworks

- UN Global Compact
- UN Sustainable Development Goals (SDGs)
- UN Framework Convention on Climate change (Paris Agreement)
- UN Kigali Amendment to the Montreal Protocol
Response to the Global Framework

Formulization of long-term environmental vision
Support for the Paris Agreement with a target of reducing greenhouse gas emissions to net zero by 2050

Contribution to UN Sustainable Development Goals (SDGs)

Participation in the UN Global Compact

Announcement of Endorsement of the TCFD Recommendations
Analyze risks and opportunities that climate change poses to our businesses with the aim of reflecting them in management strategies and further enhancement of information disclosure
Daikin's Aims for Value Creation and Contributes to Sustainable Development Goals

Provide new value that makes people and space healthier and more comfortable while at the same time reducing environmental impact.

**Value Creation for the Earth**
Reduce environmental impact through all business activities and contribute to alleviating climate change

**Value Creation for Cities**
Contributing to solving energy-related issues arising from urbanization and contribute to the creation of sustainable cities

**Value Creation for People**
Pursue new possibilities for air and contribute to healthy, comfortable lifestyles

Sustainable Development Goals (SDGs) targets
Ensure healthy lives and promote well-being for all at all ages
Prevention of heatstroke and infectious diseases, measures against air pollution, increase in productivity, etc.

Ensure access to affordable, reliable, sustainable and modern energy for all
Increase in energy efficiency, use and spread of renewable energy, etc.

Contribute to sustainable cities and communities
ZEB (net-zero energy buildings) initiatives, promotion of energy management and demand response, etc.

Ensure responsible production and consumption
Initiatives for energy efficiency during production, recycling, resource efficiency, etc.

Take urgent action to combat climate change and its impacts
Spread of inverter products, refrigerants with lower global warming potential, and heat pump products, etc.
Process of Value Creation

Through efforts to find solutions to social problems through our business, Daikin provides new value, and aims for sustainable growth.
Sustainable Development Goals Daikin is Contributing to through Its Business
① Promotion of Environmentally Conscious Products Utilizing Core Technologies
Environmentally Conscious Products
Utilizing Our Core Technologies

Long-term vision for “Achievement of reducing greenhouse gas emissions to net zero”

Reduction of environmental impact during use

Environmentally conscious products

- Energy-saving products such as Inverters, etc.
- Refrigerants with lower global warming potential such as R32
- Non-fossil-fuel, water and space heaters using heat pumps

Environmental solutions

- Energy Management
- Use of renewable energy
- Cooperation with energy-saving buildings (ZEB and ZEH)

Promotion of Widespread Adoption through Rule Formulation

- Open licensing of patent
- Support for the development of regulatory standards
- Service engineer education and training
Core Technologies: Energy Savings by Inverter Air Conditioners

- More 50% reduction in power consumption by inverter use

**Actual survey results in Brazil**

![Graph showing energy savings comparison between non-inverter and inverter air conditioners]

**Actual survey results in Mexico**

![Graph showing energy savings comparison between non-inverter and inverter air conditioners]

**Final results from field tests**

Energy consumption comparison between Non-inverter R-410A vs Inverter R-32

- **UFSC** FLORIANÓPOLIS/SC
- **MAUÁ** SÃO CAETANO/SP
- **PUC-RJ** RIO DE JANEIRO/RJ

(Source: Report on Promotion of Environmentally Conscious Air Conditioners in Mexico, JICA)

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**Rate of energy savings by inverters**

58% Energy savings

**Calculation of Annual Power Consumption in JIS B8616:2015**

According to the conditions set forth in [District: Tokyo, Building Use: Stores]

Air conditioner (*) without inverter 5,702kWh

2,375kWh air conditioner (SSRC140BA) equipped with inverters

* Because non-inverter air conditioners are not sold in Japan, calculation was made equivalent to the SSRC140BA air conditioner without an inverter

(Source: Report on Promotion of Environmentally Conscious Air Conditioners in JICA)
Status of Energy Conservation Regulations in Each Country

- Energy Conservation: Higher Regulation Values in Energy Conservation Regulations by Inverter Use

Conversion to energy conservation regulations that account for inverters (EER→CSPF/SEER)

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Vietnam</td>
</tr>
<tr>
<td>2018</td>
<td>Malaysia</td>
</tr>
<tr>
<td>2019</td>
<td>Indonesia</td>
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<tr>
<td></td>
<td>Philippines</td>
</tr>
<tr>
<td></td>
<td>Australia</td>
</tr>
<tr>
<td></td>
<td>New Zealand</td>
</tr>
<tr>
<td>2020</td>
<td>Singapore</td>
</tr>
</tbody>
</table>

