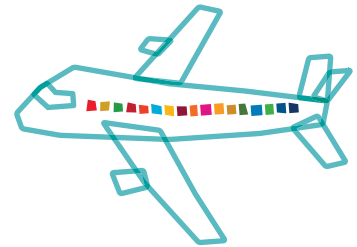
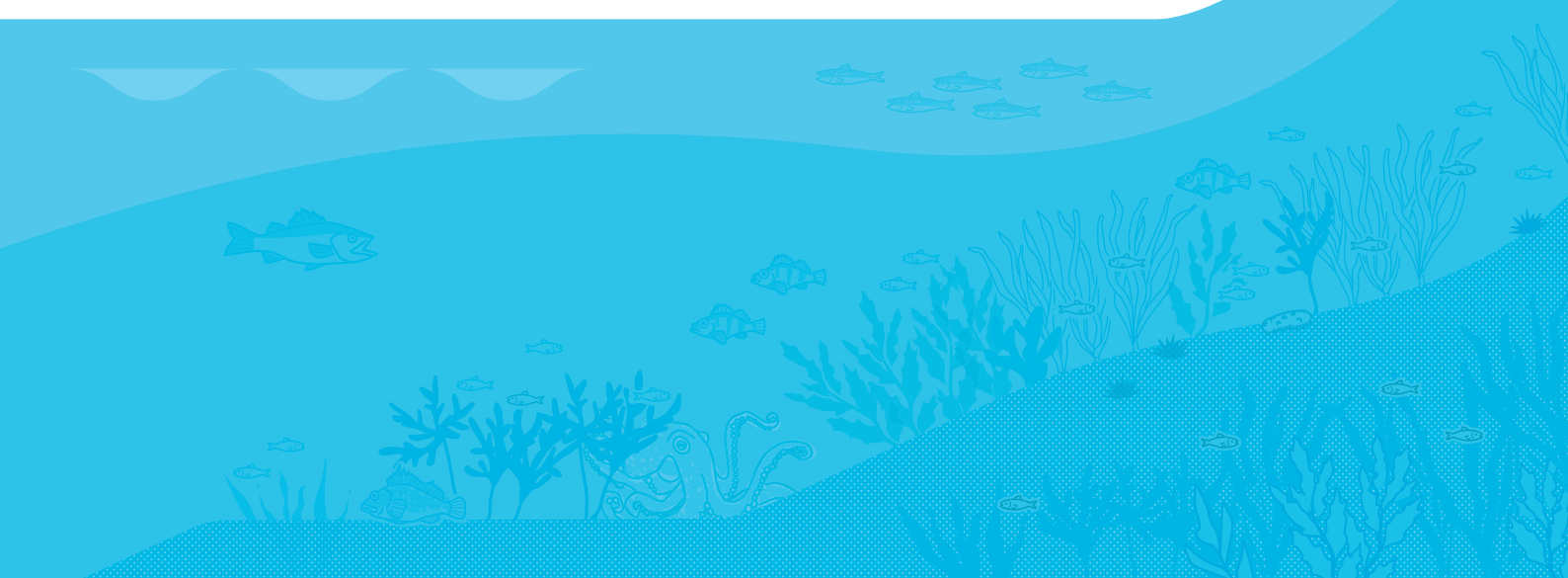
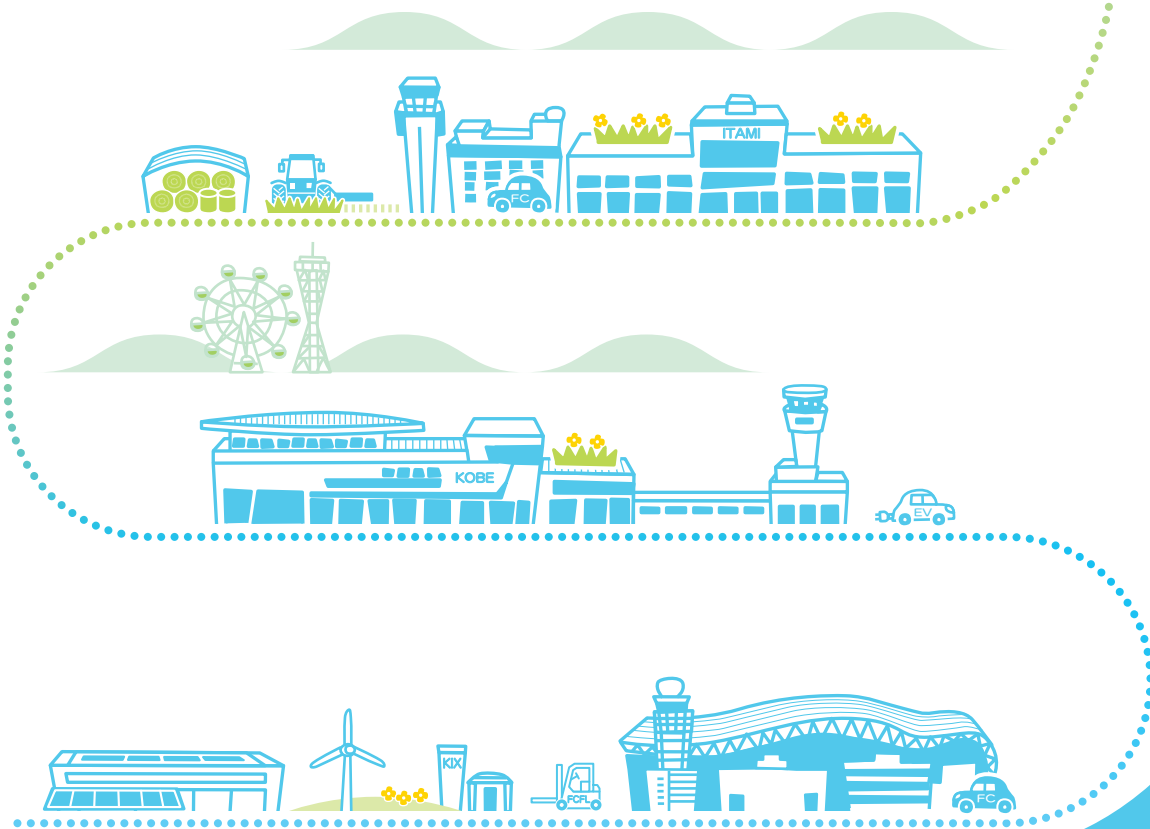


Shaping a New Journey



Kansai International Airport / Osaka International Airport / Kobe Airport

Environmental Report 2019



Committed to Operating Eco Friendly, Smart Airports



Shaping a New Journey

Kansai Airports Environmental Statement

Kansai Airports group is engaged in various activities to reduce the impact on the environment at 3 airports (Kansai International Airport, Osaka International Airport and Kobe Airport). In order to further promote our activities, we have created a new environmental plan "One Eco-Airport Plan", set specific targets and measures have been established based on the following 4 pillars as indices for future initiatives toward reduction of environmental impact.

• Response to climate change

We promote efficient energy usage to reduce environmental burdens and engage in measures aimed at reducing greenhouse gas emissions. We also encourage the use of solar, hydrogen and other types of sustainable energy and new energy that contributes to protecting the global environment.

• Resource usage

We reduce, separate, recycle and reuse all the waste and plastics generated. We also contribute to resource conservation through the promotion of "Reduce, Reuse and Recycle (the 3Rs)" with respect to both waste and water, including efforts to make water use more efficient through data analysis, expand the adoption of recycled water and examine rainwater usage.

• Environmental harmony

We continue to work on reducing aircraft noise, conduct environmental monitoring appropriately and disclose monitoring results. We will also promote the creation of positive spaces where airport users can relax and feel comfortable while striving to preserve biodiversity through the maintenance and expansion of greenbelts and conducting environmental surveys to verify species.

• Environmental management

Using environmental evaluation programs, we have created a mechanism to enable the understanding and assessment of environmental burdens that lead to their reduction. We also make an effort to engage in dialogues with customers, airport staff and local communities through the dissemination of environmental information and the provision of environmental education, as well as alliances with airport-related businesses and airports throughout Japan and overseas.

Kansai Airports group is fully aware of its responsibility toward the global and regional environmental changes. We will continue to promote initiatives aimed to reduce our environmental impact and to develop the airport while coexisting with the surrounding environment.

【Our environmental targets: (target year: FY 2022, base year: FY 2016)】

1. Reduce our energy use per unit of traffic by 1% per year on average.
2. At each airport, reduce our CO₂ emissions per unit of traffic by 1% per year on average.
3. At each airport, reduce the use of city water per passenger by 2% per year on average.
4. Increase the rate of recycling to 35 %.
5. At each airport, reduce the use of one-way plastics by 25%
6. Enter each airport in environmental certification programmes such as Airport Carbon Accreditation and ISO14001.
7. Perform biodiversity assessments and protect biodiversity on and around our airports.
8. Actively support the development of hydrogen as a clean energy source.

Yoshiyuki YAMAYA
Chief Executive Officer
Kansai Airports

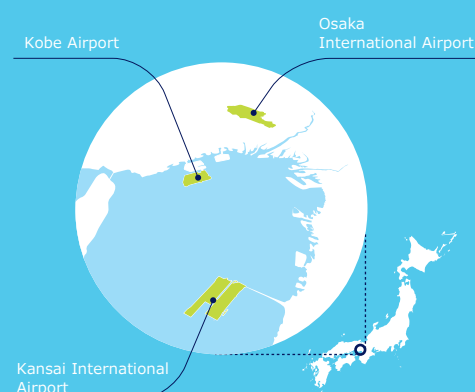
Benoit RULLEAU
Co-Chief Executive Officer
Kansai Airports



Company Profile

Name	Kansai Airports
Date of incorporation	December 1, 2015
Location	1-banchi, Senshu-Kuko Kita, Izumisano-shi, Osaka 549-8501, Japan
Company representatives	Yoshiyuki YAMAYA Chief Executive Officer Benoit RULLEAU Co-Chief Executive Officer
Business scope	<ul style="list-style-type: none"> ● Operation and management services, etc. of Kansai International Airport and Osaka International Airport ● Operation of Kobe Airport by Kansai Airports Kobe
Capital	25 billion yen
Shareholders	ORIX Corporation 40% VINCI Airports 40% Other investors 20%

* On April 1, 2018, Kansai Airports Kobe commenced its business as an operator of Kobe Airport (KOBE).



● Kansai International Airport
Website: www.kansai-airport.or.jp
Official Facebook page:
www.facebook.com/KansaiInternationalAirport/



● Osaka International Airport
Website: www.osaka-airport.co.jp
Official Facebook page:
www.facebook.com/OsakaInternationalAirport/



● Kobe Airport
Website: www.kairport.co.jp
Official Facebook page:
www.facebook.com/kobeairports/



CONTENTS

- 01 Introduction
- 03 Airport Summary
 - 04 Kansai International Airport
 - 05 Osaka International Airport
 - 06 Kobe Airport
- 07 One Eco-Airport Plan
- 11 Our Initiatives
 - 11 1 Response to Climate Change
 - 17 2 Resource Usage
 - 21 3 Environmental Harmony
 - 29 4 Environmental Management
- 31 To become a smart airport
- 33 Environmental Chronology
 - 33 Kansai International Airport
 - 35 Osaka International Airport and Kobe Airport



Editorial Policy

● Purpose of this report

This report is published to convey to stakeholders in an easy-to-understand manner initiatives, including data, for reducing environmental impacts being carried out by Kansai International Airport, Osaka International Airport and Kobe Airport to help realize sustainable society, which are managed by Kansai Airports.

● Reporting boundary

This report focuses on the activities of Kansai Airports and also covers the activities of certain Group companies and businesses operating at the airports its manages.

● Reporting period

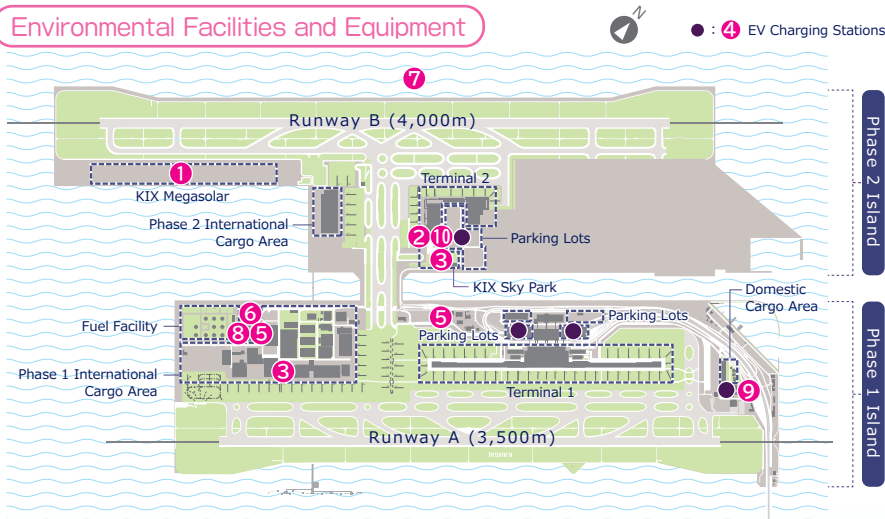
Activities carried out during fiscal 2018
(April 2018 to March 2019).

Airport Summary



Runways	2	Annual Aircraft Movements	approximately 190,000	Operating Hours	24 hours
Aircraft Parking Stands	104	Annual Passenger Traffic	approximately 29,410,000 (FY2018 operational results)	Size	Phase 1 Island approximately 510 ha / Phase 2 Island approximately 545 ha

Environmental Facilities and Equipment



1 KIX Megasolar

One of the largest megasolar power plants operated by an airport in Asia.



2 Small-scale wind turbines

Three wind turbines are installed at the airport. The generated electricity is used to power streetlights.



3 Hydrogen stations

Two stations serve fuel cell vehicles and industrial vehicles such as forklifts, etc.



4 EV charging stations

EV charging stations are available to encourage the use of eco-friendly vehicles.





5 Heat supply plant

The plant serves as a community heating and cooling system that centrally supplies cold water and steam.



8 Waste disposal center

General waste from the airport is sorted and either incinerated or recycled.



9 Environmental Center

Introduces environmental information and initiatives inside the Sky View Observation Hall.



