

# GREEN REPORT

2010



Incheon  
International Airport  
Corporation



IIAC 2010 Green Report

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## About This Report

Incheon International Airport Corporation (IIAC) has taken pains to achieve the goal of environment-friendly airport operation through the execution of consistent environment management from the stage of airport construction. Since 1996, Green Report has been issued to provide a wealth of information about IIAC environment management and results to stakeholders. IIAC will make every best to create an environment friendly, green airport. And IIAC will also make sure that stakeholders will gain access to transparent information in this arena.

- Guidelines for This Report

2010 Green Report was published based on G3 guidelines issued by GRI (Global Reporting Initiatives) and Ministry of Environment guidelines.

- Period of This Report

The period of report is from January 1, 2009 to December 31, 2009 and for comparison of quantitative performance, recent three years of data were listed up.

- Scope of This Report

Green Report features management activities concerning water quality, air, wastes, noise and performance results. Details will be made known gradually in line with the enforcement of green growth.

- Inquiry About This Report

Inquiry about This Report and additional information can be acquired through IIAC's website and departments concerned.

## CEO's Message

Incheon International Airport Corporation promises to evolve into “The World's Best Green Airport” by pushing its green growth and green airport operation initiative.



Above all, the Incheon International Airport (IIA) intends to become "The World's Best Green Airport" through the steady implementation of its green growth measures and green airport operation initiatives.

Since its opening in March 2001, Incheon International Airport has become a top-tier international airport based on its nine years of successful operation. Incheon International Airport Corporation ranks second in terms of air freight volume and 12<sup>th</sup> in international passengers. Of particular note, Incheon International Airport Corporation has been designated "The World's Best Airport" by the Airports Council International for five consecutive years. Indeed, IIAC's global leadership has been regularly confirmed by its receipt of a number of prestigious awards. Along with continuously adopting change and innovation, Incheon International Airport Corporation is at the forefront of green growth efforts in response to social demands, including measures to mitigate global warming.

In recent years, IIAC has earnestly implemented green growth initiatives for the purpose of reducing greenhouse gas emissions. Ongoing efforts include the development of a pilot project to promote renewable energy, measures to enhance energy efficiency, and use of light-weight containers. The significance of green growth, which maximizes the synergy of environmental and economic benefits as part of a virtuous circle, is evident from its potential to drive economic development. In fact, a green growth paradigm is now being actively pursued by the public and private sectors.

In response to the demands of the times and government policy, IIAC is resolute in its commitment to push ahead with a green growth campaign and environment-friendly airport operation initiatives, which will enable Incheon International Airport to become "The World's Best Green Airport."

Thanks to the forward momentum of last year, 2010 is poised to be the year in which IIAC takes another leap forward. Amidst fierce market competition and a rapidly changing business environment, all IIAC employees are fully committed to transforming Incheon International Airport into a global airport, where people and nature and human coexist in harmony.



**Chae Wook Lee**

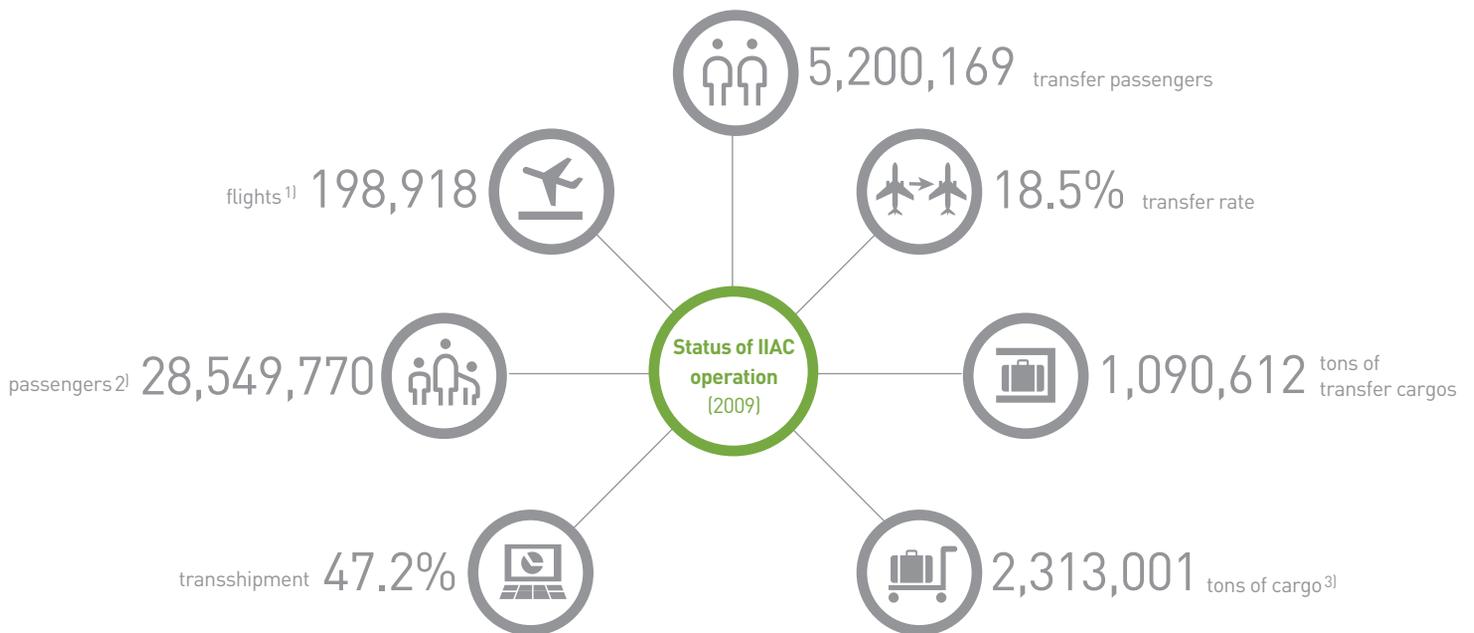
President & CEO

Incheon International Airport Corporation



# Incheon International Airport

Incheon International Airport serves flights to 177 cities in 62 countries. It ranked 12<sup>th</sup> in terms of international passengers, epitomizing the steady growth of the airport. For six years, 3 trillion won have been invested into IIAC's second-phase expansion, along with a cumulative work force of 3.5 million. Incheon International Airport is the first airport that has been chosen as the world's best airport in ASQ (Airport Service Quality) by Airports Council International for five years in a row. Based on the world's best security system, safety infrastructure and environment management, Incheon International Airport is charting a new roadmap for future airport growth.



1) Flights: A 5.8% reduction was registered due to the downturn of economy, the appreciation of Korean currency, air fare hikes and other reasons.

2) Passengers: The number of passengers declined 4.8% over the previous year, adversely affected by the appreciation of Korean currency, less demand on trips overseas and outbreak of new flu.

3) tons of cargo : A 4.6% cut was reported to the sluggish economy and steep hikes in oil prices.



Corporate name	Incheon International Airport
Representative	Chae Wook Lee
Location	2850, Unseo-dong, Jung-gu, Incheon Metropolitan City
Number of employees	859 (standing directors included)
Sales revenues	1,186,560 million KRW (as of December 2009)
Runway	3 runways (56,060,000 m <sup>2</sup> )

Ramp	Passenger ramp: 2,440,000 m <sup>2</sup> , Cargo ramp: 740,000 m <sup>2</sup> (108 units for passenger aircraft; 36 units for cargo aircraft)
Passenger terminal	500,000 m <sup>2</sup> Boarding Building 170,000 m <sup>2</sup>
Traffic center	250,000 m <sup>2</sup>
Flight safety facilities	Control towers, radars, aeronautical lightning
Free trade zone	Freight terminal 1.1 million m <sup>2</sup> , Airport logistics area 990,000 m <sup>2</sup>

## Milestones in 2009

### Airport Operation

- Efforts to induce flights and expand air routes (As of Sept. 2009) (The number of 47 airlines which made flights 109 cities has surged to 62 airlines serving 177 cities)

### Safety and Security

- CART-11lb (landing is possible within 100-meter visibility distance) landing status is preserved.
- Navigational and safety facilities have been in operation without interruption for seven years since IIAC's opening
- Navigational and safety facilities have been operated for 70,000 hours without interruption

### Service Improvement

- Gained ASQ for five consecutive years
- Received the "World's Best Airport" prize from Global Traveler for four consecutive years (Jun. 2010)
- Selected as the world's best airport by Skytrax (Aug. 2009)
- Selected by the world's best airport by U.S. Business Traveler (Dec. 2009)
- Gained the CAPA airport city of year award (Oct. 2009)

### Improvement of Financial Structure

- IIAC has recorded large-scale profit since 2004, four years since its opening

### Airport Infrastructure Expansion

- A blueprint for IIAC's third-phase construction was announced (Jun. 2009)
- 72.8% of the airport's logistics complex was leased (Dec. 2009)
- Work was launched for the second-phase logistics complex (Nov. 2009)
- Private investment in International Business Area (two hotels, 1 business, 4 offices)
- Development of idle land around the airport (1 72-hole public golf course, two golf exercise centers)
- A magnetic levitation pilot line announced (Apr. 2009)

### Management Innovation

- Selected as Korea's most respected enterprise for three years by KAMC (2008, 2009, 2010)
- Gained AA status in the family friendliness index (Dec. 2008)
- Gained the "New Price Grand Prize" in a new product forum (May 2009)

### External Citation

- Honored as an outstanding human resources development entity (BEST HRD)
- Gained ISO1400/9001 on airport operation and construction
- Received ICAO accreditation on airport operation



# How we reduce our environmental impact

3.68%

Environment expense against  
operating profit



21.09  $\mu\text{g}/\text{m}^3$

Indoor air quality (PM10) of  
Passenger Terminal  
(Legal requirements 150 $\mu\text{g}/\text{m}^3$ )



1.71 million ton

Recycling of gray water



Creation of an environment-friendly airport in which nature and human beings become “one” is the main objective of Incheon International Airport Corporation. We operate a diverse range of environment pollution prevention facilities under the basic principles of environment management in order to minimize environment impacts of airport operation.