Implemented in Japan, China, and Europe

Minimum energy performance standard (MEPS) rises at 1.7% per annum (IEAs)

(Source: IEA report "the cooling for future")

(Reference)
China’s National Development and Reform Commission (2019):
“Green and High-Efficiency Cooling Action Plan”
- Increase efficiency of air conditioners by 30%, 20% of showcases (by 2022)

Government of India (2019):
“India Cooling Action Plan”
- Energy savings of 30% for refrigeration air conditioners by the-2030s
## Current Market Status: Progress of Inverter Diffusion and Environmental Contribution

### Increasing use of inverters worldwide

Penetration rate of residential inverter AC

<table>
<thead>
<tr>
<th>Region</th>
<th>2007 INV Ratio</th>
<th>2007 Number of units (10,000 units)</th>
<th>2018 INV Ratio</th>
<th>2018 Number of units (10,000 units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>100%</td>
<td>965</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>7%</td>
<td>4,215</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>25%</td>
<td>617</td>
<td>79%</td>
<td></td>
</tr>
<tr>
<td>Asia</td>
<td>12%</td>
<td>1,612</td>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td>~5%</td>
<td>824</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>~5%</td>
<td>1,354</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21%</strong></td>
<td><strong>9,587</strong></td>
<td><strong>59%</strong></td>
<td><strong>9,587</strong></td>
</tr>
</tbody>
</table>

(Source: Japan Refrigeration and Air Conditioning Industry Association website with supplemented data by Daikin)

- **2007 Electricity Consumption**
  - Inverter: 9%
  - Non-inverter: 1.6 times

- **2018 Electricity Consumption**
  - Inverter: 22%
  - Non-inverter: 1.1 times
Core Technologies: Reasons for Determining Refrigerant with Lower Global Warming Potential R32 as Optimal Refrigerant

- Refrigerant selection requires comprehensive evaluation
  - Comprehensive evaluation items for refrigerant selection

- Assessment at time of R32 selection (for direct expansion air conditioner)

- LCCP.... Impact on global warming throughout the lifecycle of air conditioner (impact of air conditioner use + impact of refrigerant emissions)

- Refrigerant selection requires comprehensive evaluation

- Comprehensive evaluation items for refrigerant selection

- Assessment at time of R32 selection (for direct expansion air conditioner)

(*1) LCCP.... Impact to global warming throughout the life cycle of air conditioner (impact of air conditioner use + impact of refrigerant emissions)
Effectiveness of R32 for Reducing Impact to Global Warming during Air Conditioner Life Cycle

- Daikin reduces CO\textsubscript{2} emissions by 20% to 35%.
- Use of R32 reduces the impact of refrigerant on global warming (to one-third of conventional refrigerants), improves equipment efficiency, and reduces refrigerant volume.

### Residential air conditioners: 2.8kW class

- **R410A (2005)**
  - Power consumption
  - Manufacturing: 9% energy savings
  - Refrigerant: GWP reduces to 1/3 + Saves 30% or more in refrigerant = 22.6%

- **R32 (2015)**
  - Power consumption
  - Manufacturing: 21% reduction
  - Refrigerant: GWP reduces to 1/3 + Roughly 15% in refrigerant = 27.5%

### Commercial air conditioners: 14 kW class

- **R410A (2005)**
  - Power consumption
  - Manufacturing: 30% energy savings
  - Refrigerant: GWP reduces to 1/3 + Saves roughly 15% in refrigerant = 27.5%

- **R32 (2015)**
  - Power consumption
  - Manufacturing: 34% reduction
  - Refrigerant: GWP reduces to 1/3 + Roughly 15% in refrigerant = 27.5%
Refrigerant: HFC phase down under the Kigali Amendment was started in developed countries in 2019.

**Europe**
- Refrigerant prices soared with the reduction in supply due to stricter quotas in 2018. Although illegal refrigerant imports are increasing, refrigerant prices are level at high prices. Further reduction in quotas is expected in 2021 and 2024. This has made the need for regeneration apparent.
- The trend toward lower GWP is due to higher prices. Small-sized air conditioners are rapidly converting to R32. For refrigeration and freezing equipment, CO₂ is used for medium to large sized equipment while small sized products use propane.

