GMR AERO

Your caring gateway to a connected world

HYD RAJIV GANDHI INTERNATIONAL AIRPORT

GMR AERO ENTERPRISE

CII NATIONAL AWARD FOR ENVIRONMENTAL BEST PRACTICES– 2026

Project Title:

" Net Zero Carbon and Climate Resilient Airport: GHIAL's Integrated Climate Change Mitigation and Adaptation Program"

Category: 'Climate Change & Mitigation Efforts'

GMR HYDERABAD INTERNATIONAL AIRPORT LIMITED

Team Members:

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GMR Hyderabad International Airport Limited (GHIAL)



MODEL

PPP · BOOT

GHIAL operates the Rajiv Gandhi International Airport (RGIA) under a Public-Private Partnership (PPP) model.



OPERATIONS COMMENCED

23 March 2008

Rajiv Gandhi International Airport (RGIA), Shamshabad



INITIAL DESIGN CAPACITY

12 MPPA

Terminal capacity; cargo 1.5 lakh MT per annum



FINAL CAPACITY

34 MPPA

Terminal capacity; cargo 2.5 lakh MT per annum

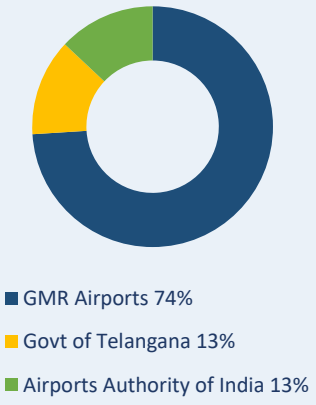


PRESENT OPERATIONS

30+ MPPA

Passengers per annum; cargo 1.93 lakh MT per annum

COMPANY SHARE



RGIA AT A GLANCE

5,495 acres
Airport land area

96
Destinations connected

100% RE Powered
Captive Solar Power Plant + Renewable Grid Energy

Net Zero Carbon
Reduced > 95% Scope 1 + 2 GHG emissions

2008
Asia's first LEED-certified airport terminal

50 MPPA
Environmental Clearance for handling capacity

"GMR Group will be an institution in perpetuity that will build entrepreneurial organizations making a difference to society through creation of value."

Net Zero Carbon and Climate Resilient Airport:

GHIAL's Integrated Climate Change Mitigation and Adaptation Program

TRIGGER: WHY WE STARTED

From a global climate commitment to GHIAL's own policy

Global climate commitments cascaded down to airports: each step made a Net Zero airport a responsibility rather than a choice.

Paris Agreement
Limit warming to 1.5°C; India commits to Net Zero by 2070

IATA Fly Net Zero
Airlines commit to net zero CO_2 emissions by 2050

ICAO LTAG
Net-zero carbon goal for international aviation by 2050

ACI Airport Carbon Accreditation
Airport pathway from Level 1 to Level 5: net zero on Scope 1 & 2

GHIAL Policy
≥90% cut in Scope 1 & 2; Net Zero in Scope 3 by 2050 or earlier

PLUS LOCAL DRIVERS

- Rising climate risk: extreme heat, flooding, intense rainfall, severe winds
- Future-proofing a fast-growing airport's infrastructure
- Aspiration to make RGIA a global benchmark airport

UNIQUENESS: A FIRST-OF-ITS-KIND INTEGRATED MODEL

Growth decoupled from carbon
>95% reduction in Scope 1+2 GHG emissions in-spite of constant traffic growth

100% renewable electricity
10 MWp captive solar plus green power purchase; Scope 2 = 0

Airside decarbonisation
BME with FEGPU and PCA, single-engine taxiing, 5 MW EV charging. Stakeholder Partnership

Cliimate Mitigation plus adaptation
Climate risk assessed to 2070 within the same framework

Net Zero (Scope 1& 2) PLAN VS ACTUAL

2035 planned → **2024** achieved

Net Zero for Scope 1 & 2 reached 11 years ahead of the 2035 target.

- Commenced: 2023 - 2024
- Completed (Scope1+2): 2024; ACI-Airport Carbon Accreditation (ACA) Level 5 for CY 2024 emission reduction (>90% Emission Reduction from 2010 Baseline year
- Ongoing: Scope 3 roadmap to 2050

Conceived by leadership, this project was successfully executed through cross-functional collaboration.