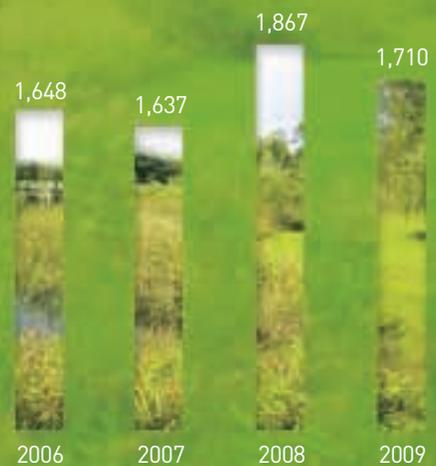


Indoor air quality (PM10) of passenger terminal (PM10  $\mu\text{g}/\text{m}^3$ )

(Legal requirements 150 $\mu\text{g}/\text{m}^3$ )



Recycling of gray water (1,000 tons)



### Airport & Noise

Incheon International Airport was constructed as a marine airport in order to minimize aircraft noise from the stage of airport planning. With a view to consistently reduce aircraft noise, Incheon International Airport and airlines make best efforts to share information about aircraft noise and analyze related data for low noise through improvements in flight procedures.



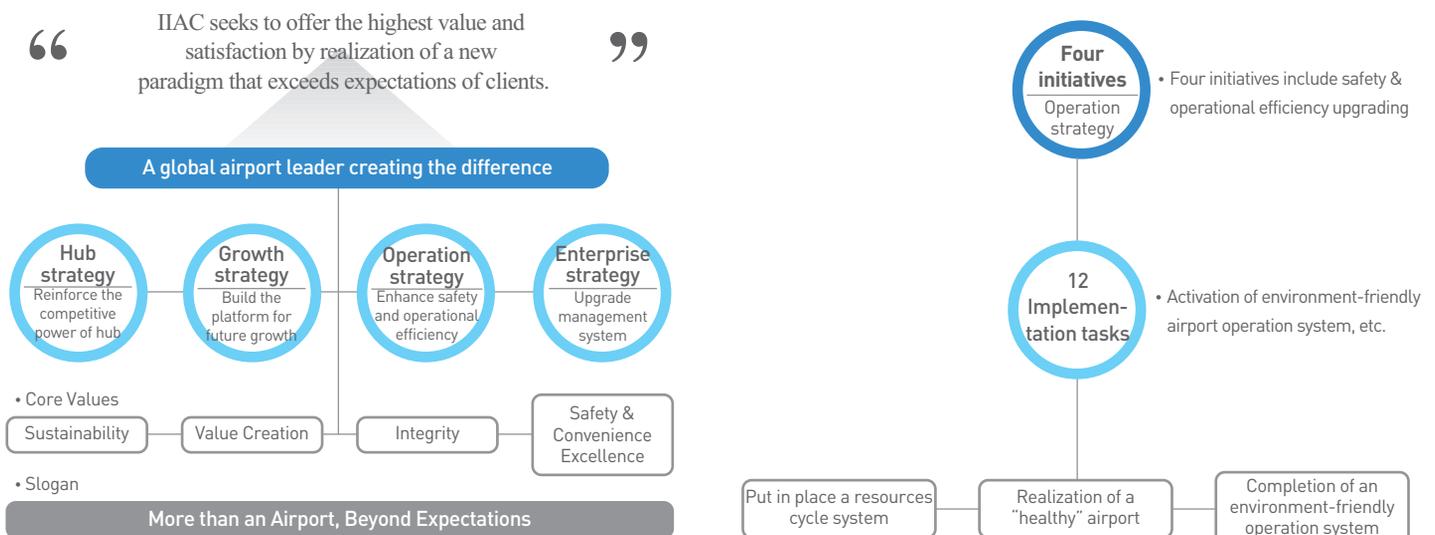
A ceremony marking the declaration of "Global IIAC 2015 Vision"

# Environment-friendly Green Growth Strategy of IIAC

## Global IIAC 2015

In December 2009, IIAC declared a "Global IIAC 2015" initiative, a new strategy for environment-friendly airport operation. "Global IIAC 2015" features four main initiatives including strengthening of its hub function as a leading global airport enterprise, building a solid foundation for future growth, enhancement of safety and operation efficiency and upgrading of management systems. It also adopted 12 priorities.

Of note, IIAC worked out implementation programs in the area of environment, including setup of a resources cycle system, materialization of a "healthy" airport and environment-friendly operation system. IIAC is determined to complete these initiatives by 2015.





A ceremony marking the declaration of "Global IIAC 2015 Vision"

## Activation of environment-friendly management system

### Directives on environment and energy management

IIAC has adopted and adheres to its policies on environment and energy in order to evolve into a responsible social enterprise through creation of an environment friendly, green growth airport. The policy on environment calls for setting environmental goals and minimizing environmental impacts through consistent environment improvement.

Furthermore, it pursues sustainable growth through systematic implementation of IIAC's environment management system. The policy also calls on all the employees to thoroughly implement its energy management system in response to climate change through the reduction of greenhouse gas emissions.

IIAC is strongly committed to upgrading its environment and energy management system through education and training of partners, supervisors and contractors as well as the employees.

### Environment management policy

- Adhere to environment law-related laws, regulations and international pacts
- Control generation of environment pollution resulting from airport operation and construction of new facilities and minimize environmental impacts on nearby areas
- Formulate and activate plans for environmental goals and improvement and implement a positive and systematic environment management system through regular performance assessment.
- Improve transparency on environment management by providing related information to stakeholders
- Build close partnerships with local communities and NGOs in an effort to operate and build environment-friendly facilities.

### Policy on energy management

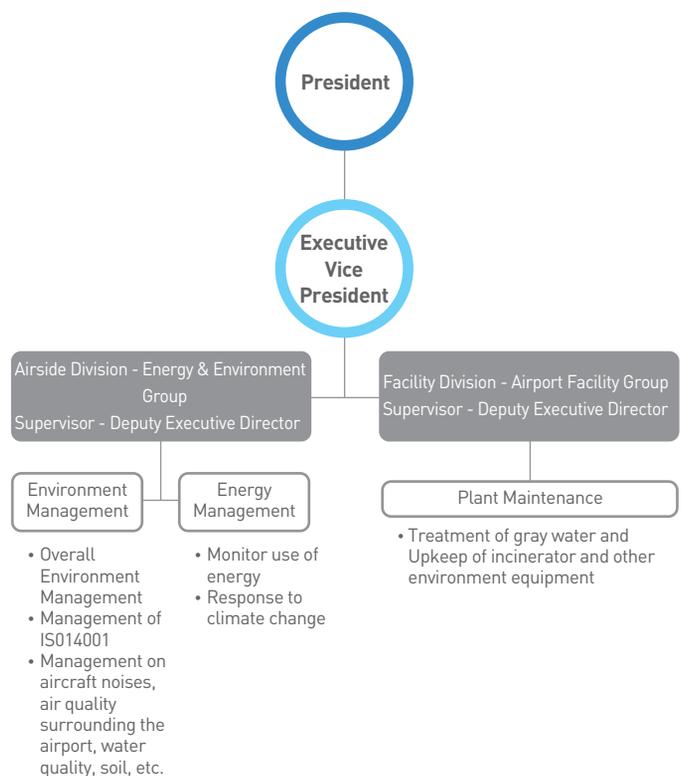
- While regarding efficient energy use as IIAC's priority, create enterprise value through positive energy management
- Fulfill its social duties as a public enterprise by purchase and use of energy saving items
- Elevate energy self-reliance by expansion of new, renewable energy in airport operation and construction and reduce greenhouse gas by cutting down on usage of fossil fuels.
- Actively assist all the employees and partner firms in energy-saving education and energy management activities
- Follow through domestic and foreign energy-related laws and regulations, strive to upgrade energy management and open to the public its results.
- Set energy management goals, along with energy improvement plans. Put a positive and systematic energy management system in force.

## Environment management goals

Based on "Global IIAC 2015," IIAC formulates its environment management strategy, reinforce its capabilities for environment management and implement tasks by limiting environmental impacts. For this purpose, IIAC, which set environment management KPI, seeks to improve environment by 5%. KPI, set by environment related departments in order to achieve environment goals, is used to measure improvement in environment management on airport operation and construction

## Environment management organization

IIAC operates an environment organization consisting of staff devoted themselves to handling environment issues. The Facility Division has a plant facility team, while the Airside Division operates three organs, including environment management team and energy management team. These organs conduct professional and mutually cooperative activities on environment management. Management on environment oversight facilities, treatment of gray water and resources recovery are commissioned to three professional business partners.





