

# Electrification of Transport

## Decarbonising India's Two-Wheeler Fleet

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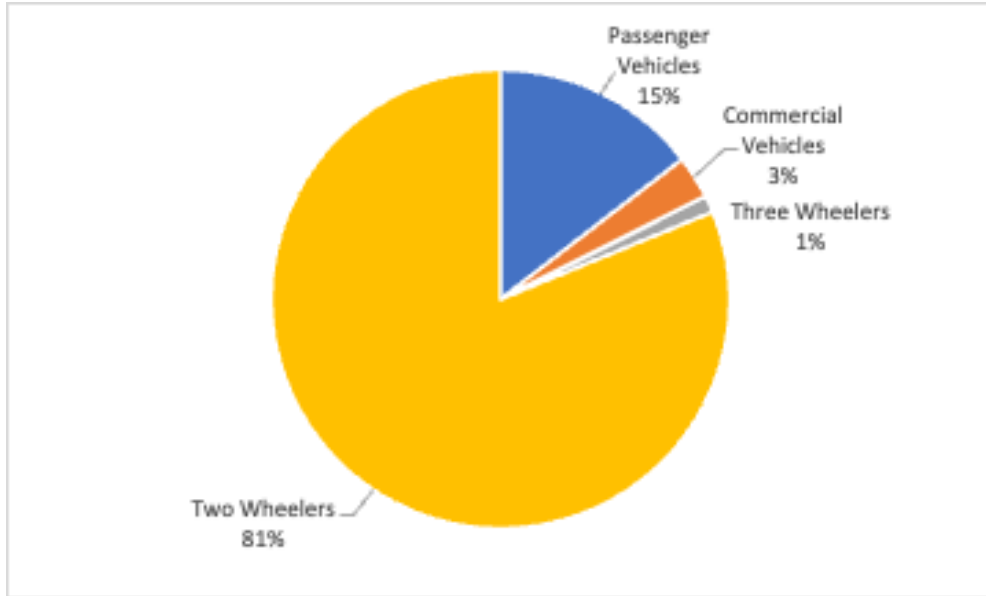
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# Key Statistics

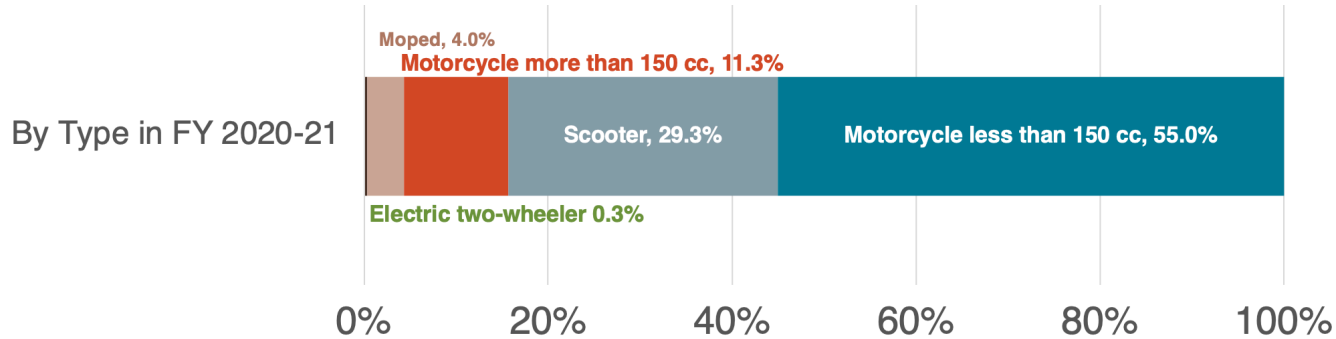
## Automobile Domestic Sales Trends (2020-21)



Source: <https://www.siam.in/statistics.aspx?mpgid=8&pgidtrail=14>

- **Volume:** About 15 million annual new vehicle sales; ~80% share of the market
- **Fuel:** Responsible for 60% petrol consumption in the country
- **Emissions:** Two wheelers account for about 26% of all emissions inside Delhi
- **Market:** India is the largest two-wheeler manufacturer in the world

