

Insight into Green Airport

Moonkyu Park



Republic of Korea



National GHG Reduction Policy

Emission Trading Scheme ('15~)

Negotiated Assignment ('10~'14)

- Contract with government (14. Apr. 2010)
- Period : 2010 ~ 2014
- Assignment target : 30% energy saving during assignment period



National Energy Usage Regulation for Public Organization

- ✓ Obtaining a building energy efficiency rating certification over 1st Grade
- ✓ Installing renewable energy facilities (New construction building)
- ✓ Maintaining airport passenger terminal temperature
(summer: over 25°C, winter: under 20°C)
- ✓ Using high efficiency facilities (LED Installation 100% by 2020)
- ✓ Encouraging Electric Vehicle (EV) purchase
- ✓ Carrying out energy saving education & promotion

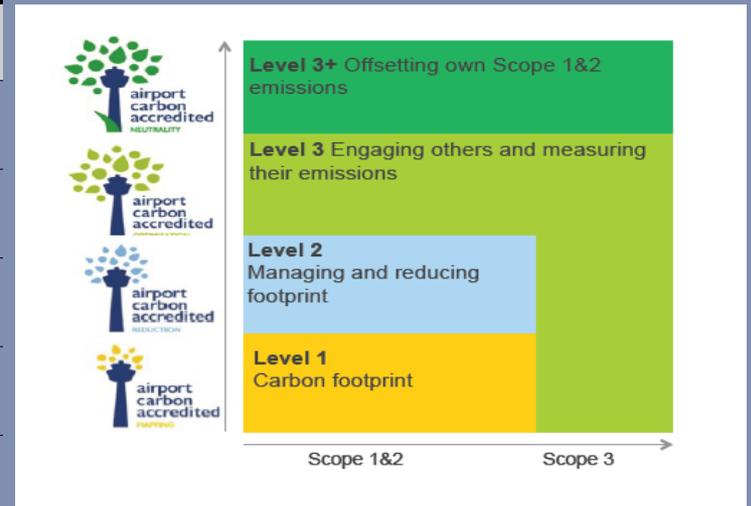


‘Promoting optimized carbon emissions management by identifying the total amount of Green House Gases emitted by all airport facilities and stakeholders’