# Environment Management System

## Environment management structure

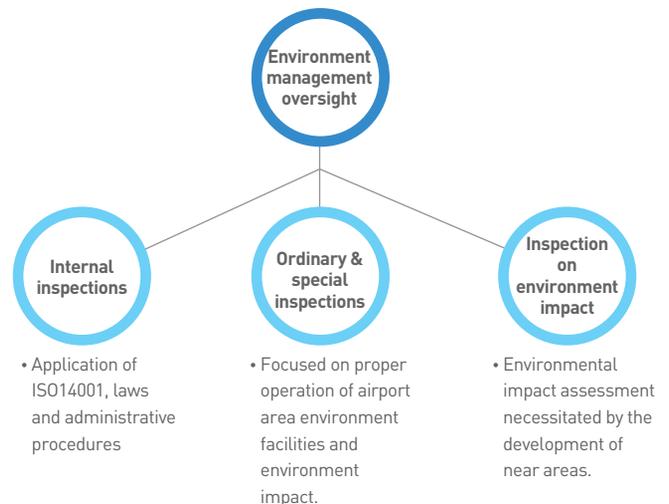
**Oversight on environment management**

Incheon International Airport Corporation conducts guidance on environment management through various means including on-site inspection, confirmation and education in order to assess the status of environment management on airport construction activities. Guidance is consisted of internal examination, ordinary & special inspection and research on environment impacts. Of particular note, in 2009, IIAC conducted general inspections involving deicing of aircraft in the A/S area, waterways, water reservoirs, dust, handling of wastes and washouts in spring times. When inspections are under way, active communications occur with personnel involved, so that suggestions and opinions are actively reflected into environment management programs.

**Status of ISO14001 certification and management**

Incheon International Airport Corporation, based on its environment management system, tries to minimize environment effects of airport operation and facility construction. For the first time in the world, Incheon International Airport Corporation obtained ISO14001 on airport construction in 1998 and airport operation in 2002. Every year, Incheon International Airport Corporation improves its environment

management system through inspections on compliance with regulations and prevention of pollution from the certification agency. In addition to external inspections, internal environment inspection repeatedly applies to the PDCA (Plan-Do-Check-Act) cycle to find out whether the environment management systems works properly and actual improvement is made.





**Surveys on environment Impacts** IIAC conducts environment impacts in a bid to minimize environment effects resulting from airport construction, operation and other projects. This survey is commissioned to an outside professional entity in order to increase the professionalism and objectiveness of environment surveys. Efforts are focused on surveys on water quality in seas and detection reservoirs, bad smelling, disorder of electric waves, and soil pollution. As a preventive measure, we conduct environment impact assessments. Based on results, measures are taken to minimize environment effects in areas nearby the airport or on nature. Incheon International Airport Corporation strives to put environment impacts resulting from new facilities, operation and other projects to a minimum.

### Environmental monitoring and responsive system

To consistently monitor environment impacts on airport operation, Incheon International Airport Corporation operates an environment surveillance center. Environmental surveillance is focused on water quality and noise around the clock. Targeted are 18 noise monitoring centers around the Incheon International Airport Corporation and three air measurement centers. Results of the noise and air monitoring are open to the public via Incheon International Airport Corporation website. Results of noise measurements are also delivered to airlines and related agencies.

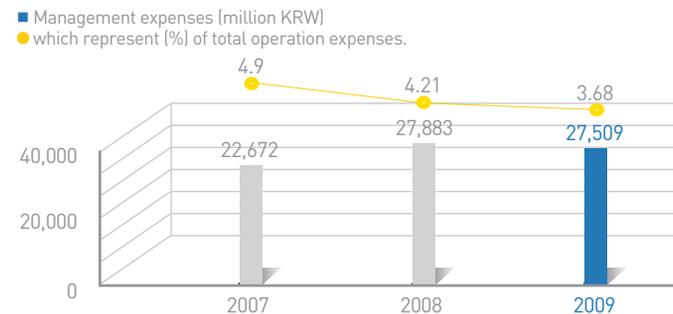
### Emergency response

Incheon International Airport Corporation has set up a phase-by-phase responsive system to cope with environment emergencies. To effectively cope with environment pollution incidents, environment incidents are classified by type. In the case of a minor incident, the Situation Headquarters (Environment Management Team at day and Situation Control Center at night) is involved. It provides anti-disaster materials (oil fence, oil absorption paper, etc.) to facilities hit by incidents and then participate in anti disaster efforts and put a disaster under control.

### Environment accounting

Incheon International Airport Corporation classifies expenses paid for environment improvement and management into three sectors every year. In 2009, such expenses totaled KRW27,509 million KRW, which accounted for 3.68% of total operation expenses.

#### Environment improvement and management expenses





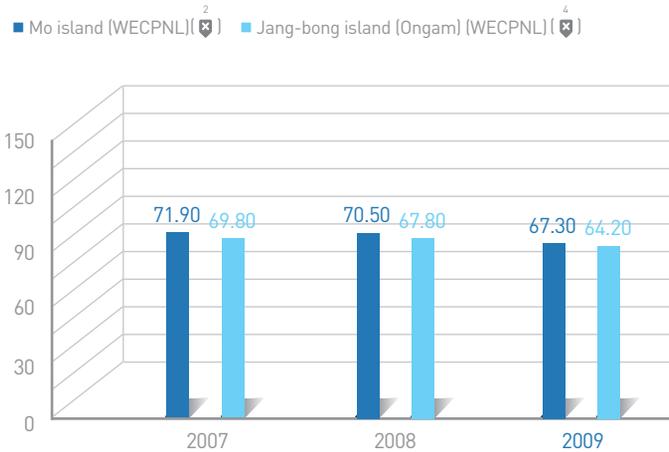
Water reservoir west of IIAC

# Noise Control

## Monitoring of aircraft noise

In 2009, aircraft noise in areas surrounding Incheon International Airport was measured as 42.2-71.2 WECPNL on average. Compared to 2008, noise levels were slashed by 1.4%-5.3% in 2009 at noise-sensitive areas in Jang-bong, Jang-bong (Ongam), mo island

### Aircraft noise at noise-sensitive areas (WECPNL)





Mobile environment surveys



Aircraft noise measurement stations



Aircraft noise measurement

## Cooperation sought for abatement of aircraft noise

Incheon International Airport Corporation analyzes aircraft noise levels constantly and deliver results to Seoul Regional Aviation Administration and airline companies in a bid to induce them to reduce aircraft noise. Of note, Incheon International Airport Corporation has urged low noise since 2001, based on analysis of freighters, aircraft flying at night and operation of aircraft generating high noise. As a result, while operations of aircraft have been on the rise, the number of high noise aircraft has decreased on a daily basis.

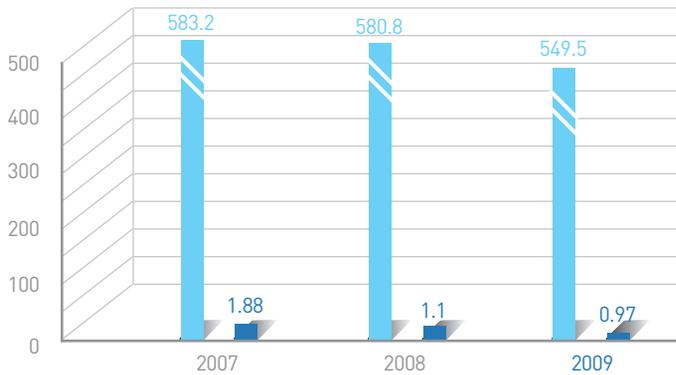
### Standards for high noise aircraft

- Jang-bong island (Ongam): Aircraft generating noise more than 83dB(A)
- Other areas: Aircraft generating over 80dB(A)

\*Jang-bong island (Ongam) measurement standard is based on 2008 data on aircraft noise

### The number of high noise aircraft against all aircraft in operation

■ Operation of all aircraft (number/daily) ■ High noise aircraft (number/daily)



## Measures to reduce aircraft noise

Incheon International Airport Corporation has completed an anti-noise project in 2007 at the request of residents of Mo island and Jang-bong island north of the airport. Afterwards, noise levels at the areas dropped to 6dB(A).

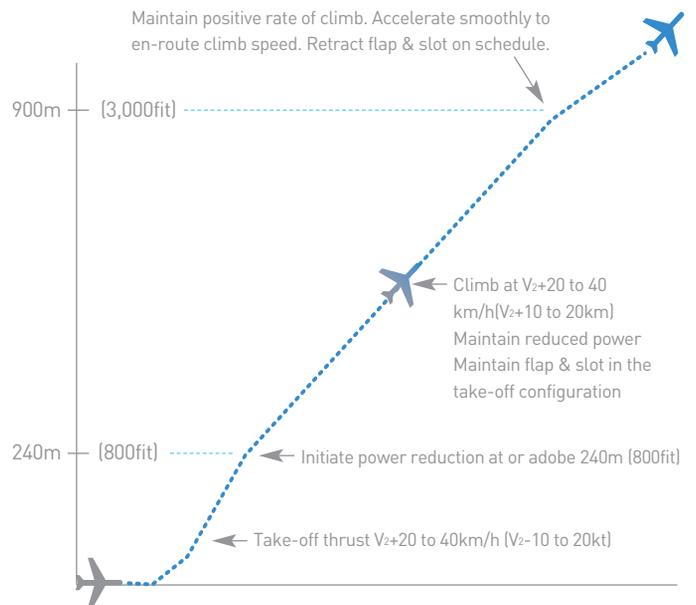
## Noise assessment commissioned to external entity

Incheon International Airport Corporation had outside specialists conduct surveys on aircraft noise in step with the operation of the Third Runways. When the assessment got underway, opinions of residents were expressed in selection of survey areas. IIAC explained results to people living in Bukdo-myeon, Ongjin-gun, Ganghwa-gun, and Yong-yu island, Junggu. These activities were notified to Seoul Regional Aviation Administration as well.

## Airside procedures for low noise

Incheon International Airport Corporation introduced and operates NADP1,2, in order to mitigate noise levels. Procedures that restrict aircraft operation at residential areas at night are in effect.