10 KIX Sky Park

This roughly 4 hectares park features an expansive lawn and views of the sea.



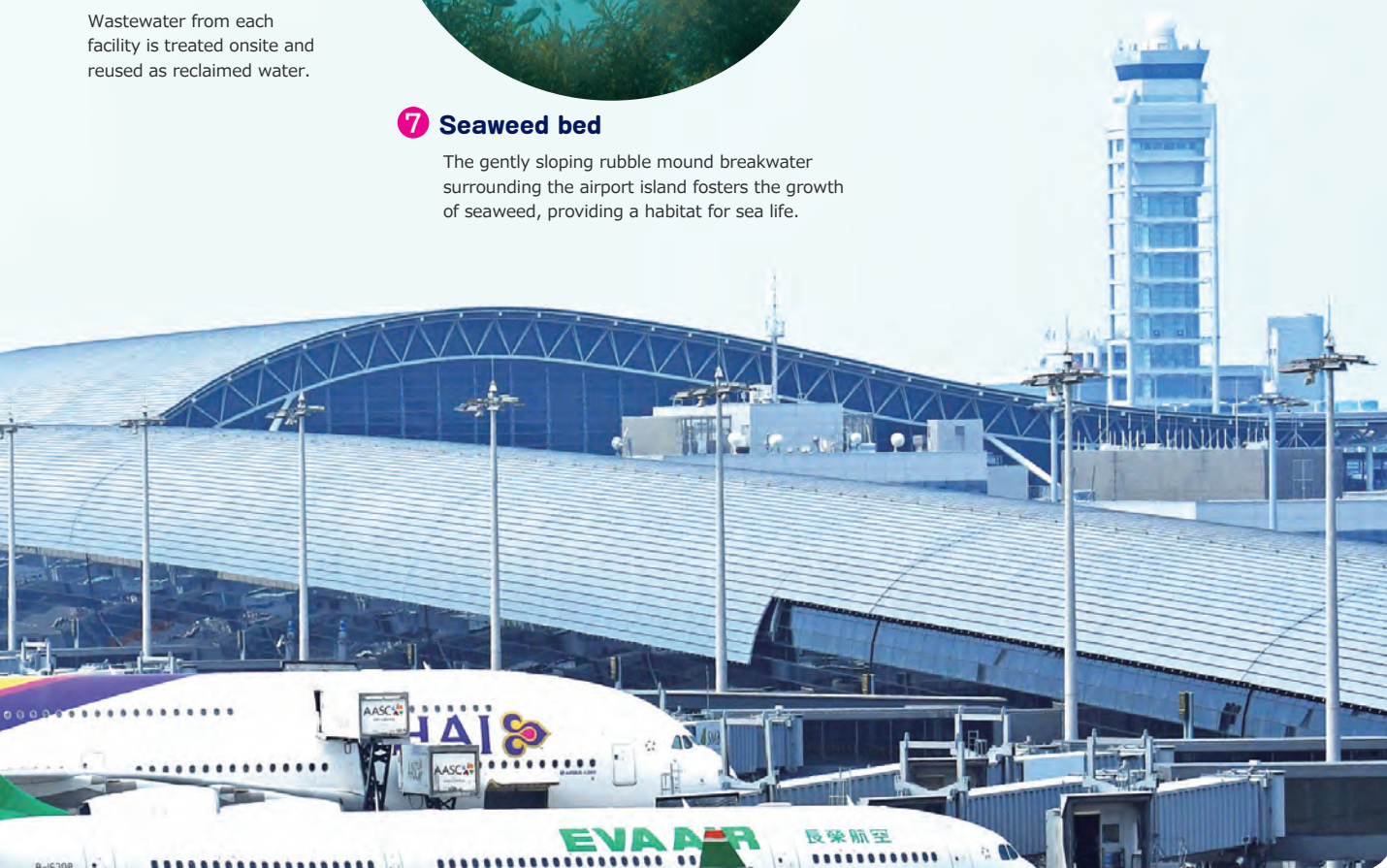
6 Water treatment center

Wastewater from each facility is treated onsite and reused as reclaimed water.



7 Seaweed bed

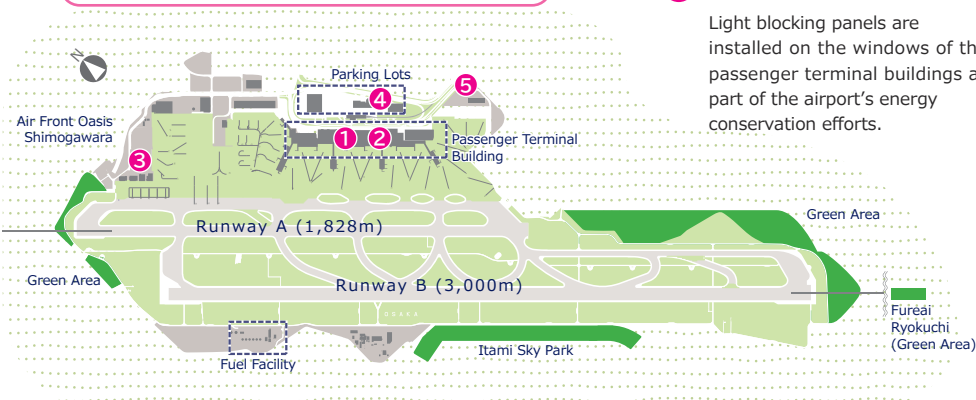
The gently sloping rubble mound breakwater surrounding the airport island fosters the growth of seaweed, providing a habitat for sea life.





Runways	2	Annual Aircraft Movements	approximately 138,000	Operating Hours	7 a.m. to 9 p.m.
Aircraft Parking Stands	52	Annual Passenger Traffic	approximately 16,300,000 (FY2018 operational results)	Size	approximately 311 ha

Environmental Facilities and Equipment



1 Light blocking panels

Light blocking panels are installed on the windows of the passenger terminal buildings as part of the airport's energy conservation efforts.



4 EV charging stations

EV charging stations are available to encourage the use of eco-friendly vehicles



3 Grass storehouse

Stores grass for feed. Cut grass reused as animal feed helps to reduce waste.



2 Rooftop greenery

Rooftop greenery is encouraged and used on top of the passenger terminal building.



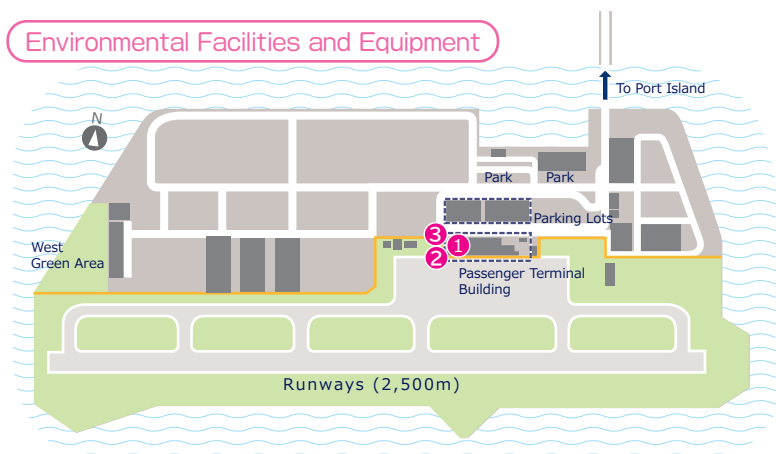
5 Hydrogen station

A station serves fuel cell vehicles.





Runways	1	Annual Aircraft Movements	approximately 29,600	Operating Hours	7 a.m. to 10 p.m.
Aircraft Parking Stands	10	Annual Passenger Traffic	approximately 3,190,000 (FY2018 operational results)	Size	approximately 156 ha



1 EV charging stations

EV charging stations are available to encourage the use of eco-friendly vehicles.



2 Rainwater filtration system

Rainwater is filtered and reused as recycled water.



3 Co-generation facility

The facility uses heat from the generation of electricity to heat and cool the passenger terminal building.



One Eco-Airport Plan

We established the One Eco-Airport Plan, an environmental plan covering the three airports of Kansai International Airport, Osaka International Airport, and Kobe Airport. This plan, which got underway in fiscal 2018, spans the five-year period up to fiscal 2022, using four policies to promote activities across all three major airports in the Kansai region aimed at reducing our environmental impacts.

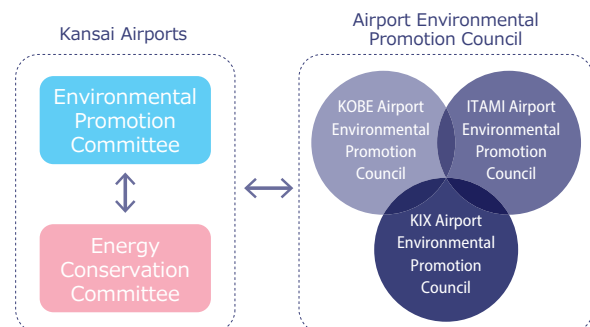
Committed to Operating Eco Friendly, Smart Airports



Environmental Promotion System

Working in conjunction with airport-related businesses

Kansai Airports established the Environmental Promotion Committee to promote plans, analyze and assess the status of target achievement and improve initiatives. The Energy Conservation Committee promotes specific actions aimed at conserving energy and reducing greenhouse gas emissions. Further, each of the three airports has its own Airport Environmental Promotion Council through which they promote cooperation, collaboration and initiatives with airport-related businesses.



- Leaflets and introductory movies of One Eco-Airport Plan are available from:
<http://www.kansai-airports.co.jp/efforts/environment/efforts/oneecoairport.html>



1

Response to Climate Change

We promote efficient energy usage to reduce environmental burdens and engage in measures aimed at reducing greenhouse gas emissions. We also encourage the use of solar, hydrogen and other types of sustainable energy and new energy that contributes to protecting the global environment.



Promote Energy Conservation

[Strategic Goal]

5% reduction in energy usage by fiscal 2022 (compared to fiscal 2016, per traffic unit)

[Strategic Actions]

- Promote energy-saving operations
- Introduce high-efficiency equipment along with thermal insulation and measures against sunlight in buildings
- Introduce energy management system

Main Initiatives



Thorough management of temperature and lighting



Improve building material thermal insulation and shade



Efficient equipment



Reduce GHG Emissions

[Strategic Goal]

5% reduction in CO₂ emissions by fiscal 2022 (compared to fiscal 2016, per traffic unit)

[Strategic Actions]

- Promote carbon-free operations
- Encourage GPU* utilization

Main Initiatives



Thorough waste recycling



Introduce eco-cars



Introduction of Clean Energy

*GPU is equipment that supplies parked aircraft with required electricity and air conditioning from the ground, enabling reductions in CO₂ and noise compared to when using the aircraft's auxiliary power unit (APU).

→ See p.11

Progress in fiscal 2018

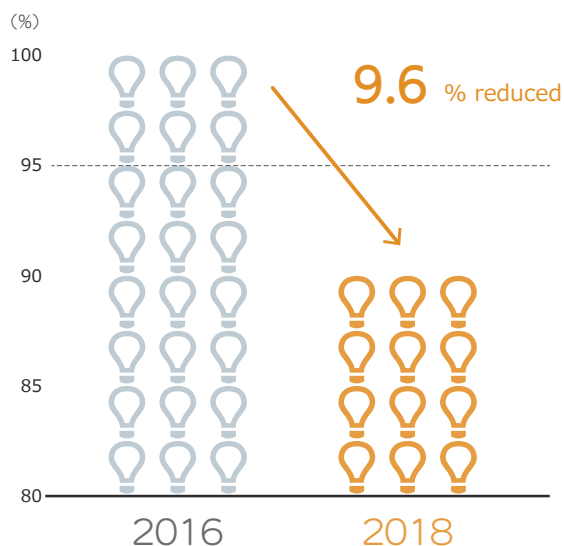
Amount of energy used

[Strategic Goal]



5% reduction in energy usage by fiscal 2022 (compared to fiscal 2016, per traffic unit)

[Progress]



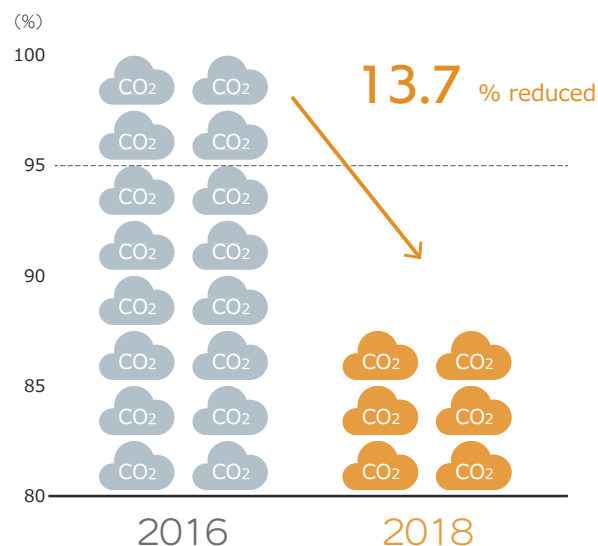
CO₂ emissions

[Strategic Goal]



5% reduction in energy usage by fiscal 2022 (compared to fiscal 2016, per traffic unit)

[Progress]



2 Resource Usage

We reduce, separate, recycle and reuse all the waste and plastics generated. We also contribute to resource conservation through the promotion of "Reduce, Reuse and Recycle (the 3Rs)" with respect to both waste and water, including efforts to make water use more efficient through data analysis, expand the adoption of recycled water and examine rainwater usage



Reduction of Clean Water Consumption

[Strategic Goal]

10% reduction in clean water usage (compared to fiscal 2016, per PAX)

[Strategic Actions]

- Utilize rainwater/reclaimed water
- Promote water-saving operations

Main Initiatives



Thorough use of reclaimed (recycled) water



Examine rainwater usage



Install water-saving equipment



Waste Recycling

[Strategic Goal]

By fiscal 2022:
• Waste recycling rate: 35%
• Amount of one-way plastics waste: 25% reduced

[Strategic Actions]

- Promote thorough sorted collection and recycling of waste
- Promote green procurement
- Minimize and recycle construction waste

