PRESS RELEASE
June 30, 2021

KIX to conduct a demonstration with Kobe University to save air-conditioning energy and boost infection control

Kansai Airports today announced that it will team up with Kobe University to conduct a demonstration experiment of the air-conditioning system for energy savings and infection control in Terminal 2 at Kansai International Airport (KIX).

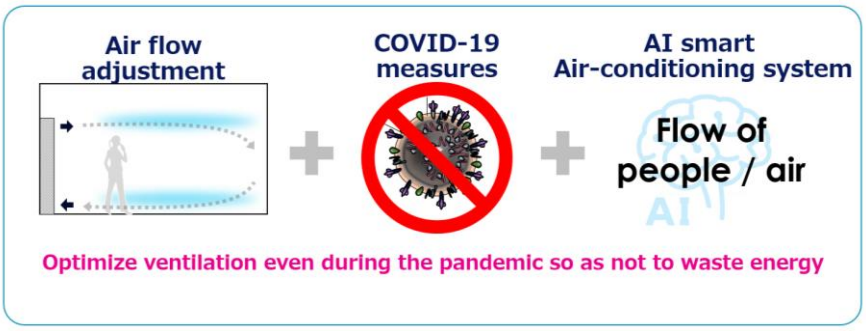
The joint demonstration project, commissioned by the Ministry of the Environment, is aimed at reducing carbon emissions and improving infection control measures through advanced air-conditioning technologies that use AI and other innovative solutions.

Setting a long-term goal of achieving net-zero greenhouse gas emissions by 2050, Kansai Airports Group is taking various actions to reduce environmental footprint at its three airports in the Kansai region—KIX, Osaka International Airport (ITAMI), and Kobe Airport (KOBE).

Kansai Airprots Group will continue to strive to pursue environmentally friendly practices to develop harmonious airport environments.

Outline

Project name:	T2 Smart Air Conditioning Demonstration Experiment
Commissioned as part of:	FY2020 demonstration project for accelerating the practical application of innovative, CO2-saving infection-control technologies (Commissioned operations: Visualization of infection risk at the airport, and development and demonstration of cutting-edge technologies that enable both air-conditioning and disinfection)
Project type:	Entirely commissioned by the Ministry of the Environment
Period:	Winter 2021 (for partial launch, with full-scale launch scheduled for the beginging of 2022) until the end of March 2023
Target area:	Entire Terminal 2 at KIX
Description:	1. Develop technologies for the visualization of infection risk in a large space 2. Develop methods to disinfect spaces and remove virus based on information about the flow of people and crowded areas 3. Develop control technologies that integrate the existing equipment, infection control technologies, and CO2-saving technologies
Targets:	1. Cut air-conditioning costs & CO2 emissions by over 50% 2. Reduce infection risk in the terminal by over 95%
Project cost:	¥550 million (2-year total)



Contact Information
Kansai airports
Group Corporate Communications Department
TEL: +81-72-455-2201

KANSAI AIRPORTS

Shaping a New Journey

KANSAI AIRPORTS

Kansai Airports was established by a consortium made up of VINCI Airports and ORIX Corporation as its core members. Kansai Airports took over the operations of Kansai International Airport ("KIX") and Osaka International Airport ("ITAMI") from New Kansai International Airport Company ("NKIAC") and has been operating the two airports since April 1, 2016.
Kansai Airports Kobe, Kansai Airports' wholly-owned subsidiary, took over the operations of Kobe Airport ("KOBE") from Kobe City and started its business as an operating company on April 1, 2018.
Under the concept of "One Kansai Airports Group", Kansai Airports group strives to continuously improve its services for all airport guests through appropriate investments and efficient operations, with safety and security being the top priority. Kansai Airports group aims to maximize the potential of the three airports, for the benefit of the communities they serve.
For more information, please visit : http://www.kansai-airports.co.jp/en/

