

# KPIT

23<sup>rd</sup> September, 2019

## Implementation of eBuses - Challenges and Opportunities



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# Opportunities for electric mobility in India

- INR 10,000 Cr for demand incentives and charging infrastructure
- Focus on public transport 7 K buses, 500 K 3-wheelers, 55K Cars
- 64 cities expected to release tenders for 5,500 electric buses



Electric buses powered by  
REVOLO - Start operations in  
Kolkata, May 1st, 2018

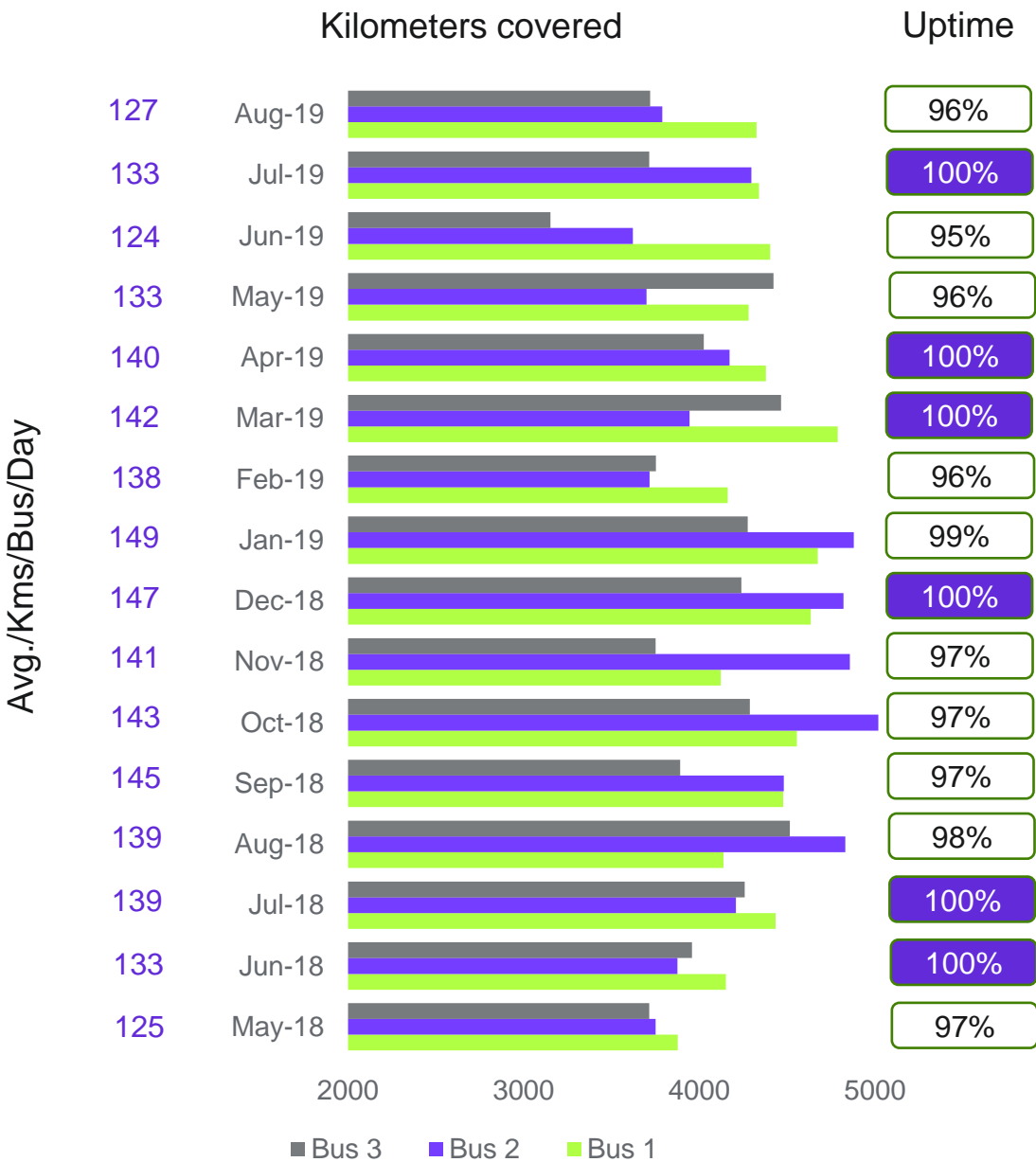
- Mr. Debasish Sen, IAS Chairman HIDCO
- Three electric buses with dedicated facilities



