ACI Asia-Pacific

# Environmental Survey Report 2015


## Report Abstract

This is a report abstract for the ACI Asia-Pacific Environmental Survey Report 2015. The purpose of this report abstract is to publish high level findings of the ACI Asia-Pacific Environmental Survey for airports in the region. The full version of the report has been distributed to participating airports, which included customized results against aggregated data enabling participants to reference the experience of other airports. We would like to thank all participating airports for their efforts.

# Disclaimer

This report is the result of the analysis of the responses received from the airports that answered the Airports Council International (ACI) Asia-Pacific Environmental Survey 2015. All the data, figures, numbers, statement, and/or any other information contained in this report are only indicative, intended solely for reference purposes, and do not necessarily represent those of airports in general.

No reader should act on the basis of any such information without referring to applicable national laws and regulations and/or without taking appropriate professional advice. Although every effort has been made to ensure accuracy, ACI Asia-Pacific shall not be held responsible for loss or damage caused by errors, omissions, misprints or misinterpretation of the contents hereof.

# Executive Summary

## Background

The ACI Asia-Pacific Environmental Survey was initially conducted as a pilot project in 2014-2015. It was developed by ACI Asia-Pacific Regional Environment Committee (REC) with the objective of developing a database of ongoing environmental activities and policies in the region on 10 core airport environmental aspects, namely:
**Environmental policy & management**; **noise**; **air quality**; **waste**; **water**; **energy**; **carbon**; **biodiversity**; **ground transportation**; **land & water contamination**.

The pilot survey report was published in mid-2015, and allowed participants to gauge their own airports' environmental performance against the aggregate results of all participating airports. With much positive feedback received from the 18 participating airports, the Committee decided to expand the survey to all ACI airport members in the region. In this survey report, we have successfully included the responses from **39 airports**, representing about **30%** of Asia-Pacific airport traffic.

## Survey results

The survey results show that **energy**, **water**, and **waste** management are the top priorities among the responding airports. Airports in general are actively seeking opportunities to maximize efficient energy use through installation of efficient lighting e.g. LED and automatic monitoring/smart metering systems. Similar to energy management, the majority of responding airports are taking measures to save the scarce water resources through controlling the water flow setting and monitoring water usage. Waste reduction is most commonly implemented through the means of source separation and waste recycling.

Over half of the respondents also place a high priority on **noise**, **carbon**, and **land & water contamination management**. For noise, the majority of responding airports have a land-use compatibility policy, and efforts have been made to cooperate with airlines to enforce noise-preferred operational procedures such as Noise Abatement Departure Procedures (NADP), Continuous Descent Arrival (CDA), etc. Reduction of carbon emission is attempted through various means at most airports, and a few have advanced to the stage of carbon offsetting. Prevention of land and water contamination is deemed important, but there seems to be no standardized procedures for release of hazardous substances contained in cleaning chemicals, fuels, etc.

In comparison with other environmental aspects, **ground transportation**, **biodiversity**, and **air quality** are considered less of a priority among the respondents. Only a few airports have direct responsibility for ground transportation or biodiversity plans. On managing air quality, only a few airports have means to manage ground aircraft operations e.g. reduced engine taxiing and banning APU.

## Conclusion

It is important to note that the survey results are only indicative, with limited samples available so far, and each airport has different priorities and environmental policies based on their ownership geographical location, political or regulatory context in different jurisdictions. But we hope this report will encourage participating airports to learn from one another for best practice sharing and assist environmental managers to have a better grasp of the current industry trend in this vastly diverse region.

# Table of Contents

**Disclaimer** ..... **0**

**Executive Summary** ..... **1**

**Introduction** ..... **3**

*Objectives of the survey* ..... *3*
*10 core environmental aspects* ..... *3*
*Basic rules* ..... *4*
*Statistics* ..... *4*
*Acknowledgement* ..... *5*

**General Information** ..... **6**

**Overview** ..... **8**

**Part 1. Environmental Policy and Management** ..... **11**

**Part 2. Noise** ..... **12**

**Part 3. Air Quality** ..... **13**

**Part 4. Waste** ..... **14**

**Part 5. Water** ..... **15**

**Part 6. Energy** ..... **16**

**Part 7. Carbon** ..... **17**

**Part 8. Biodiversity** ..... **18**

**Part 9. Ground Transportation** ..... **19**

**Part 10. Land & Water Contamination** ..... **19**

# Introduction

The ACI Asia-Pacific Environmental Survey 2015 is the first airports environmental survey developed by ACI Asia-Pacific Regional Environment Committee (REC) for ACI Asia-Pacific Region.

## The objectives of the survey are:

- To develop an environmental activity database of ACI Asia-Pacific airport members; and
- To assist environmental managers in engaging with senior management and seeking the approval of senior management for their environmental initiatives.

## 10 core environmental aspects

Below are a series of questions that relate to the ten core environmental aspects that airports need to manage.