Kansai Airports

Location	1-banchi, Senshu-kuko kita, Izumisano-shi, Osaka	Shareholders	ORIX 40%, VINCI Airports 40%, Other investors 20%[1]
Company Representatives	Representative Director and CEO:Yoshiyuki Yamaya Representative Director and Co-CEO: Benoit Rulleau		
Business Scope	Operation and management services, etc. of Kansai International Airport and Osaka International Airport		

Kansai Airports Kobe

Location	1-ban, Kobe-kuko, Chuo-ku, Kobe-shi, Hyogo	Shareholder	Kansai Airports 100%
Company Representatives	Representative Director and CEO: Yoshiyuki Yamaya Representative Director and Co-CEO: Benoit Rulleau		
Business Scope	Operation and management services, etc. of Kobe Airport		

ORIX

About ORIX:
ORIX Corporation (TSE: 8591; NYSE: IX) is a financial services group which provides innovative products and services to its customers by constantly pursuing new businesses.
Established in 1964, from its start in the leasing business, ORIX has advanced into neighboring fields and at present has expanded into lending, investment, life insurance, banking, asset management, automobile related, real estate and environment and energy related businesses. Since entering Hong Kong in 1971, ORIX has spread its businesses globally by establishing locations in 31 countries and regions across the world.
Going forward, ORIX intends to utilize its strengths and expertise, which generate new value, to establish an independent ORIX business model that continues to evolve perpetually. In this way, ORIX will engage in business activities that instill vitality in its companies and workforce, and thereby contribute to society. For more details, please visit our website: https://www.orix.co.jp/grp/en/
(As of March 31, 2021)

VINCI AIRPORTS

VINCI Airports, the leading private airport operator in the world, manages 45 airports in 12 countries in Europe, Asia and the Americas. We harness our expertise as a comprehensive integrator to develop, finance, build and operate airports, while leveraging our investment capability and expertise in optimising operational performance, modernising infrastructure and driving environmental transition. VINCI Airports became the first airport operator to start rolling out an international environmental strategy, in 2016, with a view to achieving net zero emissions throughout its network by 2050.
www.vinci-airports.com

[1] ASICS Corporation; Iwatani Corporation; Osaka Gas Co., Ltd.; Obayashi Corporation; OMRON Corporation; The Kansai Electric Power Company, Incorporated; Kintetsu Group Holding Co., Ltd.; Keihan Holdings Co., Ltd.; Suntory Holdings Limited; JTB Corp.; Sekisui House, Ltd.; Daikin Industries, Ltd.; Daiwa House Industry Co., Ltd.; Takenaka Corporation; Nankai Electric Railway Co., Ltd.; NIPPON TELEGRAPH AND TELEPHONE WEST CORPORATION; Panasonic Corporation; Hankyu Hanshin Holdings, Inc.; Rengo Co., Ltd.; The Senshu Ikeda Bank, Ltd.; Kiyo Holdings, Inc.; The Bank of Kyoto, Ltd.; THE SHIGA BANK, LTD.; The Nanto Bank, Ltd.; Nippon Life Insurance Company; Mizuho Bank, Ltd.; Sumitomo Mitsui Trust Bank, Limited; MUFG Bank, Ltd.; Resona Bank, Limited; and the Private Finance Initiative Promotion Corporation of Japan.

Date: June 30, 2021

Project: T2 Smart Air Conditioning Demonstration Experiment

KIX to start a joint demonstration with Kobe University!

To enable energy savings and infection control through the air-conditioning system

KANSAI AIRPORTS × KOBE UNIVERSITY

国立大学法人神戸大学

産官学連携本部SSC室・工学研究科・医学研究科

Project outline

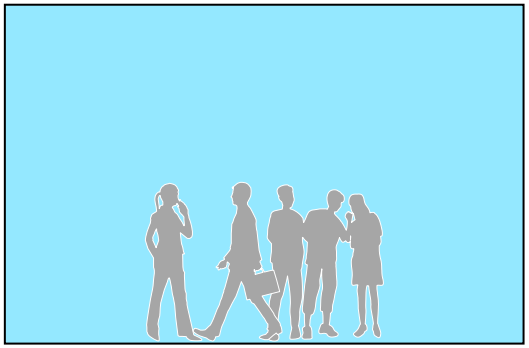
This is a joint project between Kansai Airport and Kobe University, commissioned by the Ministry of the Environment.

