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Session 5: Transition to Cleaner Energy Sources and
Sustainable Infrastructure



Sustainable Airport Development in Indonesia

Directorate of Airports – Directorate General of Civil Aviation – Indonesia



PRESENTATION OVERVIEW

01 Airport Overview

02 Sustainability
Policy

03 Program
Implementation

04 Follow up Actions

01 Airport Overview

AIRPORTS SYSTEM IN INDONESIA

251 AIRPORTS (EXISTING)

- INTERNATIONAL : 17 AIRPORTS

INCLUDING 5 MAJOR INTERNATIONAL AIRPORTS :
KUALANAMU, SOEKARNO-HATTA, JUANDA, I GUSTI NGURAH RAI AND SULTAN HASANUDDIN

- DOMESTIC : 234 AIRPORTS

TYPES OF ADMINISTRATION

- CENTRAL GOVERNMENT OWNED
- LOCAL GOVERNMENT OWNED
- AIRPORTS ENTERPRISE (AP I AND AP II)

AIRPORTS IN INDONESIA

**PUBLIC AIRPORTS
(EXISTING)
251 AIRPORTS**

**NEW AIRPORTS
PLANNED
45 AIRPORTS**

INDONESIAS' AIRPORTS TRAFFIC OVERVIEW

2023 Operational Achievements

1.562.814 *movements*
Aircraft

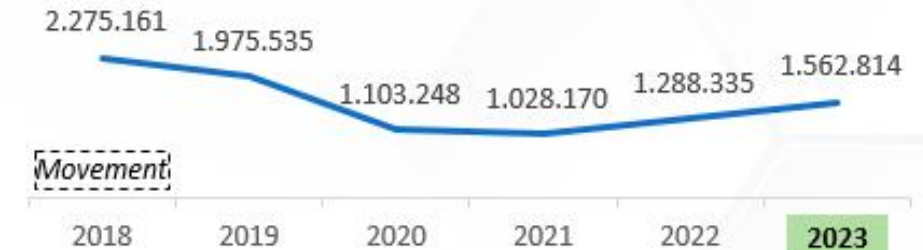
154,89 *million*
passengers

1.303 *million of kg*
cargo

PASSENGERS



AIRCRAFT



CARGO



Vision & Misions



*President & vice President
Republic of Indonesia*

Vision of 2020-2024

“realizing an advanced Indonesia that was sovereign, independent, and with a mutual-cooperation personality”

Misions of 2020 - 2024

1. Improving the quality of Indonesian human resources
2. A productive, independent, and competitive economic structure
3. Equitable and fair development
4. Achieving a sustainable living environment
5. Cultural progress that reflects the national principles
6. Corruption-free, dignified, and reliable law enforcement
7. Protection for the entire nation and provide a sense of security for all citizens
8. Trustworthy, effective, and reliable governance by the Government
9. The synergy of local regional Governments within the framework of a united nation



02 Sustainability Policy



Location
Determination



Development
Phase



Airport Operation

Legal Basis on Airport Environment (Government Regulations)

- Environmental issues shall be considered at any aspects in the airport, starting from the determination of airport location, construction and development phase as well as airport operation”
- Every airport shall implement eco-friendly airport concept (Eco Airport)
- National Strategic plan 2020 - 2024 with strategic targets to increase the quality of green transportation through actions to reduce GHG emissions including emissions from airport operations

ICAO Green Airports 2024

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Sustainability Policy in Indonesian Airports : Operator Level

ANGKASA PURA II ECO-AIRPORT MASTERPLAN

ENVIRONMENTAL MANAGEMENT & MONITORING

Air Quality - Energy – Noise - Water - Soil
Pollution - Waste (liquid, garbage, and B3)
– Natural Environment (Flora/Fauna) -
Social Culture



HUMAN RESOURCES CAPACITY IMPROVEMENT

- Environmental Management Policy Socialization
 - Technical Guidance;
- Competency Training and Certification



INNOVATION & TECHNOLOGY

- Utilization of New Renewable Energy Sources
- Application of Technology and Innovation
- Digitization of Environmental Reporting