# Public transport operations since May 2018



- 7 days a week , 52 weeks a year
- 200,000+ kms covered cumulatively
- 150,000+ happy passengers





Electric buses powered by  
REVOLLO - Start operations in  
Kolkata, May 1st, 2018

Infrastructure created by KPIT :

- Charging stations,
- bus bays,
- maintenance pit and bus stops

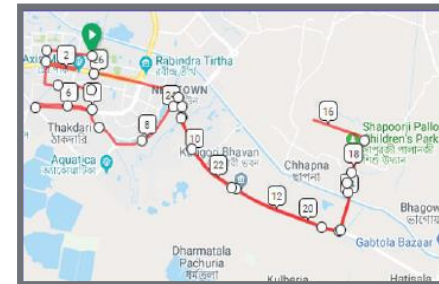


# Electric bus implementation – learnings (1/3)

## Depot

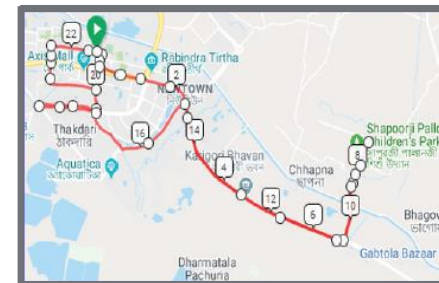


## Routes



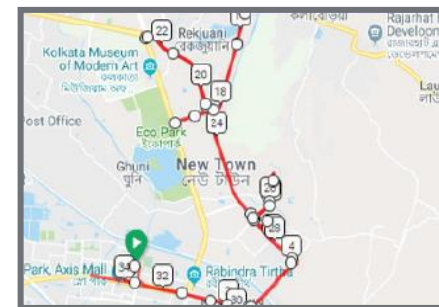
#1

Pride hotel – Uniworld Mall  
– Pride hotels (23 kms)



#2

Pride hotel – Uniworld Mall  
– Shapoorji park - Pride  
hotels (23 kms)



#3

Pride hotel – Eco space –  
Eco urban village- Pride  
hotels (34 kms)

## Electric bus implementation – learnings (2/3)



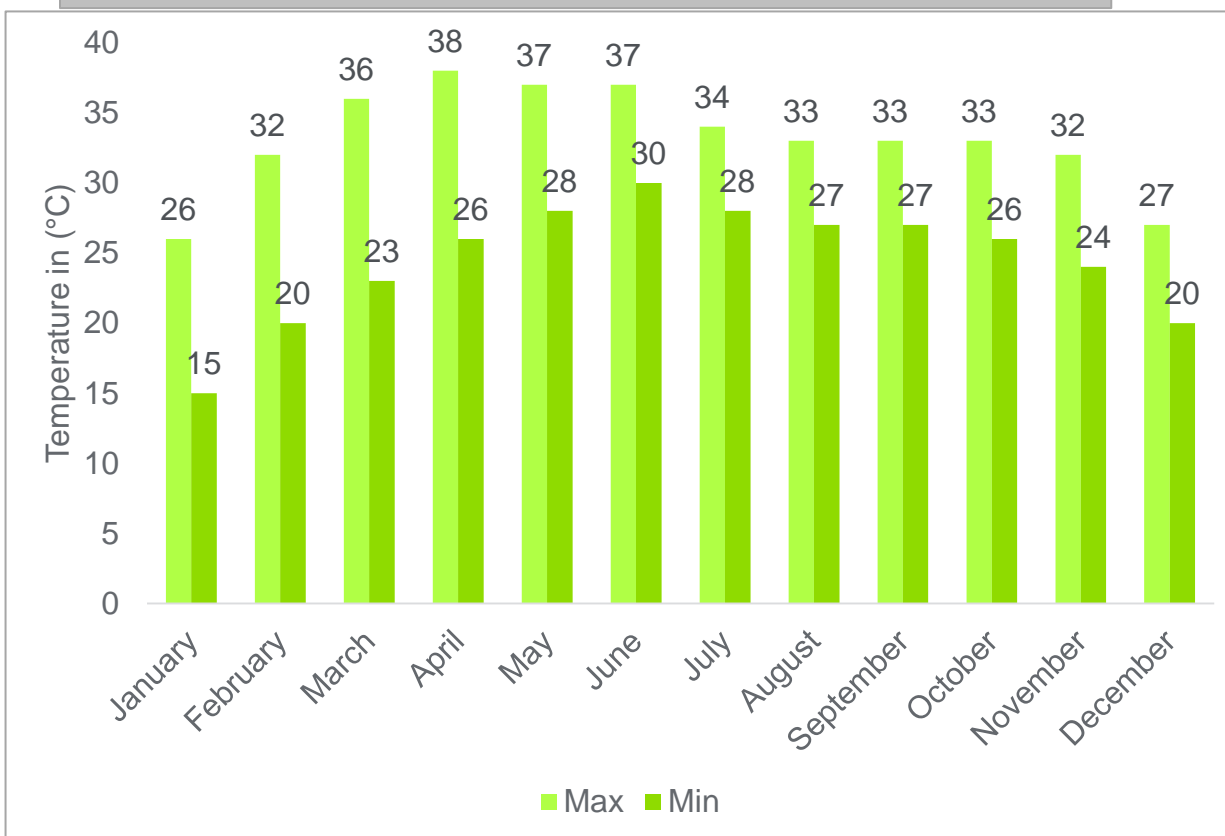
Charging stations – need for flexibility