1. **Environmental policy and management** (including green procurement)
2. **Noise**
3. **Air quality**
4. **Waste**
5. **Water** (including both municipal water usage and wastewater discharge)
6. **Energy**
7. **Carbon**
8. **Biodiversity**
9. **Ground transportation**
10. **Land & water contamination**

## Basic rules

- All of airports' responses will be kept strictly confidential. ACI will not release the information to any third party without an airport's consent. All the information filled in this survey will be confidential even among individual airports.
- Aggregated results will be developed and disclosed to only participating airports and ACI.
- There will be no ranking for individual airports in the report.

## Statistics

- This report is generated from the ACI Asia-Pacific Environmental Survey 2015 with 39 participants representing about 30% of Asia-Pacific traffic.

(Blue indicates countries covered by the survey)

## Acknowledgement

➢ ACI Asia-Pacific would like to extend its gratitude to all participating airports for their continue support of ACI initiatives. They are:

| Name of Airport | Name of Airport |
|---|---|
| Abu Dhabi International Airport | King Abulaziz International Airport |
| Adelaide Airport | King Fahd International Airport |
| Alice Springs Airport | Kuala Lumpur International Airport |
| Bahrain International Airport | Macau International Airport |
| Bandaranaike International Airport | Muscat International Airport |
| Bengaluru International Airport | Nadi International Airport |
| Brisbane International Airport | Nanjing Lukou International Airport |
| Chhatrapati Shivaji International Airport | Narita International Airport |
| Christchurch International Airport | Newcastle Airport |
| Clark International Airport | Queen Alia International Airport |
| Darwin International Airport | Rajiv Gandhi International Airport |
| Fua'amotu International Airport | Sharjah International Airport |
| Gimpo International Airport | Singapore Changi Airport |
| Gold Coast Airport | Soekarno-Hatta International Airport |
| Guam International Airport | Suvarnabhumi International Airport |
| Hong Kong International Airport | Sydney International Airport |
| Incheon International Airport | Taiwan Taoyuan International Airport |
| Indira Gandhi International Airport | Tennant Creek Airport |
| Kansai International Airport | Yangon International Airport |

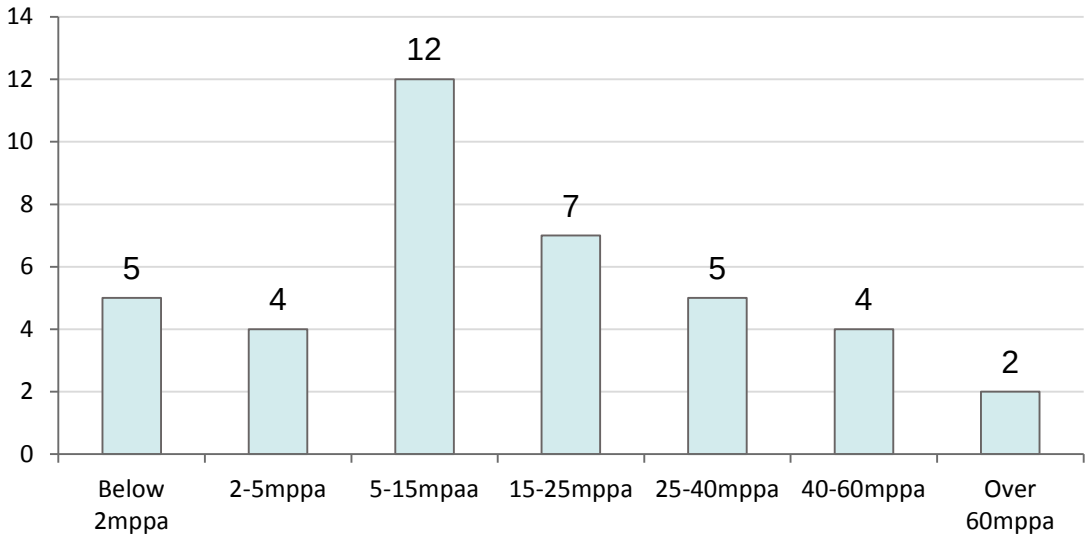
and others.

Special thanks to Hong Kong International Airport for taking the lead in proposing and drafting this survey.