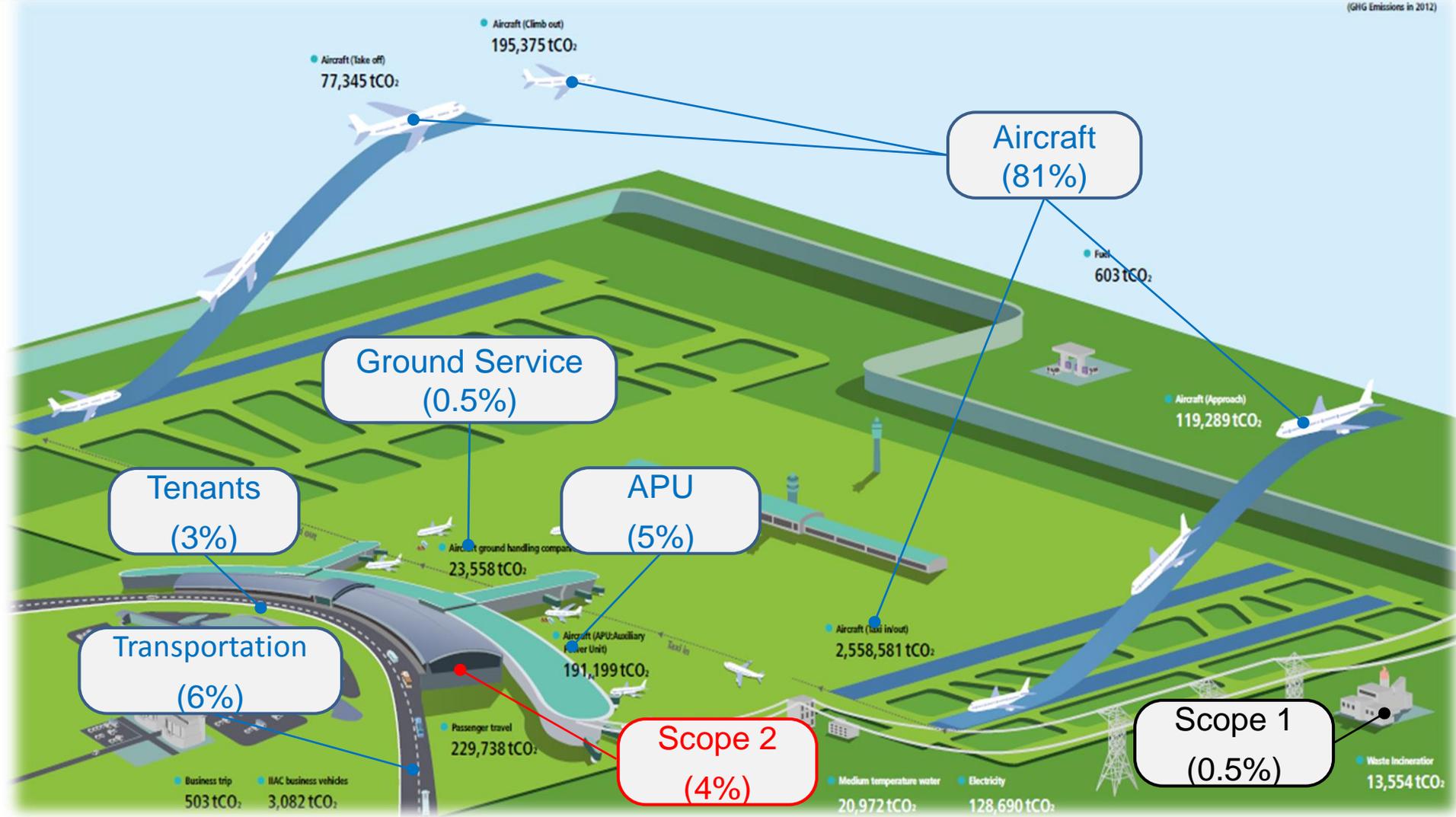
ACI Airport Carbon Accreditation

- Period : 19 March 2014 - 18 March 2015
- Level : 3 (OPTIMISATION)

Section	Level I	Level2	Level3	Level3+	Total
ACI EU	27	26	16	17	86
ACI Asia	8	7	5	-	20
ACI NA	-	1	-	-	1
ACI Africa	-	1	-	-	1
Total	35	35	21	17	108



(GHG Emissions in 2012)