### NADP1: Noise Abatement Departure Procedure 1



※ NADP1, NADP2(Noise Abatement Departure Procedure)  
Procedure to abate noise at takeoffs. (ICAO DOC8165)



IIAC Incinerator

# Disposal of Wastes

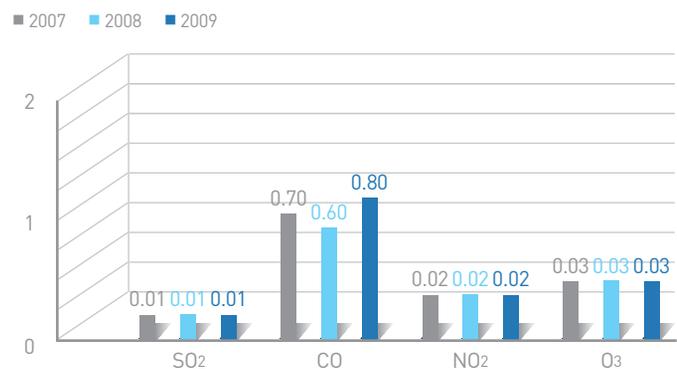
## Air pollutants

IIAC operates three air quality measurement stations, including the New Airport City, around the clock for analysis of air quality of aircraft and vehicles operating nearby. In 2009, no noticeable change in air quality has been found in the Newtown, Yeong-jeong island and airport area. analysis show that air quality around the airport is in good shape. In addition, IIAC uses vehicles to monitor air quality in areas. We also check vehicle exhaust fumes operating in the airport, as part of our efforts to cut down on exhaust fumes. In an effort to reduce the occurrence of fugitive dust, which originates at construction sites, IIAC installed belt conveyers to transport soil and stones that cause PM 10. Furthermore, IIAC operates a variety of anti-pollution devices, such as incinerator, SDR (Semi-Dryer Reactor), equipment to input activated carbon and Selective Catalytic Reactor.

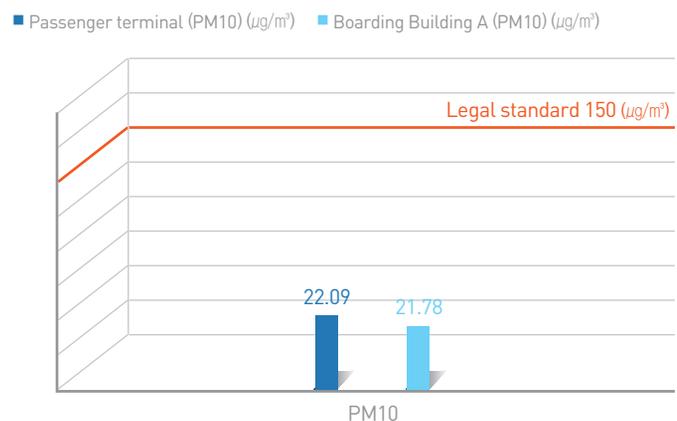
### Incinerator (kg)

	2007	2008	2009
Sox	973.00	406.60	467.84
TSP	306.00	156.20	131.60
HCL	230.96	214.41	121.86
Nox	1,464.80	1,367.60	1,032.60

### Air pollutants( $\mu\text{g}/\text{m}^3$ )



### Indoor measurement of air quality





Incinerator



Water quality analysis room



Aircraft De-icing

## Water quality management

Incheon International Airport Corporation separately operates gray water and gray water treatment facilities for efficient treatment of wasted water originating from airport operation. Daily, about 30,000 tons of "living sewage" and wasted water were generated. About 59% of gray water are recycled for gardening, toilets and cooling water. In addition, Incheon International Airport Corporation operates five facilities that treat rainfalls in early times, minimizing the effect of the pollutants, like oil, by washout by rainfall from precipitation. Won-unit assessment of water pollution materials released from wastes in 2009 showed that except total nitrogen, COD, BOD, SS and TP all declined over the previous year.

Operation status of gray water treatment facility (g / million KRW)

	2007	2008	2009
COD	11.64	10.01	7.91
BOD	0.97	0.34	0.70
SS	1.07	0.86	0.96
TN	7.53	7.49	5.72
TP	0.27	0.23	0.31

## Soil pollution control

IIAC conducts regular checks in order to preserve soil ideally in line with the provisions of Soil Environment Preservation Act. In 2009, Incheon International Airport Corporation implemented inspections on pollution and leakage on the underground oil storage facility of "Power Station A" that is subject to legal management. The facility was in excellent shape, however.

## Release and recycling of wastes

In 2009, IIAC reported a total of 14,253.8 tons of wastes, of which 7,237.25 tons were recycled. Of total, 45% were incinerated, 50.8% were recycled and 4.2% were buried. We operate a recycling center that is equipped with can compressors and separators for operation of an efficient resources cycling system and incinerator that burn

flammable items. In 2009, 15,143 tons of inflammable items were incinerated, down 0.9% from a year earlier.

A resources management center is under construction for efficient management of wastes and enhancement of recycling. Completion is due in 2010. In the case of wasted construction items, they are handled by external waste treatment firms or incinerated by the airport. IIAC conducts monitoring through monthly checks into the treatment of wasted materials by construction companies to consistently reduce the volume of wastes.

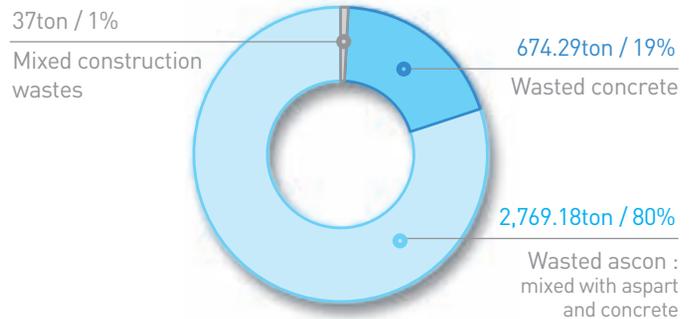
### De-icing PAD and wasted water treatment

- IIAC operates eight De-icing PADs at eight places, including south of the passenger terminal and north of aircraft maintenance shop. Ice off aircraft is stored at a storage tank and handled by an outside specialized firm.
- \*De-icing refers to the work to remove ice or frost off the surface of aircraft in winter times. De-icing is vital to safe flights of airliners.

### Status of wastes



### Recycle of wastes in 2009





Environment-friendly soil/stone conveyer belt

# Construction Environment Management

## Management of construction wastes

IIAC properly manages construction wastes under the provisions of both the laws on promotion recycling of construction wastes and management of wastes. IIAC files reports on wastes in all construction sites inside the airport and presents its construction waste disposal plans to related government agencies.

## Management of water quality and topography

IIAC conducts management of water quality and topography of all airport construction sites including a geographical formation around the free trade area and the project to remove the hills. Of particular note, we always set up soil erosion prevention facility in the times of development of quarries.

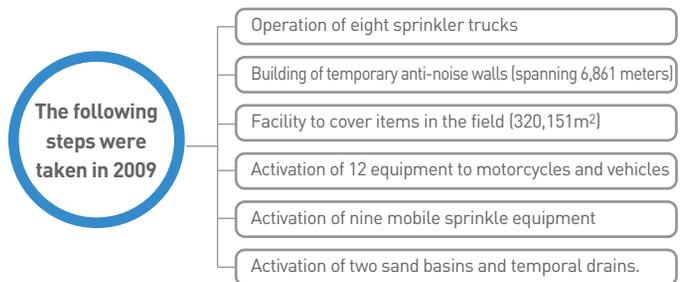
## Noise and vibration

We consistently endeavor to minimize noise coming from construction sites. Nightly work and use of explosives nearby residential areas are strictly restricted. When explosion is urgently required, we make it a rule to inform residents nearby in advance about the construction activity.

## Air quality management

IN 2009, IIAC mapped out a program to control PM10 (Particulate Matter 10) arising from construction work. The program features introduction of motorcycles-washing facility, operation of sprinkler trucks, setup of dust-proof facility, recruitment of regular janitors and restriction of driving speed to less than 20km/hr.

### Measures to reduce PM10 at construction sites





Water reservoir park north of IIAC

# Assessment of Environment Impacts

## Water quality at water reservoirs

IIAC conducts water quality checks into water reservoirs four times in the southern, northern and eastern areas of the airport every year. These checks are focused on 20 items, such as Do, COD, T-N, T-P, etc. Checks done in 2009 showed that the water quality of detention reservoirs was lower than the targets (COD 8mg/L, DO 5mg/L, etc.)

## Sea waters quality

IIAC administers checks into water quality of nine peak points in the seas near the airport (three located near water reservoirs) four times every year. The checks are designed to measure six areas of general quality and four heavy metals. Results of 2009 ocean water quality showed Ph 1-11 concentration and COD 11 concentration on average. Heavy metals were found lower than the standard concentration. (Surveyed in May, 2009)

## Preservation of ecosystems

IIAC conducts surveys on marine and ground ecosystems nearby the airport four times every year. We thus are involved in consistent management of ecosystems.

### Birds

IIAC also conducts surveys on birds surrounding the airport twice a year. In 2009, a total 25,533 birds of 66 types were spotted in the spring and fall. Dominant species were snipes and water birds, followed by seagulls and natatorial birds.