# General Information

## Airport size - Passenger traffic in million passengers per annum (mppa)

0.09



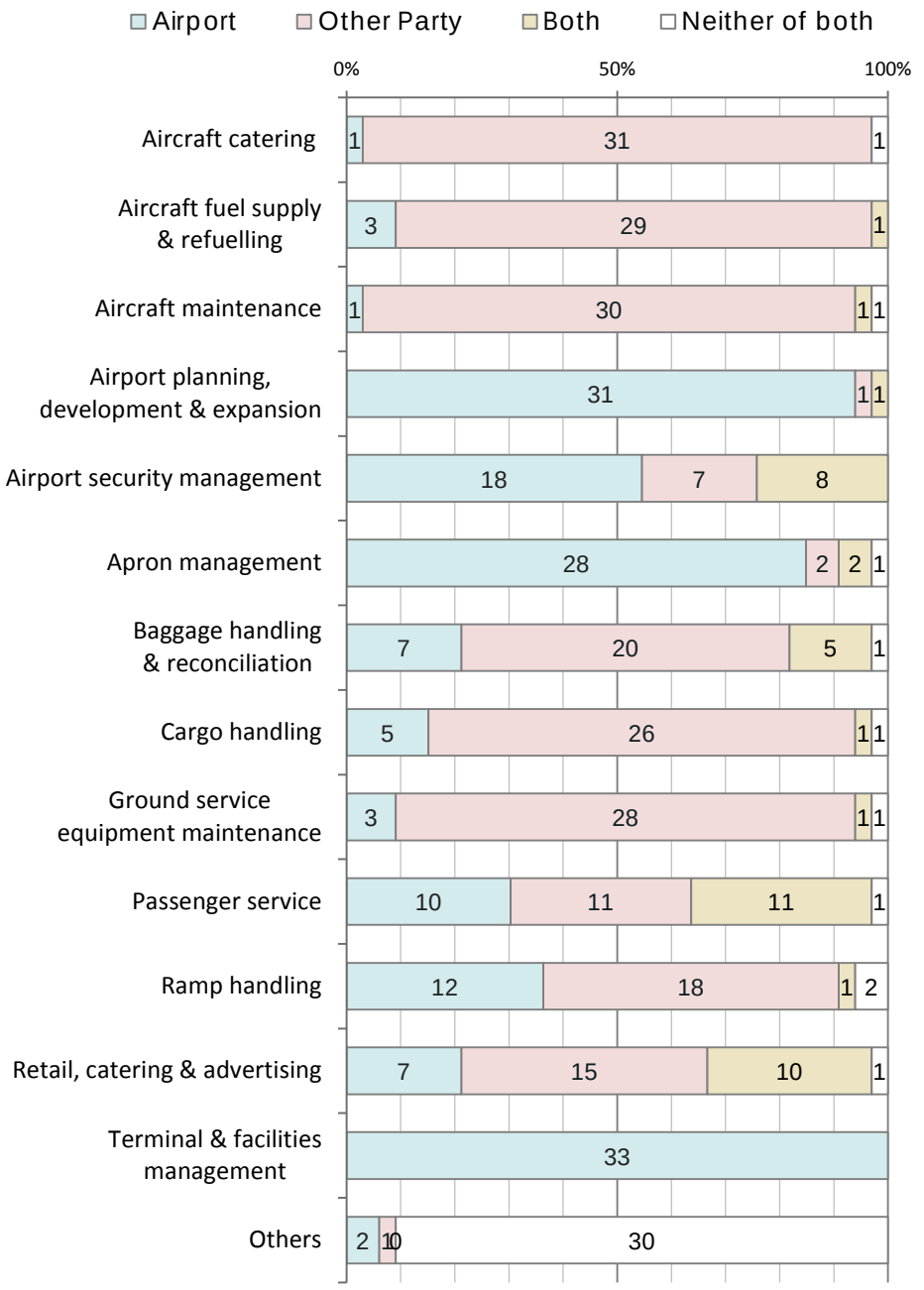

- Total responses : **39** airports
  - ➔ represent **30%** of total airport traffic in Asia-Pacific
- Well-distributed samples in terms of airport size, covering both small and large airports
  - ➔ the largest group is airports with traffic of **5-15mppa**

## Scope of responsibility

*Please indicate the party(ies) responsible for delivering the following services*

*Examples for other party include airlines, aviation service providers, business partners, government authorities, etc.