Main Initiatives



Reduce amount of plastics used



Compost kitchen waste



Use mowed grass for fertilizer and feed

→ See p.17

Progress in fiscal 2018

Amount of clean water used

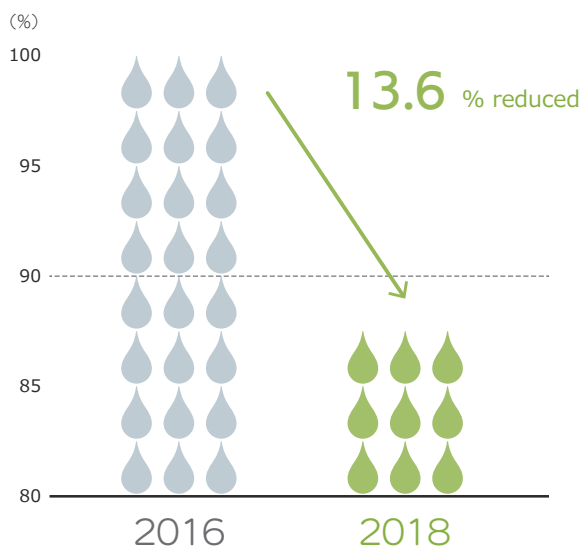
[Strategic Goal]



10% reduction

In clean water usage by fiscal 2022 (compared to fiscal 2016, per PAX)

[Progress]



Waste recycle rate

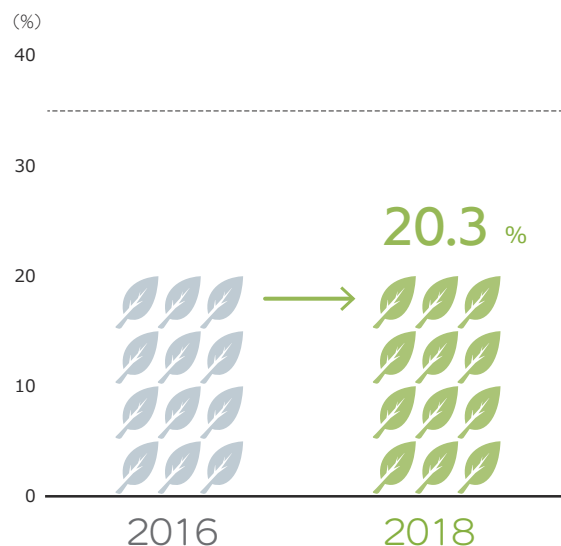
[Strategic Goal]



35%

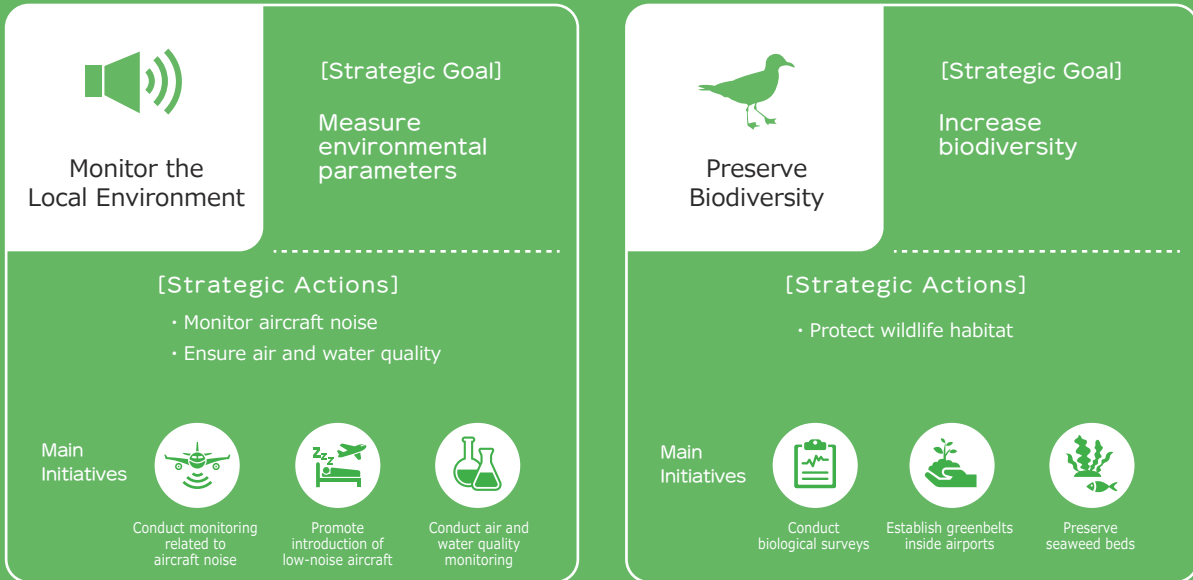
Waste recycling rate by fiscal 2022

[Progress]



3 Environmental Harmony

We continue to work on reducing aircraft noise, conduct environmental monitoring appropriately and disclose monitoring results. We will also promote the creation of positive spaces where airport users can relax and feel comfortable while striving to preserve biodiversity through the maintenance and expansion of greenbelts and conducting environmental surveys to verify species.



→ See p.21

4 Environmental management

Using environmental evaluation programs, we have created a mechanism to enable the understanding and assessment of environmental burdens that lead to their reduction. We also make an effort to engage in dialogues with customers, airport staff and local communities through the dissemination of environmental information and the provision of environmental education, as well as alliances with airport-related businesses and airports throughout Japan and overseas.



→ See p.29



Response to Climate Change



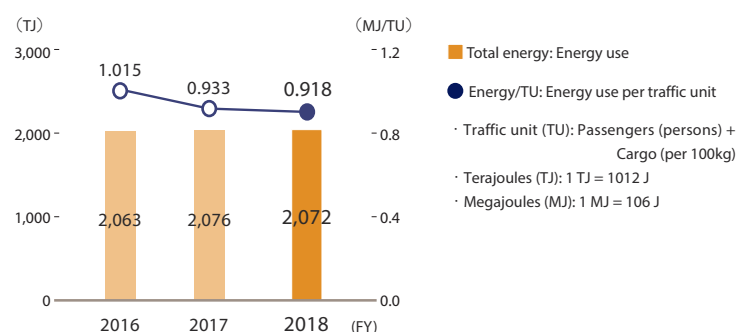
Promote Energy Conservation



Kansai Airports Group has established a carbon management plan to rein in CO₂ emissions. This plan outlines our future actions for reducing our carbon footprint including energy conservation promotion system, reduction targets and medium-to long-term plans.

Our energy conservation measures involve increasing the efficiency of equipment and plants along with upgrading building insulation and other facility-focused solutions. Also, we are promoting the optimization of operations and initiatives based on visualization and analysis of the energy we use.

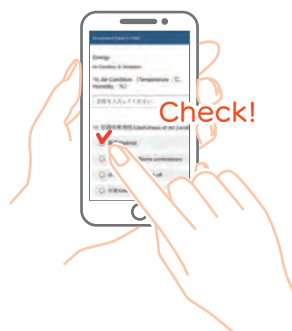
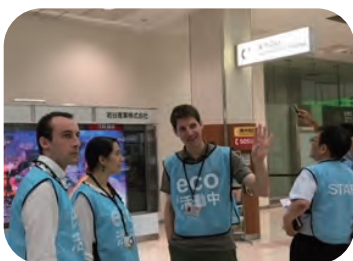
Energy use of the Kansai Airports Group



Promoting Energy-Saving Operations

Members of the Energy Conservation Committee members and the Environment Ambassadors patrol all three airports regularly to ensure the facility set-up and operation save as much energy as possible.

Those on patrol target a comfortable configuration by optimizing the lighting and temperature to particular areas and situations and collecting and sharing information on defects by smartphone. The result obtained is then applied on an ongoing basis to improve the patrol.



Energy-Efficient Air-Conditioning System

We strive to ensure optimized control of air-conditioning systems and to make them as energy-efficient as possible. KIX Terminal 1 building and other major facilities are heated and cooled by Kansai International Airport Heating & Cooling Supply Co., Ltd., a Kansai Airport group company. We also work hard to ensure only energy-efficient heat source equipment is used for heating. Annual savings of 1,000 tons of CO₂ are expected after upgrading to an energy-efficient inverter-controlled turbo chiller from 2018 over 2019.

We have also introduced the Building Energy Management System (BEMS) and processed data analysis to optimize the air-conditioning control. We have leveraged data of KIX Terminal 1 building which we analyzed in fiscal 2018 to optimize the setting of outdoor air coolers and the number of cold water pumps operating.



Inverter-controlled turbo chiller (KIX)



* Pages 11 to 30 highlight initiatives carried out by each airport mainly in fiscal 2018.

KIX : Kansai International Airport

ITAMI : Osaka International Airport

KOBE : Kobe Airport

Energy-Efficient Lighting System

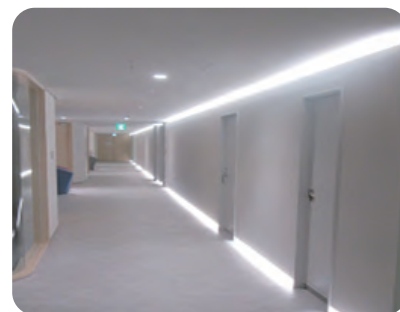
Our plans include switching to LED lighting (underway) and sensor-controlled optimized illuminance.

ITAMI is installing LED lighting for its apron and outside lighting. KIX is doing the same with its office illumination as well as introducing a sensor-controlled illuminance system. KOBE, meanwhile, is introducing a daylight sensor in windbreak rooms and cargo-handling areas.

Collectively, these measures have helped save around 310 tons of CO₂ annually.



Apron LED lighting(ITAMI)



Sensory illuminance control (KIX)

Anti-sunlight Measures

As well as upgrading our facility, we also prioritize window insulation, sunlight blocking and other building upgrades as part of our energy conservation measures. With the building renovation,

ITAMI is introducing double low-e glass and applying heat-shielding paint to the windows. At KOBE, we have also installed automatic curtains and applied heat-shielding paint in the waiting room.

ITAMI



Light-blocking panels



Heat-shielding paint

KOBE



Automatic curtains

1 Response to Climate Change



Reducing GHG Emissions



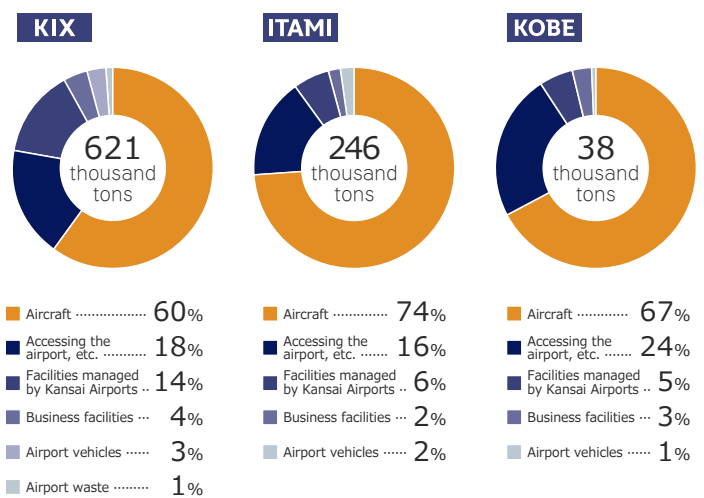
Reducing CO₂ from Our Airports

In fiscal 2018, CO₂ emissions from operations totaled 621 thousand tons at KIX, 246 thousand tons at ITAMI and 38 thousand tons at KOBE, marking as a whole an decrease of 4.1% and 13.7% per traffic unit compared to those in fiscal 2016.

Total CO₂ emissions from aircraft per traffic unit dropped due to an increase in the number of aircraft landings and takeoffs along with an increase in the percentage of small aircraft. Meanwhile, CO₂ emissions per traffic unit decreased for airport facilities managed by Kansai Airports, and for airport facilities managed by other businesses. This was due in part to efforts to reduce emissions, including energy conservation. The largest share of CO₂ emissions was from aircraft, followed by accessing the airports, passenger terminals, and other airport facilities.

Going forward, we will make efforts to lower energy use and improve overall energy efficiency at our airports.

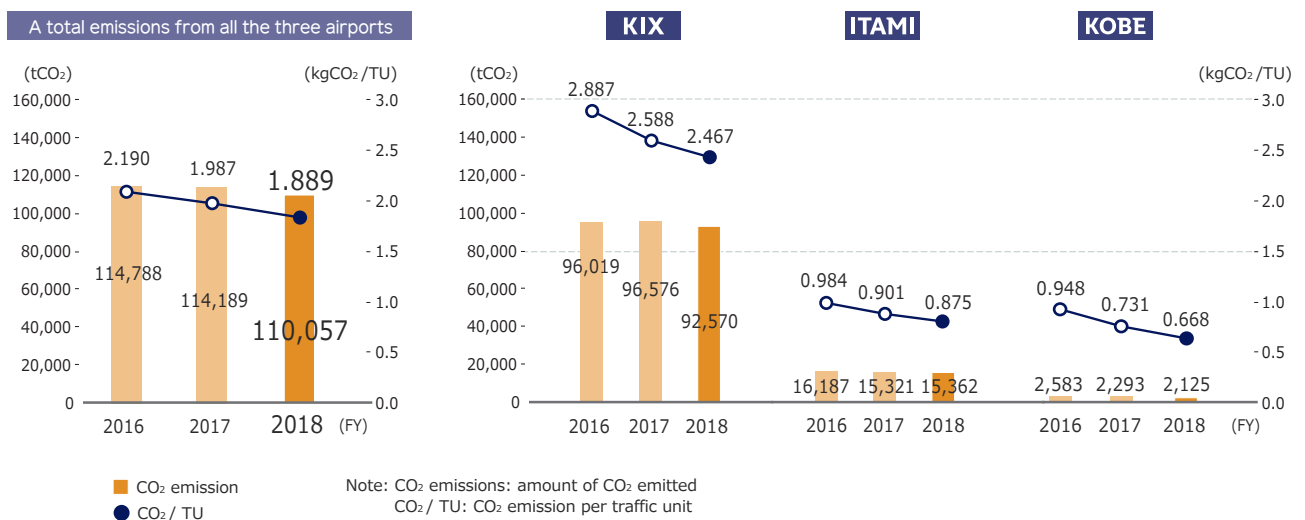
CO₂ Emissions from all the three airports



Note: Calculation Conditions

- Airport vehicles refer to passenger vehicles and GSE vehicles.
- Waste materials are based on carbon neutrality.
- Emissions from accessing the airport, etc. and aircraft are based on estimates.
- Emissions from aircraft are based on the LTO (Landings and Takeoffs: aircraft activity at altitude of 3,000ft and under) cycle stipulated by ICAO.

