Innovative Technology for Sustainable Transport

2016 UN DESA Energy Grant
Powering the Future We Want

by Mohit Kochar
AVP & Head of Global Marketing
Automotive & Transportation Business

14th and 15th December, 2016
### Expectations from UN DESA

1. **A background of your institution**
2. **The sustainable transport problem that your institution seeks to address**
3. **Your achievements in working to improve sustainable transport**
4. **Challenges that you have come up against during implementation**
5. **Your future plans for increasing the scale and impact of your initiatives**
A background of the institution
Mission and Purpose

To create Technologies for a Better World.

KPIT focuses on envisioning and enabling a cleaner, greener, intelligent world - a world that is self-sufficient, sustainable and efficient.
An organization focused on providing Transformational **products, solutions and services** by combining **Engineering and IT**

- **Automotive and Transportation**
  - Alternate fuel technologies
  - Intelligent transport systems
  - Embedded Software

- **Manufacturing**
  - Internet of Things
  - Product Lifecycle Management
  - Supply Chain Management

- **Energy and Utilities**
  - ERP & Automation
  - Operations and Asset Management
  - Big Data & Analytics
Providing the best in class solutions to the Industry

Leading Brands
Leveraging Technology
Innovations from KPIT

Playing meaningful role with Associations and Consortiums

KPIT Technologies Limited

© 2016 KPIT Technologies Limited

22/12/2016
Community Initiatives

Education
Transform lives of people through science and technology education

- Chhote Scientist Initiative
- Techno Wolves Robotics Program
- Sparkle – National level innovation contest

Environment
Making this world a better place to live in

- Zero Garbage
- Farm Ponds
- One Tree One Child
- Environment Week
- Forest Safari

Energy
Developing innovative solutions for efficient energy consumption and renewable supply

- Solar Water Heater Project
- KPIT The “Energy Champion”

Employee Engagement
Utilizing employee strength to make this society better

- Blood Donation Drive
- Annadan (Food/Grain Donation Drive)
- Volunteer Fair, USO Drive, etc.
The sustainable transport problem that the institution seeks to address
Need for sustainable transport solutions – Challenges

Rapid Urbanization
31% urbanization in 2011, leading to pollution & congestion

High CO₂ emissions
India is world’s third largest emitter of CO₂

Greenhouse Emissions
18% from transportation alone

Very high crude oil imports
$ 74 Bn of crude oil was imported

Pollution from Urban Transportation
Transportation contributes > 30% to urban pollution

High diesel consumption by transportation
Transportation accounts for > 70% of total Diesel consumption
Need for sustainable transport solutions – Impact

Severe Air Pollution

Among the world’s 20 most polluted cities in the world, 13 are in India

Healthcare Costs

Healthcare cost of air pollution in India is ~ 1.2% of its GDP

Vehicle Pollution in Delhi

Delhi tops the list of most polluted cities - 25% of the pollution in Delhi is due to Vehicles
Low standard of Public Transport has led to increased preference for own vehicles

- **Quality of travel experience**
- **Lack of comfort**
- **Lack of convenience**

**Recent Survey**
- 55% feel own vehicle is more comfortable
- 27% feel lack of convenience & predictability
- 76% women feel unsafe due to lack of monitoring

Public Transportation has seen a steep downward trend

Bus Ridership in India declined from 62% to 17% in last 2 decades
But…. Indian Citizens are now more urban, richer & connected

- 65% population is under age of 35
- Urban population to reach 590 million by 2030
- Middle class to double by 2025 to 547 million
- World’s 2nd highest Smartphone users

Attracting these citizens to public transport is the challenge

Bus transport in India has to be RE-Imagined ...

The need is for ...

Clean  Connected  Comfortable  Safe

Public Transport
Achievements in working to improve sustainable transport
KPIT’s Solutions for Sustainable Transport

**Clean**
- Alternate Fuel Technologies
  - EV for bus
  - HEV for bus
  - PHEV for cars

**Connected**
- Intelligent transport system
- Vehicle Tracking System
- Command Center

**Comfortable**
- Mobile Apps for Journey planning
- Public Information Systems
- Wi-Fi Infotainment System for Buses

**Safe**
- Advanced Safety Systems e.g. Monitoring of Harsh Braking, Sudden Acceleration etc.
- Advanced Driver Assistance Systems (ADAS) e.g. FCW, LDW
Alternate fuel technologies from KPIT
### REVOLO – Alternate Fuel Technologies

<table>
<thead>
<tr>
<th>Model</th>
<th>Fuel Savings</th>
<th>Emission Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV</td>
<td>100%</td>
<td>Zero</td>
</tr>
<tr>
<td>HEV</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>PHEV</td>
<td>35%</td>
<td>30%</td>
</tr>
</tbody>
</table>