0.12



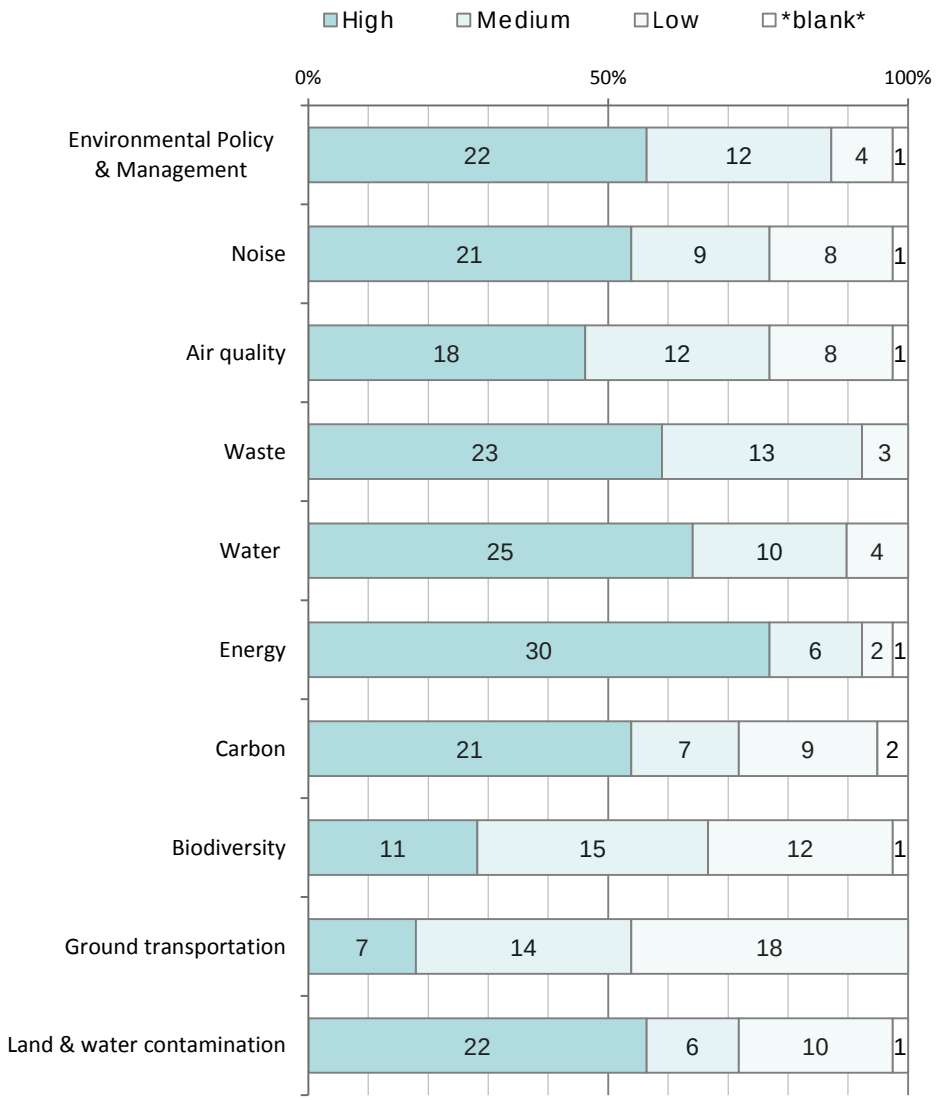

* 6 airports are not included in this question because no updates were provided on 2015 survey

- In general, airport operators take full responsibility for activities directly related to managing and developing the airport premises and facilities, including **airport planning**, **development & expansion**, **terminal & facilities management**, and **apron management**.
- Airports rarely render services related to aircraft/airline related activities, including aircraft catering, aircraft fuel supply & refueling, baggage handling reconciliation, cargo handling, and ground service equipment maintenance.

# Overview

## Management priority

Please indicate the management priority of your airport for the 10 environmental aspects covered in this survey. 0.14