ENVIRONMENTAL ASSESSMENT & CERTIFICATION

- ISO 14001:2015
- ISO 50001:2018
- PROPER
- Airport Carbon Accreditation



03 Program Implementation



Greening Program



Utilization of Renewable Energy



solar powered lights

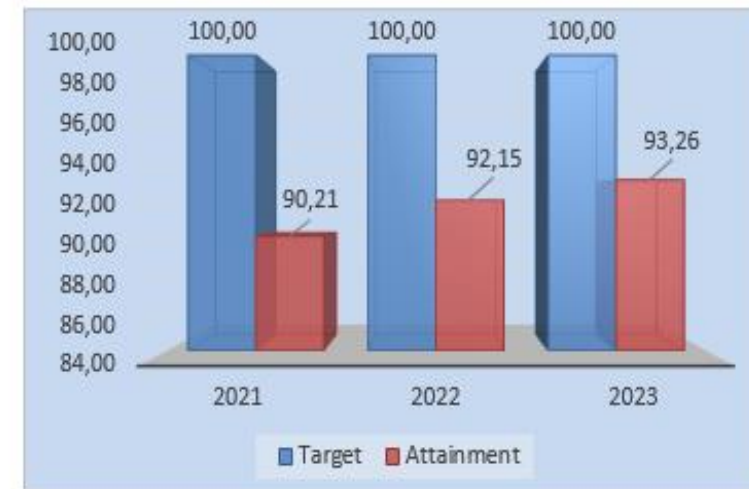


LED for apron flood light

✓ Since 2011, the progress of the implementation
Until 2023:

No	Program	Airport
1	Greening program	12 airports
2	Utilization of Renewable Energy	
	a. Solar Panel	49 airports
	b. Solar Powered Lights	109 airport
3	Usage of LED	18 airports

✓ The Implementation Plan until 2023:





- Since 2022, DGCA and 10 Regional Offices are mandated by law to monitor as well as conduct inspection regarding adoption and implementation of eco airport concept in which 150 airports already implement the eco airport until end 2023.
- In 2023, DGCA organized the Beauty and Comfortable Airport Competition to increase the awareness of airport operator in the aspects of connectivity, cleanliness, beautification and environmental quality as well as fulfillment of special needs friendly requirement. One of indicators assessed is the use of alternative energy at airports and the building design that reflects local culture. (6 Airports under DGCA : SWQ, KNG, KAZ, LNU, MOH, LLG).

RENEWABLE ENERGY IMPLEMENTATION



Solar PV at Parking Area Kalimarau Airport,
Cap. 360Kwp
Operated on Dec 2016



Solar powered lights,
Access road
Cap. 50 @60watt
Operated on May 2021



Emergency Assistance for Rehabilitation and Reconstruction Mutiara Sis Al Jufri Airport In Palu, with Retrofits concept were carried out to deal with the damage that occurred, including by adding reinforcement to the building structure and runway as well as adding several smart features to the terminal.

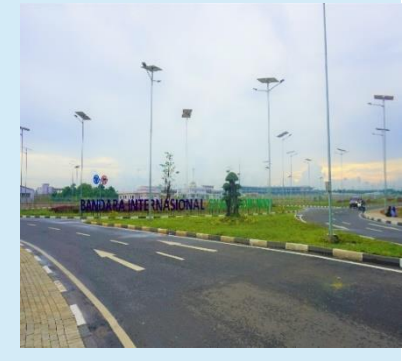


Solar powered lights,
At air side and access road
Cap. 75 @60watt
Operated on Dec 2022



Solar PV at Ayawasi Airport,
Cap. 120 KVA
Operated on Dec 2021

AIRPORT ENVIRONMENTAL PROGRAMMES OF ELECTRICITY & FOSSIL FUEL USAGE ASPECT : PT. ANGKASA PURA I



Conduct Energy & Fossil Fuel Management Strategy such as :

1. Digitization to save paper (TNDE/appro/appays, HCIS/My inspection, etc)
2. Electricity savings programs (MOT, campaign, LED, green building certification, energy management certification)
3. Installation of Solar PV System and solar PV street lighting
4. Fuel reduction (bike to work, providing bicycle, EV, public transport, fuel coupon)



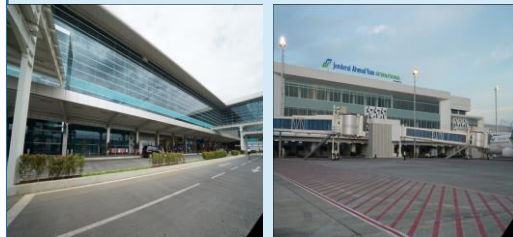
GHG EMISSIONS REDUCTION IMPLEMENTATION : PT ANGKASA PURA I



- installation of LED Lights in airport facilities (15 Airports)
- Reducing GHG emissions by 9,913 tons of CO₂e (2022) and 55,498 tons of CO₂e (2023)