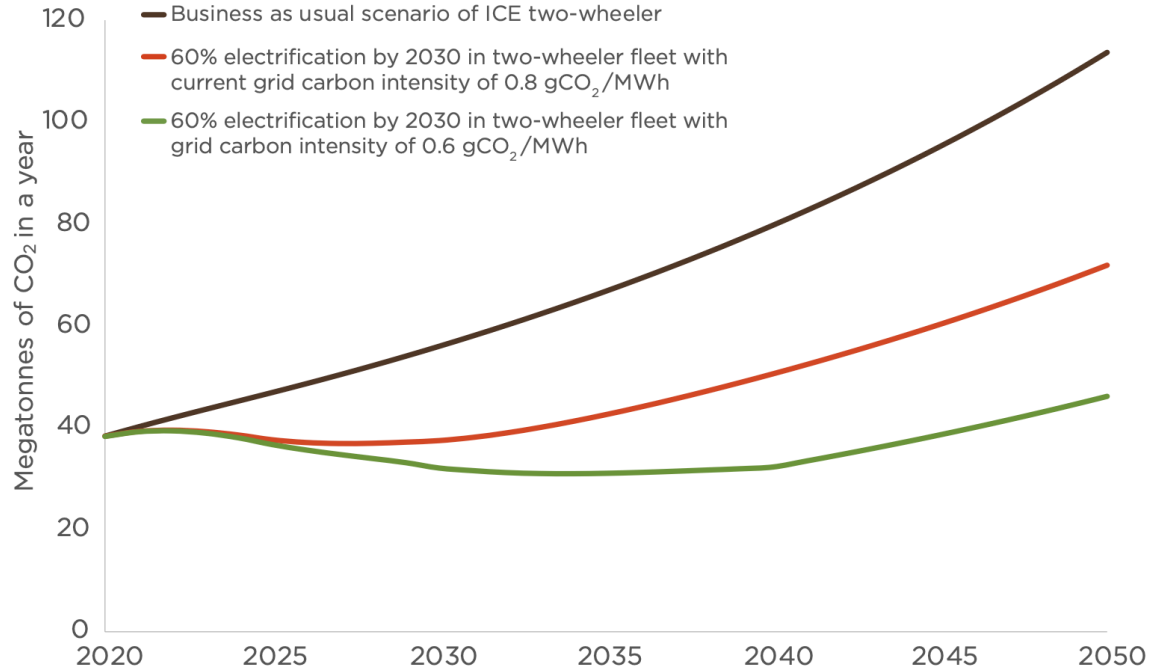
# Current trend of two-wheeler market in India