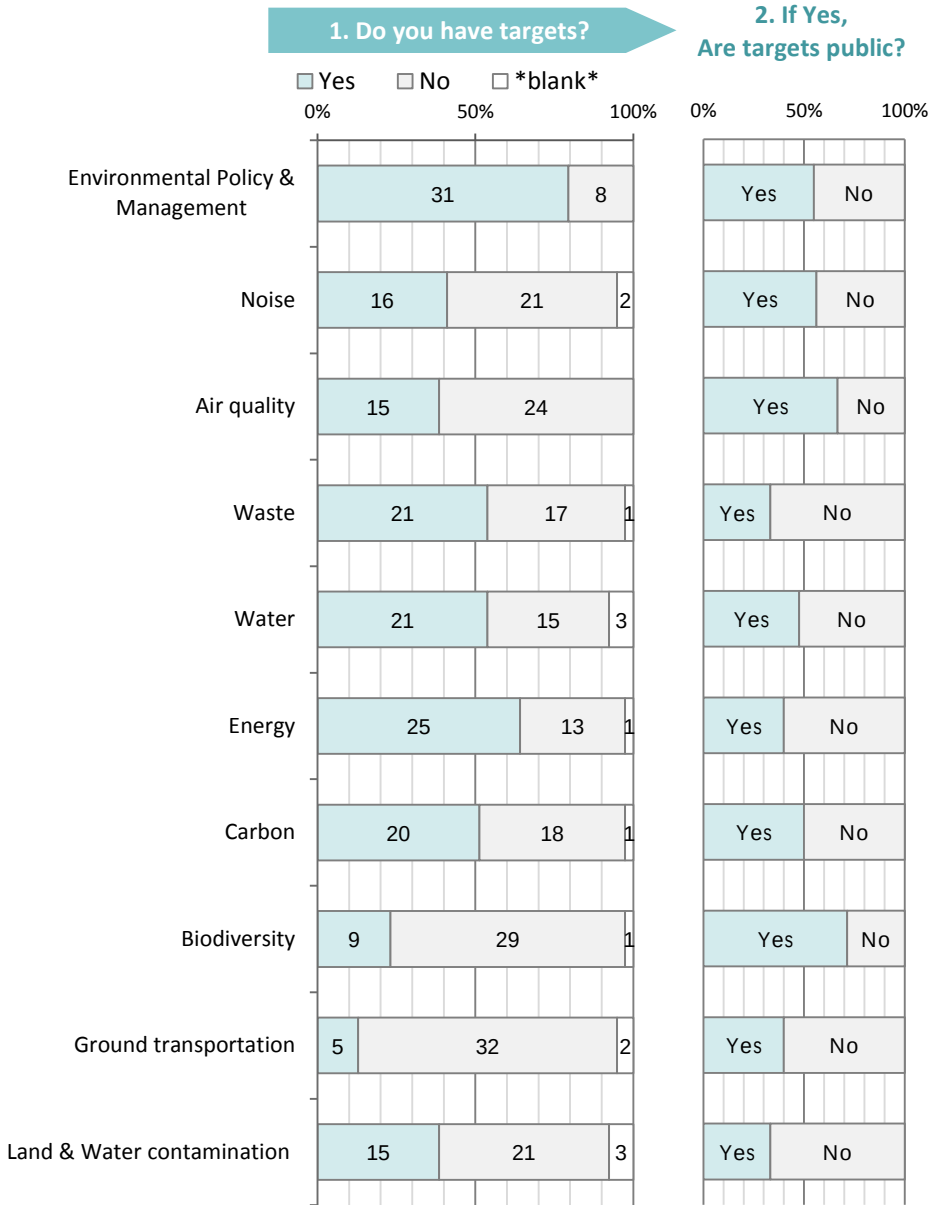



- **Energy**, **water**, and **waste management** are the **top priorities** among responding airports.
- Over half of the respondents also put **high priority** on **noise**, **carbon**, and **land & water contamination management**.
- **Ground transportation**, **biodiversity**, and **air quality** considered less of a priority among the respondents.

## Environmental targets

Does your airport have any targets for the 10 environmental aspects covered in this survey? / Are the targets available to the public?



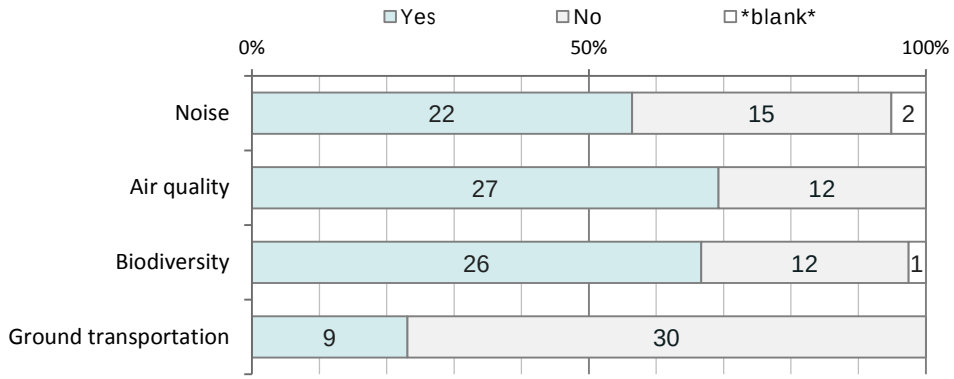



- **The majority** of responding airports have a target on **environmental policy and management**.
- **About half** of the airports also have an environmental target for **energy**, **waste**, **water**, and **carbon** managements.
- While less than half of responding airports set a target for **noise** and **air quality**, the targets are published publicly in many cases if such information is available.
- Airports rarely set targets for **ground transportation** and **biodiversity**.

## Direct responsibility

### Do you have direct responsibility or control for the following environmental aspects?

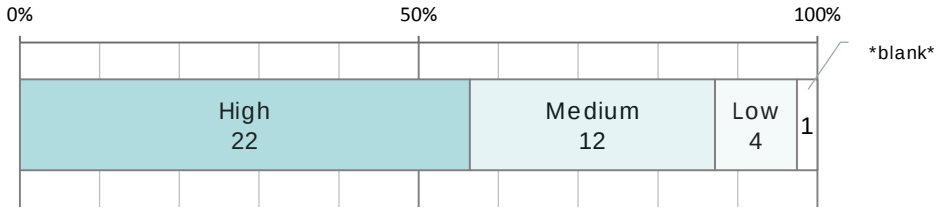
2.01 3.01 8.01 9.01




- **The majority** of responding airports have direct responsibility / control over **air quality** and **biodiversity**.
- **About half** of the airports have direct responsibility / control over **noise.**
- **Most airports** do not have direct control over **ground transportation**.

# Part 1. Environmental Policy and Management

## Management priority




**Over half** of responding airports place high priority on **environmental policy and management**

## Summary

In an effort to maintain sustainable airport management, more and more airports recognize the need and place a high priority on setting environmental policies and rules to govern day-to-day operations. The survey results show that the majority of responding airports have a written **environmental policy**, which is often made available to the public. Setting **environmental objectives and targets** is also a common practice.

The majority of airports have a register of **environmental aspects and legislation** in place to ensure airport activities and operations are compatible with environmental requirements. **Roles and responsibilities** are clearly defined and well communicated both internally and externally to ensure that airport stakeholders recognize what needs to be done at airports.

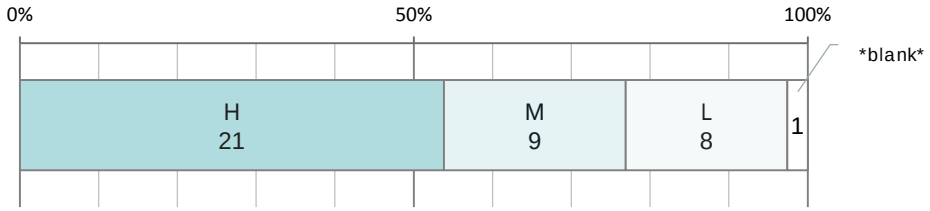
Various internal efforts are being made at a number of airports to provide **environmental training** for employees and to conduct a **review of environmental performance** on a regular basis. Most airports have an **Environmental Management System (EMS)** to address environmental issues based on a defined set of rules, but many of them are not certified under an international standard such as ISO14001.

