Waste To Resource Centre

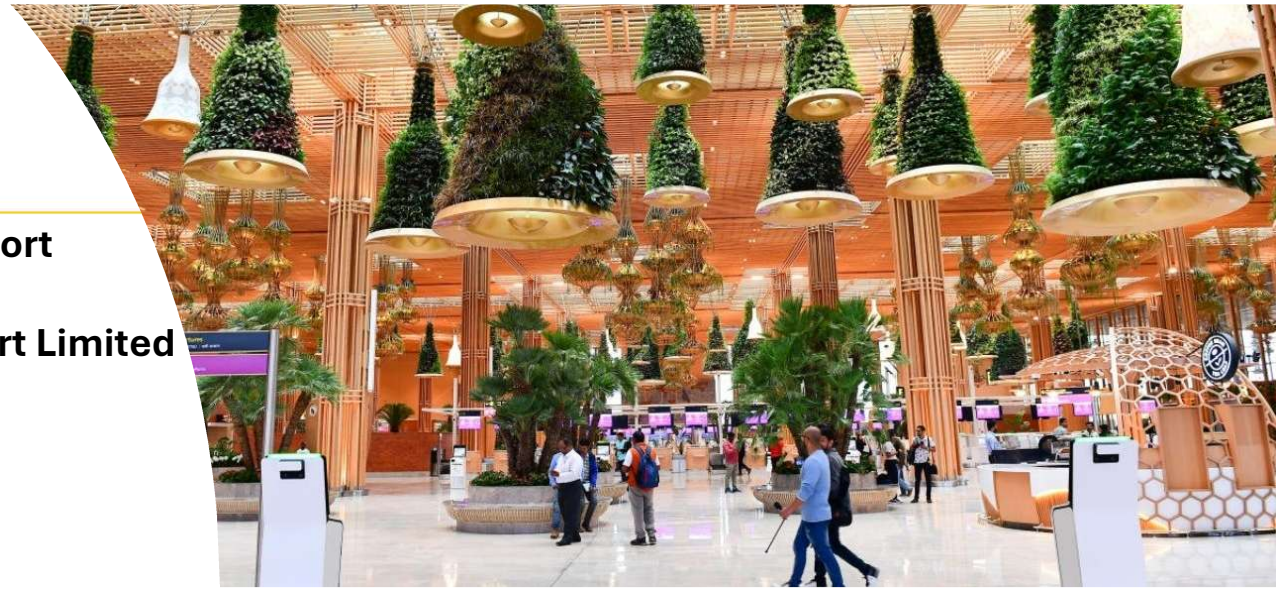
The Circular Airport Model: Closing Loops, Creating Value

October 2026



Overview

✓Airport: Kempegowda International Airport Bengaluru (KIAB)
✓Operator: Bangalore International Airport Limited (BIAL)
✓Area - ~ 4000 Acres



❖ **Infrastructure:**

T1: Domestic operations
T2: International Operations - "Terminal in a Garden" – sustainability - focused design
2 Runways
Cargo facilities supporting air freight movement



❖ **Operations:**

45 million passengers (FY 2025–26)
3rd busiest airport in India
Bussiest in South India
75+ domestic & 30+ international destinations

Sustainability Strategy 2030

Contributing to UNSDGs – United Nations Sustainable Development Goals

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Vision

Strategic Pillars

Foundational Values

ESG Progress so far..

USGBC LEED & **IGBC Platinum** rating forT2 First Indian airport to adopt **TNFD** **Climate Risk** Assessment completed	Signatory to **UN global compact (Environment, Labour, Anti-corruption, Human rights)**	Solid Waste treatment plant commissioned (Leading to **Zero Waste to Landfill**)
>160 Million kWh renewable electricity (**100%** of total Airport Power Consumption per annum) **LED powered runway,** ISO 50001:2018 certified (Energy Management)	**Scope 3 emissions reduction:** >98% utilization of BME – FEGP **Sustainable Mobility:** Phased Implementation of E vehicles	**Water Positive :** We replenish more water than our consumption. Water Positivity Index **2.36** 2 MLD potable water recovery from rainwater harvesting
KIAF: Community interventions – **Education** etc. **Behavioural change programme:** WIP towards sustainable transformation **ESG Disclosure: First** Airport globally to publish ACI world ESG disclosure framework **ISO:** Seamless integration of multiple standards	**First Airport in Asia: Level 5** Highest ACI Carbon Accreditation. Net Zero GHG emission (Scope 1&2), 7 years ahead of 2030 commitment Collaborative working towards Scope 3 Net Zero GHG emission by 2050	**Green Landscape** Reflects the ethos of Garden city with lush green landscaped gardens leading to carbon sequestration (>3000 tCO_2e) Biodiversity index: 5.18