Outline	
Commissioned project	FY2020 Demonstration project for accelerating the practical application of innovative, CO2-saving infection control technologies
Issues	- **Visualization of infection risk at the airport** - **Development & demonstration of cutting-edge technologies that enable both air-conditioning and disinfection**
Project type	Entirely commissioned by the Ministry of the Environment
Operating cost	¥545,600,000 (2-year total)
Duration	FY2021-FY2022

Current issues

Result of the joint research with Kobe University

Summer



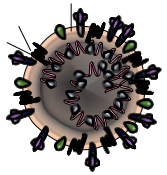
- The entire space is cooled down
- The temperature gets colder than the setting

Winter

- A large difference in temperature occurs between the top and bottom of a room (up to 5.2 °C)
- The room temperature is lowered by the air coming from the outside

A lot of energy is wasted…

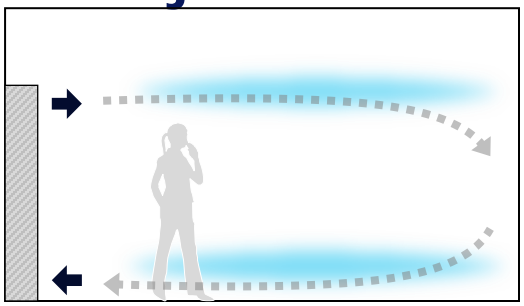
We cannot lower the ventilation rate amid the COVID-19 pandemic



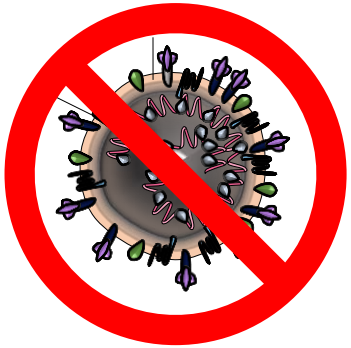
Concept & target

First in Japan!

