As an "Eco-Airport," Narita International Airport engages in initiatives to combat global warming, contribute to the local environment, and implement resource recycling. Here are some of our activities to reduce the environmental impact of airport operations.

**LED Lighting**

**On Taxiways**

We have been promoting the shift of taxiway lights to navigate aircraft from halogen lamps to LEDs (light-emitting diodes). LED lamps have a longer life than halogen lamps and reduce the replacement frequency of lighting components. LEDs consume 1/10 of the power of halogen bulbs and are four times more energy-efficient even when including the lighting device. As of the end of fiscal 2018, LEDs accounted for 63.0% of taxiway lighting.

**In Passenger Terminals**

Besides ceiling lights and signs outside the passenger terminal buildings, LEDs are also used for the backlights in advertising boards and information signs. Through the use of LEDs, illuminance has increased and displays are brighter and easier to see. In addition, LEDs offer many other advantages in terms of convenience, running cost, and the environment such as lower heat emission, significantly reduced power consumption, and longer life. Currently, we are renewing the lighting fixtures in the International Departure Lobby of Terminal 1, where 1,940 LED lights are to be installed (completion scheduled for fiscal 2019). We will introduce of high-efficiency lighting fixtures such as LED lighting in conjunction with future facility renovation plans.

**Main LED Switching Locations**

<table>
<thead>
<tr>
<th>Period</th>
<th>Location</th>
<th>Number of LEDs</th>
<th>Power Consumption Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 2016</td>
<td>International Arrival Lobby of Terminal 2</td>
<td>1,270 units</td>
<td>40%</td>
</tr>
<tr>
<td>December 2017</td>
<td>Nine signs outside Terminals 1 and 2</td>
<td>9 locations</td>
<td>50%</td>
</tr>
<tr>
<td>June 2019</td>
<td>International Departure Lobby of Terminal 2</td>
<td>600 units</td>
<td>40%</td>
</tr>
</tbody>
</table>

**Green Power Certificate**

To promote the reduction of greenhouse gas (GHG) emissions and the introduction of renewable energy, we purchased a “Green Power Certificate” for solar power generation of 125,000 kilowatt-hours (kWh) in fiscal 2017. This amount is equivalent to the energy consumed for continuous real-time monitoring of aircraft noise, air quality, and water quality around the airport in one year. Green power refers to electricity produced from renewable energy such as hydroelectric, wind, solar, biomass, and geothermal. It is environmentally friendly as it produces little to no emissions unlike fossil fuel energy. The Green Power Certification scheme promotes the spread and expansion of renewable energy use through the issue of tradable certificates certifying the environmental value of clean power. Narita International Airport also uses these Certificates at events within the airport. We will enhance the introduction of renewable energy and reduce GHG emissions through various initiatives.
When aircraft are parked on the apron and engines are shut off, essential power and air conditioning can be provided by a small engine fitted to the aircraft known as an Auxiliary Power Unit (APU). However, APU operation generates noise and gases causing global warming and air pollution. Consequently, the use of APUs is restricted and the use of Ground Power Units (GPUs) is encouraged at Narita International Airport. GPUs enable us to reduce these emissions as they provide power and air conditioning from ground facilities. Currently, GPUs have been installed at all fixed stands in Passenger Terminals 1 and 2. They are also installed at most stands in Passenger Terminal 3 and cargo area (power supply only). Additionally, since state-of-the-art aircraft such as the Boeing 787 and Airbus A380 power requirements exceed the capacity of existing GPUs, we have been increasing their power output.

**GPU Supply Channels**

- **APU**
- **Electrical room**
- **Kitchen wastewater treatment facility**
- **Solid-state ground power unit**
- **Buried duct (PCA)**
- **Buried cable (electric power)**
- **Frick (PCA)**
- **Frick (electric power)**
- **PCA duct (connected to aircraft)**
- **Electric power cable (connected to aircraft)**

**Aircraft Tracking Map with Flight Corridors (Example)**

- **Runway A, arrival**
- **Runway A, departure**
- **Flight corridor (Runway A)**
- **Runway B, arrival**
- **Runway B, departure**
- **Flight corridor (Runway B)**
- **Flight corridor (Runway H)**
- **Runway H, arrival**

**GPU Supply Channels**

- **APU**
- **PCA supply**
- **Electric power supply**
- **Pre-conditioned air (PCA)**
- **Electric power**
- **Pit (electric power)**
- **Passenger terminal**
- **Air handling unit**
- **Solid-state ground power unit**
- **Buried duct (PCA)**
- **Buried duct (electric power)**
- **Frick (PCA)**
- **Frick (electric power)**
- **PCA duct (connected to aircraft)**
- **Electric power cable (connected to aircraft)**

- **Noise, CO2, and air pollutant emissions**

**Establishing and Monitoring Flight Corridors (Monitoring Zones)**

To minimize the impact of aircraft noise, flight corridors (monitoring zones) for direct ascent and descent have been established from the Tonegawa River to the Kujukuri Coastline. They are monitored to ensure that aircraft do not deviate from these corridors. In case of deviation without any valid reasons such as weather or safety, their flight numbers and reasons are disclosed to the public. Also, the Ministry of Land, Infrastructure, Transport and Tourism issues a directive to the airlines concerned as necessary. In fiscal 2018, the number of aircraft deviating without valid reason was 10 (0.004%).