CO₂ Emissions of Kansai Airports Group



KIX : Kansai International Airport **ITAMI** : Osaka International Airport **KOBE** : Kobe Airport

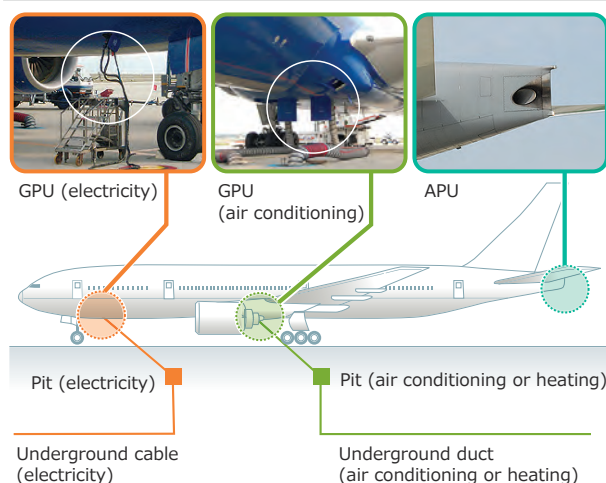
Promoting the Use of GPU

CO₂ emissions can be controlled by increasing the use of GPU (Ground Power Units) instead of an aircraft's APU (Auxiliary Power Units) to supply electricity to parked aircraft. Kansai Airports has requested that all airlines using its airports use GPU.

In terms of GPU use, partial changes were made to the AIP (Aeronautical Information Publication) effective January 2010. This included shortening the time allowed for APU use at KIX from 30 minutes to 15 minutes prior to scheduled departure, making KIX the first airport in Japan to do so.

At ITAMI and KOBE, the AIP defines the time allowed for APU use as 30 minutes prior to scheduled departure, effective from March 2018 and January 2019, respectively.

Outline of GPU

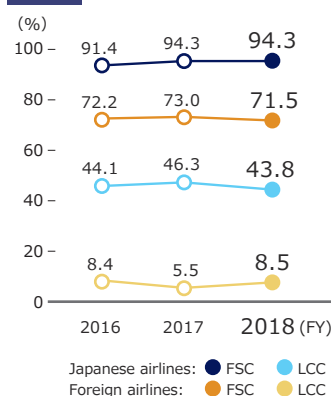


GPU utilization rate

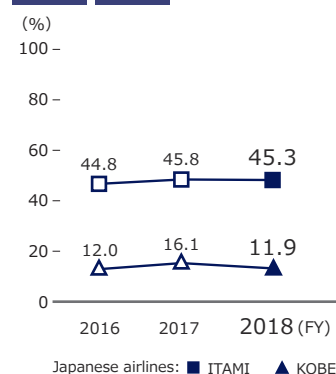
These are 34 airlines below (in alphabetical order), which have over 95% of GPU utilization rate in 2018.

- Air Canada Rouge
- Air China
- Air China Cargo
- Air China Cargo
- Air France
- Air Hong Kong
- Aircalin
- All Nippon Airways
- Amakusa Airlines
- China Airlines
- China Eastern Airlines
- China Southern Airlines
- Delta Air Lines
- Emirates
- FedEx Express
- Finnair
- Garuda Indonesia
- Hawaiian Airlines
- Japan Airlines
- Japan Transocean Air
- Lufthansa Cargo AG
- Lufthansa German Airlines
- Malaysia Airlines
- Nippon Cargo Airlines
- NokScoot
- Philippine Airlines
- SF Airlines
- Sichuan Airlines
- Thai Airways International
- United Airlines
- United Parcel Service
- Vanilla Air
- Vietnam Airlines
- Xiamen Airlines

KIX



ITAMI KOBE



Note: Indicates the ratio of flights supplied to the number of flights with an opportunity to be supplied. Rate of use includes mobile GPUs.

Working to Eliminate Vehicle Idling

Calling for Understanding and Cooperation in Stopping Vehicle Idling

The Airport Environmental Promotion Councils of KIX, ITAMI and KOBE are implementing a stop idling campaign at the airports during the month of June, which is designated as Environmental Month by Japan's Ministry of the Environment. As part of the campaign, the airports raise awareness among airport users and businesses about the importance of environmental conservation and make efforts to encourage their active participation in environmental conservation activities. This year the airports handed out an educational leaflet and paper fan to drivers of trucks, limousine buses, taxis, and passenger vehicles that use the airports to call for their understanding and cooperation in stopping vehicle idling. With 150 airport stakeholders, the airports helped to raise awareness and promote active participation in environmental conservations.

Every year, after this campaign ends the airports hold a zero-garbage campaign to pick up trash around pick-up and drop-off zones and parking lots. Another zero-garbage campaign is held on May 30 with the cooperation of businesses at the airports to pick up trash around their offices.



1 Response to Climate Change

Promoting the Use of Eco-Friendly Vehicles

At our airports, we are helping reduce CO₂ emissions by including eco-friendly vehicles in the large-scale fleet for servicing operations, including Ground Support Equipment (GSE) vehicles and passenger vehicles. Within the Kansai Airports Group, we are promoting the introduction of eco-friendly vehicles in our fleet and sharing EV, FCV and other vehicles.

As of March 2019, within the Kansai Airports Group fleet, 48% of passenger vehicles and 22% of GSE vehicles were classed as eco-friendly.* Alongside these measures, we will also keep calling on airport-based businesses to follow suit.

* EV, FCV, CNG, HV, PHV, CDV, and low emissions vehicles (see note)

Note: Low emissions vehicle refers to vehicles that satisfy the following emissions and fuel economy standards.

1) Gasoline vehicles

Emissions: 75% less than 2005 standards

Fuel economy: At least 2015 standards or 25% above 2010 standards

2) Diesel vehicles

Emissions: Post new long-term regulation

Fuel economy: At least 2015 standards

Installation of EV Charging Stations

Each of our airports has a full complement of electric vehicle charging stations to encourage the use of eco-friendly vehicles.



EV Charging Station

Expanding the Use of Clean Energy

We are encouraging the use of renewable energy and new forms of energy to lower our GHG emissions.

KIX

Solar Power

In February 2014, KIX Mega Solar commenced operations using solar panels installed at a site on the south side of the 2nd phase airport island and the rooftop of the airport's cargo terminal. In September 2015, the airport began operating a solar power system installed on the rooftop of the International Cargo Area at the 1st phase airport island.

In March 2016, another solar power system commenced operations on the roof of the Nankai Bus Terminal in the Domestic Cargo Area. This demonstrates that the airport is working hard to promote the spread of solar power onsite.

This clean energy generated at the airport has helped it reduce total electricity use by around 10%.



Solar panels on the roof of Nankai Bus Terminal



KIX Mega Solar

Small Wind Turbines

The airport began operating a 5kw small wind turbine as part of a trial in September 2014 becoming the first airport in Japan to do so. Currently, the airport has three of these turbines.

The electricity generated by these small wind turbines is used to power the street lights inside KIX Sky Park.



Small wind turbines

KIX : Kansai International Airport **ITAMI** : Osaka International Airport **KOBE** : Kobe Airport

KIX ITAMI

Hydrogen Energy

The airport marked the full-scale launch of the Hydrogen Grid Project in May 2014, through which the airport is promoting the use of hydrogen energy. Since it emits only water when burned, it is considered the gold standard in clean energy terms and attracting considerable attention as an anti-global warming measure.

The Kansai Airports Group promotes efforts to introduce the Zero-Emission Vehicle (ZEV) and introduces fuel-cell vehicles (FCV) into its fleet. In fiscal 2018, we introduced FCV at ITAMI and a total of three FCVs are operating in our three airports.

Meanwhile, CTKS Co., Ltd., a Kansai Airports Group Company, introduced an additional four fuel cell forklifts (FCFL) at the KIX cargo area in fiscal 2018, for a total of seven FCFLs now in operation. We aim to become a people- and environment-friendly airport and will strive to introduce as many FCFLs as possible.

Fuel Cell Vehicles

In January 2016, a large hydrogen station opened on the 2nd phase airport island. This was the first and commercial hydrogen stations to open at an airport in Japan. The station is able to service fuel cell vehicles (FCV) and in the future it will be able to accommodate fuel cell buses expected to be operated on limousine bus routes from ITAMI and as shuttle buses operating within KIX.

- May 2007: Opens hydrogen station and introduces vehicles with a hydrogen engine into its fleet
- October 2012 to March 2014: Conducts real life testing using a hydrogen fuel cell bus as a shuttle bus from the Aeroplaza to Terminal 2
- April 2015: Introduces the Toyota Mirai, the world's first mass produced hydrogen fuel cell vehicle, into its vehicle fleet
- January 2016: Iwatani Hydrogen Station KIX begins operations
- December 2016: Introduces the Honda Clarity Fuel Cell
- March 2019: Introduces the first FCV in ITAMI
- April 2019: Iwatani Hydrogen Station ITAMI begins operations

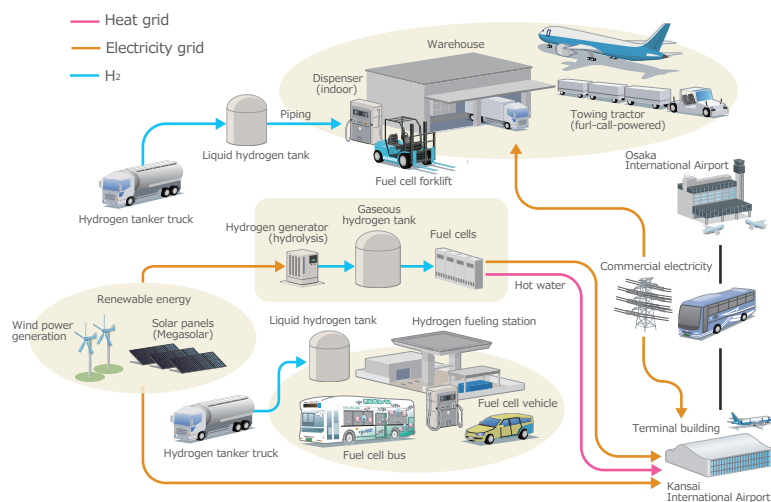
Fuel Cell Forklifts

In April 2017, the airport completed work on Japan's first hydrogen infrastructure for industrial vehicles at the International Cargo Area that includes liquid hydrogen tanks and high pressure hydrogen supply lines. The largest trial operation in Japan using hydrogen February infrastructure and fuel cell forklifts is now taking place.

Introducing fuel cell forklifts to handle air cargo 24 hours a day can help to lower CO₂ emissions compared to forklifts powered by fossil fuel or electricity. In addition, fuel cell forklifts can be refueled in around three minutes, meaning they can be operated continuously without the hassle of charging or replacing battery packs. As a result, they can offer significant improvements in both work efficiency and work environment.

- February 2015: Begins trial operation of fuel cell forklifts at the International Cargo Area as part of the Fuel Cell Forklift Practical Application and Development / Testing of Optimal Hydrogen Infrastructure Improvements Project, selected by the Ministry of the Environment, becoming the first airport in Asia to do so
- November 2016: Introduces first mass produced fuel cell forklift
- April 2017: Commences operations of hydrogen station for industrial vehicles
- February 2018: CKTS introduces additional two FCFLs; three FCFLs in total
- February 2019: With additional four FCFLs introduced by CKTS, seven FCFLs in total

KIX Hydrogen Grid(Concept)



Hydrogen station
(2nd phase airport island)



Iwatani Hydrogen Station ITAMI
Opening Ceremony



Hydrogen station for
industrial vehicles
(KIX international cargo area)



Fuel cell forklift



Resource Usage



Reduction of Clean Water Consumption



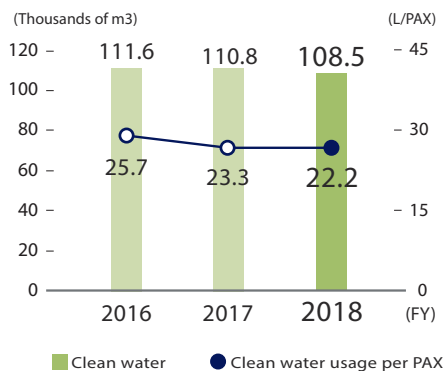
We have initiated various efforts to reduce clean water consumption at KIX, ITAMI and KOBE airports. In fiscal 2018, the total consumption figures for these three airports were 758,000, 295,000 and 33,000 m³ respectively, marking a total reduction in consumption per passenger of 13.6% compared to the fiscal 2016 result.

Clean water usage

A total emissions from all the three airports

Clean water

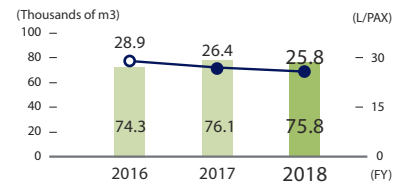
1,085,000 m³



KIX

Clean water

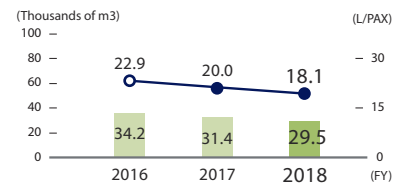
758,000 m³



ITAMI

Clean water

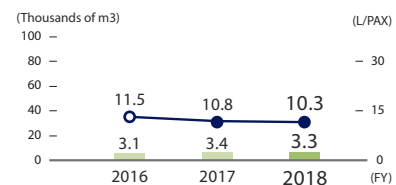
295,000 m³



KOBE

Clean water

33,000 m³



Utilize rainwater/reclaimed water

KIX

KIX effectively utilizes water resources by reclaiming and reusing water treated at the Sewage Treatment Center on the airport island within public restrooms.

* Reclaimed water is also referred to as recycled water.



