ZERO CARBON KOCHI METRO

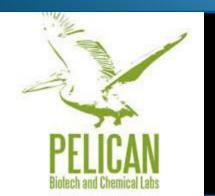


A joint project of **KMRL**

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PELICAN BIOTECH & CHEMICAL LABS P LTD.

(Dept of Scientific and Industrial Research, Ministry of science & Technology, Govt of India supported in-house R&D unit)









OBJECTIVE

- To reduce the carbon foot print of METRO RAIL LINES by greening the pillars and ans using carmedibon neutral, renewable materials
- To use city compost in the process thereby providing a sustainable solution for Swachh Bharat.

Problem solved

Soil used in the median is from a farm land



Greening considered financially unviable expense



Urban bio-degradable waste management is now a

Solution

PROJECT DELIVERABLE

1

Grow pad derived of agro industrial waste and municipal compost

5000MT of urban compost = 10000 MT biodegradable waste)used ever year. To triple by the 5th year

3

Red earth can be completely avoided

Pillars and medians double up as ornamental plants nursery

INNOVATION BY PBCL

- Hardening of coir fiber: **funded by NCRMI, Govt. of Kerala** (2008-10)
 - Application: hardening and preservation of coir fiber
- 3. ZERO CARBON GROW PAD: INDIAN PATENT application no: 201641039783 (date: 22/11/2016)
- 4. MOU and confidentiality agreement with KMRL to green the medians and pillars with eco-friendly materials 2017.



Operations: clockwise from above











Honorable Minister for MOHUA Shri Hardeep Singh Puri at the vertical garden site with KMRL and PBCL officials



Environmental impacts



WASTE MANAGEMEMT

- QUANTITY OF COMPOST USED/MEDIAN = 10MT
- TOTAL MUNICIPAL COMPOST REQUIREMENT /year = 15000MT
- **TOTAL CARBON SINK IN 1500 MEDIAN/year: 7500MT**

Oxygen generation

- Each median (75 sq M) will have a total plant body mass of 3000Kg/year
- This will produce 300000L of oxygen/year

In situ soil less planting media derived out of compost mined from dumping site, STP sludge, street sweeps, garden and compost from residences

APARTMENT COMPOSTING: 20000 FAMILIES, 10000 Kg waste/day, 5000kg compost/day, 150000 Kg compost/month

@10000Kg compost/median.



APARTMENT COMPOSTING

- 20000 FAMILIES
- □ 10000 Kg waste/day
- 5000kg compost/day
- □ 150000 Kg compost/month
- @10000Kg compost/median 15 medians/month to start with
- to scale by 25% every quarter apartment complexes covered in the project
- ☐ To reach 3000 medians, 30000MT compost/year

Waste management in residential colonies





Domestic waste management

Garden/tree pruning waste management

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This project ---

- ☐ Thus intend to green the KMRL medians with compost
- Derived out of apartment complexes
- And provide comprehensive solutions for waste management
- including clean Non-biodegradable waste collection and recycling
- And collection and forward linkage of soiled waste and sanitary waste



Campaign

- Mind change Management
- Green protocol, package free life style
- My waste my responsibility
- Involving children and students
- Dumpsite clearances
- Opening up a perennial solution for BD waste

Business segments/ partners

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- Metro rail companies
- Municipal corporations
- Residential and commercial establishments
- CSR initiatives
- Commercial branding segments
- Government waste management initiatives
- Carbon partners

Revenue Models

Csr funds * Commercial branding *government grant *Waste management service charges from municipal corporation and residential/commercial establishments * soil less plant nursery



Thank