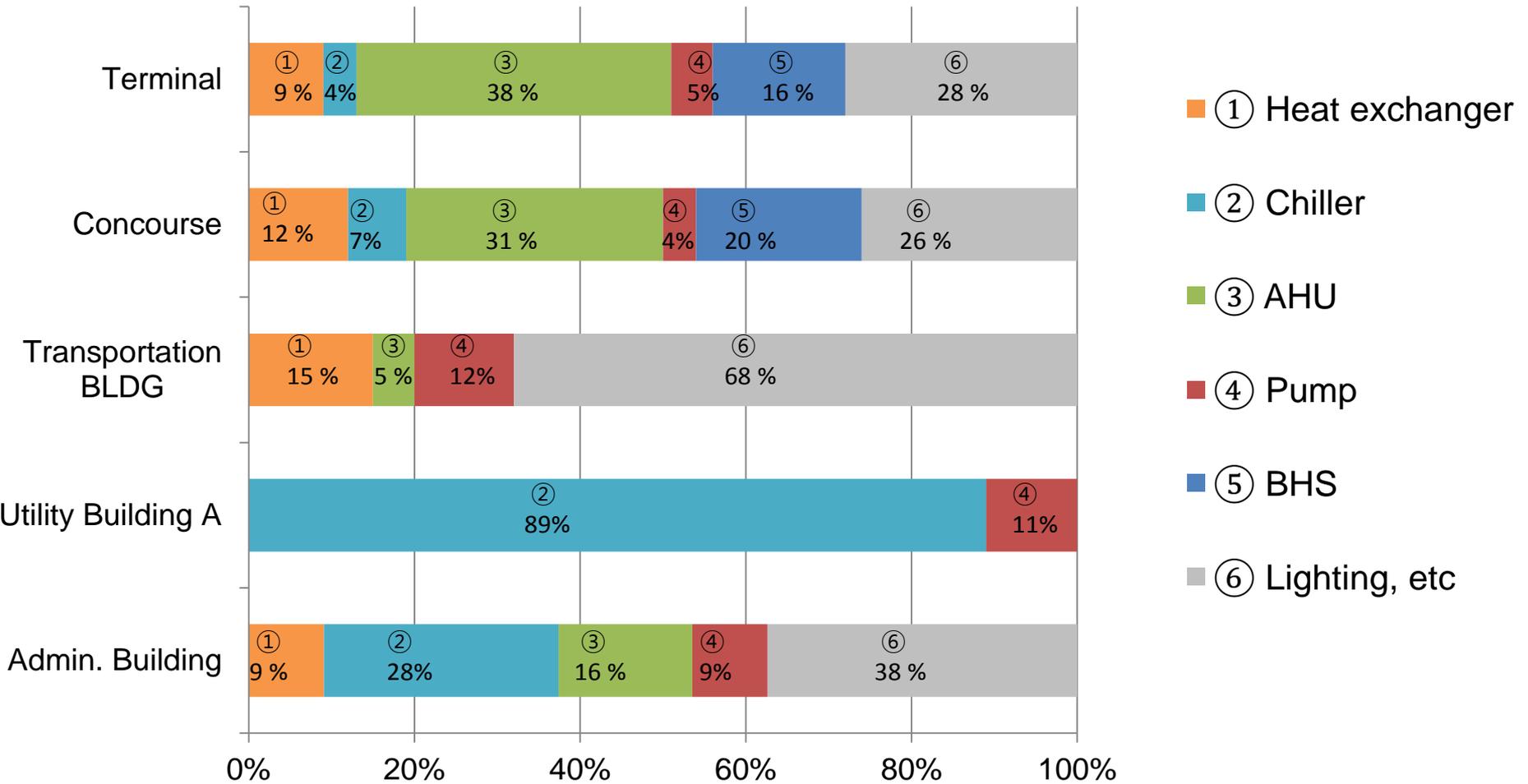


Energy usage (Scope 1 & 2)

Energy usage	Consumption (TJ)	Proportion (%)
Electricity	4,136	86.0
Steam	610	12.8
Fuel (car)	51.6	1.0
Fuel (Boiler)	8.3	0.18
Fuel (Generator)	0.5	0.02
Total	4,806	100



Scope 2 (Significant Energy Use in IIAC)



Vision **Globally Leading Low-carbon Eco-friendly Airport (by 2020)**

Strategic theme	ACI Airport Carbon Accreditation	LED Lamps Installation 100%	Energy Self-reliance 3%	GHG emission reduction 66,000tCO ₂	Environmental Performance Index 250
Action plans	Enhance eco-friendly management	Improve energy efficiency	Expand low-carbon operation	Reinforce environmental resources management	
Strategic objectives	Enhanced eco-friendly management systems Comprehensive energy management Training, Publicity	High-efficiency equipment Renewable energy Construction of certified eco-friendly airport	Green transportation Reduction in aircraft GHG emissions Carbon offset program	Surveillance of resource-recycling Eco-friendly space Minimization of environmental impacts	



- ISO 50001 demonstration certification in 2012
- ISO 50001 formal certification in 2014
- Purpose
 - 1) Establish systematic energy management system
 - 2) Achieve cost reduction & efficiency improvement
 - 3) Induce company-wide participation by employees