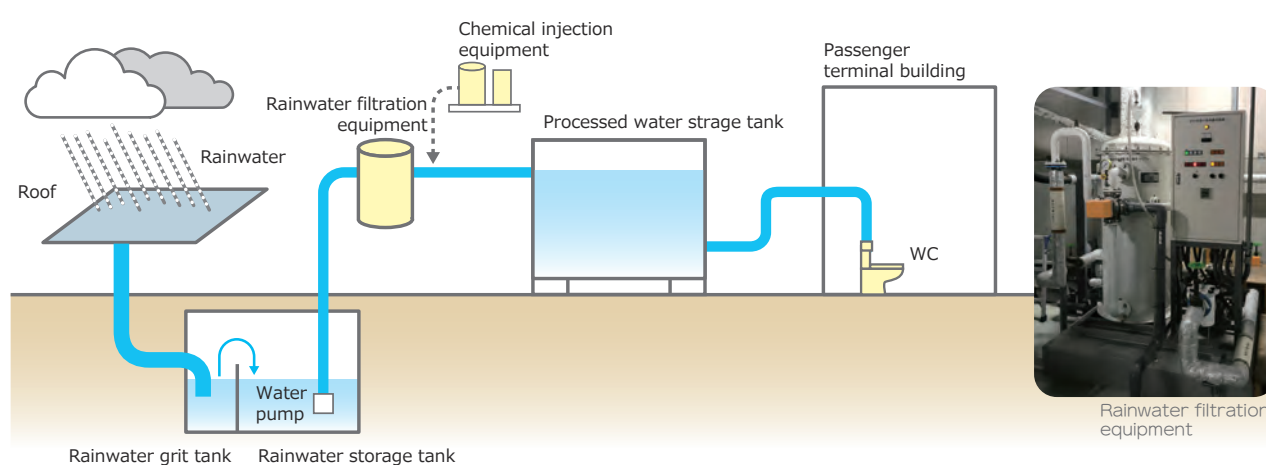
[Processed at the Sewage Treatment Center]

KIX : Kansai International Airport **ITAMI** : Osaka International Airport **KOBE** : Kobe Airport

KOBE

KOBE utilizes resources effectively by using filtered rainwater and water that has been processed at a sewage treatment plant in restrooms and to water plants.

Rainwater utilization



Water Conservation Initiatives

Kansai Airports is carrying out a number of initiatives to conserve water, including installing low-flow toilets when remodeling terminal buildings. Businesses operating at the airport are also reducing their water consumption by installing water-saving equipment and via other initiatives.

Initiatives by Businesses Operating at Airport

The Nankai Bus Co., Ltd. has installed water-saving bus washing equipment at its facilities on the airport island. Also, the company has installed wastewater filtering and recirculation system to re-use wastewater, which is reducing the consumption of clean water.



Hotel Nikko Kansai Airport has initiated various water-saving efforts such as introducing water-saving shower head and automatic water faucet. In fiscal 2018, water-conserving devices were introduced installed at 20 places in the kitchen and washing place of their restaurants. Work efficiency in the kitchen was verified and the installation result was checked by measuring water flow prior to the installation so that the clean water consumption has been reduced.



2 Resource Usage



Waste Recycling

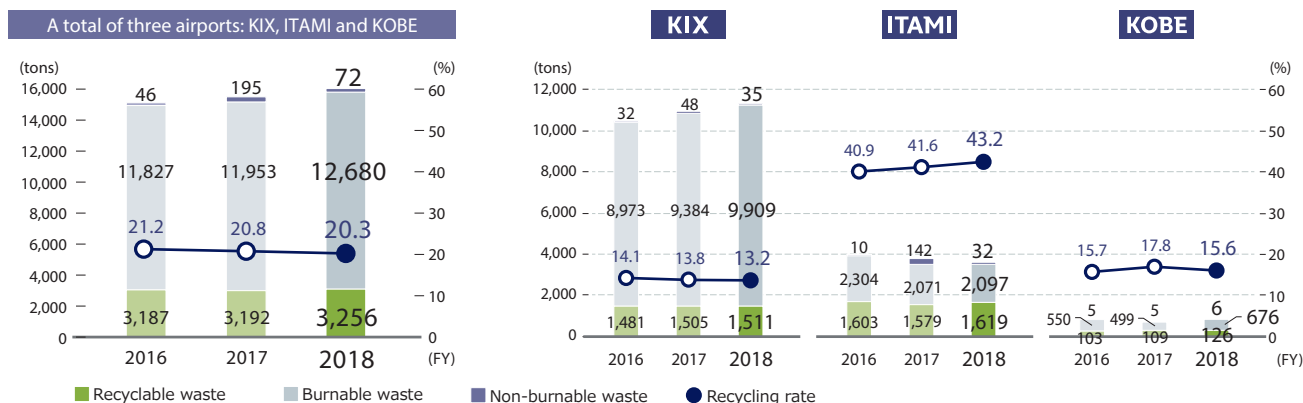


Toward Plastic Free Airports

Kansai Airports is reducing, separating, reusing and recycling all waste group-wide. With recent marine pollution in mind, we are emphasizing efforts to reduce, sort and recycle plastic waste and shift toward using eco-friendly materials and become a “plastic-free” airport.

Kansai Airports Group is also working to recycle office (multipurpose) paper as more of more thorough sorting and recycling. Through the Airport Environmental Promotion Council set up at each of our airports, we plan to share this initiative with businesses operating at our airports and expand the scope to cover the entire airport.

Waste Emissions and Recycling Rate



Reducing Waste and Recycling

KIX

Approximately 11,455 tons of general waste generated at KIX each year come mainly from sources such as aircraft, airline catering plants, and passenger terminal buildings. In order to recycle and reduce this volume of general waste, KIX has established rules for waste separation in its “Regulations Governing the Use of Waste.

Processing Facilities” and reaches out to businesses operating at the airport, urging them to sort their waste.

As a result, the amount of waste per passenger has declined, despite a somewhat higher amount of waste generated at the airport in fiscal 2018. The airport’s recycling rate was 13.2% for general waste. As for industrial waste, we have been encouraging businesses operating at the airport to manage waste properly, avoid creating waste, and recycle, in accordance with relevant laws and ordinances.



Waste Reduction Initiatives by Businesses Operating on Airport Island

About 16% of all waste generated at KIX comes from aircraft. Recognizing the need to reduce such waste by sorting and compacting it, airlines - including JAL and ANA - sort garbage coming from the aircraft passenger cabins.

The Airport Environmental Promotion Council, comprising representatives of airport businesses, is working to raise awareness of waste reduction. Going forward, the councils plan to recommend initiatives to the Airline Operators Committee for airlines to mitigate their environmental impacts.

Moreover, we organized the Friendship Dragon Boat Festival, an annual race event in the water area between the two airport islands of KIX and using paper straws and cups and wooden spoons on this occasion rather than plastic with the environment in mind. In this vein, we will keep disseminating our eco-friendly efforts through events and other activities.



KIX : Kansai International Airport **ITAMI** : Osaka International Airport **KOBE** : Kobe Airport

ITAMI

About 3,748 tons of general waste are generated at ITAMI in fiscal 2018, most of which from the terminal building.

To promote recycling, ITAMI is minimizing waste by using its grass clippings as animal feed, reusing office supplies, carefully sorting and separating waste and collecting recyclables as part of ongoing recycling-boosting efforts. These measures have seen the waste generated per passenger decline and have helped ensure the recycling rate of general waste stood at 43.2%.

Toyonaka City has accredited retail stores and restaurants promoting eco-friendly activities as Toyonaka Eco Shops, which includes restaurants and shops in our airports. As well as promoting their eco-friendly activities, we cooperate with Toyonaka City in encouraging customers to proactively use their service and strive to boost the number of certified stores.

Through its Airport Environmental Promotion Council, ITAMI is sharing best practices and working to raise awareness of waste.



Waste is collected in separate bins for recycling, and different materials are handled separately



Preparation before resource recovery
(examples of deconstructing, breakdown and sorting)

Initiatives as an Eco-Friendly, Resource-Recycling Airport

ITAMI produces about 1,000 tons of grass clippings annually from mowing the green spaces (landing strips) along the runways. These clippings are then fermented into animal feed (silage), provided at no cost to livestock farms and the Foundation for the Protection of Deer in Nara Park, as part of the airport's efforts to thrive with local communities. These clippings from the green spaces along the airport's runways provide a healthy, pesticide-free feed to cows and other livestock.

In May 2017, the airport built a warehouse to store grass clippings, which is used to protect the rolled clippings from humidity and enable long-term storage. Through this effort, around 50% of the grass clippings that were once incinerated are now successfully recycled.



Silage



Grass mowing



Warehouse for storing grass clippings



Cow eating feed made from the airport's grass clippings



Dried rolls

ITAMI won Silver at ACI* Asia-Pacific Green Airports Recognition 2018 for reducing waste and lowering waste reduction costs by transforming grass clippings normally incinerated into feed that is provided to nearby livestock farms. The theme for Green Airports Recognition is determined every year, based on which airports in Asia-Pacific submit their initiatives. The theme for 2018 was minimizing waste. ITAMI became the first airport in Japan to receive this award from Green Airports Recognition for recycling grass clippings as animal feed. This also served as an excellent opportunity to widely spread initiatives taking place at Kansai Airports to other airports in Asia.

* ACI: Airports Council International



ACI Asia-Pacific Green Airports Recognition 2018 Award Ceremony

KOBE

In fiscal 2018, 806 tons of general waste were generated at KOBE airport, which is striving to promote recycling. It is working to minimize waste by carefully sorting and separating the waste generated, collecting recyclables and working to increase its recycling rate, which ultimately stood at 15.6%.

Through its Airport Environmental Promotion Council, ITAMI is sharing best practices and working to raise awareness of waste.



Environmental Harmony



Monitor the Local Environment



KIX

Measuring and monitoring aircraft noise

Environmental assessments based on flight paths and flight procedures established to minimize aircraft noise found that only areas over water were affected by noise levels exceeding environmental quality standards.

KIX conducts both continuous and periodic monitoring of aircraft noise, and publishes the findings. For fiscal 2017, as in the prior year, noise levels complied with environmental standards (maximum Lden 57 dB) at all land-based continuous monitoring stations and periodic monitoring sites.



KIX was built on an artificial island in Senshu Bay 5km from the coast to enable 24-hour-a-day operations as an airport that is pollution free and co-exists with surrounding communities. Since the new overland flight path was established in December 1998, the airport measures aircraft flight path and altitude as part of its noise monitoring efforts.

Currently, KIX examines flight path and altitude data for eight observational cross-sections and publishes the results.

Reducing aircraft noise

To reduce aircraft noise, we encourage airlines to switch to quieter aircraft and closely monitor established flight paths and altitude. We ask the KIX Airline Operators Committee to take steps to ensure compliance with flight paths and to find ways to reduce aircraft noise.

- Aircraft are expected to fly over land only after gaining sufficient altitude over Osaka Bay after takeoff from the runway.
- Aircraft arriving or departing late at night or in early morning are restricted to flight paths in airspace over Akashi Strait and Kitan Strait.
- Quieter flight procedures*¹ and continuous descent flight procedures*² have been adopted to minimize noise from aircraft approaching the airport from Kitan Strait.

*¹ Quieter flight procedures

Noise-reducing flight procedures for aircraft, including delayed use of flaps and delayed deployment of landing gear on approach to the runway.

*² Continuous descent operations (CDO)

A method of aircraft flight during descent, maintaining the minimum engine thrust for optimal descent (not horizontal flight) until the aircraft reaches the starting point for instrument landing. KIX uses CDO during certain hours. Benefits of the method include reduced fuel consumption and reduced CO₂ emissions.

Complaints, inquiries, and responses

The annual number of complaints and inquiries peaked at 263 in fiscal 1998 when new flight paths were introduced in airspace over the Osaka Prefecture region, and since then have been on a declining trend. In fiscal 2018, the airport received a total of 14 complaints and inquiries.

The majority of complaints and inquiries were about individual aircraft being too loud or flying too low, or queries about whether aircraft were staying on their regular flight paths. In response, we study these issues in cooperation with the Civil Aviation Bureau (under the Japanese Ministry of Land, Infrastructure, Transport and Tourism) and publish our findings.



KIX : Kansai International Airport ITAMI : Osaka International Airport KOBE : Kobe Airport

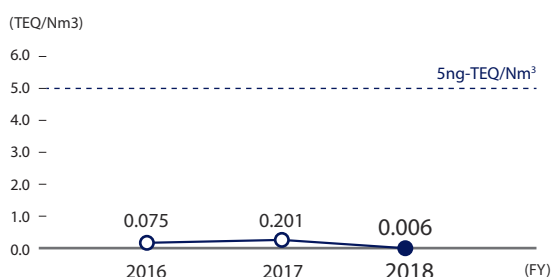
KIX

Measures to reduce emissions from Incineration Plant (Clean Center)

We separate general waste from the airport island into combustibles and recyclables, with combustible waste incinerated at the airport's Incineration Plant (Clean Center).

Emissions from incineration go through a filter-type precipitator. As a result, air pollutant levels such as nitrogen oxides are fully below regulated emission standards. Dioxin emissions are also well below regulated standards. Waste heat from incineration is being used as a source of heat for the incinerator, and for hot water and air conditioning at the Incineration Plant (Clean Center).

Emission gas measurements (dioxins)



Incineration Plant (Clean Center)

This plant features a fluidized bed furnace. It also uses a filter-type precipitator that utilizes catalysts to remove nitrogen oxides, as well as humidity-regulated fly ash stabilizing equipment. The plant was designed with careful consideration of the local environment. Emissions at about 850 °C from the incinerator's furnace are directed into a cooling chamber, through heat exchangers designed with heaters to prevent white smoke, and then to a reactor. Dust and hazardous gases are then removed by a filter-type precipitator, and exhaust gases are released into the atmosphere via an induced-draft fan and an exhaust stack. We operate with strict voluntary standards at the stack outlets for dust, sulfur oxides, hydrogen chlorides, and nitrogen oxides, with maximums of 0.02 g/Nm³, 20 ppm, 30 ppm and 70 ppm, respectively.