"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."

Waste to Resource Centre

Vision:

- Demonstrate thought leadership,
- Be role model in SWM sector, by driving technology, innovation through social inclusion.

Goals:

- Enhance recyclables reducing waste to landfill
- Achieving circularity in waste management
- Social Inclusion
- Zero waste Company



A corporate-level initiative to accelerate KIAB's circular resource management vision.

Waste to Resource (WRC)

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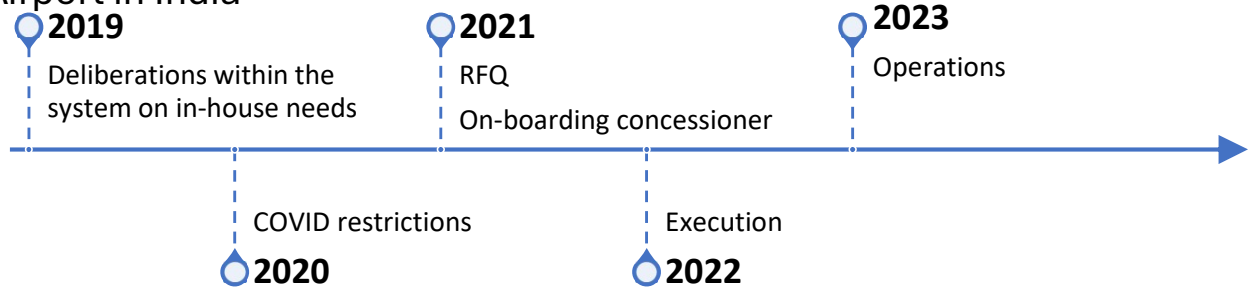
Why WRC:

- ❖ End-to-end waste traceability and accountability
- ❖ Driving the transition from conventional waste management to circularity
- ❖ Enabling data driven decision making
- ❖ Support net-zero ambitions through resource recovery and renewable energy generation

Uniqueness:

- ❖ Closing material loops within the airport boundary
- ❖ Embedding Circular thinking across operations
- ❖ Community focused model
- ❖ First-of-its-kind initiative in Airport in India

