

E-Mobility

What is holding back E-Mobility in INDIA?

Faster Adoption and Manufacturing of (Hybrid & Electric Vehicles in India - FAME

Vision- 2020



- “To encourage reliable, affordable and efficient xEVs that meet consumer performance and price expectations through Government- Industry collaboration for promotion and development of indigenous manufacturing capabilities, required infrastructure, consumer awareness and technology.
- Thereby helping India to emerge as a leader in the xEV Two Wheeler and Four Wheeler market in the world by 2020, with total xEV sales of 6-7 million units thus enabling Indian automotive Industry to achieve global xEV manufacturing leadership and contributing towards National Fuel Security”
- As per the National Mission on Electric Mobility, if the present scheme continues till 2020, "it is expected to save about 9,500 million liters of crude oil equivalent of Rs 62,000 crore".

Electric Vehicle Market Structure & Sale Trend

Type	Company	Models
Electric 2- Wheeler	HERO Electric	Photon, Optima, Maxi, Cruz, E-Sprint, Wave
	Electrotherm	YO Exl, YO Speed
	Avon Cycles	E-Scoot 207, E-Star, E-Mate
	Ampere Vehicles	V60, V48
	Lohia Auto Industries	OMA Star, OMA Genius
	Tork Motors Pvt Ltd	T6X
Electric 4- Wheeler	Mahindra	Reva
	Maruti India	Ciaz & Ertiga (Hybrid)
	Toyota	Camry (Hybrid)
	BMW	i8




	2012-13	2013-14	2014-15	2015-16	2016-17 (projection)	2017-18 (projection)
Total EV's Sales in India (units)	100000	42000	14000	22000	45000	100000

HERO Electric E-Bikes Tech Specs

Category	Model name	
	 <p>Optima Plus</p>	 <p>Photon</p>
Maximum Speed(km/h)	25	45
Range(km/charge)	70	Power Mode- 50 km /charge, Economy Mode- 80 km /charge
Wheel Rim Size	16"	10"
Battery type*	VRLA 24 AH/ 48V	VRLA 33 AH/ 48V
Brake Type	Drum	Front Disc, Rear Drum
Motor Power(watts)	250 W	1000 W
Seating Capacity	Two Adults	
Ex Showroom Price (Delhi)	40,190	48,490
Salient Features	Remote Locking, Odometer, Mobile Charging arrangement, Lockable battery compartment. Anti-Theft Alarm.	

* Above models are also available with Lithium-ion batteries

Running Cost Analysis of Electric v/s Petrol two wheeler

Average Running Cost Analysis of Electric & Petrol Two-Wheelers			
Model	HE PHOTON (HSS) (Li-ion)	HE MAXI (LSS) (Lead Acid)	Petrol 2-Wheeler
Ex showroom Price*	87790	35490	60489
Fuel consumed in running 50 km/ day	1.5 units of electricity	1.5 units of electricity	1 liter of Petrol
Cost of fuelling for per 50 km run (Rs.)	11	11	60
Duration of Ownership (years)	5	5	5
Total running in 5 year (km)	75000	75000	75000
Average Maintenance for 5 years (Rs.)	10000	10000	25000
Cost of Refueling for 5 years (Rs.)	15750	15750	90000
Battery Cost for 5 years (Rs.)	0	30300	0
Cost of running for 5 year (Rs.)	113540	91540	175489
Saving in 5 years (Rs.)	61949	83949	
CO2 Reduction by using EVs in 5 year (Metric Tons)	1.9	1.9	

* Ex showroom price in Delhi.

E-Mobility Issues

E-Mobility Issues are :