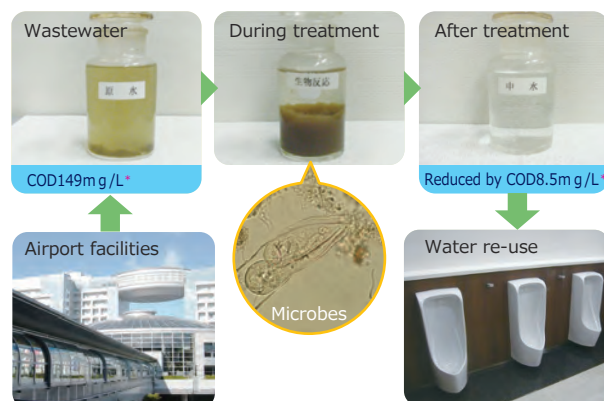
Incineration Plant (Clean Center)



Advanced treatment of general wastewater

Advanced treatment of general wastewater

Gray water generated from each facility undergoes sophisticated treatment at the airport's Sewage Treatment Center. Water quality is carefully managed during each treatment process and water is discharged only after fully meeting regulated emission standards. We also strive to maximize the effective use of water resources and to consider the local environment, such as by using some of the advanced-treatment water for flush toilets and the watering of plants.



Wastewater treatment plant (Sewage Treatment Center)

Wastewater from the passenger terminal buildings and other airport facilities is considered to be general wastewater, and undergoes advanced treatment such as activated-sludge circulation nitrification/denitrification, chemical clarification, and rapid sand filtration. Special wastewater from industrial sources first undergoes onsite pre-processing to remove hazardous substances, and then undergoes advanced treatment at the Sewage Treatment Center, through chemical coagulation/sedimentation and rapid sand filtration processes, etc. After advanced treatment, the treated water some of the treated water is reused as reclaimed water for airport flush toilets.

Processing capacity in fiscal 2018 (daily average)

General wastewater
2,061 m³

Special wastewater
187 m³



Sewage Treatment Center



Sand filtration

3 Environmental Harmony

ITAMI

Measuring and monitoring of aircraft noise

To monitor aircraft noise, ITAMI conducts continuous monitoring of noise levels at 10 locations in the airport region, and releases the results publicly.

The noise level exceeds the legal limit (Lden 57) in certain communities around the airport. To reduce the impacts of aircraft noise on these communities, the airport is working on measures at noise sources, improving airport layout, and measures in the vicinity of the airport.



Reducing aircraft noise

Measures at noise sources

• Restricting flight movements and hours of operation

Considering the impacts of noise on local communities, the airport has established a limit on aircraft movements for regularly scheduled flights of 370 movements per day (200 for jets and 170 for quieter aircraft).

In addition, airport operations are restricted to the 14 hours between 7:00 am and 9:00 pm.

• Encouraging the use of quieter aircraft

ITAMI promotes the introduction of low-noise aircraft through a unique landing fee system, with discounts for low-noise aircraft and surcharges for high-noise aircraft, based on actual noise levels measured around the airport.

• Noise abatement flight procedures

The airport employs the following noise abatement flight procedures in order to reduce the impacts of aircraft noise.

Rapid ascent (take-offs/departures)

To reduce aircraft noise on communities next to the airport, the airport has established flight procedures that require departing aircraft to rapidly ascend to 3,000 feet (about 1,000 meters).

Preferential flight paths

To minimize the range of aircraft noise impacts, aircraft taking off to the north are required to fly inside the area of (1) Chugoku Expressway Connector to the north, (2) Zuga Pond and Koya Pond to the south, and (3) Muko River to the west (see figure below).

Delayed-flap approach and landings with low flap angle (landings)

The airport has established flight procedures that reduce engine noise and wind noise due to air resistance by controlling the necessary engine thrust and air resistance by having aircraft on approach delay the lowering of flaps and use the lowest flap angle possible when landing, in order to reduce aircraft noise on communities under the flight path.



ITAMI

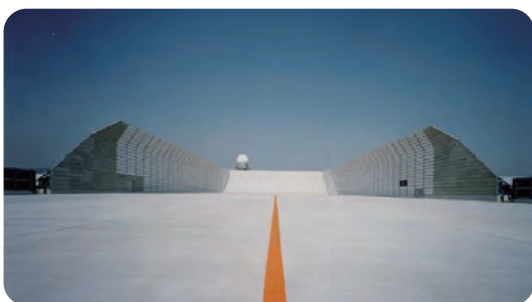
• Reducing aircraft noise from within the airport

Curtailling the use of reverse thrust at night

Jet aircraft landing on runway B between 7:00 pm and 9:00 pm are required to avoid the use of reverse thrust until idle within the safe operation parameters of the aircraft, in order to reduce aircraft noise at night for communities near the runway.

Noise reduction measures during aircraft engine testing

The airport has erected a large noise barrier at the engine testing site in order to reduce noise during aircraft engine testing.



Promoting use of GPUs and limiting use of APUs

In order to reduce noise impacts from auxiliary power units (APUs) while aircraft are parked, we are promoting the use of ground power units (GPUs).

Improving airport design

Noise barriers, noise protection embankments, and noise protection forests have been set up around the airport to reduce the impacts of noise from aircraft takeoffs and landings and use of the taxiways.



Noise barrier



Noise protection embankments

Measures in the vicinity of the airport

ITAMI carries out the following measures in the vicinity of the airport based on the extent of noise impacts on local communities.

General: Lden 57 or higher

- Financial assistance for soundproofing of schools, hospitals, common-use facilities, etc.
- Financial assistance for park improvements
- Financial assistance to make common-use and other facilities barrier-free
- Financial assistance for local events
- Financial assistance to purchase materials for schools, common-use facilities.
- Mobile health checkups

Class 1 Areas Lden 62 or higher

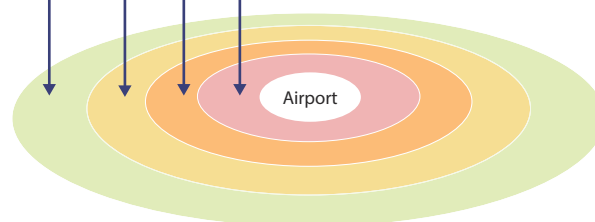
- Financial assistance for soundproofing of housing

Class 2 Areas Lden 73 or higher

- Relocation compensation program

Class 3 Areas Lden 76 or higher

- Creation/improvement of green buffer zones, etc



Relocation compensation programs

In areas around the airport significantly affected by aircraft noise, the airport provides relocation compensation or purchases the land of buildings located in designated areas.



3 Environmental Harmony

ITAMI

• Utilization of land acquired by relocation compensation program

The airport clears and plants trees on land purchased through the relocation compensation program located in Class 3 areas around the airport. As a result, a greenbelt (see photo below) that serves as a buffer zone between the airport and surrounding communities is taking shape. With the progress of the relocation compensation program in Class 2 and 3 areas, there has been an increase in vacant sites (after residents have relocated) in the area. Responding to community concerns about losing local cohesiveness, the airport has been working to develop green space in a planned and integrated way, by having Class 2 and 3 areas and surrounding areas designated as green space, as defined under the nation's City Planning Act. Examples include the Itami Sky Park on the Hyogo Prefecture side and Fureai Ryokuchi (public green space) on the Osaka Prefecture side of the airport.

Also, the airport developed Air Front Oasis Shimogawara using land acquired in the Class 2 area as part of the relocation compensation program. This area aims to familiarize local residents with the airport through greenery and it also serves to improve the disaster prevention functions of the surrounding communities. As a result, the area improves the living environment of people in the surrounding communities along with disaster preparedness.

Green buffer zones

Green buffer zones created on sites after residents have relocated out of Class 3 areas near airport



Itami Sky Park

This green space was developed as a place of relaxation for the local community and is also designed to serve as a refuge area in time of disaster.



Fureai Ryokuchi (Friendship Green Square)

This area was developed as a green space for local residents and, based on their feedback, it features a multipurpose open space, tennis court, heated swimming pool, grass lawn, play equipment, and biotope, among other amenities.



Air Front Oasis Shimogawara and Shimogawara Green Area

Air Front Oasis Shimogawara is well-located with a view of ITAMI. Its main feature is an observation deck with a commanding view of the daily activities at the airport, but it also includes a monument to the wind and other items with an aeronautical motif. Together with the Shimogawara Green Area provided by Itami City, it is a place for locals to relax and enjoy the play and athletic equipment, and rest area.





KIX : Kansai International Airport **ITAMI** : Osaka International Airport **KOBE** : Kobe Airport

ITAMI

• Soundproofing for communities surrounding the airport

In accordance with laws, ITAMI subsidizes part of the costs for soundproofing work of homes and educational facilities in communities that are significantly impacted by aircraft noise.

Category		Outline
Soundproofing of public facilities	Soundproofing of schools, etc.	If the aircraft noise exceeds intensity and frequency limits specified by legislation* related to aircraft noise prevention, a subsidy is provided to local governments and other bodies to defray part or the entire cost for work (soundproofing, installation of upgraded air conditioning) to prevent or reduce aircraft noise in facilities including schools, child care centers, and hospitals.
	Improvement of shared or common-use facilities	Based on legislation, a subsidy is provided to local governments where noise reaches Lden 57, to defray the partial cost for improvements of shared or common-use facilities used by local residents for learning and other purposes. Eligible work includes new construction, renovation, installation of upgraded air conditioning.
Soundproofing of housing	Soundproofing of housing	Based on legislation, a subsidy is provided to defray the partial cost for work to prevent or mitigate aircraft noise (soundproofing, installation of upgraded air conditioning) on housing that was located in Class 1 areas when the national government made the designation.

* Act on Prevention of Damage caused by Aircraft Noise in Areas around Public

• Other programs

In addition to legally mandated programs, ITAMI provides mobile health checkups and subsidizes part of the costs of community events and park development by local governments in communities that are significantly impacted by aircraft noise.

Category		Outline
Others	Mobile health checkups	To promote the good health of residents living near the airport, mobile health checkups are offered, particularly for people who live in areas with greater amounts of aircraft noise.
	Environmental improvements in surrounding areas	In order to improve the living environment around the airport, this program offers subsidies for efforts of local governments, to improve noise-measuring equipment, develop parks, make public facilities more accessible, support equipment purchases by schools and public facilities, revitalize the area, and other activities.

Complaints, inquiries, and responses

The airport responds to complaints and inquiries appropriately, sharing this information between relevant parties in a timely manner.

ITAMI receives a total of 215 complaints and inquiries about aircraft noise and flight paths because of its location in an urban area.

KOBE

Measuring and monitoring aircraft noise

KOBE monitors aircraft noise at four and six locations respectively on an ongoing and periodic basis and publishes the findings. For fiscal 2018, as in the prior year, noise levels were confirmed as complying with environmental standards (maximum Lden 57 dB) at all land-based continuous and periodic monitoring sites.



Reducing aircraft noise

Measures at noise sources

• Restricting flight movements and hours of operation

Considering the impacts of noise on local communities, the airport has established a daily limit on aircraft movements for regularly scheduled flights of 60 movements.

Airport operations are also restricted to the 15-hour window between 7:00 am and 10:00 pm.

Quieter flight procedures

At KOBE, aircraft take off and land while using a flight path over the Akashi Strait as far as possible to reduce the impact of aircraft noise.

Complaints, inquiries and responses

The airport responds to complaints and inquiries appropriately and shares information between relevant parties where appropriate.

KOBE received four complaints and inquiries about aircraft noise and flight paths in fiscal 2018.

3 Environmental Harmony



Preserve Biodiversity



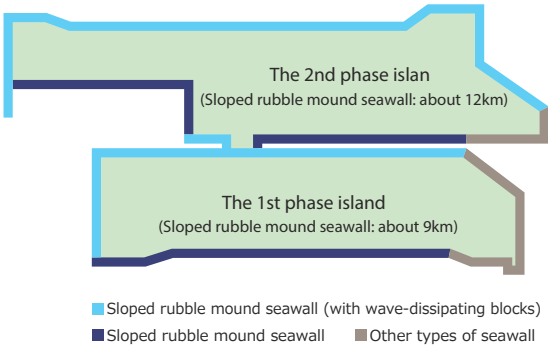
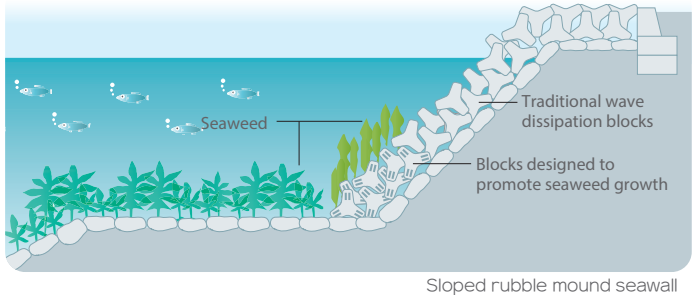
Establishing Seaweed Beds

KIX

At Kansai International Airport, we take an active approach to establishing vibrant seaweed beds surrounding the airport island to provide additional habitat for marine life in Osaka Bay. At the time of the airport island construction, sloping rock-fill seawalls were primarily used and efforts were put into developing the reclaimed shallow areas. As a result, there is rich growth of seaweed around the airport island which serves as habitat for various species of fish and shellfish. At present, the airport aims to maintain as well as expand the growth of high-quality seaweed beds by conducting various surveys and experiments including monitoring their condition.

In addition to periodic monitoring, the airport has carried out experiments to expand the declining beds of *Ecklonia cava* (a brown seaweed native to Japan) by transplanting donor algae because this species of seaweed creates an underwater forest habitat for fish and shellfish. Based on the survey conducted in fiscal 2017, the airport confirmed the presence of seedlings surrounding the transplanted donor algae. According to the whole island survey in fiscal 2018 which we conducted once every three years, we observed 59 hectares of seaweed bed areas showing about 10% expansion since the last survey. We could also confirm that the declining beds of *Ecklonia cava* have been recovering.

Going forward, the airport will continue monitoring the situation to develop a vibrant seaweed bed environment.