Milestone

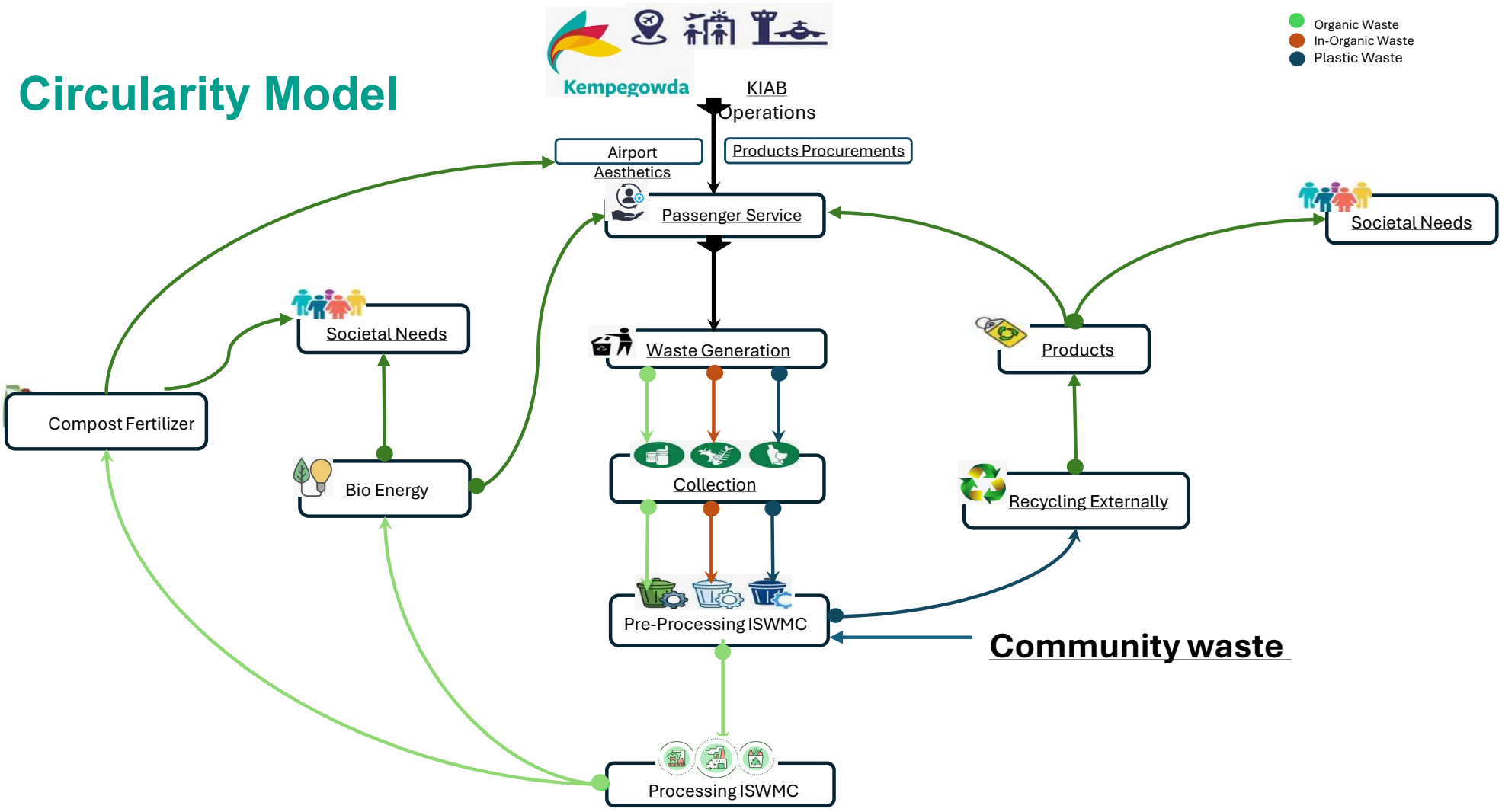


Waste to Resource (WRC) - Statutory/Regulatory Clearances

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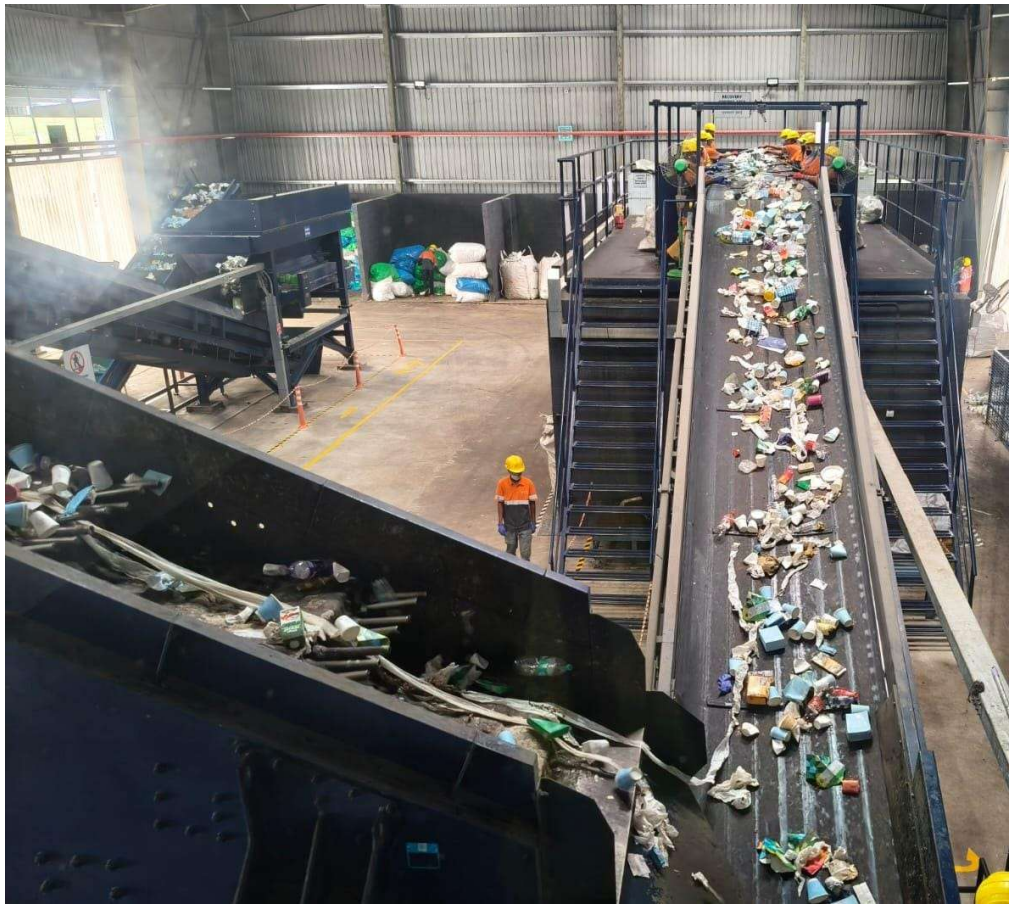
- Height clearance - AAI
- Building Plan approval – Anneshwara Gram Panchayat
- Consent to Operate – KSPCB
- Filling and Storage of CBG - Petroleum and Explosives Safety Organization
- Fire Safety Recommendation – Karnataka Fire and Emergency Services Department
- Factory License – Karnataka Boilers, Industrial Safety and Health Department
- Labor license from Dept. of Labor

Circularity Model



Circular Value from Inorganic waste

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Aluminum cans



Aluminum foils



Tetrapack



PET

Snapshots - Inorganics Recovery

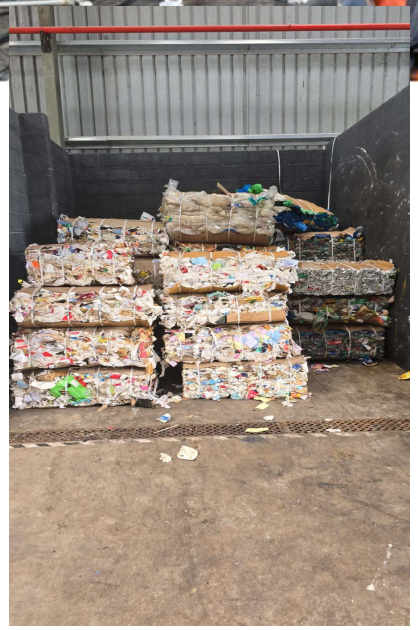












Snapshots- Organics Recovery

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Circular Value from Organic waste