MILESTONES AGAINST THE ROADMAP

2010 — Baseline year: 28,865 tCO_2e (Scope 1+2)

2016 — ACI-ACA Level 3+ Optimisation; first in APAC to be carbon neutral in its category

2023 — **ACI-ACA Level 4+ Transition** **Goal Setting year for GHIAL's Net Zero Carbon (Scope 1 &2)**

2024 — Net Zero for Scope 1 & 2 (Target was 2035)

2025 — **ACI-ACA Level 5 Accreditation** **Goal Setting and Baseline Year for Scope 3 Net Zero**

2050 — Scope 3 Net Zero goal (ICAO LTAG, IATA FLY Net Zero)

GHIAL's Net Zero Carbon Roadmap

ACHIEVED | **AHEAD**



Baseline	Level 4+	Net Zero (Scope 1+2)	ACI – ACA Level 5	Next 2 years	Scope 3 Net Zero	India Net Zero
28,865 tCO_2e (Scope 1+2) sets the reference year	ACI-ACA Level 4+; emissions cut to 13,732 tCO_2e (−52%)	Achieved against the 2035 target; 2,395 tCO_2e residual (−92%)	ACA Level 5; 1,406 tCO_2e (−95.1%)	Zero-emission GSE, Scope 3 partnerships, adaptation works, IFRS S2 disclosure	Aligned with ICAO LTAG and IATA FLY Net Zero pathways	Contribution to national goal; climate-risk horizon

HOW WE GET THERE: AVOID, REDUCE, REMOVE, ENGAGE

AVOID

100% renewable electricity: 10 MWp captive solar plus green power purchase; Scope 2 = 0

REDUCE

BME with FEGPU and PCA, single-engine taxiing, EV fleet, low-GWP refrigerants, biodiesel

REMOVE

Greenbelt sink (~776 tCO_2/yr) plus certified removal credits for residual emissions

ENGAGE (SCOPE 3)

Airlines, ground handlers and concessionaires; 5 MW airside EV charging; biofuels

Climate Risk Assessment & Adaptation: Planning to 2070

Methodology (aviation-sector guidelines, GMR ERM framework)

A Hazard identification → B Likelihood of hazard → C Impacts of hazard on airport → D Risk score → E Velocity of hazard → F Identify adaptation options

Key hazards identified: projections for 2030, 2050 and 2070

- Extreme heat
- Extreme precipitation (rain / flooding)
- Extreme wind
- Fog
- Lightning

Phase 1 · Climate Exposure Assessment

Current and projected hazard exposure of RGIA (2030, 2050, 2070).

Phase 2 · Climate Risk / Vulnerability Assessment

Stakeholder consultations and site assessments of critical assets and operations. Key risks: workforce safety, infrastructure resilience, flooding, operational continuity.

Phase 3 · Climate Adaptation Strategy

Resilience pathway with current-, near- and mid-term actions for infrastructure, operations and workforce protection.

Adaptation measures initiated

- ✓ Climate-resilient airport expansion planning
- ✓ Storm-water management and drainage resilience
- ✓ Heat-resilient terminal and airside design
- ✓ Critical utilities and systems protected against extreme weather
- ✓ Stronger business continuity and emergency response
- ✓ Workforce health and safety in extreme weather

Aligned with

ICAO Climate Risk Guidelines | ISO 14091 | ACI Climate Resilience Framework | IFRS S2

What it protects

Asset protection | Workforce safety | Business continuity | Climate-informed investments | Regulatory preparedness | Stakeholder confidence