**Rainwater Recycling**

Oil separation plant and holding pond have been installed at Narita International Airport to prevent rainwater runoff from affecting the quality and volume of water at downstream waterways. Rainwater is collected in a holding pond with a capacity of 610,000 cubic meters located on the western side of Runway A and flows out from there into drainage canals outside the airport. For effective use of recycled water, we operate a treatment facility that purifies rainwater runoff. Rainwater is collected in the pond, converted into grey water at the facility, and used as cooling water in the Central Heating and Cooling Plant as well as flushing water in terminal toilets. In fiscal 2018, the rainwater treatment facility produced 430 million liters of grey water.

**General Waste Sorting**

The greatest volume of general waste produced at Narita International Airport is aircraft cabin waste, which comprises half of the total amount. While catering waste must be incinerated under quarantine laws, other waste such as inflight magazines, bottles, cans, and plastic bottles are sorted and recycled by some airlines in spite of limited onboard sorting space and time available for cabin cleaning. Meanwhile, general waste from passenger terminals, the cargo area, the office area, and other facilities is sorted into bottles, cans, and plastic bottles, ensuring that reusable items are recycled. In an effort to reduce general waste and increase the recycling rate of plastic bottles, waste receptacles for plastic bottles with leftover beverages have been installed in front of security checkpoints since fiscal 2015. We also recycle paper that is shredded at the airport, and about 220 tons of shredded paper were recovered in fiscal 2018.

**Recycling Wastewater from Restaurant Kitchens**

Kitchen wastewater from restaurants in passenger terminals contains many impurities such as fat and organic substances. Therefore, it is treated at the Kitchen Waste Treatment Facilities to remove impurities through biodegradation. Afterwards, water is taken to the Grey Water Production Facilities where it is disinfected and purified through membrane separation and activated carbon absorption, allowing it to be reused as grey water. In fiscal 2018, 180 million liters of grey water was generated and reused for flushing toilets in terminals and at the NAA Building.
Concrete and asphalt rubble produced by upgrading the aprons and runways is crushed at the airport recycling plant and used as aggregate in airport projects. Eighty-four thousand tons of construction waste were processed in fiscal 2018. The grass cuttings are given to farmers around the airport, and some of them are used effectively as feed.

**Construction Waste Recycling**

**Effective Utilization of Grass Cuttings**

As part of the efforts according to the Eco-Airport Master Plan, we participate in the Airport Carbon Accreditation program, and Narita was accredited at Level 2 in January 2018, which is verification of its programmed reduction of the emissions from NAA and its subsidiary companies. Furthermore, Narita International Airport achieved at Level 3 as the first among Japanese airports in November of the same year. Achieving a higher level of accreditation is evidence of Narita’s firm commitment. This recognizes NAA’s airport-wide reduction program for monitoring carbon emissions from aircraft, motor vehicles, employee transport, and other sources across the airport and taking the framework for accelerating cooperation with airport stakeholders. Narita Airport will remain committed to participating in the Airport Carbon Accreditation program and will continue to strive for further reductions in carbon emissions jointly with airport stakeholders.

**First Airport in Japan to Achieve Level 3 on Airport Carbon Accreditation**

We have been participating in “EcoPro” since 2004. It is the largest environmental exhibition in Japan and is held in Tokyo every December. In fiscal 2018, we set up an airport booth together with Japan Airport Terminal Co., Ltd., Kansai Airports and others, and introduced our measures for the reduction of CO2 emissions, recycling, and noise mitigation. The NAA booth attracted some 5,500 visitors, including environment staff and students. The exhibition provided a good opportunity to acquaint people with the environmental measures conducted at Narita Airport.

**Participation in EcoPro**

Eco-Pro Gallery, which began as a project to increase people’s engagement in sustainability while having fun, marked its seventh year. It solicits submissions of photographs on themes such as the beauty of the nature around the airport, as well as aircraft, the airport, and ecology. This year, 427 works were received. Selected works including the Chairman’s Prize winning photograph and the Special Jury Prize winning photograph can be viewed on the Council’s website and are displayed at the NAA Art Gallery in Terminal 1.

