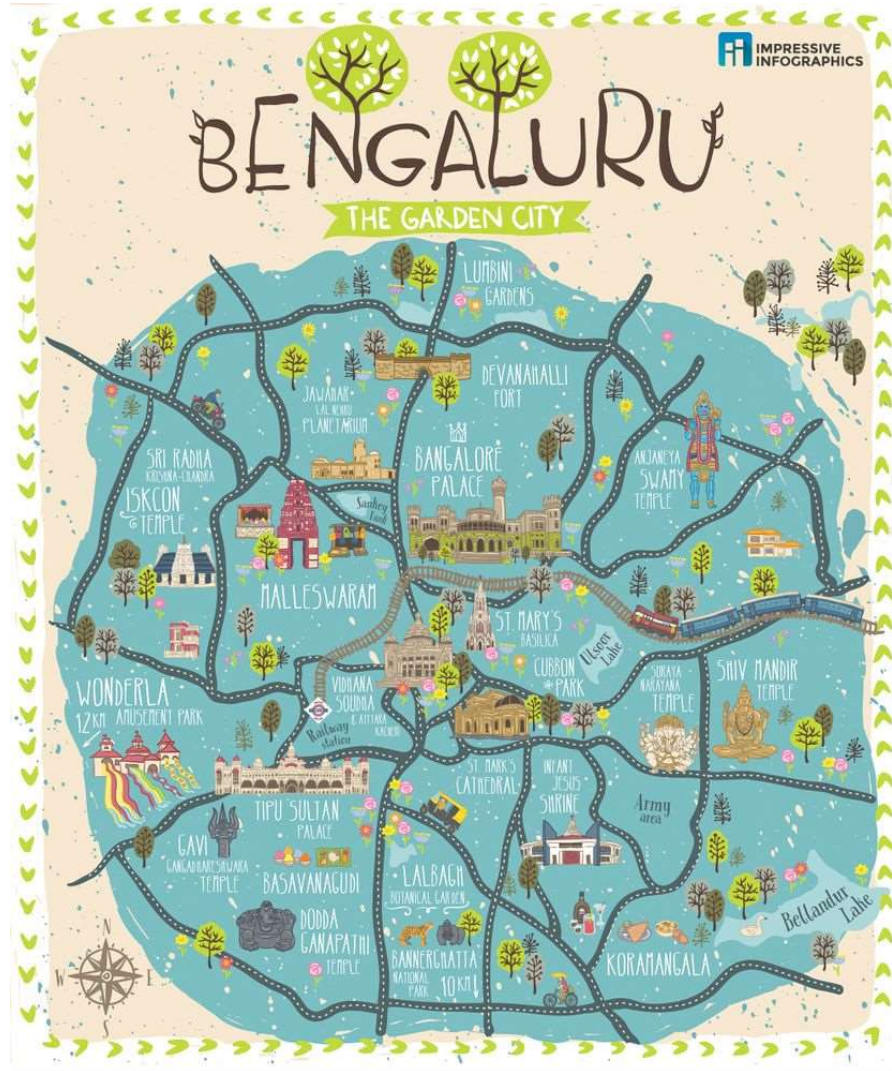


Terminal in a Garden

Bangalore Airport's response to
Climate Change

Suman Ramasundaram
AVP (Airport Planning & Development)
Bangalore International Airport Limited





About BIAL



- ❑ One of India's earliest Greenfield Airport developed through the PPP route
- ❑ Commenced operations in May 2008
- ❑ Concession Scope: Design, Build, Finance, Operate and Transfer
- ❑ Concession Period : 60 years
- ❑ Majority shareholding held by Canadian Fund Fairfax Financial Holdings with minority stakes held by Govt of India, Govt of Karnataka and Siemens



India's **3rd** largest Airport in terms of Pax and Freight

Only Airport in South India with **2 Independent Parallel** Runways



Enabling journeys, creating experiences and touching lives as the new gateway to India.