- **EV = Electric Vehicle**; **HEV = Hybrid Electric Vehicle**; **PHEV = Plugin Hybrid Electric Vehicle**

#### Key Features:

- **Indigenously developed**
- **Designed for Indian conditions**
- **Cost Effective**
- **World’s 1st frugal hybrid solution for cars and LCVs**

- **20 patents** Internationally granted
- **Versatile Technology**
- **Integration on existing vehicles**
KPIT’s Electrification Technology for Buses - REVOLO

A unique solution to convert ‘Existing buses to electric’ & ‘create New smart electric buses’

- Indigenously developed and manufactured in India
- Cost effective
- Designed specifically for Indian conditions
- Suitable for a wide range of buses
- Configuration as per customer requirements
- Supports Air Conditioning
Electric buses with KPIT’s Technology at the Indian Parliament

Mr. Narendra Modi Prime Minster of India, flags off KPIT’s Electric bus at the Parliament

- Joint project by **KPIT & CIRT** supported by **Ministry of Road Transport and Highways**
- **Two retrofitted electric buses** developed and deployed **at the Indian parliament**
- **Members of parliament use** the buses to travel to the parliament
Feature Rich Smart Electric Bus technology

Clean

Connected

Comfortable

Safe

ITS | Mobile App | AC | WiFi Infotainment
Adv. Safety System

Zero Emissions
No Fossil Fuel
ITS
Journey Planning
Ease of Driving
Smooth & Comfortable
Surveillance Cameras
Bus tracking from CCC*

*CCC – Central Command Centre
KPIT’s ITS solution in India

- Automatic Vehicle Location (AVL)
- Passenger Information App
- Vehicle Health Monitoring & Diagnostics
- Emergency Voice Calling
- Surveillance Camera Network System
- Passenger Information System (PIS)

7,000+ ITS deployed across 30 Transport Undertakings in India

100+ Mumbai- Pune MSRTC Buses use KPIT’s ITS Solution

Command centre set-up for 130+ buses at South Asian Games, Guwahati

7,000+ ITS deployed across 30 Transport Undertakings in India

100+ Mumbai- Pune MSRTC Buses use KPIT’s ITS Solution

Command centre set-up for 130+ buses at South Asian Games, Guwahati
International Recognition for KPIT’s electrification technology for buses - REVOLO

“Promising Transport Innovation Award 2016” at the International Transport Forum (ITF) Summit, in Leipzig Germany.

The International Transport Forum (ITF) is a part of The Organization for Economic Cooperation and Development (OECD) an intergovernmental organization with 57 member countries. It acts as a think tank for transport policy.

Mr. Kishor Patil, CO-founder MD and CEO of KPIT receiving the award from Mr. KL Thapar, Founder and Chairman, Asian Institute of Transport Development and Mr. Jose Viegas Secretary General ITF, OECD.
Recognition for KPIT’s Sustainable Transportation Technologies

- ‘Thomson Reuters Top 50 Indian Innovators’ list for
- Technology Innovation of the Year (2015) Award for REVOLO from IATIA
- Automotive Idea of the Year - Economic Times Zig wheels
- Technology Innovation Award - Wall Street Journal
- Sustainability Innovation of the Year by a leading business school
- Promising Innovation of the year - NASSCOM
- Project Dev. Excellence By Volvo - 2014
- Innovation award from Cummins
Challenges during implementation
Electric buses in India

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expensive</strong> – High upfront cost</td>
<td>Government support through schemes (FAME, GUTS)</td>
</tr>
<tr>
<td>Cost of <strong>Batteries</strong> (import)</td>
<td>Working on developing indigenous battery chemistries</td>
</tr>
<tr>
<td>Availability of <strong>Charging Infrastructure</strong></td>
<td>Standardization process for charging station underway</td>
</tr>
<tr>
<td><strong>Awareness</strong> on implementation</td>
<td>Promotion of technologies, innovation and product through conferences/seminars</td>
</tr>
</tbody>
</table>
Future plans for increasing the scale and impact of the initiatives
Working with all Stakeholders for Scale and impact ...

- Global Outreach
  - Thought leadership, awareness
  - Formation of associations (EV, ITS etc)

- Ecosystem players
  - Tie-up for research (battery technologies), IPs
  - Testing and validation (homologation)

- Research & Regulatory Institutes
  - Create vendor base
  - Localization of key components

- Suppliers
  - Establish Partnerships (OEMs, Fleet operators, Bus Body builders)

- Customers
  - Target Market segments (City, school, private)
Thank you

Technologies for a better world

Mohit Kochar
AVP & Head of Global Marketing
Automotive & Transportation Business

Email: Mohit.Kochar@kpit.com
Cell: 0091 98811 36726
www.kpit.com