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CBG – Kitchens

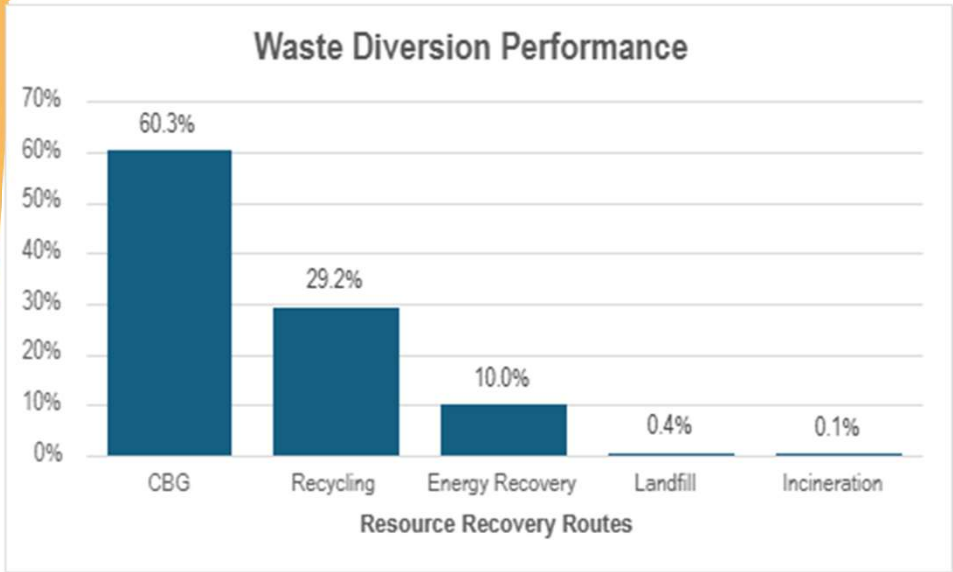


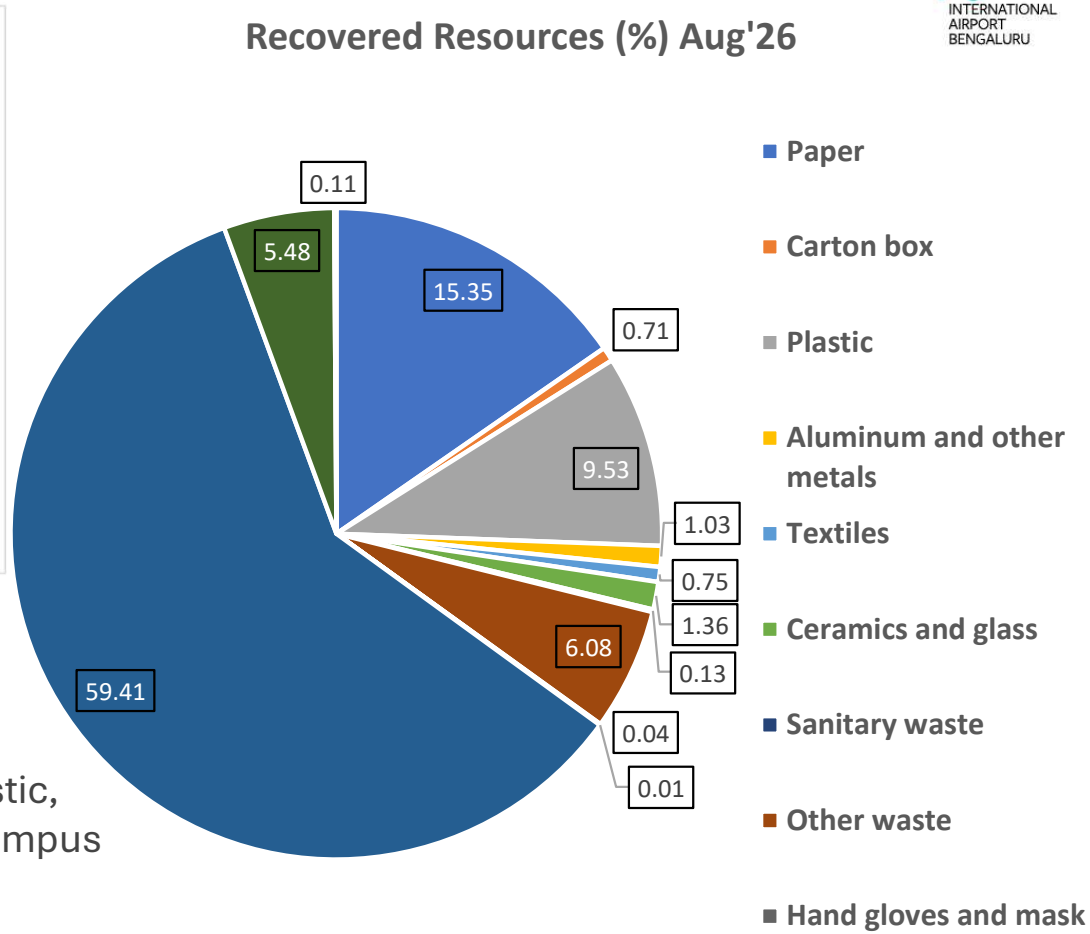
Liquid Fertilizer



Solid manure

Tangible Benefits of In-house Circularity





In-house plastic recycling

- plastic to roads - over 50 tons of waste plastic
- executed 70 kms of road made from waste plastic,
- replacing 6% bitumen within the BLR Airport campus
- reduce cost by Rs 60000/km