Saturation Capacity estimated at ~ **92 MPPA**

Growth driven by focus on air service development and connectivity

FY2008 – 1st Year of Operation

8 mn passengers

132k MT Cargo

FY 2023E -

32 mn passengers

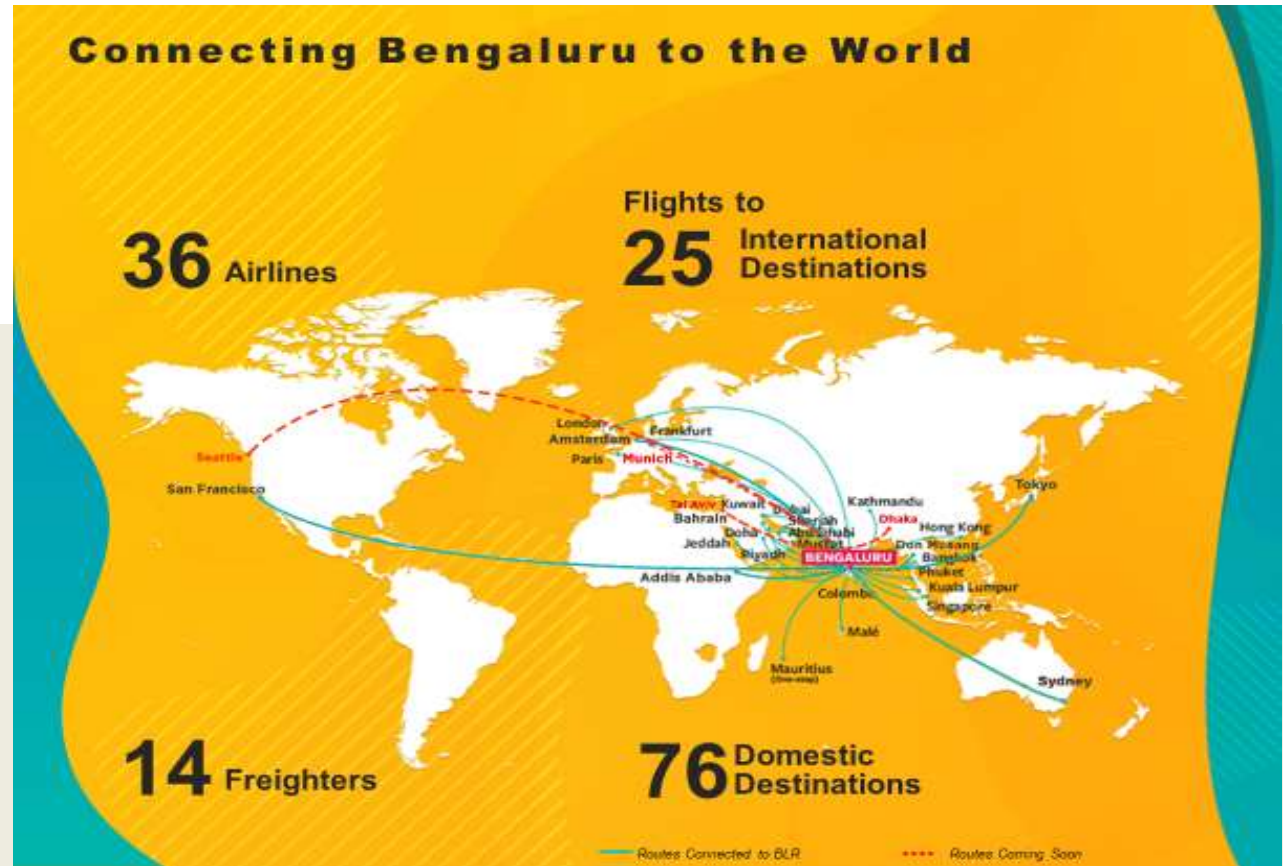
414k MT Cargo

~4.5X

Growth in Pax

~3X

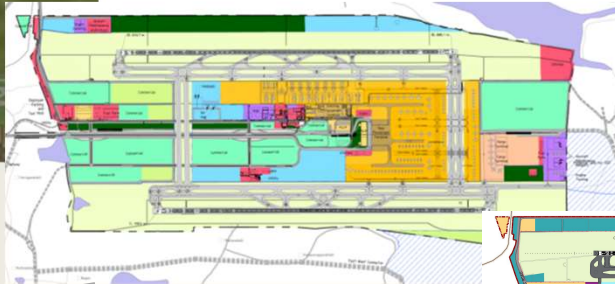
Growth in Cargo



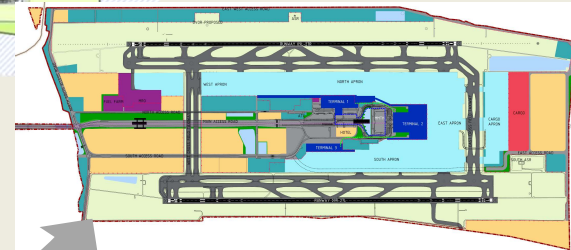
Evolution of the BIAL Master plan since COD