Other environmental initiatives reported by the respondents such as **community engagement** programs to disseminate information on efforts being made by airports to neighboring communities through meetings, forums, publications social events, etc. **Green procurement** encourages airports to become a "responsible consumer," given that airports are often some of the largest spenders in the economy in terms of volume and variety of items they need to procure. However, such an initiative is still uncommon at this point.

**Details to participating airports only**

# Part 2. Noise

## Management priority




**Over half** of responding airports place a high priority on **noise**

## Summary

Airports inherently face technical and complex noise issues. **Noise** can be one of the highest environmental priorities that airports need to cope with, especially when there are substantial number of residents surrounding the airport and flights flying into and out of the airport. As such, over half of the respondents placed a high priority and take direct responsibility on airport noise management.

To mitigate potential noise impact, the majority of airports have developed land use compatibility plans/policies to control land use adjacent to the airport. Such plans/policies are usually developed and/or executed by respective airport operator or civil aviation authority. It is also common for airports to adopt noise contours (e.g. WECPNL, NEF, LDN, etc.) to assess noise impact arising from aircraft operations.

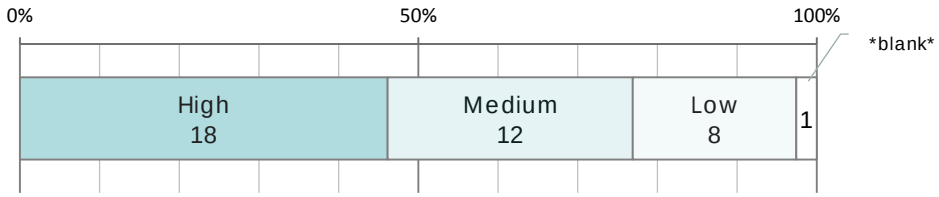
Majority of the airports also encourage airlines to adopt noise-preferred operations such as Noise Abatement Departure Procedures (NADP), Continuous Descent Arrival (CDA), or ground run-up procedures. At some airports, air traffic routes are controlled in order to mitigate noise impacts on affected areas.

However, survey results show that less than half of the airports have introduced noise monitors or noise complaints tracking systems. Restrictive or punitive programs are also less preferred among respondents. Over half of the airports do not place any operating restrictions (e.g. curfews, movement caps, etc.). Just a few airports impose noise-related charges. Provision of noise compensation is rarely practiced among responding airports. Such initiatives may not necessarily be required when affected populations or the degree of noise level is limited at smaller airports or those airports located away from populous areas. It may also be the case that airports do not prefer enforcing stringent initiatives which may harm their competitiveness.

**Details to participating airports only**

# Part 3. Air Quality

## Management priority




**Less than half** of responding airports place high priority on **air quality**

## Summary

The main sources of air pollution at airports are the pollutants emitted from aircraft engines and ground service equipment (GSE) / vehicles and vehicles delivering goods, passenger cargo and services to the airport. Key pollutants include sulfur dioxide ($SO_2$), nitrogen oxides (NOx) and volatile organic compound (VOCs) etc. Air pollution becomes a greater concern as traffic grows, some airports have begun to monitor and manage air quality, often as required by national legislation, etc.

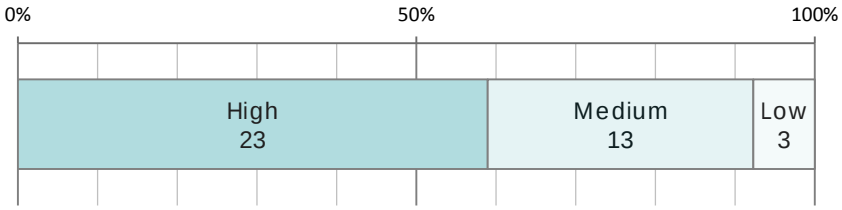
However, the survey results show that less than half of responding airports place high priority on **air quality**. While the majority of airports have direct control over air quality, they do not always set targets or introduce a monitoring system for air quality management.

Airports are making various efforts to reduce emissions. Nevertheless, the adopted measures vary across different airports, and there appears no standard solution to managing air quality at airports. One notable observation is that the use of electric vehicles / GSE is gaining popularity among airports. Some airports put restrictions on aircraft's ground operations such as reduced engine taxiing and banning APU, but such policies that restrict aircraft operation seem less popular among the respondents.

**Details to participating airports only**

# Part 4. Waste

## Management priority




Over half of responding airports place high priority on **waste**

## Summary

The amount of waste that airports handle can be enormous. Correspondingly, the disposal costs borne by the airports and the environmental impacts created by the waste disposal are significant. It is no surprise that over half of responding airports place a high priority on **waste** management.