### Marine ecosystem

- Phytoplankton: The phytoplankton in surveyed areas numbered 59 in summer (July) in 2009 and totaled 497,926 cells/ℓ on average. In fall (October), 204,951 cells/ℓ of 61 species were reported.
- Zooplankton: The zooplankton in surveyed areas numbered 24 in summer (July) and averaged 324.4 ind./m<sup>3</sup>.  
\* Ind./m<sup>3</sup> : Individual No. of zoo-plankton per m<sup>3</sup>

### Ground ecosystem

- Plants: In 2009, the volume of plants in surveyed areas totaled 212,661 tons, of which net production volume stood at 56,741 tons.
- Animals: Mammalia in surveyed area numbered five species and eight species in 2009, respectively, and herptiles stood at three species and five species. Insects totaled 33 species and 73 species, respectively.

# How we go Green

6,779  $tCO_2$

Reduction of greenhouse gas emissions



7%

Energy saving compared to 2008

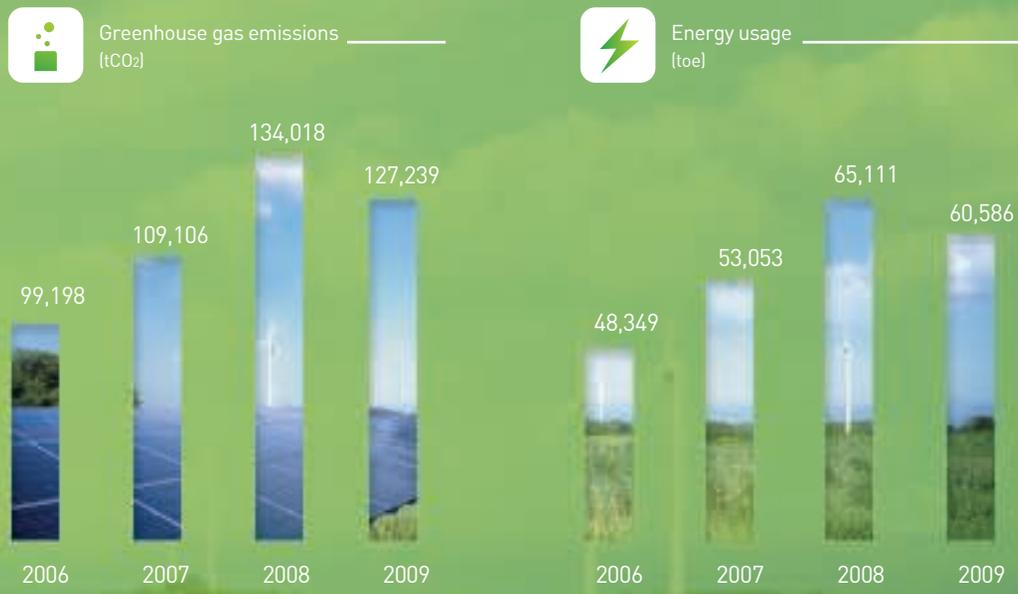


4.3%

Participates in Carbon Neutralization program of Gray Water Treatment Station (in proportion of volume of release)



IIAC, as a preminent airport enterprise, is committed to green management in an effort to evolve into “The World’s Best Green Airport.” At the same time, IIAC contributes to “low carbon green growth.” To realize green management, we are combating climate change through reductions of greenhouse gas emissions that are generated from airport operation and pushing greater energy efficiency



#### Efforts to cut greenhouse gas emissions

IIAC constantly invest in new, renewable energy facilities in order to cut CO<sub>2</sub>. A Renewable Energy Demonstration Complex is now in operation. More renewable energy development facilities are due to be brought in during the third-phase airport construction

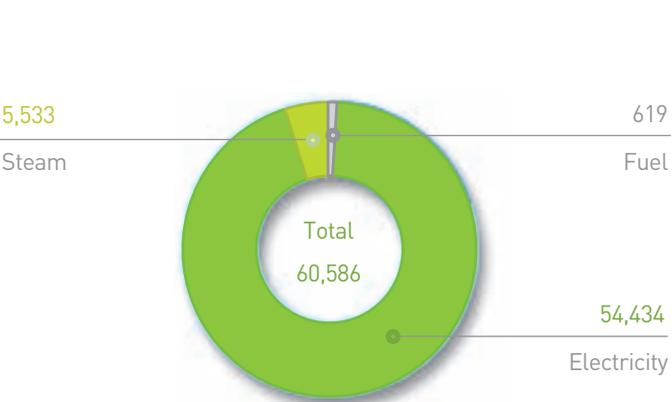


# IIAC's Energy Consumption and GHG Emissions in 2009

## Energy usage analysis

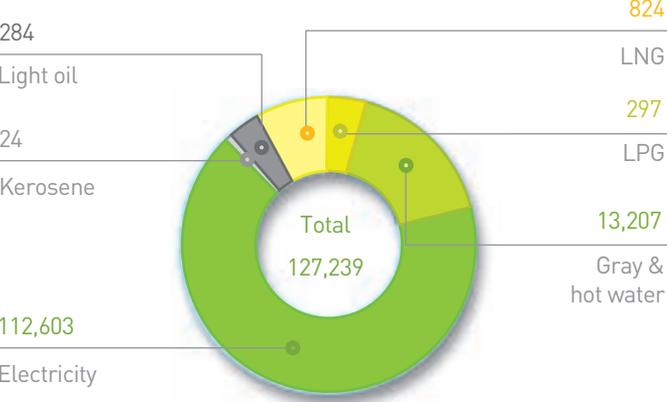
**Analysis of energy usage** The volume of energy used in IIAC's passenger terminal and other airport facilities was cut from 65,111 toes in 2008 to 60,586 toes a year later. Major energy sources are electricity and steam. In 2009, electricity accounted for 90%, with steam being limited to 9%. These energy sources represented 99% of total energy usage in 2009. We will not slack our efforts to save energy and increase energy efficiency in the years ahead.

Energy usage (2009)  
(toe)



**Greenhouse gas emissions** Most of greenhouse gas used in IIAC's passenger and airport operation facilities resulted from energy usage. IIAC generated a total of 134,018tCO<sub>2</sub> in 2008, but reduced to 127,239tCO<sub>2</sub> a year later. IIAC identifies potential releases and reductions of greenhouse gas emissions through the setup of greenhouse inventory, and set reduction goals and explore ways of implementing them.

GHG emissions (2009)  
(tCO<sub>2</sub>)





Aircraft parking-ramp at Board Building A

## Responsive to Climate Change Pacts

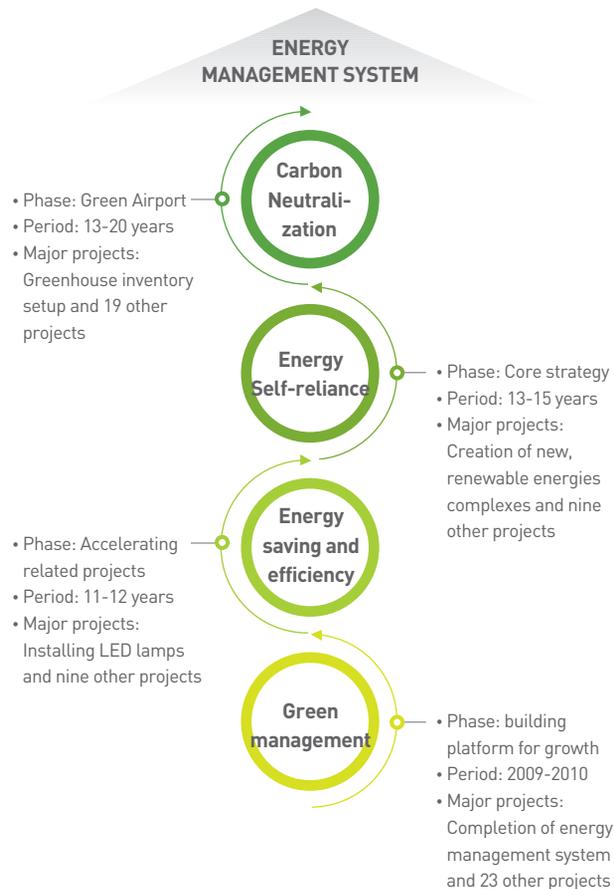
### Strategy for green growth

Based on a vision, “The World’s Best Green Airport,” IIAC formulated plans to transform the airport into a green airport. This strategy calls for building the foundation for green management, energy saving & efficiency, energy self-reliance and carbon neutralization. These four initiatives are divided into 64 detailed tasks which call for investment of 250.7 billion won by 2020. IIAC also envisions reduction of energy savings valued at 11.3 billion. IIAC intends to be at the forefront of the nation’s green growth by taking advantages of its four initiatives.

#### Low carbon growth strategy

- Contribute to the national green growth by capitalizing on low carbon green growth
- Respond to climate change pacts and play the international community through reductions of greenhouse gas emissions
- Building low-budget, high-efficiency climate by practicing green living

### “ The World’s Best Green Airport ”





Global Green Management Excellent Awards ceremony

## Green Management

### Global Green Management Excellent Award

IIAC received Global Green Management Excellent Awards (in the area of climate change) in June 2010 in recognition of its contribution to "low carbon green growth". The award was jointly sponsored by Ministry of Knowledge Economy and Ministry of Environment. Based on this award, IIAC is determined to become a key player in the international airport sector.

### Creation of energy management manual and processes



Incheon International Airport Corporation set up a companywide base for green growth through its energy management directives. In order to attain goals, we created a manual and standard procedures for energy management. In the near Future, IIAC plans to computerize an energy management system for consistent pursuit of energy management.

### Energy diagnosis

IIAC conducted energy diagnosis in 2009 with a view to explore ways to identify factors of energy losses and improvement potentials. A total of seven loss factors were identified. In 2010, IIAC will push ahead with seven energy enhancement projects.