2008 – 40 mppa



2011 – 55 mppa



2019 – 92 mppa

We have doubled the capacity within the same footprint area

BIAL's Journey

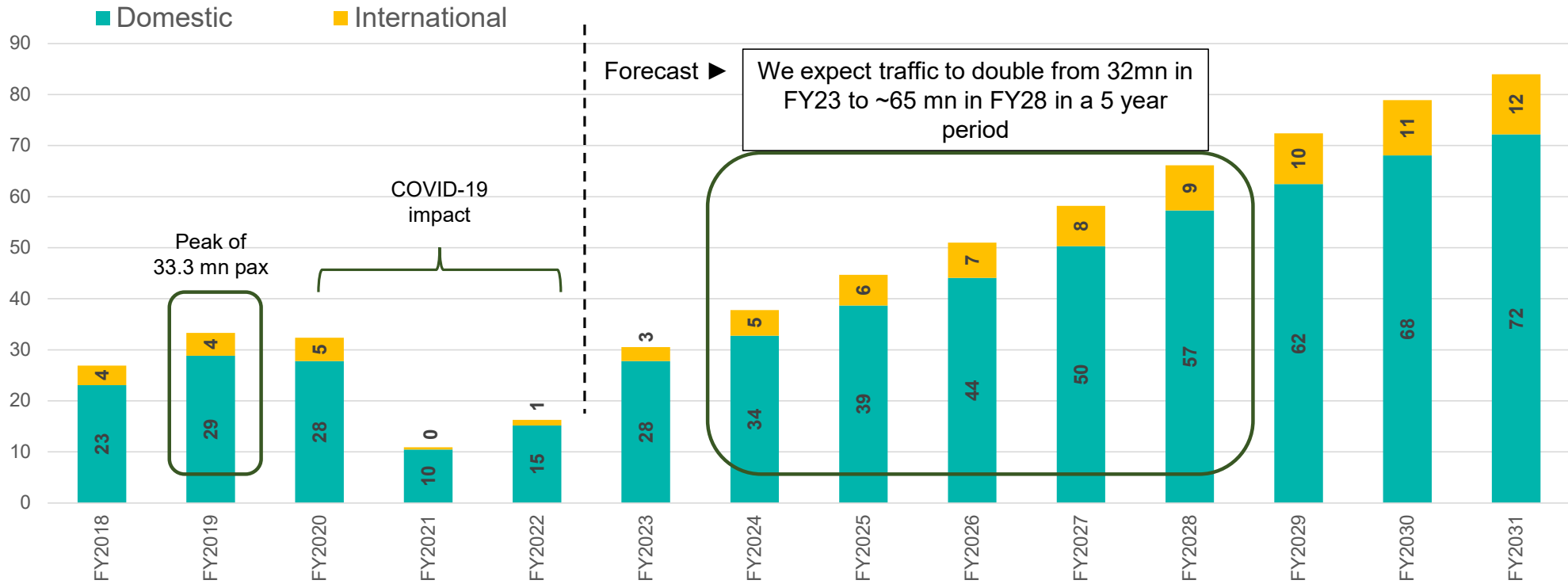
Over last 15 years, 2 major events influenced our evolution to where we are today

- Unprecedented economic growth fueling the nations appetite to travel, with BLR traffic growing at 12% over 15 years
- Climate change – extreme weather conditions, water scarcity, storm events, fog, loss of green cover in the city etc



BIAL has grown from under 8 mn passengers in our first year of operations to over 32 mn in 15 years

BLR Passenger Forecast
(in millions)





2013- Genesis for the new terminal-
T2

Sustainability was no longer a choice;
it became a must.

The “**Terminal in a Garden**” was born
with its core principle around
sustainability



Vision

Touch lives by nurturing a sustainable future through initiatives that drive economic, social and environmental transformation

Foundation Values- Corporate Social Responsibility (CSR), Behavioral Change, Compliance

Strategic Pillar

Water Stewardship

We aim to create a sustainable environment through responsible water consumption and water replenishment that are:

- **Socially equitable**
- **Environmentally sustainable**
- **Economically beneficial**
- **Sustain water positivity considering future expansions**

Strategic Pillar

Net Zero Carbon Emissions

Science-based approach to reduce and sequester carbon emissions across airport operations.