Air flow adjustment



COVID-19 measures



AI smart Air-conditioning system

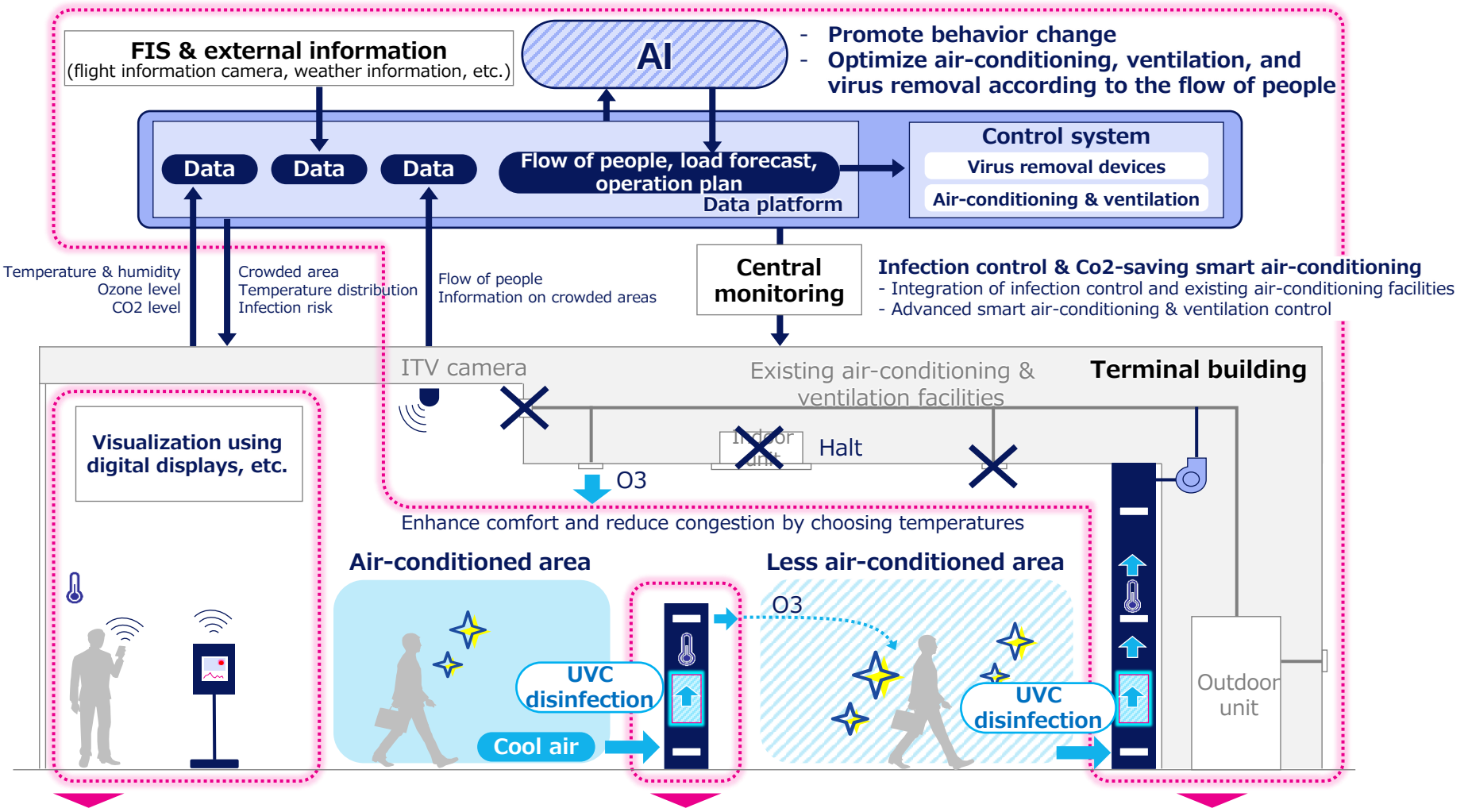
Flow of people / air

Optimize ventilation even during the pandemic so as not to waste energy

Targets:

- **Cut air-conditioning energy by 50% (1600t-CO2/year)**
- **Reduce infection risk in the terminal by over 95%**

Overview


FIS & external information
(flight information camera, weather information, etc.)
AI
- Promote behavior change
- Optimize air-conditioning, ventilation, and virus removal according to the flow of people
Data
Data
Data
Flow of people, load forecast, operation plan
Data platform
Control system
Virus removal devices
Air-conditioning & ventilation
Temperature & humidity
Ozone level
CO2 level
Crowded area
Temperature distribution
Infection risk
Flow of people
Information on crowded areas
Central monitoring
Infection control & Co2-saving smart air-conditioning
- Integration of infection control and existing air-conditioning facilities
- Advanced smart air-conditioning & ventilation control
ITV camera
Existing air-conditioning & ventilation facilities
Terminal building
Visualization using digital displays, etc.
Halt
O3
Enhance comfort and reduce congestion by choosing temperatures
Air-conditioned area
Less air-conditioned area
O3
UVC disinfection
Cool air
UVC disinfection
Outdoor unit
A1: Infection risk visualization
A2: Virus removal technologies
A3: CO2-saving

Overview

A1
Develop technologies to visualize infection risk in a large space

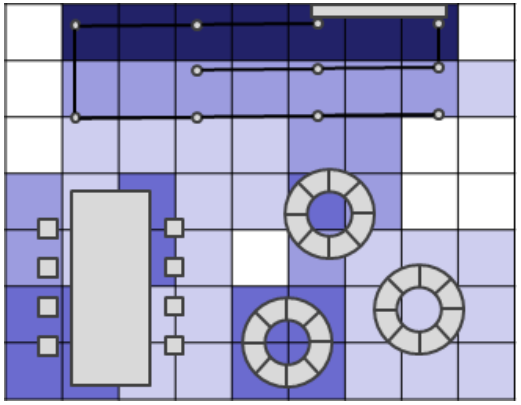
A2
Develop methods to disinfect spaces and remove the virus based on information about the flow of people and crowded areas