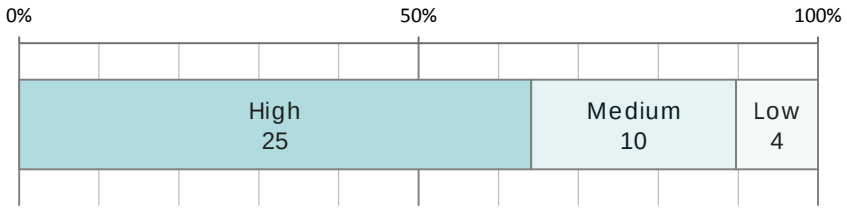
According to the survey results, about half of the respondents set a target for waste management; the more commonly seen target is increasing the waste recycling rate – some airports are as ambitious as to aim at a 50% recycling rate.

It is observed that the majority of responding airports conduct waste recycling and/or source separation as waste reduction measures. More advanced airports, while the number is limited, compost organic waste and incinerate waste for energy as measures for waste prevention and resource recovery (so-called “Zero Waste” initiatives). These waste management programs require all players within airport premises, ranging from airlines to restaurants, to engage, and the airport operator plays a key coordinating role.

**Details to participating airports only**

# Part 5. Water

## Management priority




Over half of responding airports place a high priority on **water**

## Summary

Water management is considered one of the most important environmental aspects, on which over 60% of respondents place a high priority. The demand for water consumption and disposal increase proportionally as traffics grow at airports, where water is consumed for daily operations and activities including potable water consumption at restaurants, running water at bathrooms, aircraft washing, etc. Meanwhile, because of the scarcity of water resources, airports are required to implement water management initiatives to secure sufficient water supply and minimize the environmental damage by overuse and waste water discharge.

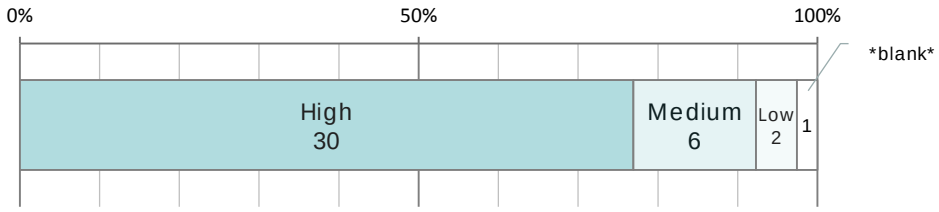
According to the survey results, about half of responding airports have a target related to water & wastewater management. The majority of airports monitor wastewater discharge quality and have installed a system to monitor the potable water consumption.

Popular means of water conservations include reduction of the flow setting of taps to control water usage and installation of water meters/leak detection systems to ensure the efficient use of water. Some airports recycle water and/or make use of rainwater for water conservation.

**Details to participating airports only**

# Part 6. Energy

## Management priority




**The majority** of responding airports place a high priority on **energy**

## Summary

According to the survey results, **energy** is considered the highest priority among the 10 environmental aspects; nearly 80% of the respondents placed high priority on energy. Operating an airport requires an enormous amount of energy for its various large-scale facilities for lighting and heating, etc., and its environmental and economic impacts can be significant. In correspondence to this, the survey results indicate that most airports are actively seeking opportunities to save energy.

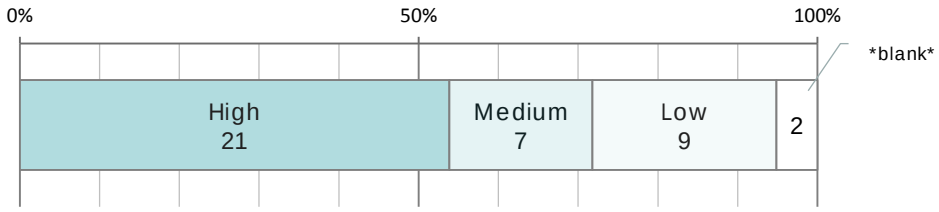
The majority of responding airports have an energy reduction target in place, and they are equipped with an energy monitoring system. However, it is still uncommon to have an energy management system (EnMS); only a few airports are certified with ISO50001 or other certification program.

The most popular energy saving measure adopted by the airports is the use of energy efficient lightings (e.g. LED); over 80% of the respondents indicated that they have already installed them. Automatic monitoring or smart metering system is also widely installed at the airports to help maximize efficient energy use. While the technological advancement and the increased affordability of new technologies clearly have benefited airports, renewable energy has yet to be a major contributing factor in energy management. Some airports reported they have plans in the future to introduce solar energy, which is becoming more competitive with conventional energy sources. It can be foreseen that renewable energy will become a more important factor in offsetting energy costs at airports.

**Details to participating airports only**

# Part 7. Carbon

## Management priority




**About half** of responding airports place a high priority on **carbon**

## Summary

Carbon emission has gained public attention as a global issue and has also been addressed at intergovernmental levels. The aviation industry is considered to be one of the high growth sources of carbon emissions. As part of the aviation community, airports are also gradually taking more active roles in carbon reduction. On this survey, **carbon** is not the highest priority among airports (about half of the respondents placed a high priority). With increasing national/state government engagement, particularly since the Paris agreement, this environmental aspect is likely to gain more significance at airports.