- 100% renewable electricity consumption
- Implement afforestation initiatives and green vehicle adoption
- Scope 1 and 2 emissions shall be zero by 2030

Strategic Pillar

Community Aligned Noise Management

We strive to ensure that the noise within the airport ecosystem is:

- **Within permissible limits through an array of initiatives including periodic noise mapping surveys, awareness spreading campaigns and collaboration with airlines**

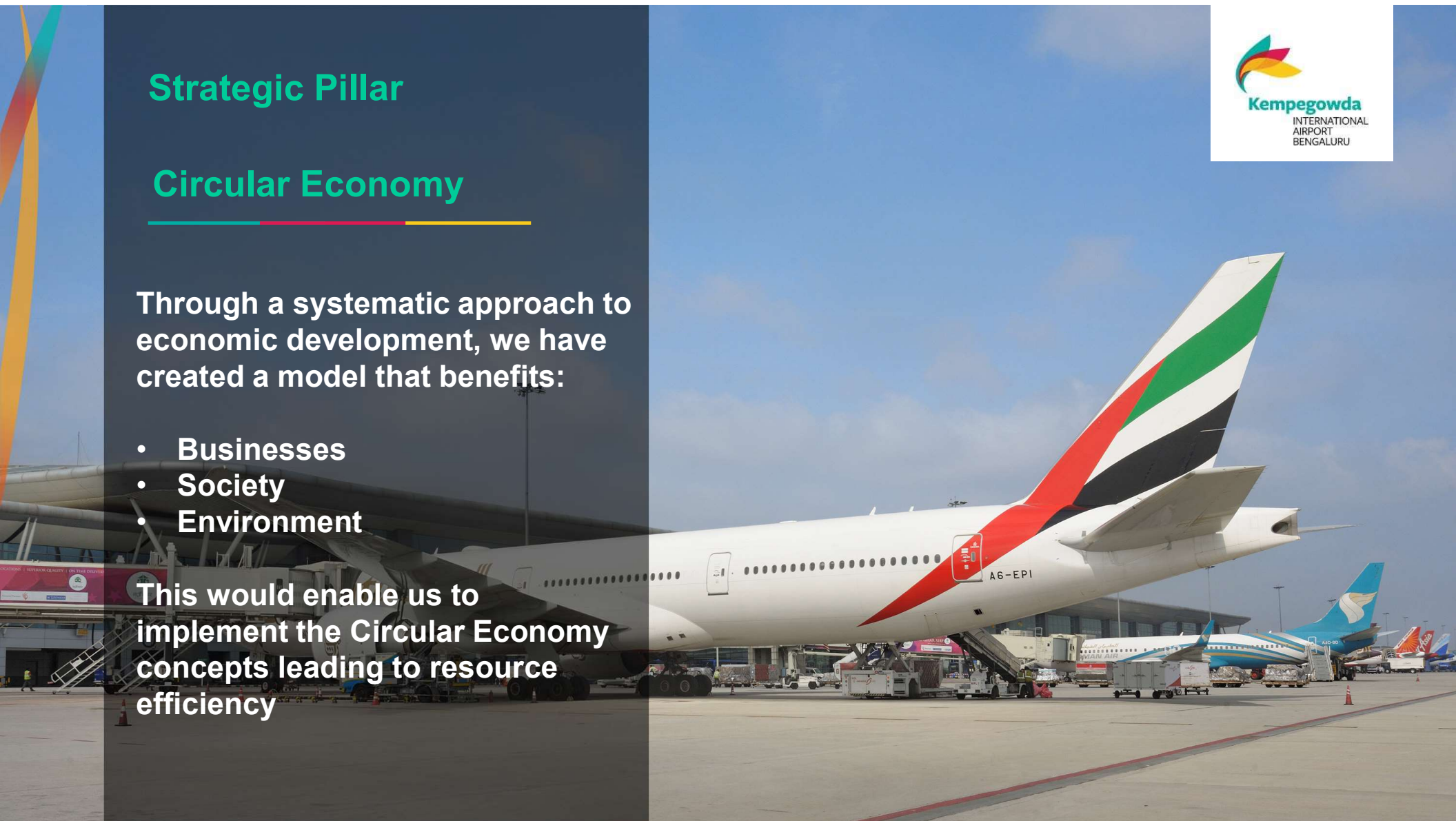
Strategic Pillar

Circular Economy

Through a systematic approach to economic development, we have created a model that benefits:

- Businesses
- Society
- Environment

This would enable us to implement the Circular Economy concepts leading to resource efficiency



Strategic Pillar

Sustainable Procurement

With Sustainable Procurement:

- We will make purchase decisions that not only meet the organisation's needs for goods and services, but also benefit the society at large and minimise the impact we create on the environment
- We will drive the process as per the ISO 20400 guideline



Strategic Pillar

Sustainable Mobility

We aim to achieve green and clean mobility solutions across the airport to balance our current and future needs

- We are working towards ensuring minimal impact on the environment along with reduced carbon emission through usage of renewable electricity

Three Core Foundational Values

- Corporate Social Responsibility (CSR)
- Behavioural Change
- Compliance

Three Core Foundational Values

Corporate Social Responsibility (CSR)

BIAL is committed to being a responsible corporate entity, sensitive to the environment and community at large.