Juvenile rockfish gathered in the Garamo field

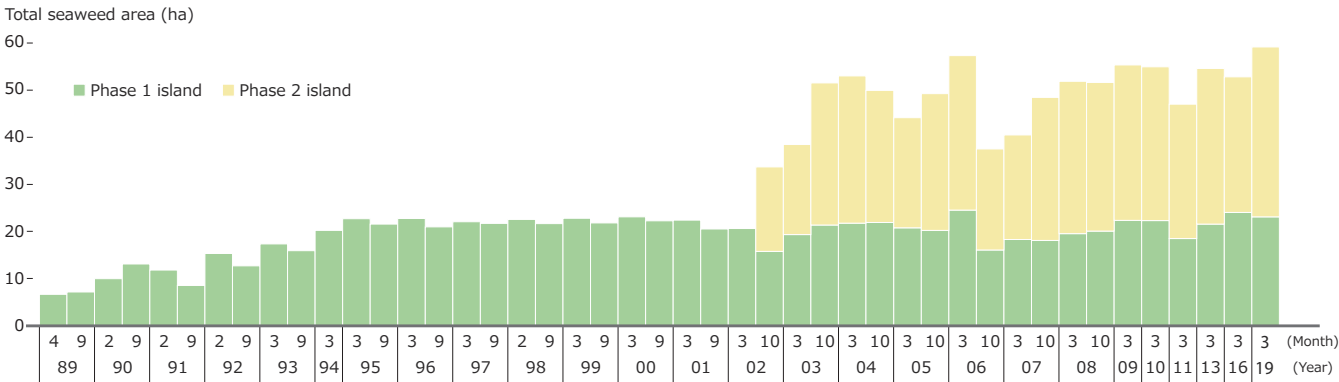


Sargassum filicinum etc



Eisenia bicyclis

Extent of seaweed bed



Note: a temporary decrease in 2011 attributes to the fact that the water areas between the airport islands were under construction which did not allow us to conduct the survey.

KIX : Kansai International Airport **ITAMI** : Osaka International Airport **KOBE** : Kobe Airport

Island Greening and Scenic Improvement Projects

KIX

Aiming to preserve landscapes and create spaces for rest and relaxation on the airport island, we are working to improve the flower spots.

Moreover, on the Phase 2 airport island, we have created areas for plants such as seashore pink, coastal moneywort, shore bindweed and beach vitex in order to restore and protect shoreline vegetation of the Osaka Bay area.

The airport has created a large-scale green space of approximately 4 hectares called KIX Sky Park that is open to the public. It is home to a grassy area for visitors to watch aircraft taxi, take off and land, as well as KIX Sky Farm, which grows crops while recycling cut grass from ITAMI by composting them into fertilizer. Also a green space is found in between Phase 1 and 2 airport islands that faces the inner water way. The green space provides visitors with jogging and walking courses that can be enjoyed while taking in the scenery of both the sea and greenery.

At the annual International Friendship Dragon Boat Festival on the inner waters, teams from Japan and around the world join in heated competitions, with the international airport as a backdrop.



ITAMI

At ITAMI, we are committed to improving landscaping and creating a comfortable environment through rooftop greening along with a rooftop observation deck and planters within the passenger terminal building. The rooftop observation deck is a wide-open wooden structure, 400 meters long with total floor space of 8,200 square meters, which allows visitors to watch aircraft up close in an open space.



KOBE

We are also working to improve landscaping and the internal environment at KOBE through wide-ranging seasonal planters set up inside the passenger terminal building.

From the rooftop deck, visitors can enjoy urban panoramas on the north side as well as aircraft operating up close. A visual feast for visitors, with views and greening alike.





Environmental Management



Utilize Evaluation Programs



Airport Carbon Accreditation

In December 2016, our efforts to reduce CO₂ emissions were recognized by the Airports Council International (ACI) when KIX and ITAMI received Airport Carbon Accreditation (ACA) Level 2*. In December 2018, the ACA of KIX and ITAMI were upgraded to Level 3 while KOBE also newly received ACA Level 2.

We will continue our efforts in collaboration with airport businesses to reduce CO₂ emissions.

* Airport Carbon Accreditation is an international evaluation and accreditation program/system to manage and reduce CO₂ emissions from airports. It is the only environmental accreditation program designed specifically for airports. ACA has four levels for carbon management: Mapping (Level 1), Reduction (Level 2), Optimisation (Level 3), and Neutrality (Level 3+).

Outline of each level



Level 1 (Mapping)

Publicly make an environmental declaration for carbon emissions reduction and calculate the amount of CO₂ emitted by the airport company



Level 2 (Reduction)

Define the CO₂ reduction target and demonstrate the actual reduction achieved by implementing the plan developed



Level 3 (Optimisation)

Widen the scope of carbon footprint to include other airport-related operators and develop a plan to reduce CO₂ emissions of the entire airport



Level 3+ (Neutrality)

Offset CO₂ emissions over which the airport company has control in order to achieve carbon neutrality



KIX **Level 3**



ITAMI **Level 3**



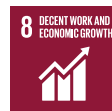
KOBE **Level 2**



ACA Accreditation Ceremony



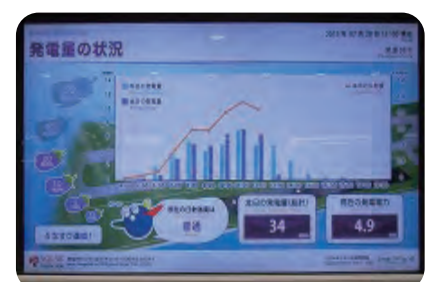
Cooperation and Education



Dissemination of Environmental Information

We established a webpage containing environmental information on our website that includes details on environmental monitoring, environmental reports, and environmental events.

ITAMI's website provides information about its environmental programs including noise abatement subsidies offered to businesses and residents near the airport. KIX has installed monitors in the terminal buildings and Observation Hall public area to display the status of electricity generation by photovoltaic panels (KIX Megasolar). The public can view information such as electricity generated to date, CO₂ emissions reduced, and the current sunlight intensity.





KIX : Kansai International Airport **ITAMI** : Osaka International Airport **KOBE** : Kobe Airport

Events related to environmental activity

World Environment Day Digital Stamp Rally

To mark World Environment Day on June 5 and the Environment Month, we held an environmental event at all three airports over the week from June 5 to 11. The quiz-style digital stamp rally we organized was intended to boost customer awareness of our environmental efforts.



Exhibit at EcoPro 2017

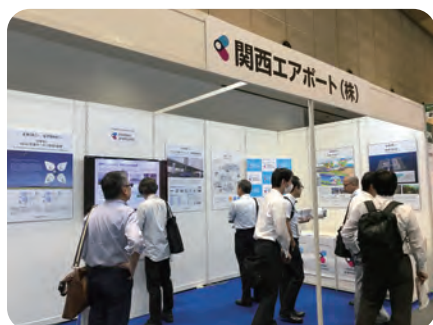
The 2018 EcoPro 2018 - Environment and Society of the SDGs Era and to the Future - took place at Tokyo Big Sight over three days from December 6. We hosted a booth there, alongside other airport-related businesses in Japan, allowing us to showcase our environmental initiatives at three airports to many visitors.



KIX

Exhibit at the six World Smart Energy Week - Osaka

The sixth World Smart Energy Week Osaka Show was organized at INTEX Osaka for three days from September 26. As well as a keynote speech entitled "Activities of Kansai International Airport to become a smart airport that is people- and environment-friendly", we hosted a booth explaining the bigger picture of Kansai Airport's environmental conservation to visitors.



Fuel Cell Bus Trial Ride in KIX

As part of our activity to promote the proactive use of hydrogen energy, we held a fuel-cell bus trial ride in KIX on December 15, which saw participants sample a ride on the latest fuel-cell bus, SORA (Toyota Motor Corporation). En route, the bus stopped by the Iwatani Hydrogen Refueling Station in Kansai International Airport so that passengers could observe a hydrogen filling demonstration. Throughout this event, a total of 117 participants experienced the outstanding environmental performance of the fuel-cell bus and a quieter and more comfortable ride than normal.



4 Environmental Management

KIX : Kansai International Airport **ITAMI** : Osaka International Airport **KOBE** : Kobe Airport

Cooperation with businesses at the airport

Airport Council initiatives

We have set up councils comprising representatives from airport related businesses at each of our airports to share best practices and engage in various efforts together with these businesses aimed at mitigating environmental impacts. These efforts include energy conservation, reducing CO₂ emissions, reducing waste, and encouraging the use of eco-friendly vehicles. The stop idling campaign held every year at Kansai International Airport together with council members was expanded to KOBE in fiscal 2018. Together with about 150 airport officials, we called for increased awareness of environmental conservation and active participation in environmental conservation activities at each airport.

In addition, on May 30 we held a zero-garbage campaign to make our airports cleaner for passengers.



KIX



ITAMI



KOBE

Participation in Airports Council International (ACI)

Kansai Airports is a member of Airports Council International, an organization representing 646 organizations that manage 1,960 airports in 176 countries and regions worldwide (as of January 2019) and a member of the ACI Asia-Pacific Regional Environment Committee. KIX hosted the tenth meeting of this committee between October 17 and 18, 2018 and hosted about 30 airport personnel tasked with overseeing environmental conservation in the Asia-Pacific region. As well as actively discussing airport environmental actions, the attendees toured the airport by SORA, the latest fuel-cell bus and gained further insight into KIX's activities.



In-house environmental education

Kansai Airports Group has introduced Environment Ambassador Initiatives to raise the environmental awareness of all employees, including those in our group companies. Environmental Ambassadors are members assigned by the individual sections of each group company who oversee the task of sharing the knowledge and insights they have obtained through initiatives with all other employees.

This activity includes promoting environment-related events such as a zero-garbage campaign and energy-saving patrol, participating in environment ambassador meetings and integrating environment-related activities within each section of each company.



To Become a Smart Airport

To develop as an airport holistically alongside local communities and society and also minimizing environmental impacts, we established the One Eco-Airport Plan, under which the three airports collectively address the task of reducing their environmental impacts. Although such integrated efforts will further boost our activities, our initiatives as Kansai Airports Group to build a sustainable society have become more important, given the growing impact on the environment and international community we expect from the surge in inbound demands and the upcoming EXPO 2025 OSAKA, KANSAI, JAPAN as well as our business scale expansion. Moreover, actions to achieve the Sustainable Development Goals (SDGs) to resolve environmental, economic and social issues are already underway worldwide.

With this in mind, Kansai Airports Group will strive to help achieve a sound global environment and sustainable society through our business operations.

SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD



Sustainable Development Goals (SDGs)

Global goals are set in the 2030 Agenda for Sustainable Development adopted at the United Nations Summit in 2015 to realize a sustainable future. SDGs comprise 17 goals and 169 targets.

Initiatives in the One Eco-Airport Plan and SDGs

Four pillars of One Eco-Airport Plan	Eight items in Environmental Goals	Major initiatives	Corresponding SDGs * The Goal descriptions are summarized for the use of this report.
1 Response to Climate Change	Promote Energy Conservation 	<ul style="list-style-type: none"> Promote energy-saving operations Introduce high-efficiency equipment along with thermal insulation and measures against sunlight in buildings Introduce energy management system 	 Access to reliable and sustainable energy Build resilient infrastructure, promote industrialization Take urgent action to combat
	Reducing GHG Emissions 	<ul style="list-style-type: none"> Promote carbon-free operations Encourage GPU utilization 	
2 Resource Usage	Reduction of Clean Water Consumption 	<ul style="list-style-type: none"> Utilize rainwater/reclaimed water Promote water-saving operations 	 Sustainable management of water and sanitation Make cities and human settlements Ensure sustainable consumption
	Waste Recycling 	<ul style="list-style-type: none"> Promote thorough sorted collection and recycling of waste Promote green procurement Minimize and recycle construction waste 	
3 Environmental Harmony	Monitor the Local Environment 	<ul style="list-style-type: none"> Monitor aircraft noise Ensure air and water quality 	 Make cities and human settlements Conserve and sustainably use the oceans, seas and marine resources Protect, restore and promote sustainable use of terrestrial ecosystem
	Preserve Biodiversity 	<ul style="list-style-type: none"> Protect wildlife habitat 	
4 Environmental Management	Utilize Evaluation Programs 	<ul style="list-style-type: none"> Utilize national and local government assessment systems Utilize environmental certification systems 	 Inclusive and sustainable economic growth Revitalize the global partnership
	Cooperation and Education 	<ul style="list-style-type: none"> Disseminate environmental information and provide environmental education Alliances with airport-related businesses Alliances with airports throughout Japan and overseas 	

Environmental Chronology

KIX : Kansai International Airport (1/3)

Year	Mo.	Event
1968	4	Ministry of Transport (MOT) launches basic study for airport siting
1971	10	Minister of Transport asks Council for Civil Aviation for advice on scale/siting for Kansai International Airport
	11	MOT conducts trial flights to study noise levels at 3 candidate sites (Senshu, Kobe, Akashi)
1972	8	Council for Civil Aviation (Kansai International Airport committee) conducts hearings with local communities
1973	8	MOT surveys 3 candidate sites commercial aircraft air pollution
1974	8	Council for Civil Aviation reports initial findings to Minister of Transport: Optimal airport location is off coast of Senshu
1975	9	MOT convenes series of briefings in communities
1976	9	MOT announces Survey Implementation Guidelines
1977	10	Marine observation facilities completed
1978	2	MOT announces plans for noise, vibration, and air pollution studies, starts site studies
	3	MOT begins bore studies near candidate sites
1979	5	MOT conducts flight studies with aircraft
1981	5	MOT presents three reports: Airport Proposal, Environmental Impact Assessment, and Approaches to Regional Infrastructure
1983	12	MOT begins ground improvement testing off the coast of Senshu
1984	10	Kansai International Airport Co. (KIAC) established
1986	2	Kansai Int'l Airport Env. Monitoring Org. established (Osaka Pref. Governor, mayors of 9 cities, 4 towns currently)
	6	Environmental Impact Assessment submitted to governor of Osaka Prefecture
	12	Environmental Monitoring Plan adopted environmental monitoring begins
1987	1	Permit obtained for land reclamation on public waters for Phase 1 construction. Phase 1 construction begins
	6	Construction begins on bridge linking mainland to airport begins, KIX Environmental General Center opens
1989	6	Phase 1 airport island seawall construction completed
1994	1	Phase 1 airport island construction areas completed
	3	Plan for Environmental Monitoring of KIX Construction/Operation adopted
	7	Kansai International Airport Environmental Center opens
	9	Kansai International Airport (KIX) opens for service (Sep 4). Monitoring begins: Aircraft noise, low-freq. air vibration
1995	8	Council for Civil Aviation releases Basic Approach to 7th Airport Preparatory 5-Year Plan (mid-term report)
1996	6	Kansai International Airport Land Development Co. (KALD) est., designated by Min. Transport as official land developer
1997	6	MOT releases "Comprehensive Initiatives relating to Flight Path Issues at KIX" paper
1998	10	Environmental Impact Assessment on Phase 2 Construction submitted
	12	New flight paths introduced. Environmental Monitoring Plan for aircraft noise, etc., reviewed, monitoring enhanced
1999	6	Environmental Monitoring Plan for Phase 2 Construction Project adopted
	7	Permit obtained for land reclamation on public waters, Phase 2 construction (start Jul 14. Silt protection sheets deployed
	11	KIX International Symposium marks fifth anniversary of opening
	12	KALD acquires ISO 14001 certification for environmental management system
2001	1	KIAC establishes Environmental Management Committee
	4	KIX receives "Monument of the Millennium" award from American Society of Civil Engineers, as offshore airport
	6	KIAC adopts Environmental Management Plan (Eco-Island Plan)
	9	Placement begins for wave-dissipating blocks to support seaweed bed growth along Phase 2 seawall
	11	International Airport Symposium 2001 hosted, Phase 2 airport island seawall completed
2002	10	KIAC adopts Regulations Governing the Use of Waste Processing Facilities
	12	<ul style="list-style-type: none"> KIAC establishes Energy Conservation Committee KIAC releases first Eco-Island Report (2002 edition)
2003	12	KIAC establishes KIX Customer Satisfaction Council
2004	9	International Airport Symposium 2004 hosted
	12	KIAC, KALD mount their first exhibit at "Eco-Products 2004" exhibition
2005	7	Kansai International Airport Environmental Center relocated to Kanku Observation Hall
2006	8	Kansai International Airport & Rinku Town designated by government as CNG vehicle model project areas
2007	1	KIAC awarded MITI Award at FY2006 Nat'l Energy-Efficiency Best Practices Conf., for IT-based air con system in passenger terminal
	5	JHFC hydrogen charging station for vehicles opens at KIX
2008	3	KIX Eco-Island Promotion Council launched KIX Environmental Plan adopted
	4	Windbreak fence completed for KIX rail system access bridge, use of pro-beam low-location lights begins