**United States**
- GWP regulations are expected to begin in California in 2023.
- In addition to the R32, the mildly flammable refrigerant R454B and the non-flammable refrigerant R466A, which has CF₃I as a component, have been proposed.
- Daikin Industries announced that it would choose R32 (September 2019).

**Japan**
- It will be difficult to achieve the Kigali Amendment in 2029, the pressure to lower GWP in VRF and refrigeration equipment will increase.
- In order to overcome the 2029 issue, the government is promoting development of "green refrigerant" as a post-R32 refrigerant. From 2030 onwards, it will be difficult to achieve current goals without a new refrigerant.
- Daikin Industries is advocating the achievement of the Kigali Amendment by promoting recovery.

**Developing countries and the United Nations**
- Conversion to R32 is proceeding in residential use. To confront the issues of protecting the ozone layer and R22 abolishment, the number of countries using UN funds to convert to R32 is increasing.
- The Montreal Conference is shifting from discussions on new refrigerants to discussions on improvements in servicing and installation technologies to conserve energy and prevent leakage during use.
Current Market Status: Contributing to the Environment by Promoting R32 and Other Refrigerants with Lower Global Warming Potential

- Refrigerant: R32 is becoming more prevalent in various countries.

(Source: Daikin Industries Independent Survey from 2019/1 to 2019/6)

<table>
<thead>
<tr>
<th>Region</th>
<th>Market</th>
<th>Residential market R32 ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>Japan</td>
<td>100%</td>
</tr>
<tr>
<td>China</td>
<td>China</td>
<td>45%</td>
</tr>
<tr>
<td>Asia</td>
<td>Thailand</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>Vietnam</td>
<td>64%</td>
</tr>
<tr>
<td>Europe</td>
<td>Italy</td>
<td>76%</td>
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<tr>
<td></td>
<td>France</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Turkey</td>
<td>46%</td>
</tr>
<tr>
<td>Other</td>
<td>India</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>Australia</td>
<td>56%</td>
</tr>
<tr>
<td>World total</td>
<td></td>
<td>32-35%</td>
</tr>
</tbody>
</table>

Sales of residential air conditioners using R32
- Global unit sales in 2018
  Approx. 26 million units (JARN)
  Equivalent to 27% share in a single fiscal year

- Worldwide cumulative unit sales
  84 million units (Daikin Survey)
  Equivalent to 140 million tons of CO₂

- Our cumulative unit sales (over 70 countries)
  21 million units
  Equivalent to 35 million tons of CO₂

Daikin’s policy in fields other than air conditioners
- CO₂, propane, and R407H are used mainly in Europe for refrigeration.
- Chillers use medium-pressure refrigerant (R1234ze, R513A) and low-pressure refrigerant (R1233zd) according to equipment specifications and regions. R32 is used for small air-cooled scroll-type compressors.
Current Market Status: Refrigerant Situation in Europe

- **F gas regulations**
  - 2006: Preventing leaks and emissions
  - 2014: Limitation of consumption (quota system)
  - GWP regulations (750 or less for air conditioners)

Refrigerant prices are soaring and recycled refrigerants are rapidly expanding (2017 data)

**Refrigerant price**

<table>
<thead>
<tr>
<th>Year</th>
<th>R404A (GWP 3932)</th>
<th>R410A (GWP 2088)</th>
<th>R407C (GWP 1774)</th>
<th>R134a (GWP 1430)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
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<tr>
<td>2016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

(Source: Okorecherche report 2019/3)

**Amount recycled**

(Source: EEA report EN-Fluorinated greenhouse gases 2018)

**Examples of Daikin’s countermeasures**

In addition to promoting R32 equipment, sales of multi-split system for commercial using recycled refrigerants.

1. Charge 100% recycled refrigerant at factory
   - Start in FY2019
2. Additional refrigerant charging and test operation service
   - Launched in FY2018
3. Maintenance and repair
   - Start in FY2019
4. Refrigerant recovery at disposal
   - Start in FY2019
Core Technologies of Daikin Industries: Potential of Heat Pump Type Heating and Water Heaters

- For household energy in Europe approximately 80% is used for heating and water heaters

<table>
<thead>
<tr>
<th>Country</th>
<th>Space heating</th>
<th>Water heater</th>
<th>Cooling</th>
<th>Light/Plug</th>
<th>Cooking</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>40</td>
<td>40</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>France</td>
<td>50</td>
<td>30</td>
<td>30</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Germany</td>
<td>40</td>
<td>40</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>USA</td>
<td>60</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Japan</td>
<td>40</td>
<td>40</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Energy consumption at home [GJ/(home/year)]
(Source: Residential Environment Program Laboratory 2013)