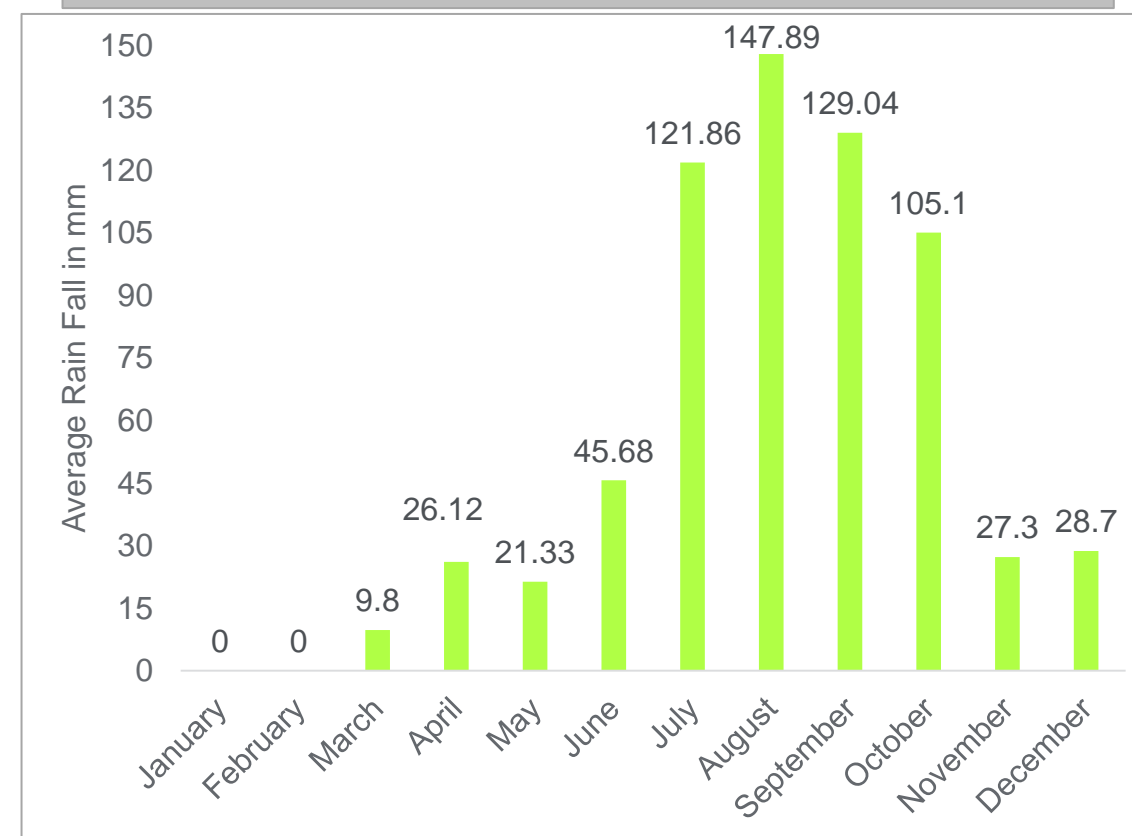
Driver & technician training

# Electric bus implementation – learnings (3/3)

Temperature (Max & Min), by Month (2018)



Average Rain Fall, by Month (2018)