KIX : Kansai International Airport (2/3)

Year	Mo.	Event
2008	5	Kanku Environmental Exhibition features KIX Environmental Plan
	6	First idling-prevention awareness campaign launched
	7	First conference held to report on KIX Eco-Island Promotion Council environmental initiatives
	10	Study tour organized by KIX Eco-Island Promotion Council
2009	7	Full-scale use of truck-mounted ground power units (GPUs) begins
	11	KIX Science Classes held
2010	1	Partial changes to aircraft auxiliary power unit (APU) usage restrictions (use reduced from 30 to 15 min. before departure)
	9	Photovoltaic system installed for temperature-controlled building for medical products
2011	1	IATA Environment Stand display installed at KIX
	3	Rapid charger installed at KIX for electric vehicles
	7	Japan fully adopts digital terrestrial broadcasting; measures targeting signal interference
	9	Electricity-powered commercial shuttle vehicles introduced (two vehicles by fiscal year end)
2012	4	<ul style="list-style-type: none"> • New Kansai International Airport Company (NKIAC) established • Professor KIXeco quiz system launches at Environmental Center
	5	KIX wins judges' special award, Airports Council Int'l (ACI) Asia-Pacific 2011 Green Airports Recognition Awards
	6	Phase 2 airport island construction almost completed, land development work by KALD is completed
	7	Kansai International Airport and Osaka International Airport are merged
	8	KIX earns runner-up award in 2012 Osaka Environmental Awards for efforts to grow seaweed beds
	10	KIX Sky Park opens adjacent to Phase 2 Terminal Building, trial begins for hydrogen fuel cell buses
	11	Olive tree planting ceremony along walking path for Phase 2, decision made to do KIX Megasolar project
2013	12	Exhibit at Eco-Products 2012 exhibition. Four regular chargers for electric vehicles installed in parkade.
	2	Int'l Strategy Comprehensive Special Area expanded by Kansai Innovation to include KIX (green innovation theme)
	3	<ul style="list-style-type: none"> • Smart Eco Logi Council holds ceremony for launch of 20 large CNG trucks in international freight zone • KIX Eco-Island Promotion Council changes name to KIX Smart Island Council
	4	KIX Smart Island Plan adopted
	8	Summer Vacation Family Eco Classes held
	10	East Asia Airport Alliance (EAAA) annual general meeting held. "Environmental Relay Declaration" adopted
2014	12	Exhibit at Eco-Products 2013 exhibition. Winter Vacation Family Eco Classes held.
	1	KIX announces event for EAAA Environmental Relay
	2	KIX Megasolar starts generating electricity (largest photovoltaic system of any Asian airport)
	5	Hydrogen Grid Project launched
	6	Rapid charger installed for electric vehicles at open parking lot No.5, with 24-hour operations
2015	7	<ul style="list-style-type: none"> • "Megasolar Observatory" and "Visualization Monitor" start operating • Small wind turbine power generator installed—a first for any Japanese airport
	2	Trial operations launched for first fuel cell-powered forklift at any airport in Asia, plus demonstration trial of hydrogen grid
	8	"Hydrogen and Fuel Cell" Family Eco Classes held
	9	Megasolar system starts operating on roof of air freight warehouse in international freight zone
	10	Exhibit at Biwako Environmental Business Exhibition 2015
2016	12	<ul style="list-style-type: none"> • Awarded the FY2015 Environment Minister's Award for Global Warming Prevention Activities • Exhibit at Eco-Products 2015 exhibition
	1	Largest hydrogen station at an airport in Asia opens
	3	<ul style="list-style-type: none"> • Awarded 2015 Kansai Eco Office Grand Prize from Union of Kansai Governments • Two new model fuel cell forklifts added for demonstration trials
	4	<ul style="list-style-type: none"> • Kansai Airports starts operating • Four more regular chargers installed for electric vehicles in parkade
	6	<ul style="list-style-type: none"> • Environmental initiatives introduced at Fifth Fukeko Festival • Potato harvest event at KIX Sora Farm promotes environmental education • KIX Smart Island Exhibit in passenger terminal
	8	KIX Family Eco-Classes: Hydrogen/Magnesium Air Fuel Cells
2017	12	<ul style="list-style-type: none"> • Airport Carbon Accreditation (ACA) obtained, a first for airports in Japan • Exhibit at 2016 EcoPro International Exhibition on Environment and Energy
	1	Terminal 2 opens (international flights)
	4	Large hydrogen filling station for industrial vehicles opens, a first in Japan
2017	5	Conducts trial operations of fuel cell bus at Kanku Tabihaku 2017 and to the Terminal 2 building

Environmental Chronology

KIX : Kansai International Airport (3/3)

Year	Mo.	Event
2017	6	<ul style="list-style-type: none"> • Hosts Smart Island Environmental Exhibition • Holds KIX Eco Class at KIX Sky Farm • Holds idling stop campaign
	8	Holds KIX Science Class
	12	Exhibits at 2017 EcoPro International Exhibition on Environment and Energy
2018	2	Introduces additional two fuel cell forklifts
	4	Establishes new environmental plan called One Eco-Airport Plan
	9	Keynote and exhibit at the six World Smart Energy Week Osaka Show
	10	Hosts the tenth ACI Asia-Pacific Regional Environment Committee
	12	<ul style="list-style-type: none"> • Airport Carbon Accreditation (ACA) Level 3 obtained • Exhibit at EcoPro 2018 • Holds the Fuel Cell Bus Trial Ride in KIX
2019	2	With additional four fuel cell forklifts introduced, seven fuel cell forklifts in total

ITAMI : Osaka International Airport

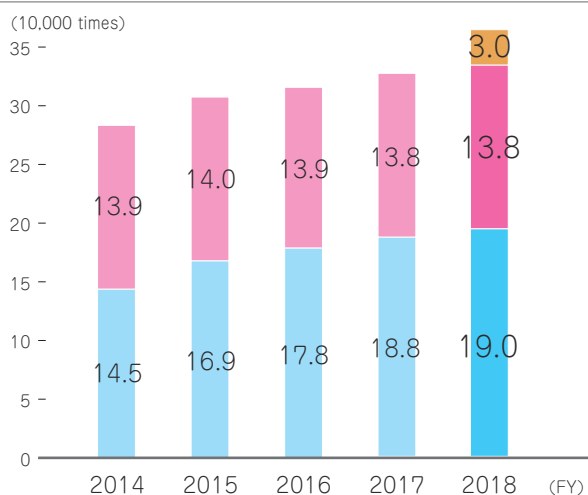
Year	Mo.	Event
1939	1	Opens as No. 2 Osaka Airport
1958	3	Complete return of airport from U.S. forces to Japan. Renamed "Osaka Airport" by the Ministry of Transport (runway was 1,828 m long)
1959	7	Designated a class 1 airport under Civil Airport Development Law, renamed "Osaka International Airport"
1960	4	International flights begin
1964	6	Passenger jet service begins
1969	1	Construction of terminal building completed
1970	2	Additional runway (3,000 m) opens and airport takes its present form
1975	12	Abolishes domestic line operation between 9:00 pm to 7:00 am the following morning
1976	7	Abolishes international line operation between 9:00 pm to 7:00 am the following morning
1977	10	Limit on aircraft movements for regularly scheduled flights of 370 movements per day (200 for jets)
1990	12	MOT concludes the agreement with local municipalities (11 cities) and local groups (mediation group) on the airport continuation
1994	9	International flights shift to newly opened Kansai International Airport
1997	4	Osaka Monorail starts operation
1999	7	Former international terminal building is renovated and opens as South Terminal
2002	6	Erects noise barrier at the engine testing site
2006	4	Switches from 24-hour operations to 14-hour operations (7:00am to 9:00pm)
2010	4	Begins examining ways of reducing amount of grass clippings incinerated as waste (recycling as fertilizer and feed)
2012	4	New Kansai International Airport Company established
	7	Management of Osaka International Airport and Kansai International Airport is integrated
	10	Successfully produces fertilizer made of grass clippings from the airport's landing strips
2013	3	Introduces landing fee system based on actual noise level
2014	2	Receives 7th Toyonaka Eco Citizen Award 2013 (for recycling grass clippings as fertilizer and feed)
	9	Receives the Grand Prize at the 2014 Osaka Environmental Awards (for recycling grass clippings as fertilizer and feed)
	10	Receives the Chairman's Prize at the 2014 Reduce, Reuse, Recycle Promotion Merit Awards (for recycling grass clippings as fertilizer and feed)
2015	12	Kansai Airports starts operations
2016	4	Kansai Airports begins operating Osaka International Airport and Kansai International Airport
2017	5	Constructs warehouse for storing grass clipping feed
	6	Holds idling stop campaign
	12	Exhibits at 2017 EcoPro International Exhibition on Environment and Energy
2018	3	<ul style="list-style-type: none"> • Receives Silver at ACI Asia-Pacific Green Airports Recognition 2018 (for recycling grass clippings as feed) • AIP defines the auxiliary power unit (APU) usage restrictions
	4	<ul style="list-style-type: none"> • Terminal renovations: Central Area opens first with light-blocking panels and rooftop greenery, etc. • Establishes new environmental plan called One Eco-Airport Plan
	8	Presents ITAMI environmental action in INTER-NOISE 2018
	12	<ul style="list-style-type: none"> • Upgrades to Airport Carbon Accreditation (ACA) Level 3 • Exhibit at EcoPro 2018
2019	3	Fuel cell vehicle introduced for the first time
	4	Iwatani Hydrogen Refueling Station in Osaka International Airport opens in the airport

KOBE : Kobe Airport

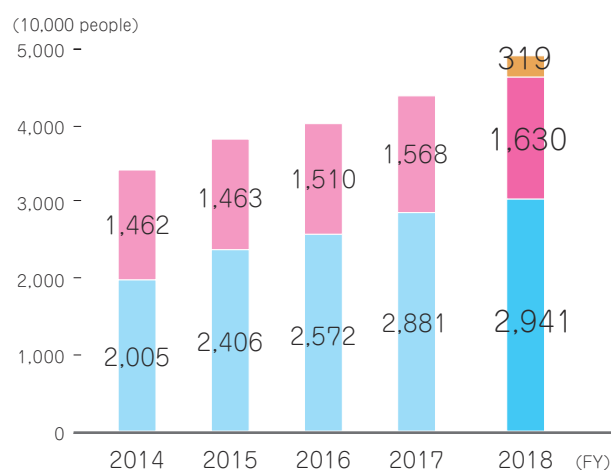
Year	Mo.	Event
2006	2	Open Kobe Airport
2018	4	<ul style="list-style-type: none"> Kansai Airports Kobe begins operating Kobe Airport Establishes new environmental plan called One Eco-Airport Plan
	12	<ul style="list-style-type: none"> Upgrades to Airport Carbon Accreditation (ACA) Level 2 Exhibit at EcoPro 2018
2019	4	AIP defines the auxiliary power unit (APU) usage restrictions

● Number of passengers and flights

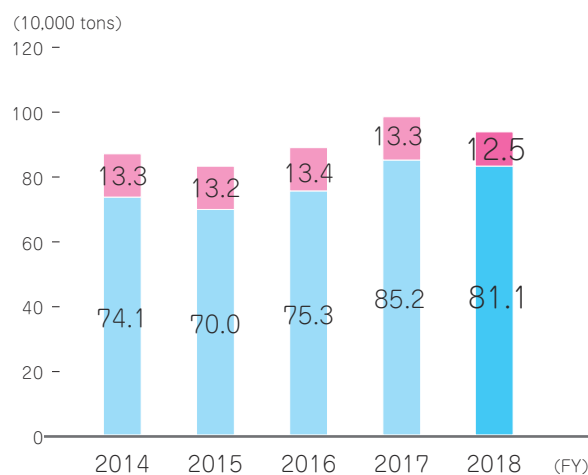
Per landing/takeoff



Annual Passenger Traffic



Annual Cargo Volume



■ KIX ■ ITAMI ■ KOBE

*On April 1, 2018, Kansai Airports Kobe commenced its business as an operator of Kobe Airport (KOBE).

[Queries]

Kansai Airports Technical Department
Smart Island Group

E-mail: kankyo@kansai-airports.co.jp



Kansai Airports Technical Department, Smart Island Group

Published: October 2019