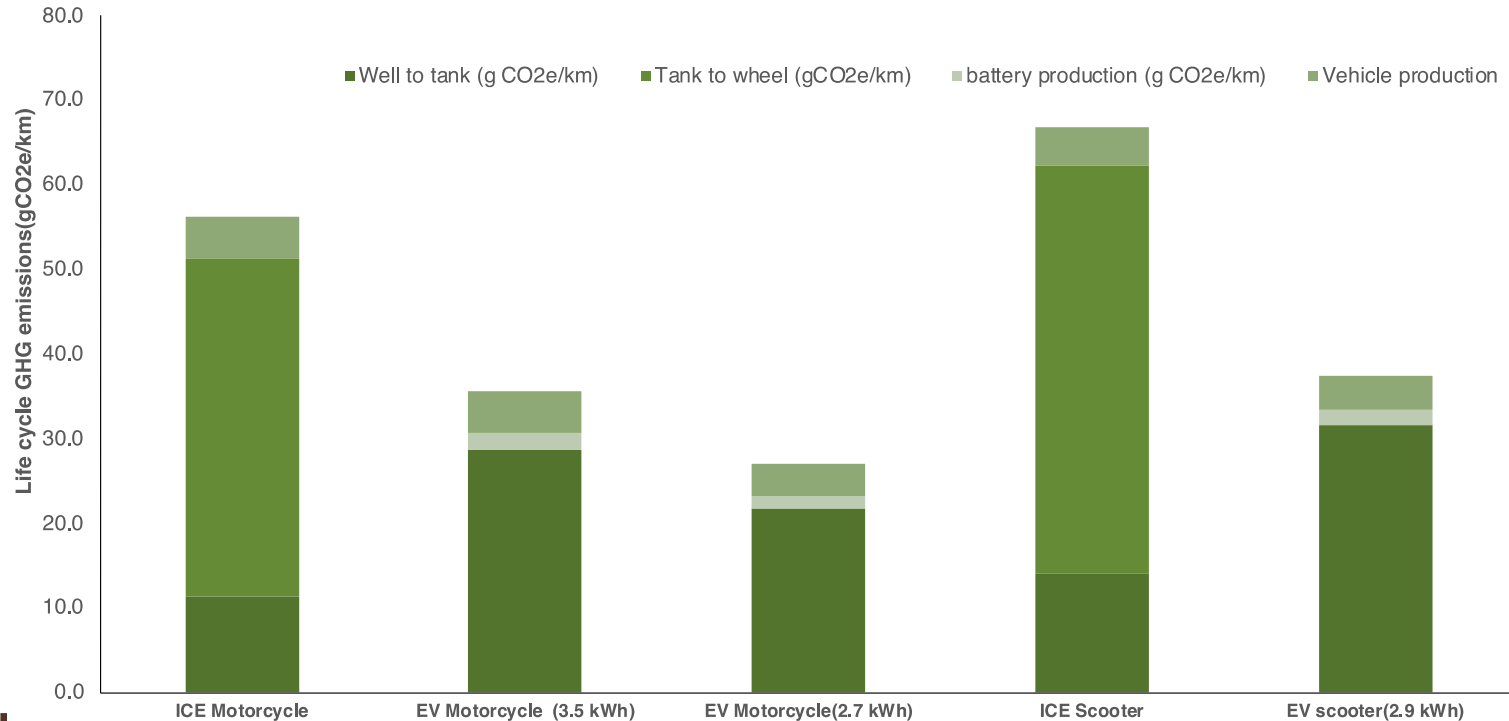
## Key insights

- Sales trend shows motorcycles of engine size less than 150 cc dominates the market followed by scooter
- Technology trend shows BS VI fleet are 100% equipped with fuel injection engines