As a role model for sustainable progress, BIAL's CSR initiatives are focused on improving:

- Education
- Health care
- Integrated development of communities in Devanahalli taluk

Three Core Foundational Values

Compliance

- We shall continue to be a fully compliant company and adhere to all statutory requirements
- We shall work proactively with all stake holders and sustain a compliant airport ecosystem

Three Core Foundational Values

Behavioral Change

We will strive for our teams and stakeholders to become:

- Ambassadors and role models of Sustainability Excellence



Achievements in our journey



USGBC pre certified **Platinum** & IGBC fully certified **Platinum** rating for Terminal 2.

Signatory to **UN global compact (Environment, Labour, Anti-corruption, Human rights)**.

77 Tonnes / day, Solid Waste treatment plant under commissioning, leading to **Zero Waste to Landfill**.

>90 Million Units renewable energy (100% of total Airport Power Consumption per annum is powered by Renewable Sources).

Scope 3 emissions reduction:
>90% utilization of BME – FEGP.
Introduction of Taxi Bot.
Sustainable Mobility: E vehicles for transportation.

Water Positive operations - We replenish more water than our consumption.

Water Positivity Index **2.36**.

LED powered runway
1st in India.

Energy Efficient operations.

Level 4+ Transition - highest Airports Council International (ACI) Carbon Accreditation.

Green Landscape

Reflects the ethos of Garden city with lush green landscaped gardens sequestering carbon emissions.

“Our entire approach is to embed ESG within the DNA of our organization's culture.”

“Strategizing is one thing, but living up to that expectation is key.

We will walk the walk.”

Sustainability – Net Zero Journey 2030

Net Zero Carbon Emission - Zero Scope 1 & 2 by 2030 through:

- 100% renewable electricity consumption
- Implement afforestation initiatives and green vehicle adoption

Initiatives:

- 100% renewable electricity >90 Mn units
- 22 lakh units of energy savings per annum, enough to power nearly 9,000 houses per month
- The streetlights, perimeter lighting & airfield lights have been converted to LED lighting.
- Our Net Zero trajectory 2030 is significantly better than IPCC 1.5 degree C targets
- Level 4+ Transition – Highest carbon accreditation from Airport Council International (ACI)
- Significant focus on scope 3 emissions reduction
- 10% Sustainable Aviation Fuel (SAF) by 2030
- Green Landscape enabling carbon sequestration



CERTIFICATE of ACCREDITATION

5 May 2023 - 4 May 2026

This is to certify that *Airport Carbon Accreditation*, under the administration of WSP, confirms that the carbon management processes at

KEMPEGOWDA INTERNATIONAL AIRPORT, BENGALURU

implemented by **Bangalore International Airport Limited**



have earned the accreditation level of **TRANSITION**, in recognition of the airport's exceptional work in aligning its carbon management with global climate goals to reach absolute emissions reductions, establishing related partnerships with its business partners and compensating responsibly the residual CO₂ emissions under its control, as part of the Global airport industry's response to the challenge of Climate Change.


Stefano Baronci
Director General
ACI Asia-Pacific


Tim Danson
Programme Director
WSP



Sustainability – Water Positive

Our Water Stewardship drive creates a sustainable environment through responsible water consumption and water replenishment:

Results:

- We replenish more water than we consume
- Our Water Positive Index 2023: 2.36 (2019 Index - 1.37)
- Recovery of 1 MLD potable water from Rainwater reservoirs from May 2023
- 33% freshwater through treated rainwater

Work in Progress:

- Recovery of additional 2 MLD potable by December 2023 (Capacity: 360 ML)