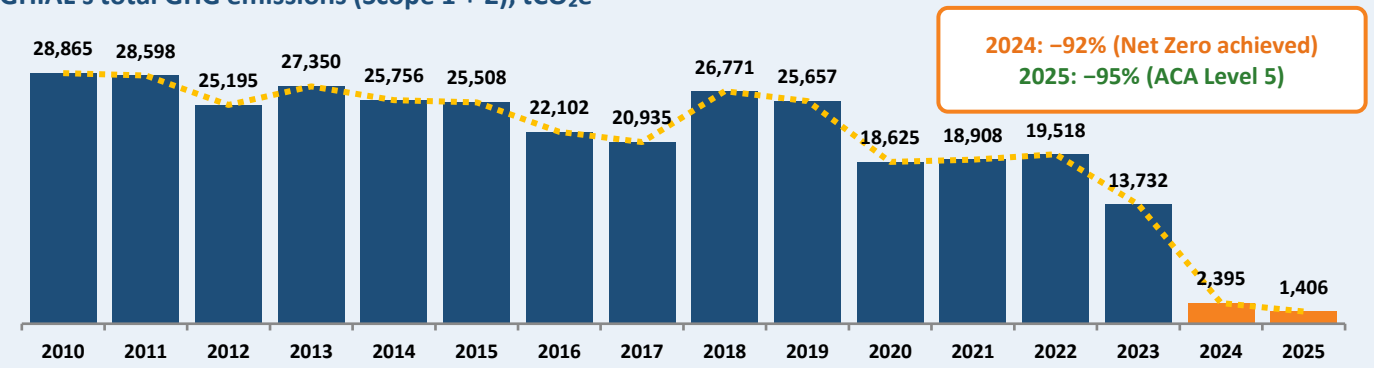
Result: proactive adaptation, built into expansion planning, capital investment and business continuity.

All three phases completed | Consultant: M/s Haskoning DHV Nederland B.V. Netherlands Airport Consultant (NACO) | GHIAL Climate Resilience Policy governs systematic climate risk management

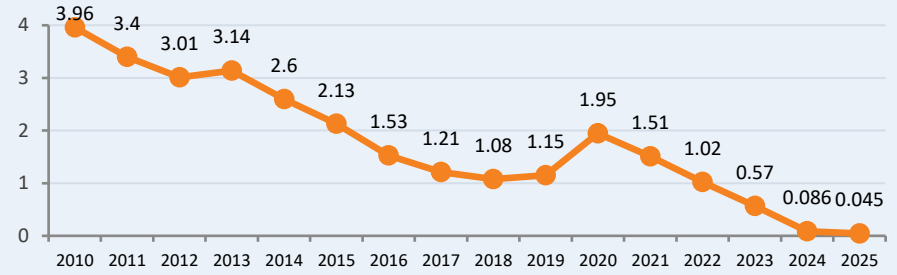
Tangible Benefits: Climate Impact

Net Zero	>95% Scope 1 & 2 GHG Emission Reduction vs 2010 baseline
GHG Avoided	1,34,165 tCO_2e GHG emissions avoided through sustainable measures
Carbon Intensity	> 99% reduction in $kgCO_2e$ per pax GHG consumption in CY2025 vs 2010 baseline year
Carbon Sink	~ 776 tonnes carbon sequestered by the greenbelt each year
LEED Platinum	USGBC-certified passenger terminal building
Climate Resilient	Climare Risk Assessment aligned with ICAO, ISO 14091, ACI framework, IFRS S2

GHIAL's total GHG emissions (Scope 1 + 2), tCO_2e



Carbon intensity, $kgCO_2e$ per passenger



3.96 in 2010 → 0.045 in 2025 (–99%)



BME with FEGPU and PCA

19,485 tCO_2e avoided



Single-engine taxiing

2,169 tCO_2e avoided



GSE tunnel

124 tCO_2e avoided



5 MW EV charging station at airside

3,967 tCO_2e avoided

Green power purchase from TGSPDCL

81,926 tCO_2e avoided



10 MWp solar power plant operation

7,772 tCO_2e avoided



Pushpak e-bus services

15,643 tCO_2e avoided



Solar GSE and other measures

3,079 tCO_2e avoided

M/s Bureau Veritas verified GHG emissions reduction and avoidance at RGIA for CY2025 (Scope 1, 2 and 3): total avoided = 1,34,165 tCO_2e

Cost Benefits

₹ 10.61 Cr

Saved annually by green electricity by the captive 10 MWp solar plant;

₹ 15.60 Cr

Saved annually by avoiding GHG emissions by use of Sustainable Ground Operations through BME + PCA + FEGPU