# Potential GHG emission reduction possible via electrification of two-wheeler and cleaner grid

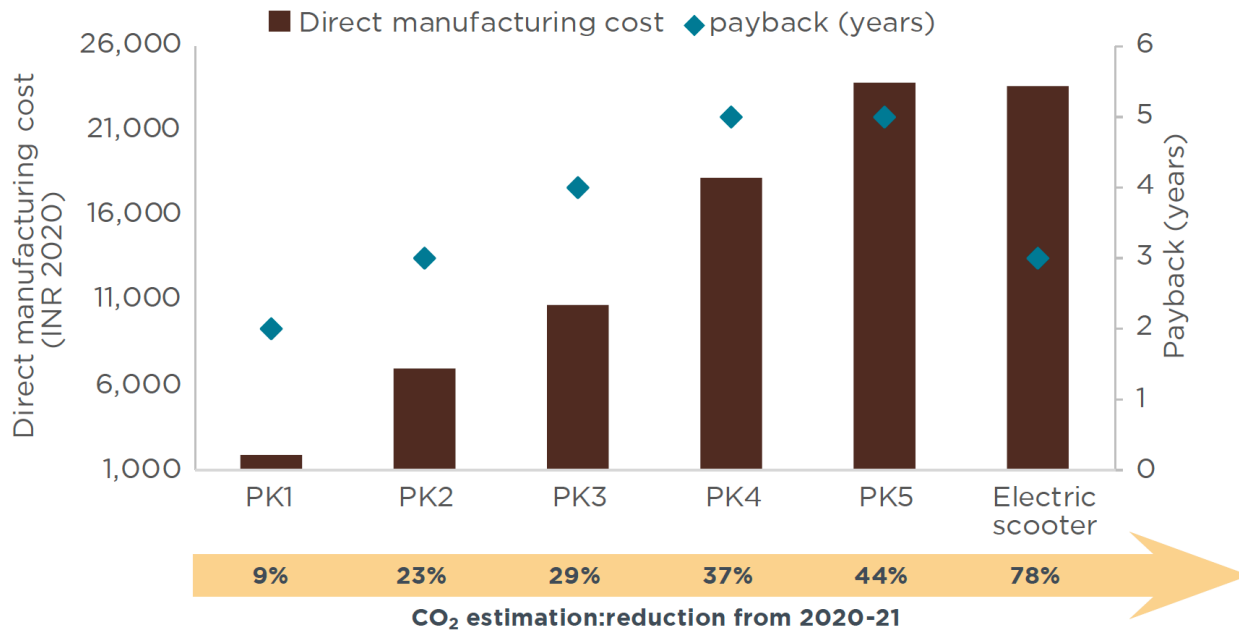


# For two-wheelers, life-cycle GHG emissions are nearly 33%-50% less than average new petrol two-wheelers



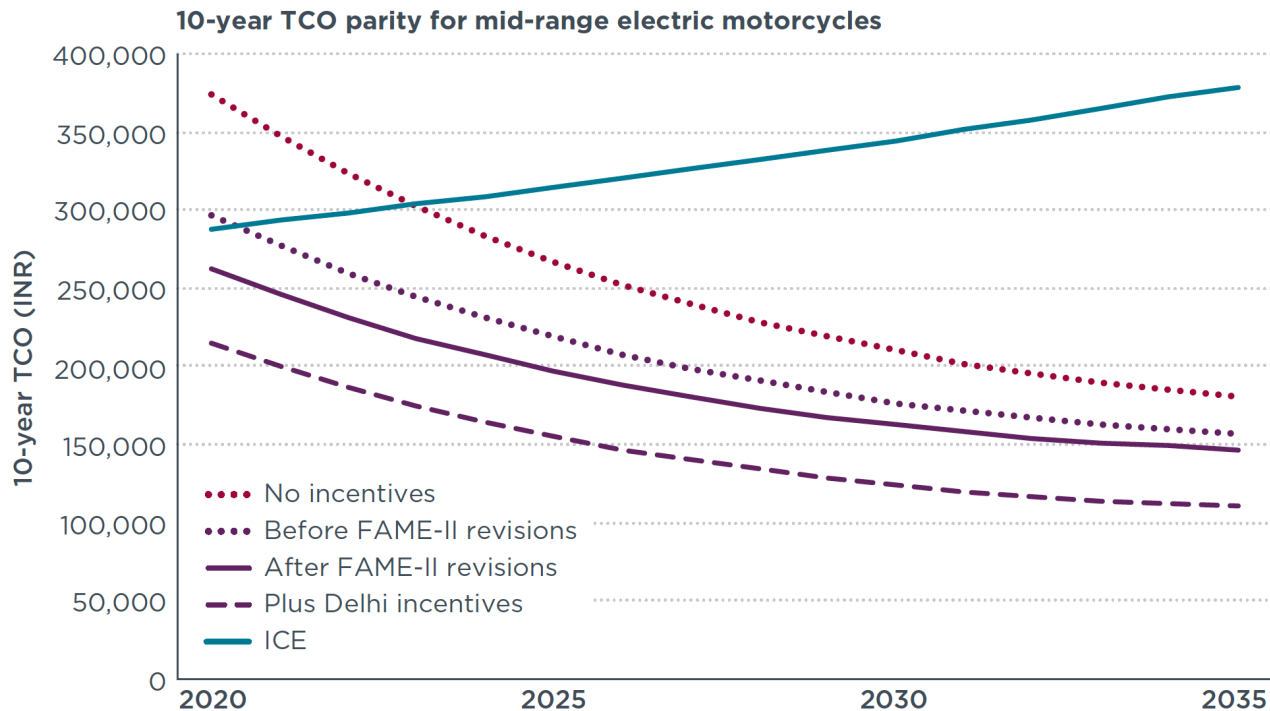
[https://theicct.org/sites/default/files/publications/lca-ghg-emissions-ice-evs-india-sept21\\_0.pdf](https://theicct.org/sites/default/files/publications/lca-ghg-emissions-ice-evs-india-sept21_0.pdf)

# Payback period of electric two-wheeler is shorter than the most expensive ICE technology



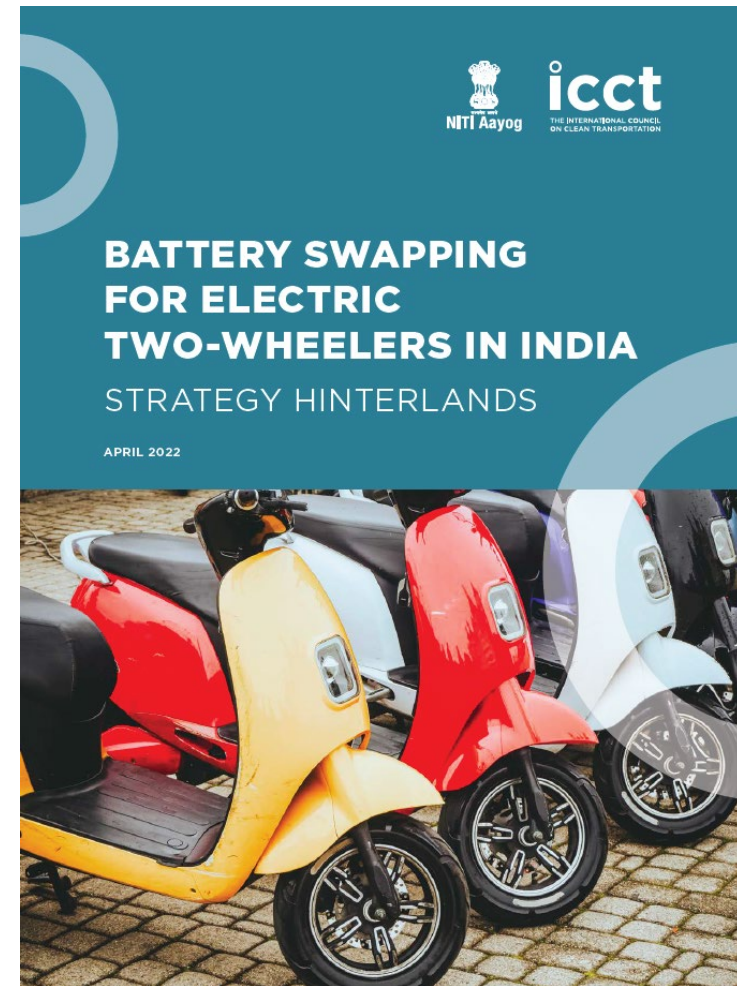
\* Individual technologies were combined to form packages PK1, PK2, PK3, PK4 and PK5. Battery electric technology is considered as a technology package