KIAB: A FOREST OF ABUNDANCE

180

Rare Endangered
Threatened Species

20235

Sqm Vertical green

620

Endemic plants of
Karnataka

10

Ecological Habitats

3600+

Different Species of
plants

74

Families

81

Genera

82700

Transplanted
Trees, Palms, shrubs &
Ground cover

Biodiversity

Hot spot

40470

Sqm Slope landscape

45 +

Themes

56

Lotus Varieties

800

Trees and palm species

310

Butterflies & Moths

300+

Flowering Taxa

> 1Cr shrubs

& Ground covers

Automized pallet
based Irrigation
System

Tree transplantation

8,312 large Trees, Palms, and Accent plants transplanted; 84% survival rate

63,279 shrubs and ground cover transplanted; 93% survival rate



Waste Management

- Intended Sustainable goal of BIAL is to achieve: Zero waste to landfill
- BIAL has recently partnered with Netherlands based firm to equip a fully circular self-sustaining solid waste management plant within airport
- Capacity of the plant : 70 tonnes per day
- Biogas generated during the treatment will be converted to CNG
- Recyclables / Inorganics will be properly segregated, baled and distributed to authorized recyclers ensuring circular economy

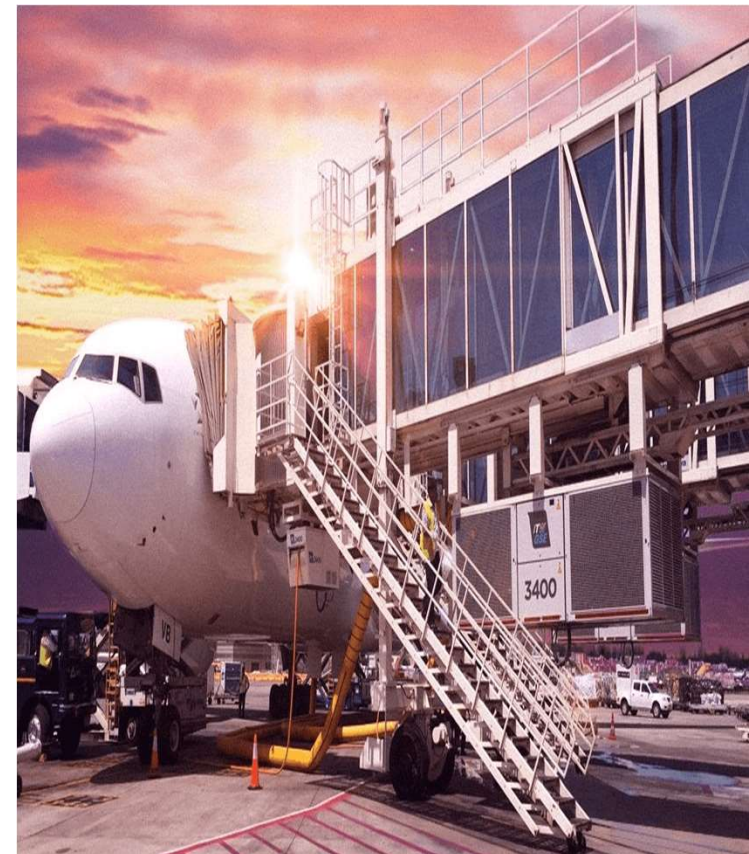


Climate Change Impact Mitigation & Adaptation

Our objective is to contribute towards Climate Change impacts mitigation **aligned with the objectives of the Paris Agreement** to limit the increase of global average temperature to 2°C above pre-industrial levels with an additional desire of **not to exceed 1.5°C**.

We are also committed to reduce scope 3 emissions significantly through:

- Bridge mounted Equipment (BME) – Fixed Electric Ground Power (FEGP) and preconditioned air (PCA) on all contact stands
- E vehicles for both internal & external mobility. Rail & Metro connectivity
- Clean Skies for Tomorrow Leaders: 10% Sustainable Aviation Fuel by 2030
- Enhanced Taxi Bot operations to save fuel, reduce CO2 emissions, noise pollution
- Stakeholder engagement – Collaborative approach ensuring positive reinforcement, exploring new alternates like Hydrogen, Mobility technologies etc.



Developing world-class infrastructure

Pillars of T2 design



Terminal In a garden



Technology



Sustainability



Art & culture





Terminal in a Garden

- 10000+ Sqm of Green walls/hanging gardens and outdoor gardens.
- Many trees of age between 300 to 800 years found new home at the Terminal forest.
- Use of Natural lighting during the day. Skylight area of 10494 Sqm, around 12% of roof area.
- Energy Efficient Chillers, Pumps and Systems.
- Rainwater harvesting system through a lagoon in front of Terminal 2. Water collected , treated and reused to the tune of 90 ML / year.
- Reusing and recycling 100% wastewater.
- Using natural material like bamboo, local granite, exposed brick work.
- Largest Airport in the world to have LEED Platinum Precertification by USGBC before beginning Operation

Terminal T2 Design - Four Pillars



SUSTAINABLE STRATEGIES T2, MLCP, CUP, FORECOURT

- MER**
- Energy Recovery
 - AHU Condensate Recovery
 - Demand Control Ventilation