### Green Growth Promotion Committee in session

IIAC revamped its energy saving promotion committee into Green Growth Promotion Committee in July 2009 in order to actively participate in the global efforts to protect earth environment in response to climate change and to respond to a new paradigm for green growth.





Signing of MOU for low carbon & green growth



Annual EAAA session



An accord was signed for efforts to attain objectives of energy saving and greenhouse gas emissions

## Creation of alliance for green growth

IIAC is in the process of establishing partnerships with domestic and foreign entities in effective response to green growth, while considering low carbon green growth as a new growth opportunity.

■ **MOU for low carbon green growth signed** IIAC signed an MOU with Korea Energy Management Corp. (KEMCO) in April 2009 with a view to lay out a platform for low carbon green growth and set up a backup system. Under the partnership, IIAC's greenhouse gas emissions inventory is inspected by Energy Management Corp. In addition, both sides agreed on a wide-ranging mutual exchanges of information on new, renewable energy, high efficiency device equipment technology, external publicity and joint education program development.

■ **Voluntary agreement signed** IIAC has been actively participating in the efforts to reduce greenhouse gas emissions after signing a Voluntary Agreement (VA) with the Korean government in 2004. The agreement provides that IIAC reports greenhouse gas emissions goals and how to implement them to the government every year. IIAC's performance results are assessed by the administration. In July 2009, IIAC signed a second MOU with the administration, evidence of its commitment to energy savings and greenhouse gas emissions reductions.

## Education and compensation

In a bid to spread "green living culture" among the employees, IIAC regularly administers education program on energy savings. In 2009, education on energy saving was conducted twice for all the employees. In order to bolster its capabilities to respond to climate change, IIAC train specialists among working-level officials through external education programs. Of particular note, our education programs are focused on nurture of greenhouse gas, green energy and energy management system specialists. In a stepped-up effort to disseminate the spirit of energy savings, IIAC offers compensation to employees who stand out in energy savings and partnership firms.

■ **Building GHG & energy NA (Negotiated agreement)** IIAC, which was selected as a model organization for energy savings and greenhouse gas emissions reductions in 2010, entered into an agreement with the government in April 14, 2010.

IIAC will review volumes of energy usage and set annual savings goals in consultation with the energy specialized agency, KEMCO. In order to attain goals, IIAC will activate a variety of improvement programs.

■ **EAAA & airport construction forum** In September 2009, IIAC hosted an EAAA (East Asia Airports Alliance) forum under theme, "EAAA Green Airports, Engines for Green Growth." Working-level officials in charge of environment matters and airport CEOs attended in the conference and shared opinions on major environment issues of airports. In November, by hosting the third airport construction forum, ways to construct energy-efficient and low carbon green growth airports were discussed in great detail, with attendance of government officials, scholars and corporate executives.



Lightning control system influenced by flight schedules

## Energy Saving & Efficiency

Enhancing energy efficiency in times of climate change and high oil prices are vital to corporations' future competitiveness. IIAC tries to materialize an environment-friendly green growth, along with responsive to climate change, through implementations of energy savings and efficiency promotions. In 2009, we managed to save up to 4,972 million KRW out of total investments of 633 million KRW in facility and operation areas.

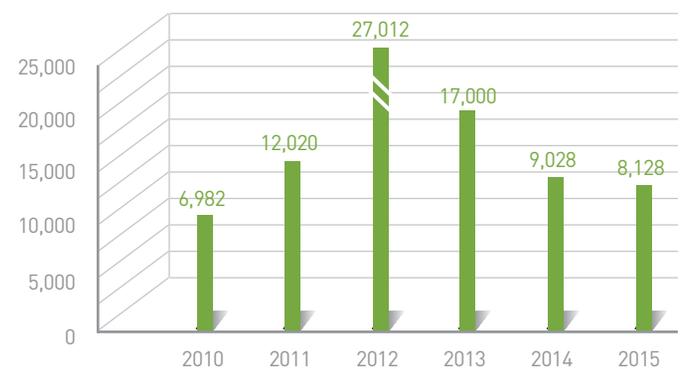
Description	Area of savings	Cases	Investment (million KRW)	Volume of saving (toe)	Amount of saving (million KRW)
Facility	electricity	22	633	468	345
	electricity	17	0	2,516	1,364
Operation	gray & hot water	2	-	3,863	3,238
	Fuel (CNG)	1	-	40	25
Sub-total		20	-	6,419	4,627
Total		42	633	6,887	4,972

### Facility

#### Introduction of high-efficiency lightning

IIAC replaced all of its light bulbs with high-efficiency lamps and LED lamps in 2009 in line with energy usage rationalization guidelines for public entities. By 2012, more than 30% lightning devices will be replaced by LED lamps, which will result in significant amounts of energy savings and greenhouse gas emissions reductions.

Annual LED lamp installments and plans (EA)





LED lightning at escalators



LED-illuminated landscape



Street energy savings campaign

### Light Control System based on flight schedules

IIAC operates a cutting-edge lightning control system by turning off lights of major areas of lamps, C.I.Q. passenger terminal and boarding buildings. We aim to achieve optimal energy saving and greenhouse gas emissions reductions by taking advantage of the elastic and efficient operation of the light control system.

#### Main features

1. Control lights based on aircraft parking and movement information
2. Control lights based on flight information at the exit/entry flow areas
3. Control lights based on carousel distribution information at baggage claims areas
4. Control lights according to weakly weather patterns of window areas

### ESCO project

IIAC installed a sludge drying equipment at the incinerators in close cooperation with ESCO, an energy saving specialized company) in 2009. The sludge drying facility dries excess heat generated by incineration of resources and dry gray water sludge. Using this facility will enable IIAC to save an estimated 200 million in gas expenses a year.

### Energy saving through operation improvement

The operation method of refrigerating machines was changed in 2009 in which focus was shifted on turbo refrigerating machines. In 2008, turbo refrigerating machines accounted for 55% of total refrigerating power, and absorption refrigerating machines 45%. The shift resulted in reductions in the operating time of refrigerating machines and circulation of coolants. As a result, IIAC saved up to 38,452,432 Mcal worth 3,417 million KRW.

## Areas of execution

### Inspection of co-companies' energy saving practices

IIAC checks how its 38 co-companies practice energy savings on a quarterly basis every year with the aim of upgrading their energy-saving facilities and management. Results of these checks are analyzed and model firms are announced so that outstanding initiatives can be shared by all partnership firms. IIAC offers incentives to co-companies that stand out in energy saving in day to day operations at the end of year so that they will volunteer to conserve energy.

### Energy saving campaign

IIAC pushes a variety of energy saving campaigns in order to attain energy saving goals, in active response to the government's low carbon, green growth policy. In summer, an energy saving PR exhibition took place for IIAC employees, staff of government agencies posted at the airport, and representatives of firms doing business at IIAC. Energy-saving stickers were also distributed. In winter times, there are also energy savings education programs for IIAC employees and staff of partnership firms. Cars are urged to enter the airport at designated days. IIAC will launch more energy savings campaign in a bid to induce active participation of staff of partnership companies, as well as IIAC employees.

#### Energy saving promotion campaign in summer

- Location: the back gates of IIAC (in the morning), west gates of combined building (in the afternoon)
- Targeted: Employees of IIAC, government agencies posted at the airport and partnership firms
- Features
  - Energy savings publicity exhibition (promotion banners, pickets, etc.)
  - Distribute energy saving publicity sticks (Eco Drives, energy savings at every life)

#### November is Energy Savings Promotion Month

- Main programs
  - Place signs and banners to promote energy conservation
  - Conduct education for employees of IIAC and partnership firms
  - Employees are urged to enter the airport by car at designate dates
  - Keep office heating thermostat at 18°C ~ 20°C in winter.



Energy Renewable Demonstration Complex

## Energy Self-Reliance

The energy imbalance is deepening, mainly due to the global economic growth and growing demands of emerging market countries. Industrialized countries, in response to this situation, is increasingly becoming concerned with development and spread of new, renewable energies and green growth. IIAC has worked out a number of initiatives to introduce renewable energies by stage in response to climate change. It has created a new, renewable energy demonstration complex, while pursuing expanded application of renewable energies and creation of an energy self-reliant airport.

■ **Creation of Renewable Energy Demonstration Complex** IIAC set up a Renewable Energy Demonstration Complex which is equipped with 100kW of solar photovoltaic and 50kW (10kW X five) of wind power generation facility. At the airport entrance, 42 hybrid street lights were installed. IIAC plans to supply electricity of about 195MWh annually through the treatment of heavy and hot water. It will have the effect of reducing about 83tCO<sub>2</sub> of greenhouse gas emissions a year.

■ **Renewable energy in the third phase construction** IIAC intends to lift its energy self-reliance rate to 10% by 2020 and in this regard, will invest 5% of total construction expenses in step with the airport's three-phase expansion. To full this objective, IIAC is examining the necessity of introducing renewable energy, commissioned to an external specialized firm. Details will be worked out soon. As a result, IIAC wants to wisely respond to climate change pacts and unstable oil prices, while upgrading its competitive edge as a leading international airport.

\*IIAC intends to formulate plans to additionally introduce renewable energies in 2010 after the completion of analysis on the necessity of new, renewable energy.