₹ 3.07 Cr

Saved annually by using electric vehicles and E.V. infrastructure

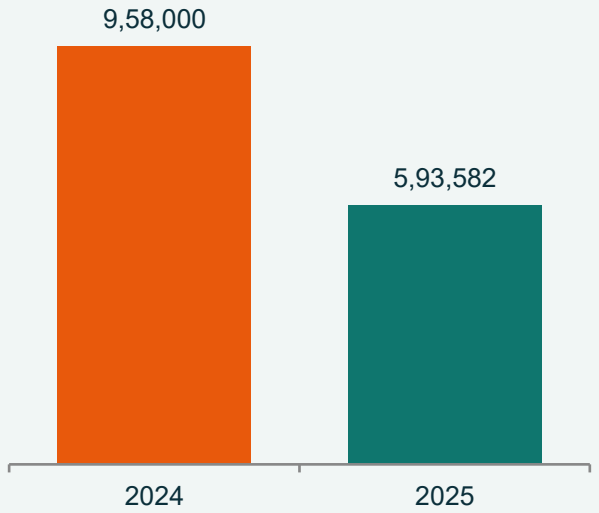
COST ECONOMICS

Initiative	Project cost	Annual benefit	Payback
10 MWp solar and RE transition	₹41.2 Cr	₹9.36 Cr/yr; 7,772 tCO_2e avoided	**4.4 years**
BME + PCA + FEGPU	Part of expansion project	11,431 tCO_2e/yr avoided	Recovered under RAB
EV infrastructure incl. 5 MW charging	₹10 Cr	2,248 tCO_2e/yr avoided	**Airside canopy CAPEX recovered in 3 years**

PRODUCTIVITY AND OPERATING GAINS

- BME with FEGPU and PCA replace aircraft APU use at the gate
- Lower APU fuel use, noise and local air pollution
- Single-engine taxiing and short taxi routes cut fuel burn
- Solar-powered GSE (baggage loader, stepladder) and GSE tunnel

Cost of carbon removal credits (₹)



–₹3.64 lakh

saved in one year (–38%) because fewer residual tonnes need removal

Emission reduction is a cost lever: every tonne GHIAL cuts is a tonne it no longer has to buy back as a certified removal (1 CER = 1 tCO_2e removed).

Intangible Benefits: People, Pride and Preparedness



People & society

- Better local air quality and noise abatement from BME/PCA versus APU use
- Safer workplace in extreme weather
- Community outreach programmes and biodiversity-rich greenbelt



Morale & motivation

- Pride in ACA Level 5, LEED Platinum and national energy awards
- Teams see measurable results: >95% reduction in Scope 1 & 2 GHG emissions
- Recognition from ACI, CII and ASSOCHAM



Skill upgradation

- GHG accounting and verification (ISO 14064, ACA)
- Climate risk assessment (ISO 14091, IFRS S2)
- Regular training on Sustainability topics including but not limited to renewable, EV and airside systems, LCA, ESG.



Attitude shift

- Climate governance built into strategy and investment planning
- Growth and decarbonisation treated as one goal
- Airlines, ground handlers and concessionaires engaged as partners



Other benefits

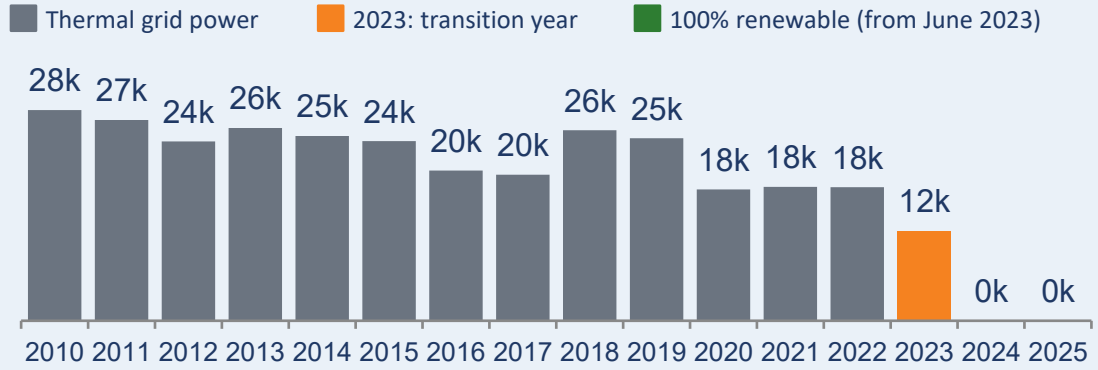
- Climate leadership and stakeholder confidence
- Energy security and reduced grid dependency
- Regulatory preparedness and business continuity

"Enhanced awareness and participation through regular training and community outreach programmes."