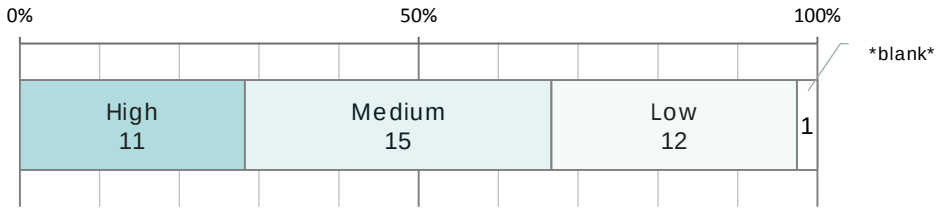
The survey results show that half of responding airports have greenhouse gas (GHG) / carbon reduction targets. More than half of the airports have GHG/carbon quantification system, which covers at least direct GHG emissions (Scope 1) in most cases. Less than half of the respondents answered that they have a GHG / carbon management system.

The most popular means of GHG / carbon reduction measures is to promote energy saving at airports. However, less than half of airports have a program to offset carbon emission. Offsetting carbon emission requires more advanced initiatives with stronger commitment than reduction such as planting trees, purchasing carbon credit, etc. It is hoped that promotion of various carbon management programs, including ACERT, Airport Carbon Accreditation, will lead to a higher number of airports engaging in carbon management initiatives.

## Details to participating airports only

# Part 8. Biodiversity

## Management priority




**One-third** of responding airports place high priority on **biodiversity**

## Summary

Airports are often involved in maintaining **biodiversity** within and/or surrounding the airport premises in order to manage sustainable business and community relations. Nearly 70% of the respondents answered that they have a direct responsibility for airport biodiversity.

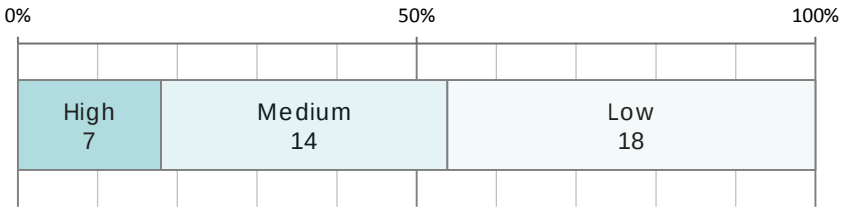
However, the survey shows that not many airports (only one third) placed a high priority on biodiversity. One fourth of the respondents have set targets on biodiversity, and less than half have a biodiversity strategy / management plan.

Some airports shared their active initiatives such as planting trees, wild-life monitoring, and responsible food consumption policy that avoids unsustainably-sourced food items, etc.

## Details to participating airports only

# Part 9. Ground Transportation

## Management priority




Only one-fourth of responding airports place a high priority on **ground transportation.**

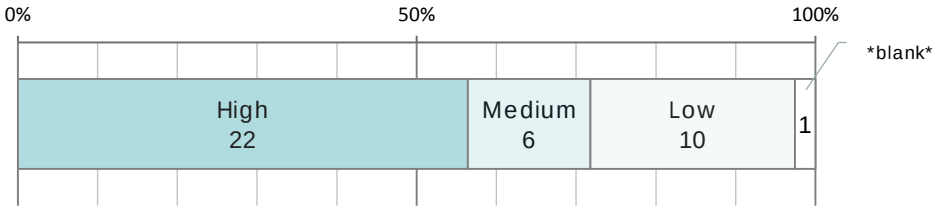
## Summary

According to the survey results, airports in general do not place a high priority on **ground transportation**; just a few airports have a target related to green ground transportation. This is considered mainly due to the fact that airports in general do not have direct control over managing transportation from/to airports.

Nevertheless, 40% of the respondents conduct a transportation mode survey in endeavor to understand passengers' behavioral patterns. Majority of airports also encourage the use of public transportation through various means (e.g. higher parking fees, staff car-sharing, staff discounts on public transportation, etc.).

# Part 10. Land & Water Contamination

## Management priority




Over half of responding airports place a high priority on **land & water contamination**

## Summary

Airports are subject to possible danger from oil or other chemical spillage in the course of day-to-day operations, including aircraft fueling, de-icing, etc. In the unlikely event when an oil/chemical spillage occurs, the environmental impact can be highly detrimental. Naturally, over half of responding airports place a high priority on managing **land & water contamination**.

The survey results show that nearly half of the respondents have a monitoring system for land/water contamination. Moreover, there are procedures in place to manage the release of chemicals at some airports but chemicals dealt at airports vary, and standards on chemical release have yet to be set among the airports.


## About ACI Asia-Pacific

ACI Asia-Pacific, one of the five regions of the Airports Council International (ACI), is based in Hong Kong and represents 101 members operating 574 airports in 48 countries in Asia-Pacific and the Middle-East.

As the only global trade association of the world's airports, ACI represents airports' interests with governments and international organizations, develops standards, policies and recommended practices for airports, and provides information and training opportunities to raise standards around the world. In 2014, ACI Asia-Pacific airports have handled 2.48 billion passengers and 46.3 million tonnes of cargo.

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