Hybrid street lightning



Solar energy generation facility



Wind power generation facility

## Status of renewable energy facility and facility construction plan

### Required facility construction

	Area	Facility	Kick-off
● Second Passenger Terminal Project	350,000m <sup>2</sup>	solar energy	2013-2015
● Passenger Terminal Expansion Project	32,000m <sup>2</sup>	solar energy	2012-2013

### Construction details

	Area	Facility
■ Construction site 1	479,000m <sup>2</sup>	Solar energy
■ Construction site 2	350,000m <sup>2</sup>	Solar energy
■ Construction site 3	376,000m <sup>2</sup>	Solar energy
■ Construction site 4	71,920m <sup>2</sup>	Solar energy





Light-type aircraft ULD(Unit Load Device) (Distribution of air cargo containers)

## Carbon Neutralization

Climate change is being recognized as a serious problem that will have serious impacts on all of us. At present, greenhouse gas emissions are a major culprit in climate change and environment deterioration. IIAC has come up with a Carbon Neutral program to obtain its goal of becoming an environment-friendly, green growth airport and accomplish its social responsibility.

### Participation in Carbon Neutralization Program



IIAC participated in the Carbon Neutralization Program since 2009.

At present, Carbon Neutralization offsets 4.3% of electricity generated greenhouse gas emissions from gray water treatment, with investment on new, renewable energies. There are plans to expand facility investment of the gray and hot water treatment station.

	Volume of electricity In designated area		Volume of energy generated by renewable energy		Carbon Neutrali- zation rate
	MWh	tCO <sub>2</sub>	MWh	tCO <sub>2</sub>	
Gray & hot water Treatment station	4,623	1,960	195	83	4.3%

### Setup of Environment-friendly Transport and Logistics System

IIAC is in the course of establishing an environment friendly transportation system. As part of the efforts to promote the use of bicycles, we built an exclusively bicycle road between New Airport City in December 2009. In addition, 21 environment

friendly vehicles were brought. There will be more environment-friendly vehicles operated by IIAC. By 2013, a magnetic levitation train, a next-generation transport facility, will be in operation at the airport. Furthermore, for optimization of parking ramp's traffic line, IIAC works hard to minimize aircraft emissions, along with energy conservation of aircraft. In 2009, operation of the low carbon, green parking ramp resulted in reductions of 154t greenhouse gas emissions. Wider use of ULDs (aircraft freight container) reduces the weight of existing containers by 40%, which contributing to greenhouse gas emission reductions and aircraft fuel conservation. IIAC intends to forge ahead with distribution of light-type ULDs. In 2009, 82 ULDs will be introduced, with the total number rising to 300 by 2010.

- Creation of an exclusive bicycle road: a total of 18.4km between the airport and New Airport City (December 2009)
- Import of one environment-friendly vehicle: an electric car (November 2009), two hybrid cars (March 2010) and 18 CNG buses
- Plans to operate a magnetic levitation train due to travel to Traffic Center, IBC and water park. Plans call for building to Yong-yu island station which 6.1km away from airport by 2013.
- Operation of low carbon green-growth parking ramp since July 2009: Fuel conservation and carbon release reductions through optimization of the parking ramp traffic line. Reduction of carbon 154tCO<sub>2</sub> & energy saving of 46,121L



AC-GPS (device to supply electricity to aircraft at the ground)



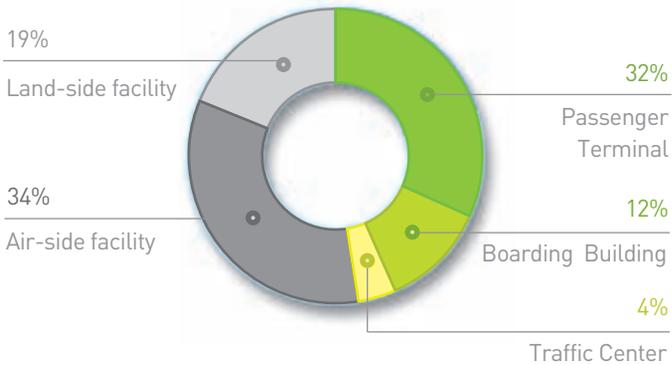
Environment-friendly electric car



Bicycle road

### Setup and Verification of Greenhouse Gas Inventory

IIAC created a greenhouse gas inventory that measures green gas emissions directly and indirectly based on application of international standards. In November, 2009, Korea Energy Management Corp. (a greenhouse gas verification expert) conducted examined the third around of verifications on gas release statistics and volume of release. Thus, we were able to secure the accuracy and credibility of inventory of greenhouse gases.



### Status of greenhouse gas inventory

- Base year : 2008
- Related regulations :
  - WRI/WBCSD Protocol(2004)
  - IPCC Guideline(2006)
  - KS A ISO14064-1(2006)
  - Good practice guideline measures greenhouse gas emissions of aircraft
- Verification organization : Energy Management Corp.
- Status of greenhouse gas emissions : 157,887tCO<sub>2</sub> (Scope1:13,962tCO<sub>2</sub>, Scope2:143,925tCO<sub>2</sub>)

### AC-GPS Operation

AC-GPS is a device used to save energy and prevent pollution when aircraft parks. (It supplies needed electricity when aircraft on the ground stops its main engine movement in the park-ramp area.) IIAC has a total of 98 Ac-GPS (44 for passengers and 54 for boarding building). When most of aircraft operates for parking, AG-GPS enables reduction of greenhouse gas emissions and fuel cost reduction. By reducing no-load of aircraft. AC-GPS works to abate engine noise and exhaust gas.

### Creation of Forest

With a view to let the world about our culture's diversity and beauty, along with our wishes for peace, IIAC completed the first "World Peace Forest" creation project inside the New Airport City. This project will call for formation of forests at an area of 58,337 m<sup>2</sup> by 2016. Planting trees nearby the airport will help to realize Carbon Neutralization and offers an environment-friendly climate to residents nearby.

### Incheon International Airport





Multi-stakeholder  
Partnership

# How we respond to stakeholders



## 8 *Primary & Secondary Schools*

A project to promote special and professional  
education for regional schools



## 18.4 *km*

Airport bicycle road construction



## 58,337 *m<sup>3</sup>*

Creation of "World Peace Forests"

Airport operation requires close partnerships of stakeholders. IIAC, airport operator, provides related information to the local community, businesses, customers and the general public. Furthermore, we strive to fulfill our social responsibility by capitalizing on active environment communication, while partnering with stakeholders.



Financial support to schools for special purposes \_\_\_\_\_  
(KRW)



#### Efforts to aid stakeholders

IIAC always intends to find out what residents really want and based on their requirements, will implement systematic social contribution activities



Events for creation of "Peace Forests"

## Partnering with Stakeholders

### Efforts to preserve ecosystems

IIAC actively participate in the campaign to preserve the ecosystems in the local communities through various initiatives such as creation of forests, a bicycle road, and constant implementation of trees. At present, inside the Airport Newtown, a second phase project on creation of "World Peace Forest" is under way. This project will continue through 2016. Of note, creation of forests is expected to help preserve natural ecosystems and absorb green house gases.

### Accreditation and awards

IIAC gains various accreditation and awards as a result of its efforts to realize an environment-friendly and green growth. In 2009, IIAC received a grand prize from Incheon Chamber of Commerce and Industry in recognition of its environment-friendly efforts. IIAC made patent application 1) in relation to algorithm concerning the track, flights, noise, air, information and integrated analysis and 2) algorithm concerning comparative display of pollution degree through image association.

### Response to international environment regulation

IIAC actively participates in seminar and other forums sponsored by ICAO and UNEP and explores issues and search for responses to international environment regulations. Of particular note, in response to climate change pacts, IIAC maintains close partnerships with KEMCO. and the government, as well as overseas organizations.

### Practical examples of voluntary environment enhancement

IIAC tries to minimize environment impacts on residents through operation of incinerators. IIAC implements the following measures with a view to save energy and preserve environment in operation of its resource recovery facility.

Reduce fuel (gas) usage through introduction of resource retrieval sludge drying equipment

Reduce gas use using spent heat at incinerators (reheating of spent gas and gas burner)

Energy saving using spent heat at incinerator

Selective return to catalyst in resource recovery facility



IIAC gains the grand prize in environment area from Incheon Chamber of Commerce and Industry



Exhibition of wetland pictures



Tree planting

Environment communication  
(Social engagement)

IIAC is pushing strategic social contribution activities in an effort to gather the demands and requirements of local communities in an effort to give them hope. Employees involve environment clearance activities through their units. The Construction Division, utilizing its equipment, remove litters, clean up green areas, while engaging in environment preservation efforts. IIAC will continue to expand its environment communication activities including social engagement linked with the local communities and stakeholders.

Compliance with laws

IIAC, which is a public enterprise responsible for airport construction and operation, abides by an array of domestic and international laws and conventions that is vital to management of a public entity.

Related laws

As a public corporation responsible for the construction and operation of IIAC, IIAC complies with the following Korean laws;

IIAC Act, Act on the improvement of management structure and privatization of public corporations, Act on the promotion of new airport construction in Seoul metropolitan area, Civil aviation act, Act on aviation safety and security, Act on planning and use of national territory, Act on designation and management of Free Economic Zone, Act on acquisition and compensation for land etc. for public projects, Public waters management Act, Public waters reclamation Act, River Act, Road Act, Urban railroad Act, Natural park act, Act on urban parks and greenery, Farmland act, Act on erosion control projects, Act on forest management, Act on the creation and management of forestry resources, Water supply and waterworks installation act, Act on designation, management and use of ports, Act on assessment of impacts of works on environment, traffic, disasters, etc. Act on the promotion of industry aggregation and plant establishment, Construction act, Act on nautical mark, Act on the management of construction standards, Act on waste management, Act on the disposal of sewage, excreta, and livestock wastewater, Clean air conservation Act, Clean water conservation Act, Noise and vibration control act, Act on the promotion of convenient transportation for the disabled, Act on the promotion of convenience for the disabled, elderly, and pregnant women, Act on the installation and management of fire fighting facilities, Act on the fire fighting facility construction, Act on the hazardous material control, Parking Act, Telecommunications business Act, Criminal law and other criminal justice Acts, Corporate tax Act and other tax Acts, Monopoly regulation and fair trade Act, Labor standards act, Act on labor participation and cooperation promotion, Trade union and labor relations adjustment Act, Act on gender equality in employment, Act on the promotion of the employment of disabled and occupational rehabilitation, Act on the honorable treatment and support of persons, etc. of distinguished services to the state, Basic employment policy Act, Employment security Act, Occupational safety and health Act, Industrial accident compensation insurance Act, Employment insurance Act, Act on the collection of industrial accident compensation insurance and employment insurance, Act on public organizations' protection of personal information, Act on the information release of public organizations, Act on the management of public records, and Act on the handling of civil complaints

• International conventions

As one of the best airports in the world, IIAC complies with the following international conventions :  
UN Global Compact (Subscribed in March 2007), ILO Labor Standards, ICAO Convention and its annex

IIAC did not violate any environment related laws in 2009.