**Eco-Photo Gallery 2019**

We proactively disseminate information to encourage a broader understanding of the environmental measures taken at Narita Airport and the results.

**Publishing Environmental Information**

About Airport Carbon Accreditation

- Airports Council International (ACI) awards accreditation in one of four levels to world airports depending upon their achievements in managing and reducing CO2 emissions.
- Verification from an independent third party is mandatory.
- ACI is divided into five regional sectors. This program was launched by ACI Europe in 2009. ACI Asia-Pacific, of which Japan is a member, joined the program in 2011 and the rest of the regions joined in 2014.

**Four Levels of Accreditation**

1. **Mapping**
   - Carbon footprint measurement
2. **Reduction**
   - Carbon management towards a reduced carbon footprint
3. **Optimisation**
   - Third party engagement in carbon footprint reduction
4. **Neutrality**
   - Carbon neutrality for direct emissions by offsetting

NAA homepage:
https://www.naa.jp/en/

Narita Airport Environmental Community:
http://airport-community.naa.jp/
(Japanese version only)

Eco-Pro 2018

Narita Airport Development and Planning Council Chairman’s Prize
Photographer: Meronpan
Location: Higashi-Kanayama, Narita

Eco-Airport Development and Planning Council (Japanese version only)

Eco-Pro 2018

Eco-Airport Development and Planning Council Chairman’s Prize
Photographer: Meronpan
Location: Higashi-Kanayama, Narita

Eco-Photo Gallery 2019

Special Jury Prize
Photographer: Matimon
Location: Narita Sakura no Yama

Special Jury Prize
Photographer: @kiki
Location: Observation Deck of Terminal 1

Eco-Airport Development and Planning Council (Japanese version only)

Narita International Airport was accredited at Level 3 as the first among Japanese airports in November of the same year.

Japanese airports in November of the same year.
According to the Greener Master Plan for Narita Airport and Environs, we develop green areas in consideration of vegetation, aesthetic value, and unique topographical features. In 2005, to make more effective use of satoyama, in cooperation with Chiba Prefectural Government, Narita City, the Narita Local Hotels Association, and the Narita Satoyama Development Association, we created four kilometers of walking trails along off-site drainage ways as shown in Photo 2 above. The trails allow visitors to jog or walk through pristine natural environments while enjoying the seasonal colors.

Satoyama (Countryside Forest) Development
Utilizing existing forestry, natural environments are conserved as satoyama (cultivated countryside forests). In 2005, to make more effective use of satoyama, in cooperation with Chiba Prefectural Government, Narita City, the Narita Local Hotels Association, and the Narita Satoyama Development Association, we created four kilometers of walking trails along off-site drainage ways as shown in Photo 2 above. The trails allow visitors to jog or walk through pristine natural environments while enjoying the seasonal colors.

Sakura no Oka (Cherry Blossom Hill)
An outlook for observing planes, opened on a noise embankment in the Toyomi district. The hill is a favorite spot for aircraft enthusiasts and local families alike.

Sanrizuka Sakura no Oka
(Cherry Blossom Mountain)
Cherry blossom trees were planted with the assistance of Narita City, restoring those lost due to airport construction. In spring, the area is crowded with people enjoying the blooming flowers.

Development of Drainage Ways and Waterside Environments
Environmental work on off-site drainage ways connecting to the Tokkogawa River north of the airport is being carried out, creating concrete canals that closely follow natural streams. Cherry blossom trees donated by local residents and others are thriving successfully on the banks, and provide a colorful spectacle in spring.

Shibayama Mizube no Sato (Waterside Park)
Many water plants, including iris sanguinea, iris pseudacorus, and water lilies are planted. Walking trails and benches in place allow people to relax and appreciate the surroundings.

Greenport Eco-Agripark
A pristine natural adventure park on a 17 hectares tract of our company’s property that adjoins Shibayama Mizube no Sato Waterside Park, south of the airport (in the Iwayama district of Shibayama). Opened in 2007, it has a variety of geographical features including low hills and vales (suita), which are typical of the Hokusu region. The Park is home to many species of insect and a rich and diverse flora and fauna. Our aim is to restore the satoyama landscape, and to maintain a highly biodiverse environment.

The Park offers not only a strolling spot for local residents but also hands-on experiences in rice cultivation in collaboration with Shibayama Town near the airport and nature observation classes by the Narita Airport Eco-Kids Club.

Creek Development
Chestnut trees have been planted which allow people to enjoy nature with chestnut picking. In autumn, local children are invited to their harvest.

Orchard Development
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