CONTINUAL IMPROVEMENT

Energy Policy
- Energy Policy and Goals

Energy Policy

Planning

- Energy consumption analysis
- Energy flow map
- Significant energy use
- Setting up Energy consumption baseline & EnPI (EnPI : Energy performance Index)

Planning

Management Review

Management Review
- Reporting to CEO

Operations

- Energy consumption goal
- Making an improvement plan or energy saving plan

Operations

Checking

Checking
- Monitoring & Verification
- Internal audit



LED lighting deployment Goal By 2020



Section	~'13	'14	'15	'16	'17	'18	'19	'20
Installation(%)	45	55	65	75	85	90	95	100
Investment (Million USD)	8.4	3	3.3	3.3	3.3	2.5	2.5	2.5
Reduction CO ₂ (tCO ₂ /yr)	5,974	1,876	1,968	1,968	1,968	1,078	1,078	1,078

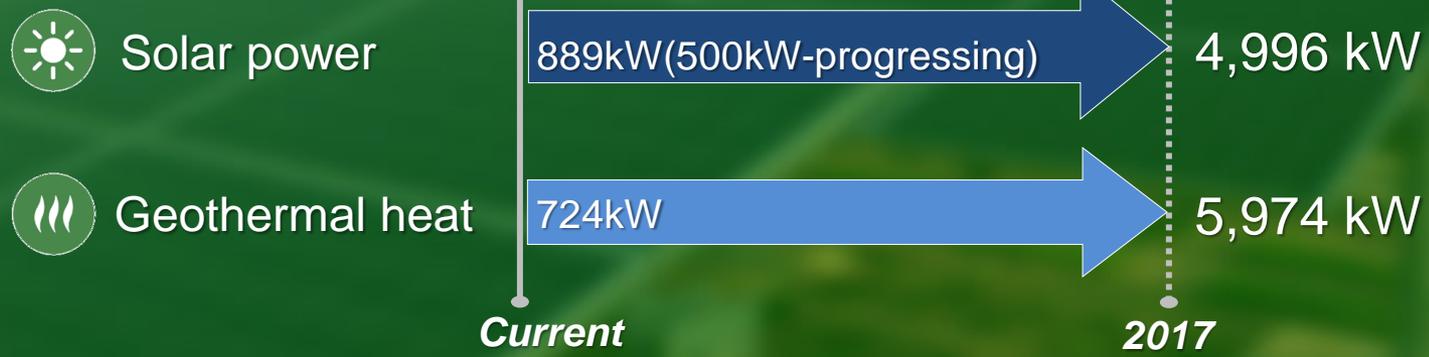


'Introducing various renewable energy & improving energy usage'

9,357KW by 2017
2ND Terminal



Total
10,970kW



'Introducing a variety of eco-friendly transport operations'



Bicycle Road(18.4km)



Hydrogen Fuel Cell Bus (2ea)



Electric Car (Low speed, 1ea)



Electric Car (High Speed, 3ea)



Hybrid Car (10ea)



Magnetic Levitation Train (6.1km)



‘Encouraging varied initiatives to reduce airplane’s carbon emissions’

Operation of Low-carbon Green Apron



- Designate position of spots to reduce the movement
- GHG reduction : 243,296tCO2/year

Light-weight Unit Loading Device Supply

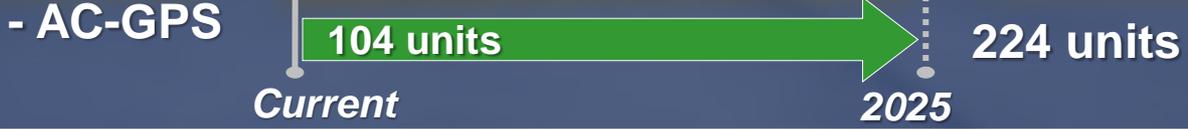


- 400 light ULDs supplied (114kg→ 69kg)
- GHG reduction : 1,800 tCO2/year

Expansion of AC-Ground Power Supply



- GHG reduction : 37,922tCO2/year (Compared to APU)



‘Expanding energy management for big energy consumers in the airport’

Voluntary Agreement for Energy and Carbon Reduction

- Date : Nov. 21th ‘13
- Participants : 11 tenants
(43.5% of total tenants’ energy consumption)
- Agreement period : ‘14 ~ ‘16 (3years)
- 2014 Goal : 2% reduction
- 2014 Performance (first half) : 3.6% reduction



Energy	First half in 2013	First half in 2014	Reduction
TOTAL	34,224 TJ	33,005 TJ	-1,216 TJ(3.6%)



‘Promoting effective energy management according to the Tenants’ Electric Facilities Guidelines.’