A3
Develop control technologies that integrate the existing equipment, infection control technologies, and Co2-saving technologies

Infection risk increase factors × **Infection risk reduction factors**

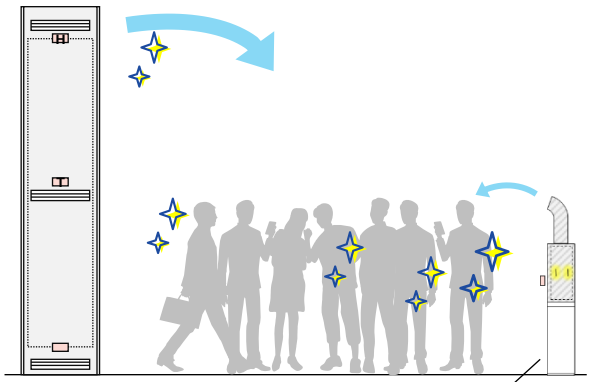
CO2
Flow of people

Ozone level
Ozone exposure time
Temperature & humidity

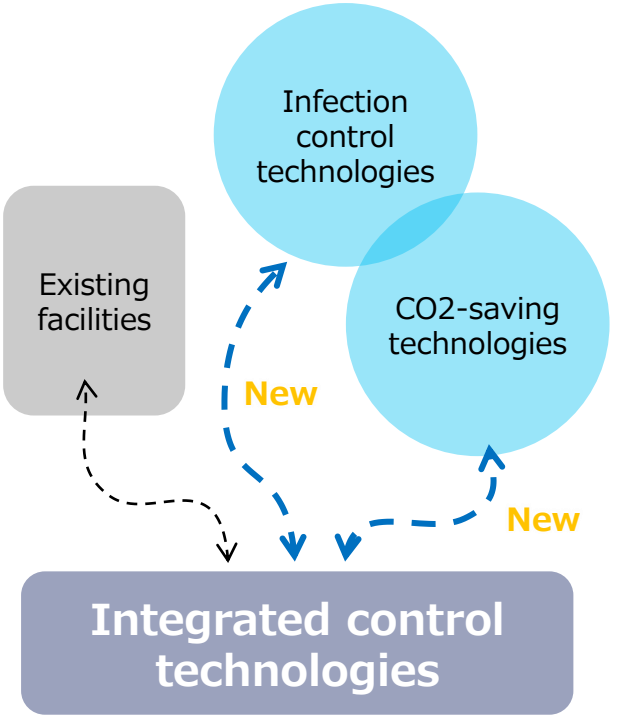


Comprehensively quantify
infection risk
for each location & time interval

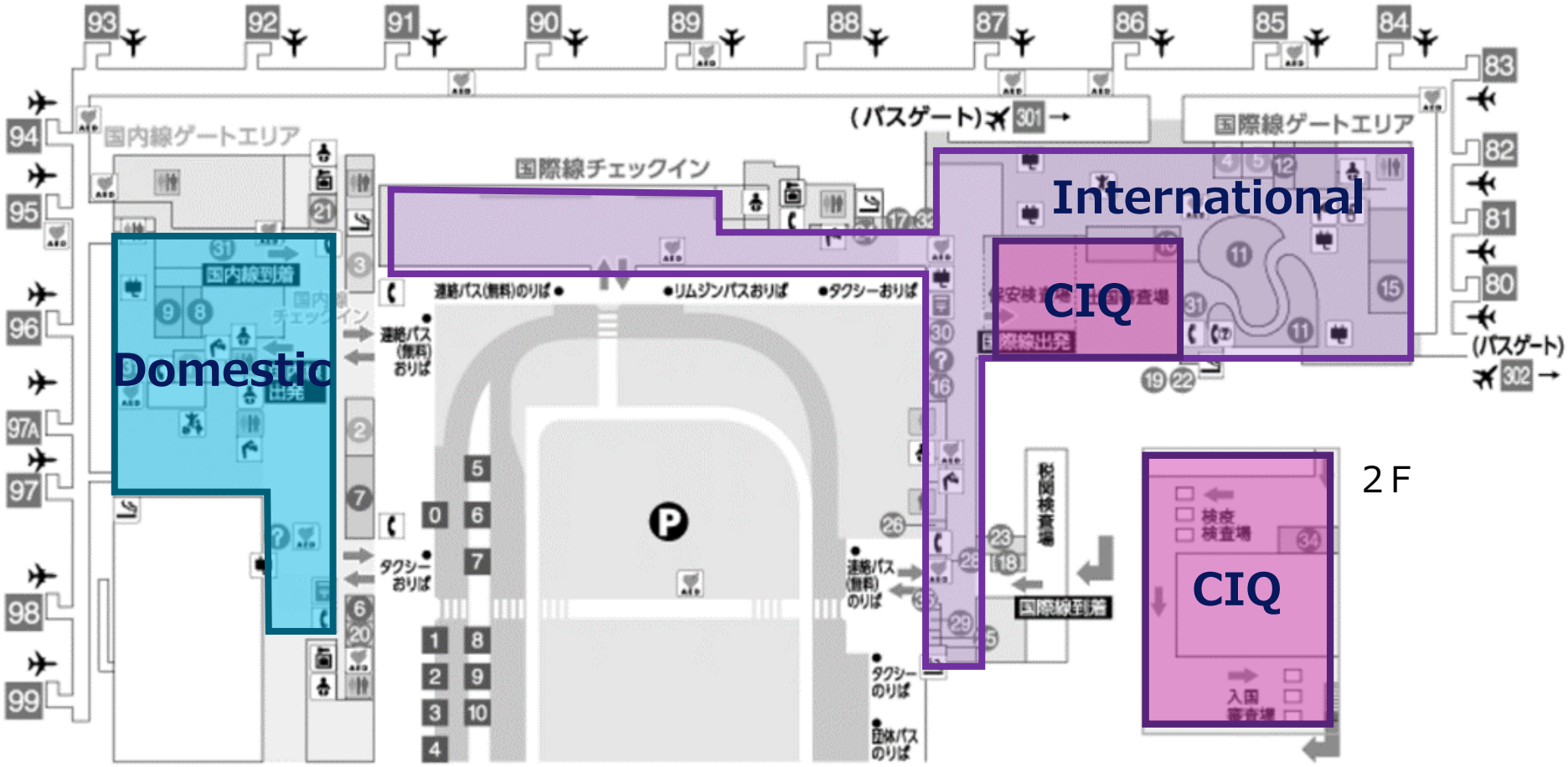
Ambient
Reduce indirect infection risk with the air-conditioning system that enables disinfection and inactivation of the virus using UV-C1 light and ozone



Task
Place where close-contact is unavoidable



Target area (KIX Terminal 2)



Demonstration structure

◆Main operator

Kansai Airports

- Supervise & conduct the demonstration
- Plan strategies for carbon neutral
- Install facilities & make adjustments
- Modify the existing facilities
- Make coordination with airport-related operators

◆Partner

Kobe University

- SSC, Innovation Commercialization Division
- Graduate School of Engineering
- Center for Infectious Diseases, Graduate School of Medicine

- Develop technologies
- Integrate systems
- Verify effects

◆Partner

SSCL
(Sustainable Smart Community Laboratory)