- Heat pump is a technology utilizing renewable energy

  - Unit of heat from water and air: 3 to 5
  - Renewable Energy Source
  - Heating: 4 to 6
  - Primary energy: 2 to 5
  - Electricity: 1
  - COP = 4 to 6

- Amid global decarbonization, electrification, and elimination of fossil fuels, the need for heat pumps will increase further

  EU parliament acknowledged “aerothermal energy” and “hydrothermal energy” as renewable energy sources in addition to geothermal energy. (2008/12/17)

(Reference)
Annual CO₂ Generation of Heating Equipment in Europe
Estimated by Daikin Industries

- Oil burning boilers 5,138Kg
- Gas boiler 3,189Kg
- Heat pump 1,450 Kg
  - SPF=4
  - For power consumption European average
Regulations Related to Heat Pumps in Each Country

Heat pump: With the trends for decarbonization, electrification, non-fossil fuels, acceleration of the heat pump market is essential.

**European policy**

*A Clean Planet for All*

The EU Committee announced a long-term vision in November 2018 for elimination of European greenhouse gases by 2050 and achieving zero net emissions.

**Decarbonization Pathways**

*European economy*

In response to the above vision, Eurelectric announced a proposal for decarbonization.

**Incentives for heat pumps in each country**

- **France:** 30% reduction in equipment costs
- **UK:** 0.0742GBP/kWh of electric power consumed
- **Italy:** tax exemptions, installation cost subsidy, and running cost subsidy

**U.S. California’s zero carbon roadmap**

Reduce greenhouse gas emissions from the building sector by 100% in 2045
Replace 100% of water heaters and heating systems with high-efficiency heat pumps in 2030.
Daikin Industries’ Refrigerant Life Cycle Management and Path to Kigali Amendment

Daikin’s stance on the Kigali Amendment
- Daikin supports the Kigali amendment
- The company selects the right refrigerant for the right equipment
- It is important to take a “sooner the better” approach.
- Not only refrigerant conversion, a product lifecycle approach has to be taken to achieve HFC phase down.
- We are also working on the development of next-generation refrigerants.

Conversion to lower GWP refrigerant
- Developing appropriate refrigerants for each application
- Reducing the amount of refrigerant charge
- Further reduction of leakage
- Conducting refrigerant recovery, reuse, and reclamation
- Minimize the environmental impact
In order to promote the conversion of refrigerants worldwide, Daikin offers companies worldwide free access to its 93 patents on the manufacture of R32 air conditioners.

**September 2011 Open Licensing to Emerging Countries**
- This was done to accelerate efforts toward phasing out of refrigerants that deplete the ozone layer.

**September 2015 Open Licensing to Developed Countries**
- Even in developed countries, there is an urgent need to convert to low GWP refrigerants that have a lower impact on global warming.

**July 2019 Worldwide Pledge for R32 Equipment**
- Daikin declared the release of all R32 air conditioner manufacturing patents filed since 2011.

To promote conversion to R32 in the United States, Daikin declared that it would adopt R32 in its main products sold in the United States. (2019/9/26)
② Provision of Energy Service Solutions
Fusion 20 Latter-Half Plan

- In addition to sales of energy-saving equipment systems coordinating ventilation and air-conditioning, we also provide energy-saving services for the entire building and services for customers throughout the value chain from design to servicing and maintenance.

- We are also taking on the challenge of creating businesses with recurring revenue streams and new business models that lead to equipment replacement.

<table>
<thead>
<tr>
<th>Value offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual optimization</td>
</tr>
<tr>
<td>Optimization to purpose of</td>
</tr>
<tr>
<td>building (office, hospital,</td>
</tr>
<tr>
<td>school, housing, etc.)</td>
</tr>
<tr>
<td>Group control (building group,</td>
</tr>
<tr>
<td>equipment group)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Energy Services Solutions business</th>
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<table>
<thead>
<tr>
<th>IAQ/Air Environment Engineering business</th>
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<table>
<thead>
<tr>
<th>Development of energy-saving equipment and systems</th>
</tr>
</thead>
</table>

2017 Chairman Prize of Energy Conservation Center, Japan (ECCJ)

2018 Chairman Prize of Energy Conservation Center, Japan (ECCJ)

2018 Director General Prize of Agency of Natural Resources and Energy

- Energy-saving equipment and systems
- Cyclical business (Instrumentation and Service Solutions)
- New types of business model (Energy demand management business, etc.)
- IAQ business expansion
- Business trials → Commercialization

Total energy consumption (%)

- Latest update: 317 (Target)
- Comparison with standard value: 55% reduction

- Lighting: △17
- AC & ventilation: △38
- Inner window: △1
- Sunlight: △6
- Operational improvement: △13
- Nearly ZEB
- ZEB Ready

Standard value: 1,267

Standard value: 1,267
Establish Cyclical Business

Connecting with customers and equipment, acquiring maintenance contracts that include equipment from other companies, and providing a selection of service options to gain replacement demand.