Tangible Benefits of In-house Circularity

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Revenue	**Income from recovered materials (₹7 cr/year)**
Circularity	**98 % of waste converted into usable resources**
Material recovery	**3800 Tonnes of recyclables recovered per year**
Organic recovery	**6570 Tonnes of organic waste processed per year**
Energy recovery	**3,85,600 methane generated and utilised (kg/year)**
Carbon reduction (2025)	**5667 GHG emissions avoided (tCO_2e/year)**
Operational efficiency	**Waste processing cost (₹4000/tonne)**
Waste prevention	**185 Waste generated per passenger (g/passenger)**
Compliance	**100 % of waste streams with traceable end destinations**

Intangible Benefits of in-house waste to resource centre

Society / People / Social development :

- Enhanced KIAB's brand reputation - *Industry leadership and benchmarking across airport sector*
- Stakeholder confidence – *Regulatory and ESG readiness*
- Stronger environmental culture – *Behavioural change*
- Innovation and knowledge development – *Experimental learning, Sustainability Education, best model in practice*
- Replicability and Contribution to a circular economy
- Long-term strategic resilience - *Builds capability to handle future growth*
- Social benefits - *Empowerment, Equal opportunities, Dignity, health and Safety assurance*

Replication potential of project within sector

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- Structured Knowledge Transfer
  - documented SOPs,
  - Standardised safety protocols
  - operational learnings,
  - KPIs and best practices;
  - initiated exposure visits and
  - technical interactions for interested airports.

- Demonstration & Industry Forums
  - live demonstrations,
  - technical forums

- Open Knowledge & Collaboration
  - peer networks,
  - professional bodies and webinars,
  - case studies and collaborative workshops to facilitate sector-wide adoption.

Challenges

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Tech

- Contaminated wastes reduce recycling potential and increasing operating cost
- Mixed materials, composites reduce recyclability
- Virgin materials are often cheaper than recycled ones

Admin

- Multiple stakeholders
- High capital and operating costs for integrated systems
- Recycled materials may have variable properties

Operational

- Manpower and skills gap
- Org waste – Trouble shooting of anaerobic and consistency of feed quality
- Dependency on external agencies

Overall approach: "Identify → Monitor → Correct → Standardise → Sustain"

Benchmarks:

- First Airport in Asia of the scale to have executed the community focused integrated Waste to Resource Center with both organic and inorganics management facility within the campus setting a benchmark for airports.

Feature	Changi	Delhi	BIAL
Approach	Food Digesters in terminals	ISWMC	Circular ISWMC
Capacity	Distributed in terminals	Recovery system and biogas facility (12 TPD)	77 TPD
Outputs	Water & Biogas	Recyclables & Biogas	CBG, Recyclables & Bio-fertilizer
Coverage	Airport	Airport	Airport + Community
Differentiator	De-centralised digesters Automated collection system	Waste diversion & recovery	Closed-loop resource recovery with utilization of recycled products, CBG and nutrients within the airport

Future Roadmap: From Digital Excellence to Smart Circularity

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❖ **+1 year: Data & Automation**

- Real-time waste management dashboards
- Stakeholder wise performance monitoring
- Automated reporting for sustainability disclosures
- Product lines for inorganic loops