Replication Potential across the GMR Group

EVIDENCE: 2010 BASELINE VS 2025

BEFORE	AFTER
Thermal grid power	 Electricity: 100% renewable (10 MWp solar + green power)
APU running on turnaround	 Aircraft at gate: BME with FEGPU and PCA
Conventional fuel	 Airside vehicles: EVs, 5 MW charging, solar GSE
28,865 tCO_2e	**Scope 1+2 emissions: 1,406 tCO_2e (–95.1%)**



WHERE THE MODEL LIVES AND SPREADS

Hyderabad (GHIAL)
ACA Level 5; Net Zero Scope 1+2; 100% renewable electricity

Delhi (DIAL, GMR Group)
ACA Level 5 and 100% renewable electricity: the same playbook, proven in a second GMR airport

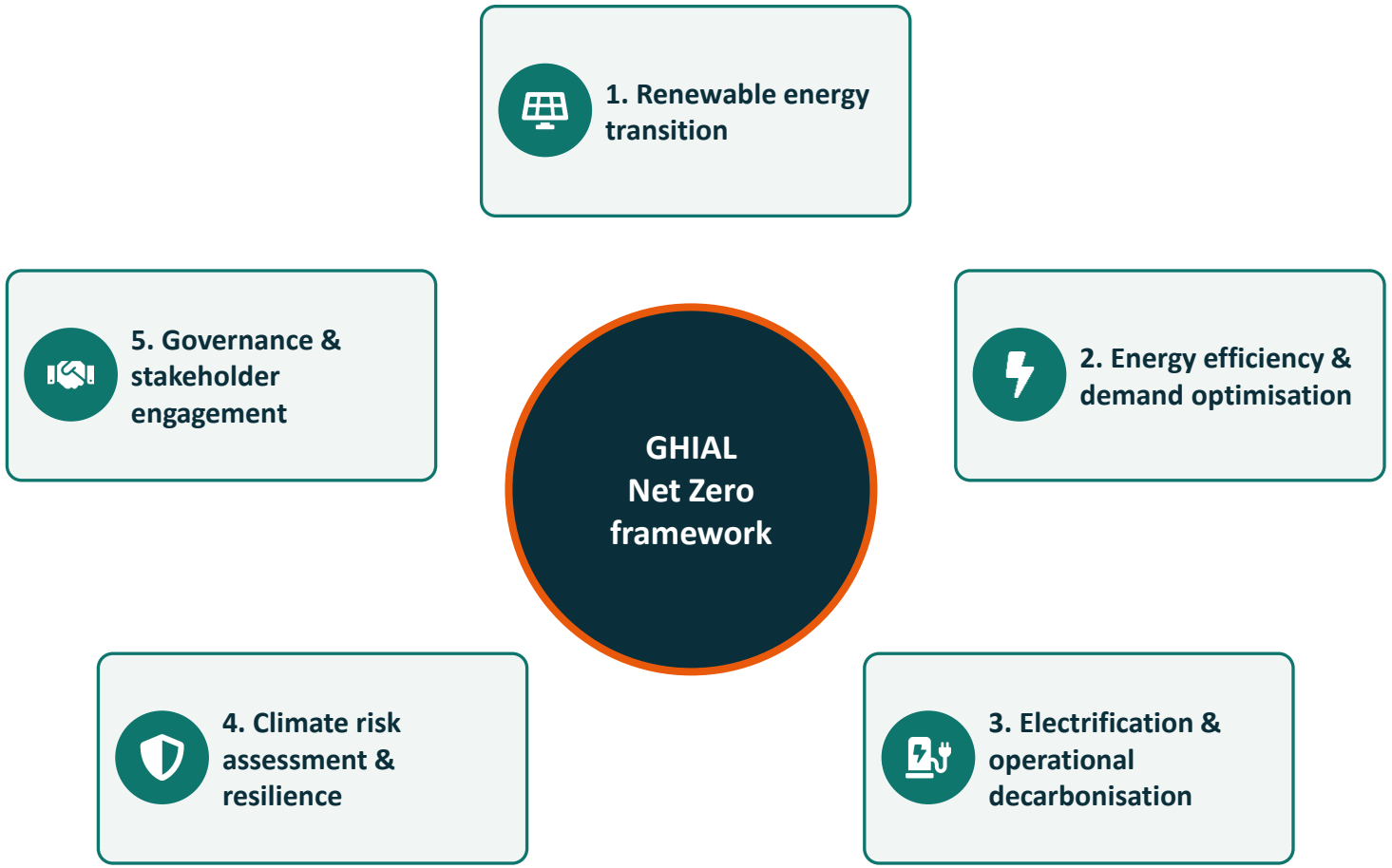
Hyderabad campus entities
Cargo, MRO, Airport City, Aerospace & Industrial Park: extend the framework on the same campus