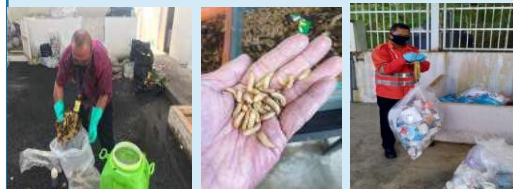
- installation of solar powered lights : 11 airport lights (SRG, BDJ, UPG, KOE, BPN, SOC, JOG, DJJ, SUB, DPS, YIA)
- Reducing GHG emissions by 954 tons CO₂e (2022) and 933 tons CO₂e (2023)



- Implementation of Airport Green Buildings (YIA, SRG)
- Reducing CO₂ Emissions by 14,093 Tons CO₂/Mwh (YIA); 2,394 Tons CO₂/Mwh (SRG)
- Saving Energy of 2,687,284. kWh, equivalent to Rp. 2,861,957,460 (SRG),
- Saving Energy of 15,817. 592 kWh, equivalent to Rp. 16,858,073,537 (YIA)



- Operation of Rapid Exit Taxiway (Runway 27) (DPS)
- Reducing CO₂ emissions by 78.5 tonnes CO₂e (2022) and 133 tonnes CO₂e (2023)



- Operation of recycling and composting program (SRG)
- Reducing CO₂ emissions by 431 tons of CH₄ and 1569.5 Tons of CH₄ (2023)



Implementation of ISO 50001:2018 DPS Airport Energy Management System

- Reducing CO₂ Emissions by 21,008 Tons of CO₂/Mwh
- Saving Energy of 26,591,862 kWh, equivalent to Rp. 31,591,131,902



- Greening at 13 Airports (SRG, LOP, BPN, BDJ, SOC, JOG, YIA, SUB, AMQ, BIK, DPS, UPG, MDC)
- Reducing GHG emissions/Offset 342,394 Tons of CO₂e (2022 and 2023)



- Operation of Solar PV at I Gusti Ngurah Rai Airport with a capacity of 155 Kwp, Reducing CO₂ emissions by 122.9 Tons CO₂e (2022) and 285.3 Tons CO₂e (2023)



- Operation of Building Automatic System for chiller operations (BDJ)
- Reducing CO₂ emissions by 22.8 tons of CO₂e

RENEWABLE ENERGY IMPLEMENTATION : SOLAR PV PROJECT PT. ANGKASA PURA II

ON-GRID Cap. 241 kWp

Operated on **October 2020**



Location : Airport Operation Control Center (AOCC)
Building CGK

ON-GRID Cap. 2.290 kWp – CGK, KNO & BWX

Operated on **January 2022**



**ENERGY YIELDS
PER YEAR**

2.898 MWh

Standard Coal Saved



1.160,5 tons

CO₂ Avoided



1.376,5 tons

Equivalent trees Planted



1.160 trees

RENEWABLE ENERGY IMPLEMENTATION : SOLAR PV ROOFTOP PT. ANGKASA PURA II



PHASE II : SOLAR PV ROOFTOP (CONSTRUCTION PROCESS)

ON-GRID Cap. 3.9 MWp at 6 airports

ENERGY YIELDS PER YEAR

8,980 MWh

ENVIRONMENTAL BENEFITS

Standard Coal Saved



4,490
tons

CO₂ Avoided



8,001
Tons/year

Equivalent trees Planted



254,000
trees

FOSSIL FUEL REDUCTION THROUGH STRENGTHENING AND EXPANDING THE USE OF ELECTRICAL VEHICLE : PT.ANGKASA PURA II

Charging Station at Terminal 3 CGK



1 Unit DC Fast Charging 40 kW



1 Unit AC Fast Charging 22 kW

Current Electric vehicle population in CGK



AUTOMATED PEOPLE MOVER SYSTEM (APMS)

Type : AGT with wheel tyred
P. Supply : 750 V DC
Train Sets : 2 Trains
Track : 2.98 km - 2 lines,
4 Stations



OPERATIONAL CAR



Bluebird e-Taxi

25 Units



Grab electric

19 Units

ACHIEVEMENTS FOR AIRPORT ENERGY MANAGEMENT & CERTIFICATION : PT. ANGKASA PURA I



The Clean Energy Ministerial (CEM)
Energy Management Leadership Award 2023

Energy Management Insight Award

I Gusti Ngurah Rai Bali Airport
Implementtion of ISO 50001 Energy



ASEAN Centre for Energy
ASEAN Energy Awards 2023
Energy Management in Buildings and Industries
- Buildings - Large Buildings - I Gusti Ngurah Rai Bali

Implementtion of ISO 50001 Energy Management



Subroto Award for Energy Efficiency (PSBE) in Building Category, Energy Management Sub Category in Large Buildings (I Gusti Ngurah Rai Bali) and Green Buildings (YIA) in 2022.