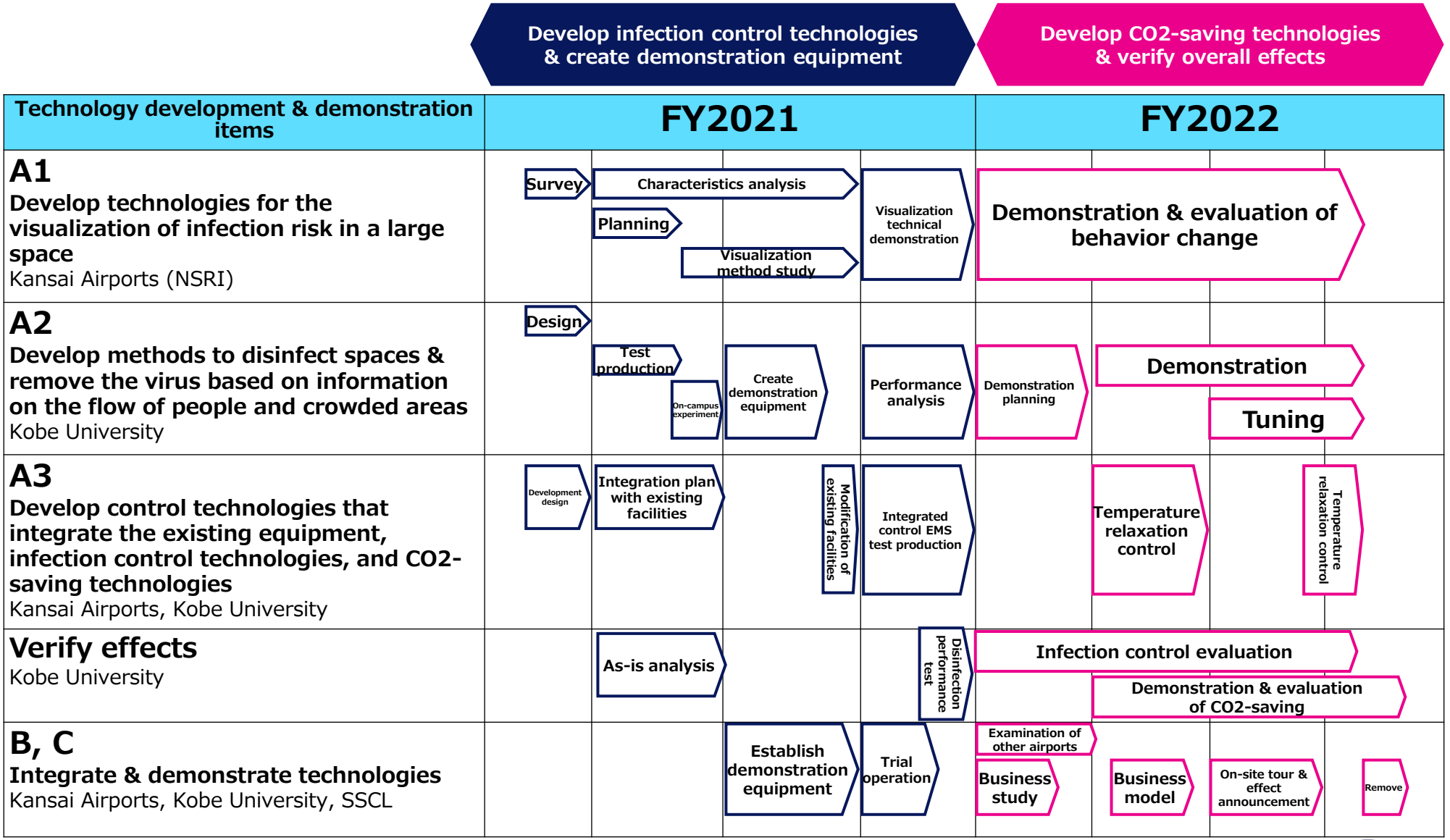
- Foster collaboration between the university and private firms
- Support study on commercialization for achieving carbon neutral

◆Collaborator

NSRI
(Nikken Sekkei Research Institute)