Kolkata weather conditions – heat , high humidity and torrential rains



# Eicher Trucks & Buses introduces Smart Electric Buses with indigenously designed technology - REVOLLO



Range – 177 kms  
9 meters , 32 seats  
Gearless driving

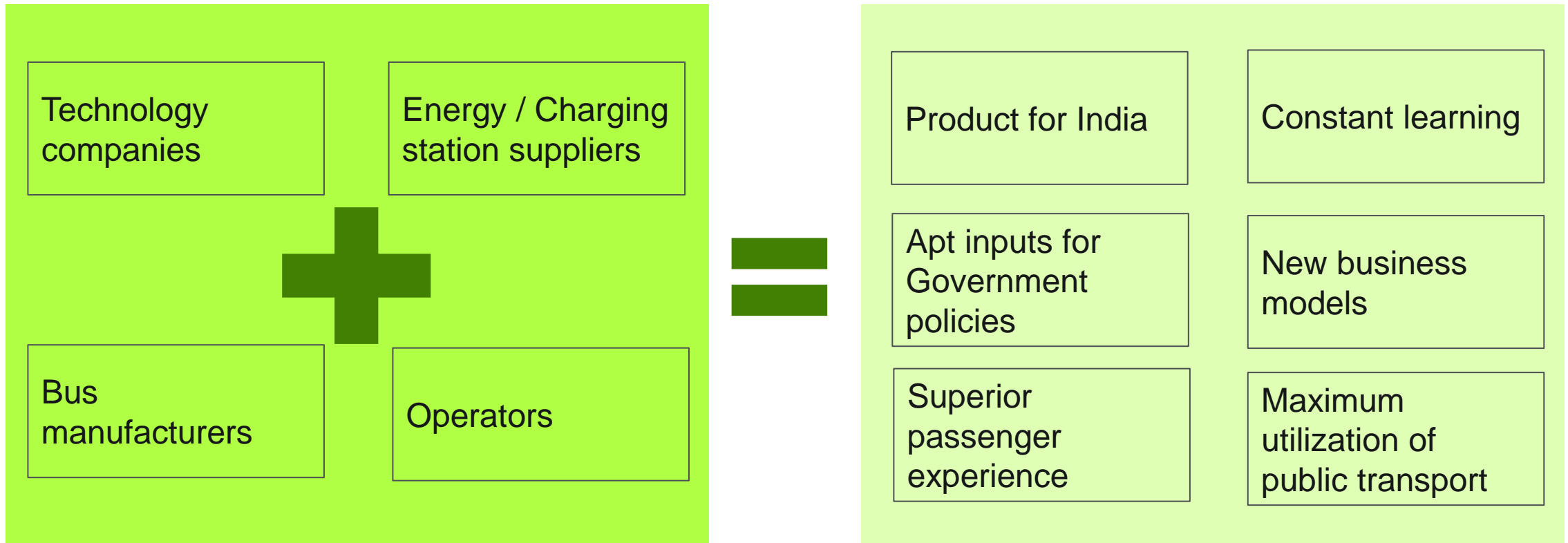


Air conditioning  
Intelligent Transport  
System



36% Regeneration  
Nail penetration test\*

# Electric mobility is a team game...



**Partnerships are the key for electric public transport to succeed in India**

# KPIT – A technology company focused on mobility



Autonomous Driving



Connected Vehicles



Powertrain



Autosar



Mechatronics



Vehicle Diagnostics

Headquartered in  
India Pune with  
Development centers in  
EU, US, Japan, China,  
Bengaluru

6600+  
Engineers  
working on next-  
gen technologies

10+  
Of  
Vehicles  
uses KPIT  
software

300+  
Vehicle  
production  
Programs

10  
Out of the top  
10 global OEMs  
use KPIT  
software



Years of  
Experience in HEV/EV  
domain

10

30+

Projects executed on Hybrid  
and Electric Vehicles

OEMs & Tier1s who rely on  
KPIT for HEV/EV  
technologies

12+

650+

Strong team of passionate  
technologists working in Hybrid  
and Electric areas

## Electric Powertrain - Overview

Battery Management,  
Inverter, Charger, DC –  
DC Converter, VCU

### Services

- Software Development
- Power Electronics and Hardware
- Controls Engineering
- Verification and Validation
- Functional Safety
- Model based system engineering

### Full Solution

- VCU
- 144 V Architecture,
- 144 V Low Cost Rugged BMS
- 48V BMS
- System Integration  
(Homologation/Certification)
- Production & after market support



Electric bus powered by REVULO at the Indian Parliament

Thank you!