Other GMR Group airports
Goa, Medan (Kualanamu), Cebu: baseline, verify and electrify

WHAT NEXT: SPREADING THE BENEFITS

1. Codify the 5-pillar playbook
2. Baseline and verify each site's inventory
3. Switch to renewable electricity
4. Electrify airside and ground operations
5. Add climate risk assessment

A five-pillar model any Airport or Industry can Adopt



Applicable to: Airports, transport hubs, infrastructure projects, industrial facilities, commercial complexes and smart cities, using commercially available technologies.

STEPS INITIATED AND SHARING PLATFORMS

External validation

Verified inventories and ACA Level 5 (ACI); Bureau Veritas assurance

Open disclosure

CY2025 carbon footprint report and sustainability information on hyderabad.aero

Industry forums

ACI Asia-Pacific & Middle East and ACA programme; CII and ASSOCHAM platforms

Peer leadership

FIVE Indian airports (Delhi, Hyderabad, Bengaluru, Mumbai, Cochin) are now ACA Level 5

Playbook for others

Climate resilience framework for airports and critical infrastructure; demos and site visits offered

Challenges & Mitigation Measures

TECHNICAL

CHALLENGE

Decarbonising the airside without slowing turnarounds

HOW WE COUNTERED

BME with FEGPU and PCA built into the expansion project; single-engine taxiing and short taxi routes; 5 MW EV charging for GSE

CHALLENGE

Managing Scope 3 GHG emissions (99% of the total Emissions)

HOW WE COUNTERED

Stakeholder framework with airlines, ground handlers and concessionaires; EV and biofuel adoption

ADMINISTRATIVE

CHALLENGE

Cutting emissions while passenger traffic keeps growing

HOW WE COUNTERED

100% renewable electricity via captive solar plus green power from the state DISCOM; net zero reached in 2024

CHALLENGE

Credible proof and residual emissions

HOW WE COUNTERED

Annual third-party verification (ACA, Bureau Veritas); certified removal credits, with cost down 38% in a year

MAINTENANCE

CHALLENGE

Keeping 10 MWp solar output steady (10,946 MWh/yr)

HOW WE COUNTERED

Planned operation and maintenance of the plant and monitoring of generation

CHALLENGE

Sustaining EV charging, GSE uptime and low-GWP refrigerants under rising heat

HOW WE COUNTERED

Heat-resilient design of terminal and airside assets; utilities protected against extreme weather

RGIA Benchmark: Preparing for Tomorrow while Decarbonising Today

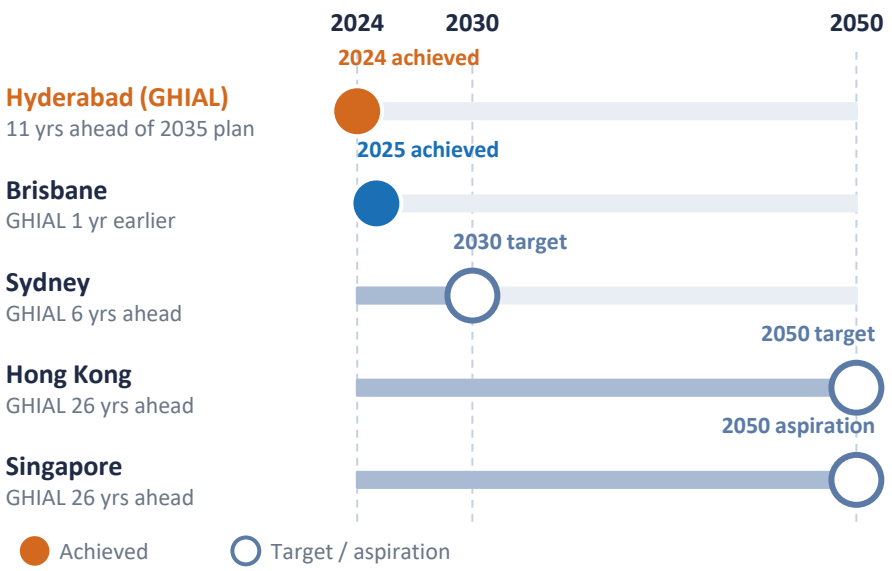
2070
CLIMATE-RISK HORIZON
Climate risk model + adaptation planning