- Develop technologies to visualize infection risk

Timeline


Develop infection control technologies & create demonstration equipment
Develop CO2-saving technologies & verify overall effects
Technology development & demonstration items
FY2021
FY2022
A1
Develop technologies for the visualization of infection risk in a large space
Kansai Airports (NSRI)
Survey
Characteristics analysis
Planning
Visualization method study
Visualization technical demonstration
Demonstration & evaluation of behavior change
A2
Develop methods to disinfect spaces & remove the virus based on information on the flow of people and crowded areas
Kobe University
Design
Test production
On-campus experiment
Create demonstration equipment
Performance analysis
Demonstration planning
Demonstration
Tuning
A3
Develop control technologies that integrate the existing equipment, infection control technologies, and CO2-saving technologies
Kansai Airports, Kobe University
Development design
Integration plan with existing facilities
Modification of existing facilities
Integrated control EMS test production
Temperature relaxation control
Temperature relaxation control
Verify effects
Kobe University
As-is analysis
Disinfection performance test
Infection control evaluation
Demonstration & evaluation of CO2-saving
B, C
Integrate & demonstrate technologies
Kansai Airports, Kobe University, SSCL
Establish demonstration equipment
Trial operation
Examination of other airports
Business study
Business model
On-site tour & effect announcement
Remove

Future vision of KIX Terminal 2 (Safe & zero-energy building)

Achieve carbon neutral using digital technologies, marine resources, and renewable energy

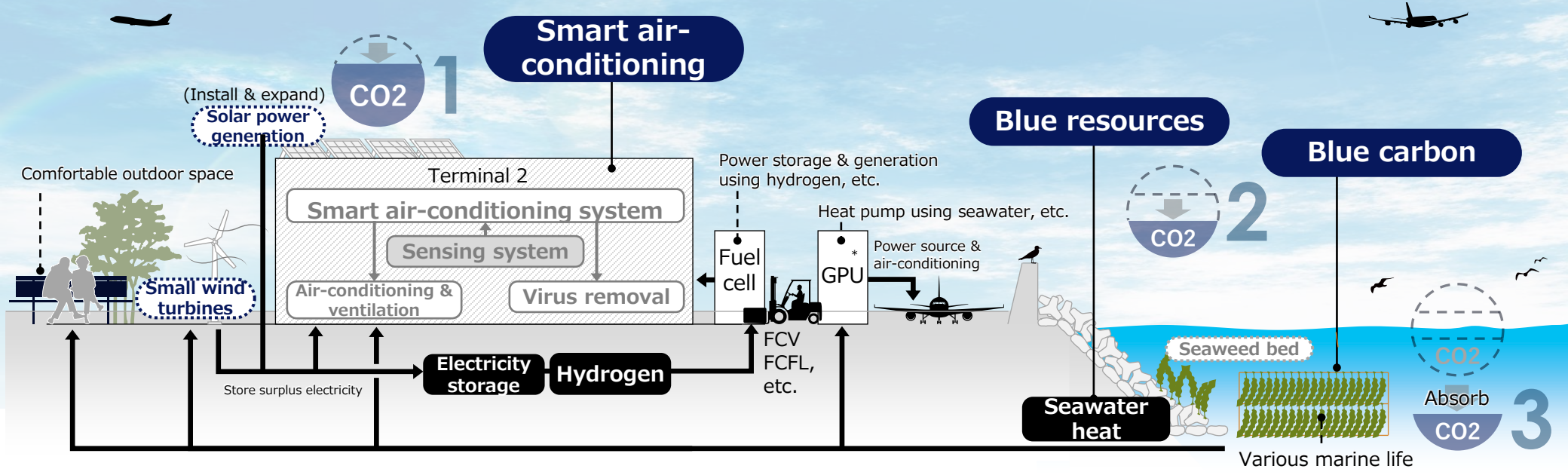
Phase1 → *Phase2* → *Phase3*

Advanced smart air-conditioning+
Optimize energy saving and ensure safety through air-conditioning system control and virus removal that are based on advanced sensing
1 Reduce CO2

Blue resources+
Use marine resources such as seawater heat as well as renewable energy such as hydrogen, and solar/wind power
2 Appropriate CO2

Blue carbon
Create a rich habitat of marine life with seaweed beds, and absorb CO2
3 Absorb CO2 → CO2

Sustainable carbon neutral SYSTEM
Smart Energy Efficiency
Blue resource
CO2 Blue carbon CO2



*Ground Power Unit:
Power supply device for aircraft