Value chain

① Acquire maintenance contracts that leads to replacements

- Strengthen customer base and after sales service
- Develop a selection of service options to meet customer needs

② Link to sales of new and replacement equipment

For example, the Applied Systems market in North America and Japan is the replacement-centered market.

 Especially in the small- and medium-sized buildings, conventional instrumentation systems with their high costs have not become widespread, and it is important to establish direct contact with customers.
Daikin Air Techno Co., Ltd. provides a comprehensive service for the design, installation, management, and maintenance of air conditioning, plumbing, sanitation and other facilities.

In addition to predictive maintenance services by remote monitoring, the company has also been commissioned to provide management services, such as the periodic inspections required under the Fluorocarbons Emission Reduction Act, periodic filter cleaning, and long-term air conditioning repair plans.

- **Air as a Service, Ltd.**
  - The company owns air conditioning equipment on behalf of customers and provides a comfortable air-conditioned environment as a monthly subscription service.

- **Daikin Air Techno, Ltd.**
  - Daikin Air Techno, an air conditioning specialist, provides reliable one-stop service for air conditioning.

- **Daikin Remote Monitoring Center**
  - Conducts remote energy-saving control based on the day’s weather and also detects signs of failure and performs maintenance.

- **Mitsui & Co.**
  - Proposal of alternative plan for power contract that meets customer’s need.

(Source: Air as a Service Website)
A demonstration was performed for a model that equalizes the overall load by consolidating multiple properties and implementing demand control of air conditioners.

A contribution was made to local energy production and consumption.
Case Study for Demand Response ②: NEDO UK (Manchester)

To advance the low-carbonization through electrification of energy for water heaters and heating systems in the residential sector, Daikin is promoting widespread utilization of heat pump technologies. At the same, to mitigate the accompanying increase in power load, we are implementing a demonstration of demand response with energy demand management performed by bulk transaction and operation (aggregation) of electricity demand.

- **Analysis server**
  - Achieved more than 200 kW DR at 144 homes. Response time was 6 min. or less at all the homes and duration of 30 min. or more was achieved.
  - DR of over 200 kW was achieved at 65 homes. Response time of 12 min. was achieved at all the homes. Duration of 120 min. was achieved at only 24% of the homes.
  - Reduction of HP operation time and a shift quantity of 350 Wh/house or more were achieved. Cost difference was negative in all time zones, which means cost reduction was achieved along with peak shifting.

- **DR quantity**
  - DR quantity of 100 kW was achieved at 26 homes, but time distribution was uneven. The control system needs to be improved.

- **DR quantity (guideline)**
  - Upheld at all the homes.

- **DR quantity**
  - DR quantity of over 200 kW was achieved at 65 homes. Response time of 60 sec. demanded by DNO was achieved at only 7 homes.
  - DR of over 200 kW was achieved at 144 homes. Duration of 60 min. was achieved at 92% of the homes, a level fit for practical use. Response time of 60 sec. demanded by DNO was achieved at only 7 homes.
  - DR of over 200 kW was achieved at 65 homes. Response time of 12 min. was achieved at all the homes. Duration of 120 min. was achieved at only 24% of the homes.

- **DR quantity**
  - DR of over 200 kW was achieved at 144 homes. The actual transaction requirement is 3 MW or more, so the target is likely to be achieved if the number of homes increases.

- **Shift quantity**
  - Reduction of HP operation time and a shift quantity of 350 Wh/house or more were achieved. Cost difference was negative in all time zones, which means cost reduction was achieved along with peak shifting.

(Source: NEDO Smart Community Case Study)
Case Study for Demand Response ③ : Lisbon Cool Energy Project

- Business feasibility is being verified in cooperation with a virtual power plant (VPP) having a demand management function that automatically controls the upper limit of power consumption of air conditioners according to the amount of energy available from the VPP operator who manages multiple power generation facilities of renewable energy.

- The use of multi-split system for commercial are equipped with cold storage units to ensure comfort for the residents.