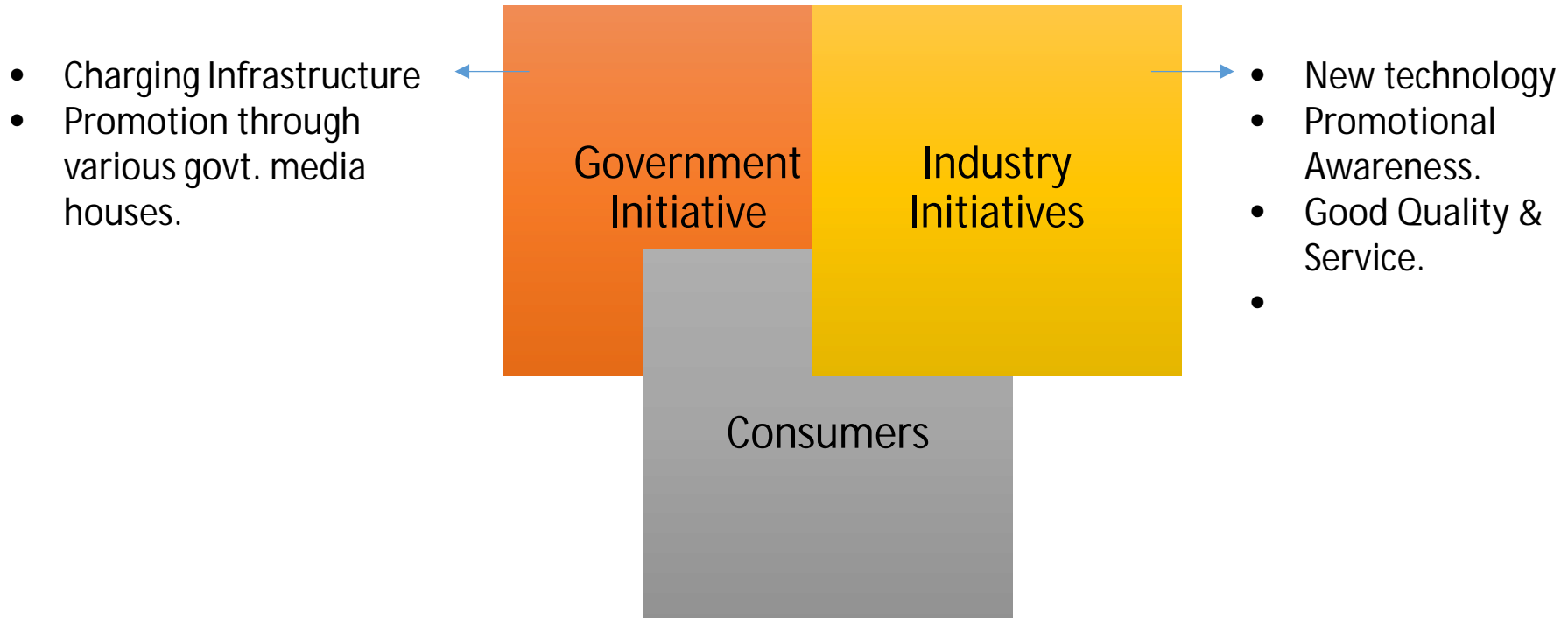
- Lack of Infrastructure or Eco System
- Affordability - Sticker shock and no commensurate immediate benefit
- Technology not yet there- particularly batteries
- Incomparable to Equivalent vehicles, unless supported from outside
- Customer resistance to radical innovation may take a long time to overcome

Solution-

1. Somehow get 1 million electric two wheelers and Small E cars on the roads
2. Catalyze – Make easy Financing available
3. Eco System – Charging stations, Swapping stations, etc.
4. Nudge or Prod- Stop Commercial use of Petrol 2Wh in phases

	Approx. no. of Delivery Boys with petrol bike in India	20%	40%	60%	80%	100%
No. of bikes	2,100,000	420,000	420,000	420,000	420,000	420,000
CO2 emission saved (metric ton)		161.28	322.56	483.84	645.12	806.40
Petrol Saved (in Million Liters)		100.8	201.6	302.4	403.2	504

Three Pillars of E-Mobility



- Charging Infrastructure
- Promotion through various govt. media houses.

- New technology
- Promotional Awareness.
- Good Quality & Service.
-

- Cost savings
- Product awareness among consumers
- Eco friendly benefits .
- Carbon footprint reduction.
- Driving and usage benefits

Four pillars to reach an early inflexion point

- Announce a phasing out program of polluting bikes and small vehicles from logistics and deliveries.
- Start Battery swapping facilities near petrol pumps and charging stations in parking lots.
- Extend preferential financing for adoption of E-Vehicles.
- Increase awareness through government channels.