2024
SCOPE 1 & 2 NET ZERO
Achieved ahead of 2035 target

LEED Platinum
GREEN BUILDING
Expanded terminal — 84-point LEED Platinum

~776 tCO_2/yr
CARBON SINK
Airport vegetation / green cover

NET ZERO (SCOPE 1 & 2): ACHIEVED OR TARGETED YEAR



INTEGRATED CLIMATE APPROACH: RGIA VS PEERS

RGIA | Peer practice | Not evidenced

Airport	Climate risk / adaptation	Green building / nature	Carbon sink / nature-based	Net Zero / mitigation
RGIA Hyderabad	2070 TCFD-aligned model + adaptation plan	LEED Platinum terminal; 10 MW solar	**~776 tCO_2/yr quantified sink**	Net Zero 2024; ACA Level 5 • 100% RE
Delhi DIAL	Flood management + operational risk assessment	T1 LEED Platinum; T3 LEED Gold + IGBC Platinum	*Green landscaping; no quantified sink found*	Net Zero 2024; ACA Level 5 • 100% RE
Bengaluru BIAL	Comprehensive risk assessment + roadmap	T2 IGBC Platinum; 10,000+ m^2 green walls	*Native vegetation; no quantified sink found*	Net Zero Carbon pillar; 100% renewable energy
Mumbai MIAL	TCFD-aligned; 2026 adaptation project (ACI)	T2 IGBC Platinum; resilience measures	Sponge infrastructure; Mithi River resilience	Carbon neutral S1&2; ACA L4+ • 100% green power
Cochin CIAL	*Long-term resilience; no 2070 study found*	IGBC Net Zero Energy; T1/T2/T3 + cargo	*Green landscape; no quantified sink found*	Power-positive; 50 MWp green-energy portfolio
Singapore Changi	Airport-wide risk mapping + adaptation pathways	Green Mark Platinum; Positive Energy Building	*Landscaping + biodiversity; no quantified sink*	Long-term Net Zero pathway + RE programme

PIONEER POSITIONING | RGIA is among the Indian airports demonstrating a particularly integrated climate approach — combining quantified future-risk assessment with adaptation, mitigation, green infrastructure and carbon sequestration.

Aligned with National and Global standards

COMMITMENTS AND PATHWAYS

- India NDC (Paris Agreement)
- India Net Zero 2070
- ICAO LTAG: net zero 2050
- IATA FLY Net Zero 2050
- IPCC 1.5°C pathway

STANDARDS, ACCREDITATIONS AND DISCLOSURE

- ACI ACA Level 5
- ISO 14064 (GHG)
- ISO 14001 (EMS)
- ISO 14091 (adaptation)
- ISO 31000 (risk)
- USGBC LEED Platinum
- IFRS S2 (climate)
- ACI Climate Resilience Framework

UNITED NATION'S SUSTAINABLE DEVELOPMENT GOALS



Priority Plans for the Next Two Years

Net Zero and Climate Resilient Integrated Project

+ 1 year Sustain & strengthen

+2 year Scale & lead

1. **Sustain Net Zero (Scope 1 & 2)**
2. **Strengthen Stakeholder Partnership for Scope 3 reduction**
3. **Aiming for Zero Emission GSE & GSV**
4. **Climate Resilience Integration**
5. **Explore SAF Ecosystem Support**
6. **Expanded solar integration and Carbon Sink**
7. **Climate Adaptive Infrastructure and Operations**
8. **Digital Carbon Management**

TARGET

Net Zero (Scope 3) & Climate Resilient Airport

ENABLERS ACROSS BOTH YEARS

PERFORMANCE EVALUATION

- Annual verified GHG inventory (ACA, ISO 14064)
- Board and ESG committee review

SCALING UP

- EV adoption for GSE and vehicles
- Solar and SAF ecosystem scale-up

TRAINING & EDUCATION

- Employee and stakeholder awareness
- Airline, GHA, school and community outreach

CONTINUOUS IMPROVEMENT

- Digital carbon management
- Annual review of Environmental & Sustainability Policy

STAKEHOLDER ENGAGEMENT

- Airline, GHA and concessionaire agreements
- SAF and fuel supplier collaboration