<Participating Companies and Organizations>

ADR Partner

Everis & Efacec server

DAIKIN server

VPP partner

NextKraftwerke サーバー

Grid

Renewables

Weather

Electricity market

ADR system

VPP system

OpenADR 2.0b

Rest-like XML API

<Diagram>

(Source: NEDO Press Releases)
③ Responding to Air Needs
As an IAQ/Air Environment Engineering business, we will work to build a business model while implementing trial themes.

Ex.) Trial projects

- Integrated service of air quality diagnosis, installation, maintenance, and replacement for food manufacturing plants.
- Develop indexes for sensitivity values such as aroma and “delicious air”.
- Verify the relationship between bio-information and IAQ environment.
- Air environment to improve office productivity, etc.

<Customer Value to Provide>

- Relief of stress
- Productivity Improvement
- Prevention of disease/pre-symptomatic state
- Recovery from fatigue
- Proper sleep
Business Proposals for Apparent Needs: Kirei Watch

- Air conditioning drain pan inspections, humidifier inspections, and certain cleaning must be implemented in accordance with the revised Maintenance of Sanitation in Buildings act.
- The drain pans and humidifying element of the ceiling-embedded indoor unit and total heat exchanger are photographed with a camera. This inspection of the air conditioner helps save labor and also contributes to a reduction in risk of water leakage and formulation of a maintenance plan.

**Kirei Watch**

Outline of Kirei Watch

- Visualization and quantification of stains through image analysis
- Utilization in maintenance plans by examining changes over time
Proposal of New Value: Improvement of Intellectual Productivity and Identifying the Role of Temperature Stimulation

- Joint research with NEC is underway to realize IAQ /air environment that enhances intellectual productivity.
- For improvement of intellectual productivity in work spaces, providing optimum temperature stimulation by an air conditioner is more effective for brain activation than manipulation of normal fragrances and lighting.
Proposal of New Value:
CRESNECT / “point 0 marunouchi” Initiatives

Aiming to create office spaces for the future, Daikin is utilizing CRESNECT, a collaborative creation platform for spatial data, and performing a demonstration in the coworking space of “point 0 marunouchi.”

Concept of “Point 0 Marunouchi”

- Efficiency and comfort
  - Improve productivity by extreme personalization
- Creation
  - Enhance creativity by stimulating communication
- Health
  - Support people’s health by visualizing workstyles

Open Space Database Platform (Cresnect) (=CRESNECT)

- Gather data
- Visualize
- Analyze

What has emerged in the course of our operations

- Many visitors say that the air is delicious. Air quality value is improved to a level where people can perceive the difference.
- Space utilization is greatly improved with changing the layout.
- Provision of alcoholic beverages has a major effect on switching work awareness ON/OFF.
- Need for shower booths and sleeping rooms as private spaces in offices is obvious.
- Sound sources that hamper meetings and concentration have been discovered.
(Reference) Our Group Philosophy (established in 2002)

1. Create New Value by Anticipating the Future Needs of Customers
2. Contribute to Society with World-Leading Technologies
3. Realize Future Dreams by Maximizing Corporate Value
4. Think and Act Globally
5. Be a Flexible and Dynamic Group
   1) Flexible Group Harmony
   2) Build Friendly yet Competitive Relations with Our Business Partners to Achieve Mutual Benefit
6. Be a Company that Leads in Applying Environmentally Friendly Practices
7. With Our Relationship with Society in Mind, Take Action and Earn Society's Trust
   1) Be Open, Fair, and Known to Society
   2) Make Contributions that Are Unique to Daikin to Local Communities
8. The Pride and Enthusiasm of Each Employee Are the Driving Forces of Our Group
   1) The Cumulative Growth of All Group Members Serves as the Foundation for the Group’s Development
   2) Pride and Loyalty
   3) Passion and Perseverance
   1) Participate, Understand, and Act
   2) Offer Increased Opportunities to Those who Take on Challenges
   3) Demonstrate Our Strength as a Team Composed of Diverse Professionals
10. An Atmosphere of Freedom, Boldness, and "Best Practice, Our Way"
We will reduce the greenhouse gas emissions generated throughout the entire life cycle of our products.

Furthermore, we will create solutions that link society and customers as we work with stakeholders to reduce greenhouse gas emissions to net zero.

Using IoT and AI, and open solutions, we will meet the world's needs for air solutions by providing safe and healthy air environments while at the same time contributing to solving global environmental problems.
Currently, medium- and long-term strategies are being formulated with the goal of 2030.
Disclaimer

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