Terminal Tenants’ Electric Facilities Guidelines

- Target : 19 terminal tenants

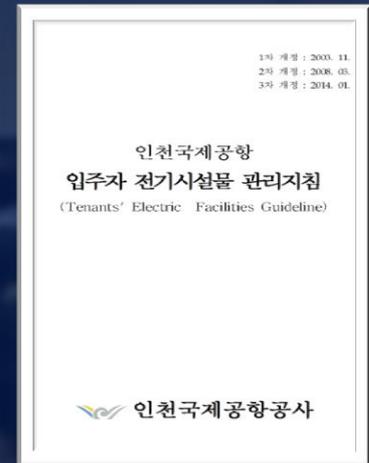
(contracted electricity of more than 75kW)

- Activities (twice a year)

1. Inspection of energy conservation effort

2. Seminar with terminal tenants to share information

- 2014 Performance (first half) : 0.8 % reduction

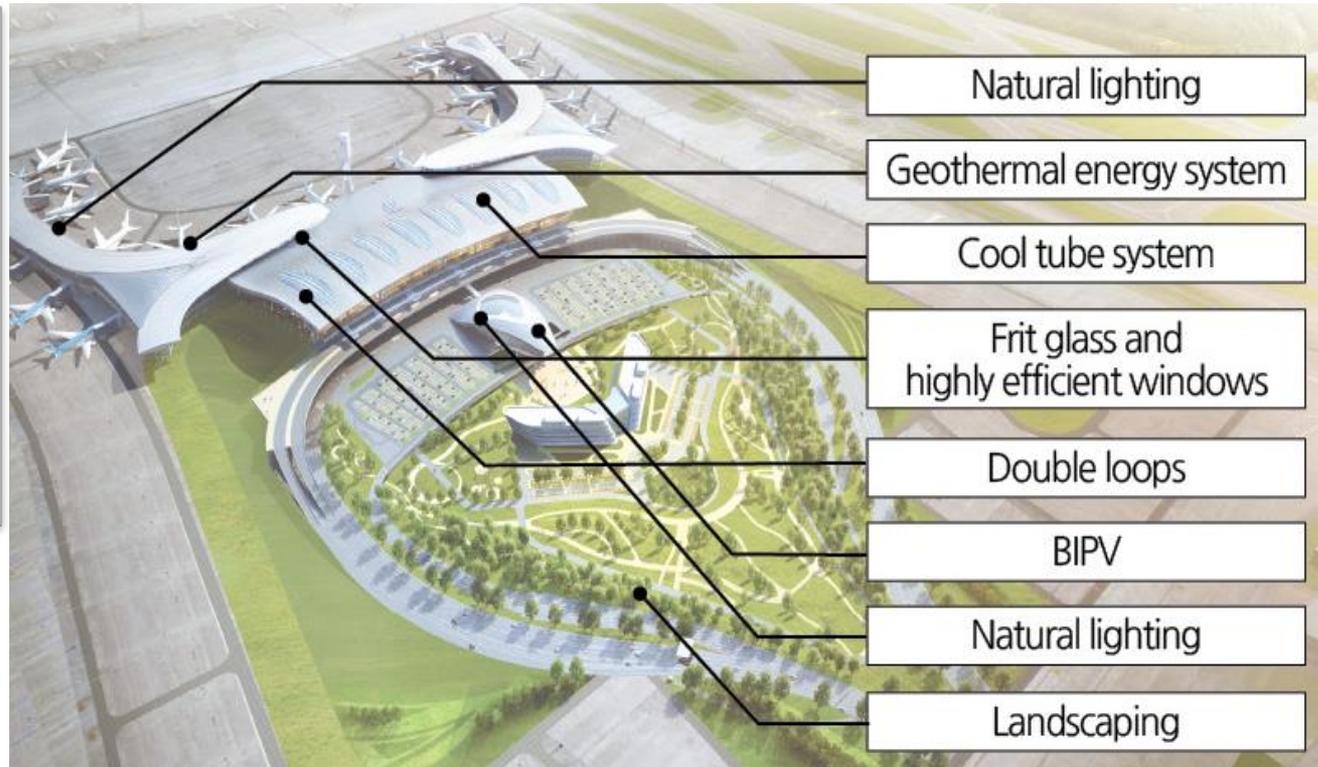


Energy	First half in 2013	First half in 2014	Reduction
TOTAL	6,891TJ	6,837TJ	-54TJ(0.8%)



“The 2nd terminal design achieved preliminary G-SEED 1st grade of domestic certificate in April 2014”

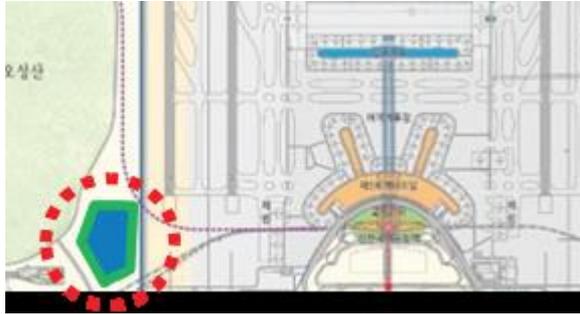
(G-SEED : Green Standard for Energy and Environmental Design)



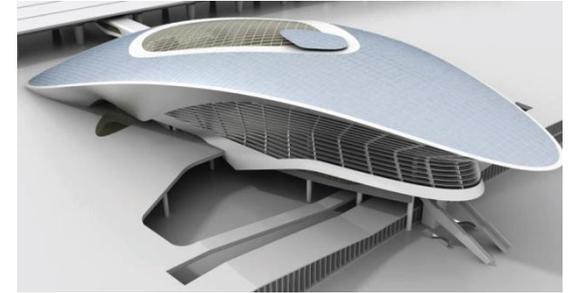
“Eco-friendly, Low carbon Airport (40% Energy saving)”



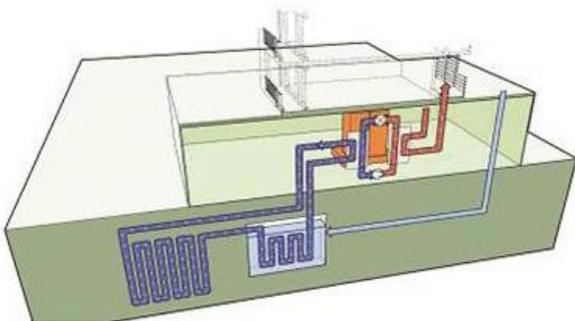
PV on the roof of Terminal 2



Power Generation site (PV)



BIPV on the Transportation center 2



Geothermal



Boarding lounge with natural light



Performance Improvement of Exterior Insulation



“ Breathing with Nature, Green Airport in the Park ”



Plants on an interior wall



Green landscape at T2 access road



More trees to expand indoor comfort



Natural finishing materials and greenery for interior



Cascade at Transportation center 2



Purification plants absorbing pollutants



Summary

Continuous implementation of strategic plan

- Specify & implement plans for airport
- Install high efficiency equipment step by step

Green, Eco, Smart Airport Construction

- Construct an Eco-friendly airport
- Save more than 40% energy for the 2nd passenger terminal

Strengthening of “Green Partnership Council”

- Airlines & ground handling companies
- Exchange of ideas & cooperation





Thank You