# Environmental Data

## Status of environment around Incheon International Airport

● Water quality measurement for nearby seas

(g / million KRW)



● Measurement of air quality around airport

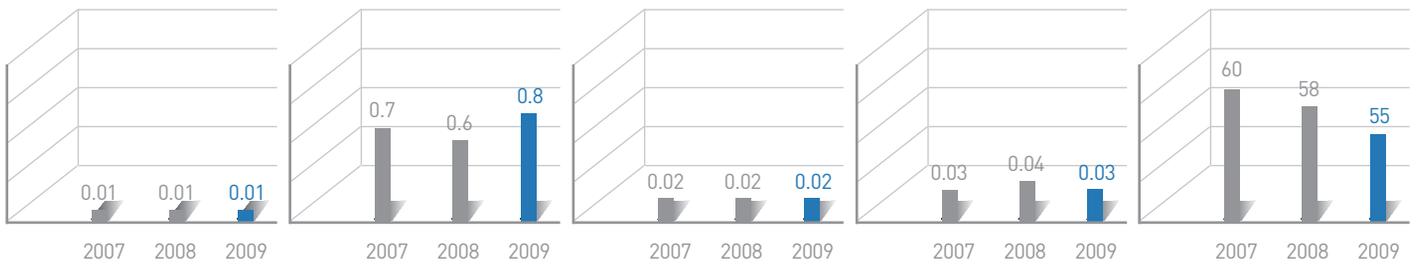
■ SO<sub>2</sub> (ppm)

■ CO (ppm)

■ NO<sub>2</sub> (ppm)

■ O<sub>3</sub> (ppm)

■ PM<sub>10</sub> (ppm)



● Status of water quality in seas east, north and south of IIAC

DO (μg/l)

● North ● East ● South

COD (μg/l)

● North ● East ● South

T-N (μg/l)

● North ● East ● South

T-P (μg/l)

● North ● East ● South

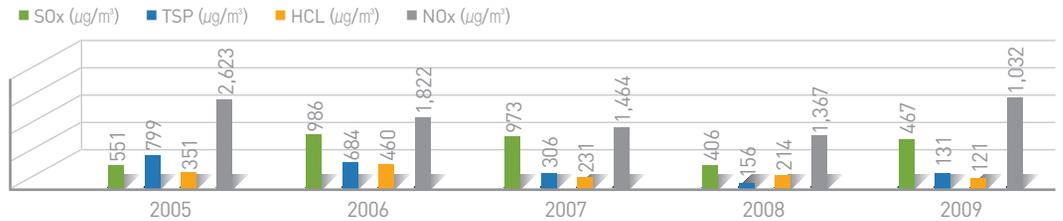


## Status of airport environment facilities

### Incinerator, status of disposal air pollutants



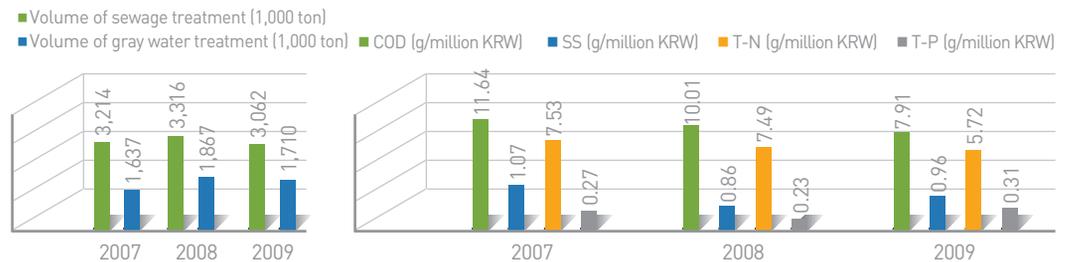
Incinerator



### Gray water treatment facility



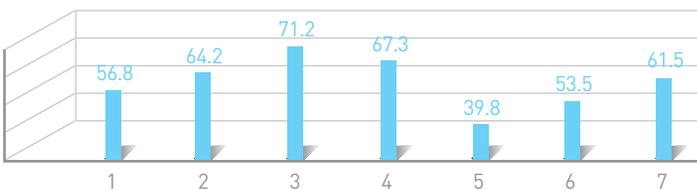
Gray water treatment facility



## Status of measurement of aircraft noise

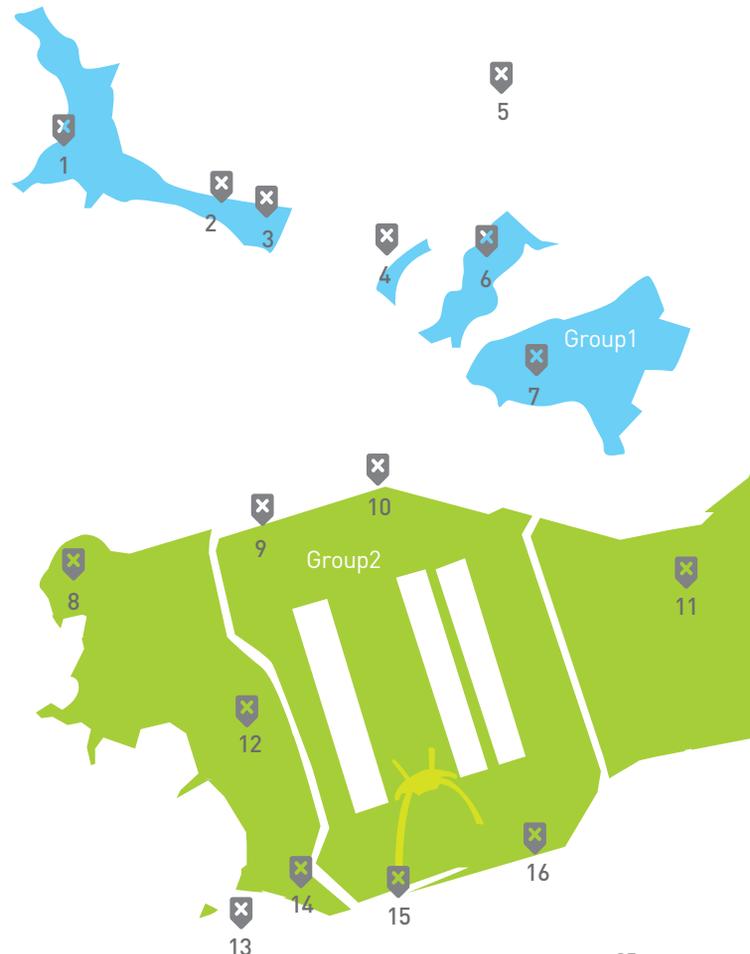
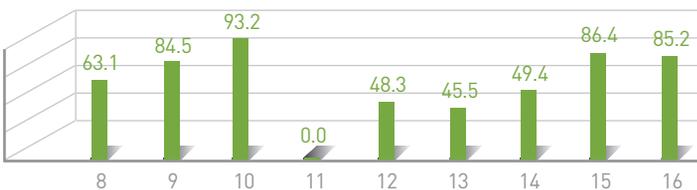
### Group 1 area aircraft noise

(WECPNL)



### Group 2 area aircraft noise

(WECPNL)

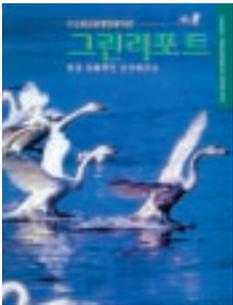


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## IIAC Green Report Issue

IIAC has been publishing "Green Report" since 1996 from the stage of airport construction in an effort to provide information on environment management and performance results to the general public. In 2006-2007, sustainability reports were issued in place of Green Report.

### Green Report



1995



1996



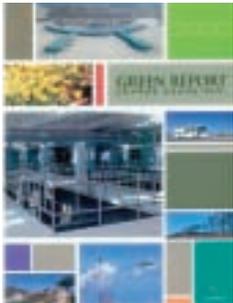
1997



1998



1999



2000



2001



2004



2009

### Sustainability Report



2007



2008

## Information

Anyone can send suggestions about Green Report to the following address:

Environment Management Team: 2850, Unseo-dong, Jung-gu, Incheon Metropolitan City (400-700)

E-mail [9chulmin@airport.kr](mailto:9chulmin@airport.kr) / [sypak83@airport.or.kr](mailto:sypak83@airport.or.kr)

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Aircraft noise [dhryou@airport.kr](mailto:dhryou@airport.kr)

Climate change response [jksong@airport.kr](mailto:jksong@airport.kr)

Incheon International Airport Corporation Website ([www.airport.kr](http://www.airport.kr)) provides detailed information about Green Report



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# The World's Best Green Airport



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