Top 10 Best Practices

1



100% Renewable Electricity

10 MWp captive solar plus green power; Scope 2 = 0

2



Sustainable Operational Practices

11,431 tCO_2e avoided each year

3



Single-engine Taxiing

Short taxi routes; 2,169 tCO_2e avoided

4



EV fleet and 5 MW EV Charging Station

2,248 tCO_2e avoided; zero-emission GSE goal

5



Low-GWP Refrigerants and Biodiesel

Scope 1 controls and fuel conservation

6



Green Buildings

LEED Platinum passenger terminal

7



Greenbelt Carbon Sink

~776 tCO_2 sequestered each year

8



Verified GHG inventory

ACA, ISO 14064, Bureau Veritas assurance

9



Certified Removal Credits

Residual emissions removed; cost down 38%

10



Climate Risk Assessment

Scenarios to 2070; ICAO, ISO 14091, IFRS S2

Mobile CAAQMS – First of its kind in Indian Airports



Mobile Continuous Ambient Air Quality & Meteorological Parameters Monitoring System (MCAQMS)

A first-of-its-kind initiative among Indian airports; monitors operational and non-operational areas.

Average Air Quality Index (AQI) at RGIA, FY 2024-25

41.8

GOOD

All monitored parameters were well within CPCB limits. Monthly AQI stayed in the Good to Satisfactory range (21 to 88).

Good	Satisfactory	Moderate	Poor	Very Poor	Severe
0–50	51–100	101–200	201–300	301–400	>401

WHAT WE MONITOR

- PM10, PM2.5, SO_2, NOx, CO, O_3 and NH_3
- Ambient noise levels
- Rainfall, wind speed and direction, temperature, solar radiation, humidity

HOW

- Two fixed CAAQMS at airside and landside
- MCAQMS for location-specific assessments
- Monthly monitoring by a NABL-accredited agency

WHY IT MATTERS

- Faster response to environmental concerns
- Real-time, transparent data reporting
- ACI Green Airports Gold 2021 for Air Quality Management

Key learnings: Growth and Net Zero can go together

1 Mitigation and adaptation belong in one framework

Cutting emissions and preparing for climate risk protect the same assets and business.

2 Design decarbonisation into growth

BME, FEGPU and PCA were built into the expansion project, so growth and lower emissions moved together.

3 Renewable electricity is the biggest lever

Green power purchase alone accounts for 61% of the 134,165 tCO_2e avoided.

4 Lower emissions lower the offset bill

Removal-credit spend fell 38% in one year as residual emissions dropped.

5 Scope 3 is the next frontier

Scope 3 is 1.51 Mt against 1,406 t for Scope 1+2: value-chain partners hold the key.

6 Verification builds credibility

Third-party assurance, ACA and ISO 14064 practice turn claims into proof.

Net Zero is a journey, not a destination.

95.1%

reduction in Scope 1+2 since 2010

61%

of avoided emissions from renewable power

–38%

removal-credit cost in one year

Environmental & Sustainability Promotional Activities





School Children Environmental Awareness Campaigns





Stakeholder Partnership & Training





Environmental Promotional Activities





Environmental Initiatives Rewards & Recognition

Global Recognition for Climate Leadership



ACI - ACA Level 5 (April 2025)

Among the top four airports in ACI Asia-Pacific & Middle East



ASSOCHAM Award (20 June 2025)

Excellence in Water Conservation & Climate Change Mitigation



CII National Energy Leader

7th consecutive year; Excellent Energy Efficient Unit for the 9th time



LEED v4 BD+C Platinum

84 points, USGBC; April 2025; expanded terminal

ACI GREEN AIRPORTS RECOGNITIONS, ASIA-PACIFIC

2018	2019	2020	2021	2022	2023
Gold	Silver	Platinum	Gold	Silver	Gold
Solid Waste Management	Green Infrastructure	Water Management	Air Quality Management	Carbon Emission Management	Single-Use Plastic Elimination

MORE RECOGNITIONS

- Asia's first LEED-certified airport terminal (2008)
- ACI ASQ Best Airport Award 2024 (15–25 MPPA, Asia-Pacific)
- Skytrax 2025: Best Airport Staff, India & South Asia (4th time)
- ACI Level 4 Airport Customer Experience Accreditation
- First Prize, National Awards for Excellence in Cost Management 2024 (ICMAI)

Thank You!