❖**+2 year: Autonomous Circular Resource Hub**

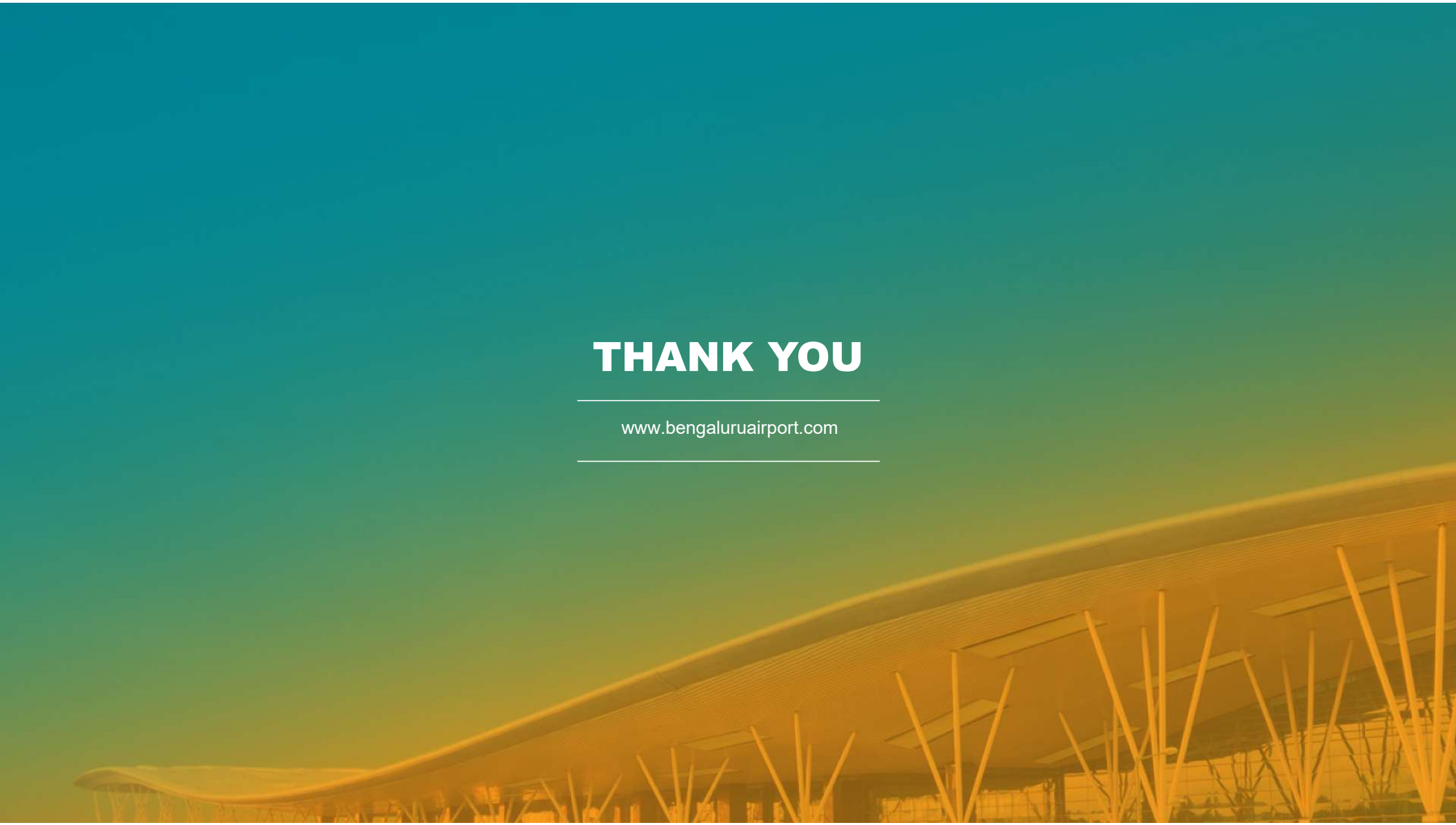
- AI vision based segregation technologies
- Knowledge sharing, training, and capacity-building programs
- Innovation partnerships
- Establishment as a Centre of Excellence for Circular Waste Management

Major Learnings

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- Successful DFBOO model with Community based project
- Collaboration drives success
- Scalability and Replicability
- Segregation is the foundation of circularity
- Material recovery needs end-to-end ownership
- Circularity requires continuous improvement.
- The biggest learning: shift from “waste management” to “resource recovery”

Collect → Segregate → Recover → Process → Reuse → Measure → Improve


THANK YOU
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