- Protect Habitat**
- Solar Shading
 - Improved Wall & Roof Insulation
 - Rain water harvesting

- Materials: Local, Recycled, Environmental Product Declarations, Low-Emitting**

- Daylighting and Controls**
- LED Lighting
 - Photovoltaics

- Improved Indoor Air Quality**
- Demand Control Ventilation
 - Stratified HVAC

Public Retail

Public Transit

- At Master Plan Level:**
- Blackwater Treatment
 - Rainwater Management
 - Photovoltaics
 - Materials Carbon Offset
 - Waste Center
 - Potentially Biofuel from Digestion

- Green Vehicles**
- Heat Island in Phase 2

- Erosion Management**
- Rainwater Management
 - Reduced Irrigation Requirements

- CUP:**
- Reduce Cooling Tower Makeup
 - Water / Energy Metering
 - High Efficiency Chiller Plant
 - Energy and Water Conservation

1. Some strategies will be consistent throughout the site
2. Some strategies will be focused in particular areas

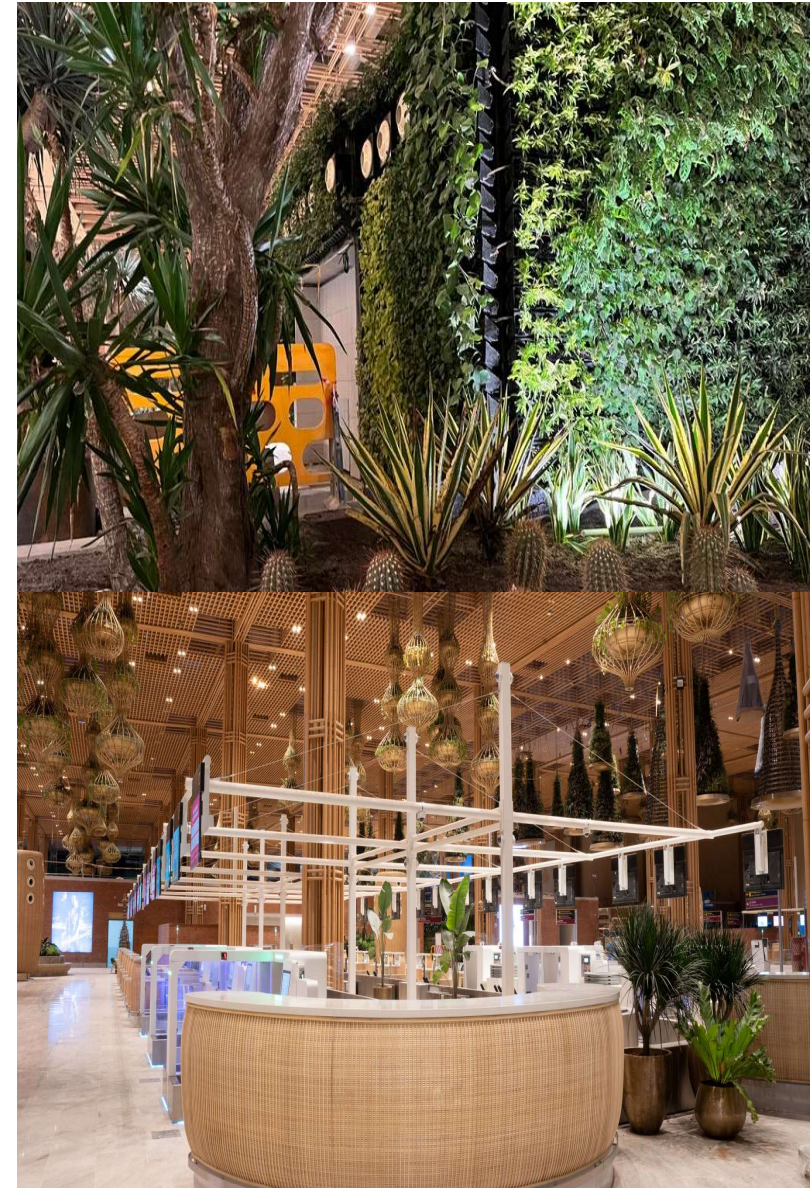
Sustainability Awards/Certifications

2023

- ✓ ACI Green Airports Recognition 2023 – Platinum Award for Plastics Circularity
- ✓ Highest Carbon Accreditation Level 4+ transition from ACI
- ✓ 'IGBC Platinum' rating under IGBC Green New Buildings for Terminal 2 (Fully Certified)