Meanwhile, in 2023 YIA received the Subroto Award in the field of Large Building Energy Management from the Ministry of Energy and Mineral Resources



Leadership a ESG Disclosure Transparency Award:
Sustainability Report

ACHIEVEMENTS FOR AIRPORT ENERGY MANAGEMENT & CERTIFICATION : PT. ANGKASA PURA I



certification of ISO 14001:2015 Environmental
Management System at 4 airports (SRG, DPS,
BDJ, YIA)



ACI APEX in Environment
Pilot Program (SRG)



GOLD GREENSHIP NEW BUILDING
GREEN BUILDING COUNCIL INDONESIA
YIA and SRG



certification of ISO
50001: 2018,
Energy
Management
System (DPS)

ACHIEVEMENTS FOR AIRPORT ENERGY MANAGEMENT & CERTIFICATION : PT. ANGKASA PURA II

ISO CERTIFICATE FOR ENERGY, ENVIROMENTAL, & QUALITY MANAGEMENT SYSTEM



ISO 50001 : 2018
Energy Management System
Terminal 3 CGK



ISO 14000 : 2015
Environmental Management
System
Environment, Sanitation Facility,
Water Treatment



ISO 90001 : 2015
Quality Management System
HO, KNO. PLM, PDG, PGK,
PNK, PKU, BDO, DJB

GREENSHIP CERTIFICATE



BWX Airport becomes the first Green Airport in Indonesia in the existing building category

The efforts in managing, reducing carbon footprint, and energy conservation to achieve alignment with global climate targets are recognized by international organization such as airport carbon accreditation, TUV SUD, and also world green building council.

04 Follow up Actions

Climate Change Mitigation Actions in the Airport Sector in supporting the achievement of Indonesia's Nationally Determined Contribution

Energy Efficiency

- Use of energy-saving equipment and technology at airports
- Electrification of ground support equipment (GSE) and operational vehicles at airports

Utilization of Renewable Energy

- Utilization of solar panel street lighting at airports
- Solar Panel in Transportation Facilities

Greening Program

- Planting selected trees that not attracting wildlife

The initiatives that continually be implemented in Indonesian airports to achieve net zero / decarbonization program



- A collaboration between DGCA with airports and stakeholders in efforts to reduce GHG emissions at airports
- Collaborative approach with stakeholders and community is the key to make sure decarbonization program give positive impact and also collect better corrective action regarding airport & environment in the future

RENEWABLE ENERGY IMPLEMENTATION



improving energy transition programs at airports

CONSTRUCT ZERO NET ENERGY FOR NEW BUILDINGS



Designing new buildings to highly efficient NZE-ready standards at airport

ELECTRIFICATION FOR GROUND SUPPORT VEHICLE



Electric vehicle conversion staging implementation for CO2 reduction in airport airside & landside area

COMPLYING WITH EIA STANDARD : MANAGEMENT & MONITORING OF AIRPORT ENVIRONMENTAL ASPECTS



Noise

Installation of noise monitoring system, noise barrier, & for noise prevention and reduction around airport area



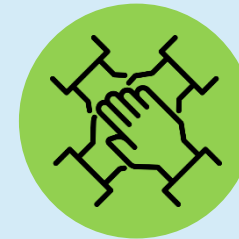
Soil Pollution

Fuel oil waste management to prevent soil pollution & contamination



Natural Environment

- *Natural environment monitoring & management affected by airport development.*
- *Vegetation control around airport area that attract birds and other animals.*
- *Wild animal handling using technology without override aviation safety*



Social Culture

- *Protection of prehistoric & cultural sites*
- *environmental development program*



KEMENTERIAN PERHUBUNGAN
REPUBLIK INDONESIA



Directorate General of
Civil Aviation



Directorate of Airports

THANK YOU



Thank You