2022

- ✓ Won prestigious Golden Peacock award for Sustainability
- ✓ “Karnataka State Environmental Award 2021-22”
- ✓ ACI Green Airport Recognition 2022 “Platinum Award” for Carbon Management
- ✓ “Best Environmental Sustainability Award” from the ET Ascent National Awards for Excellence



Sustainability Awards /Certifications

- ✓ Sustainable Carbon Management Practice Award from World Sustainability Congress
- ✓ The City of Chicago, 2022 Airports Going Green Award - In Recognition of Sustainable Carbon Management

2021

- FICCI Smart Urban Innovation Award for Solar & Renewable Energy
- Most Innovative Environmental Project & Most Useful Environmental Project Awards 2021 at the 8th CII National Award for Environmental Best Practices 2021 under the Climate Change Impact Mitigation and Adaption category





License to Operate

- The sustainable airport is the concept we need to achieve
- Airports have a great opportunity and responsibility to lead the sustainability agenda and practices
- Once the airports deliver sustainability commitments, it will strengthen their social license to operate
- This won't just be to the benefit of the industry, but will strengthen the cities and communities it serves
- Overall, the future will mandate:

SUSTAINABILITY as License to Operate

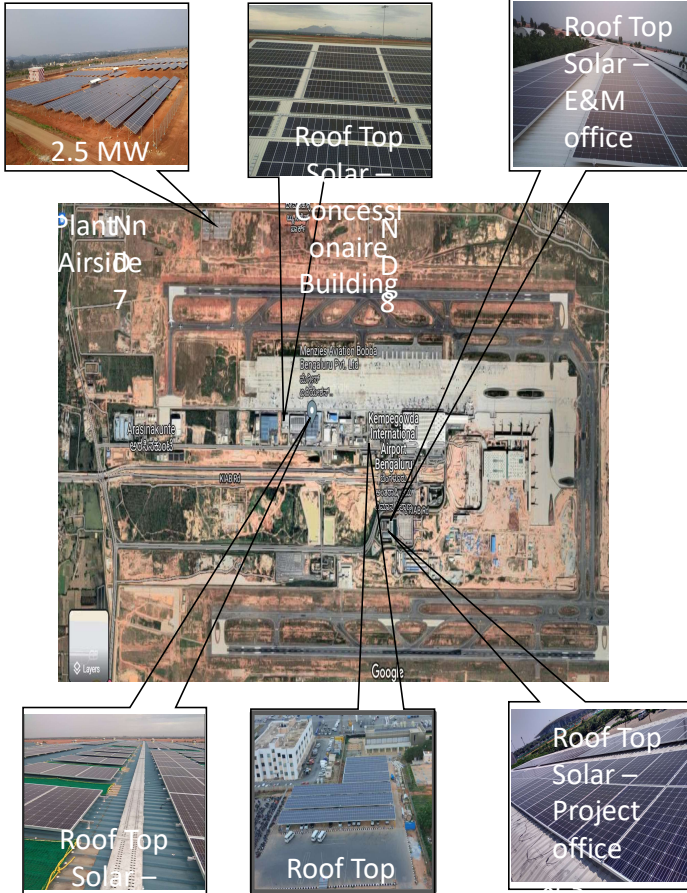
THANK YOU

Renewable Electricity, Energy Efficiency & Emissions

Onsite power generation and offsite Power Purchase Agreement (PPA) - Solar, Hydro and wind power for airport operations. (85 million units)

- 22 lakh units of energy savings per annum, enough to power nearly 9,000 houses per month
- The streetlights, perimeter lighting & airfield lights have been converted to LED lighting. Entire apron high mast lights converted to LED lighting
- The newly commissioned South Runway Airfield Ground Lighting is powered with LED lights, making it the first airfield in India to be fully powered with LED lighting system
- The recently refurbished North Runway is also powered with LED Airfield Ground Lighting

BLR Airport retained Carbon Accreditation Level 3+ i.e., Neutrality Level from Airport Council International (ACI) & working towards upgrading our ACI accreditation standard to Level 4+ by 2023





Contribution to Nation & Aviation



- National Resource Efficiency initiatives
- National Renewable Electricity Mission
- National Net Zero Commitment
- In long term, Sustainable initiatives will support in the reduction of User Development Fee (UDF)
- Contribution to United Nation Sustainable Development goals – Directly 11, Indirectly 6
- Aviation benchmark – Strategy benefits focusing on 360-degree approach beyond Net Zero

Green Landscape