# Total cost parity of E2W is already here with FAME + state incentives



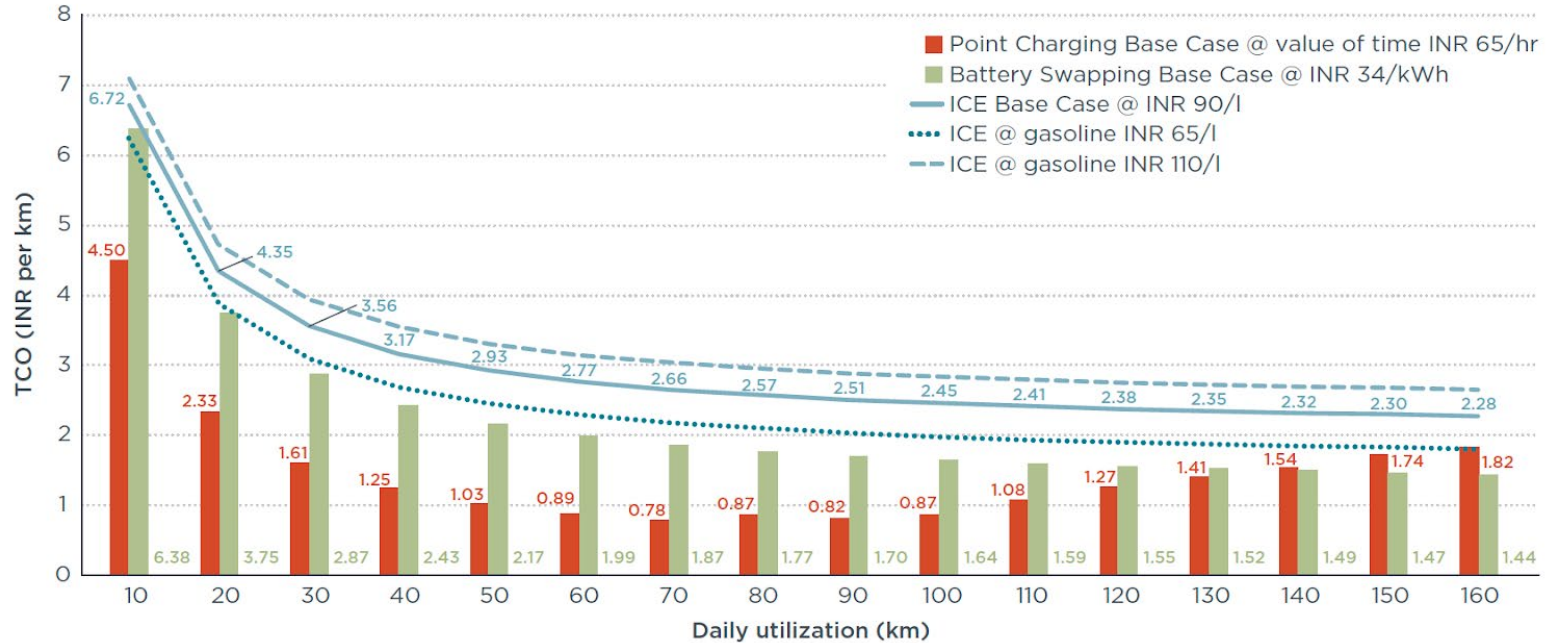
# Battery Swapping

- High upfront cost and availability of charging infrastructure is a major barrier for EV uptake
- Battery swapping promises to address these issues
- Niti Aayog launched a battery swapping policy

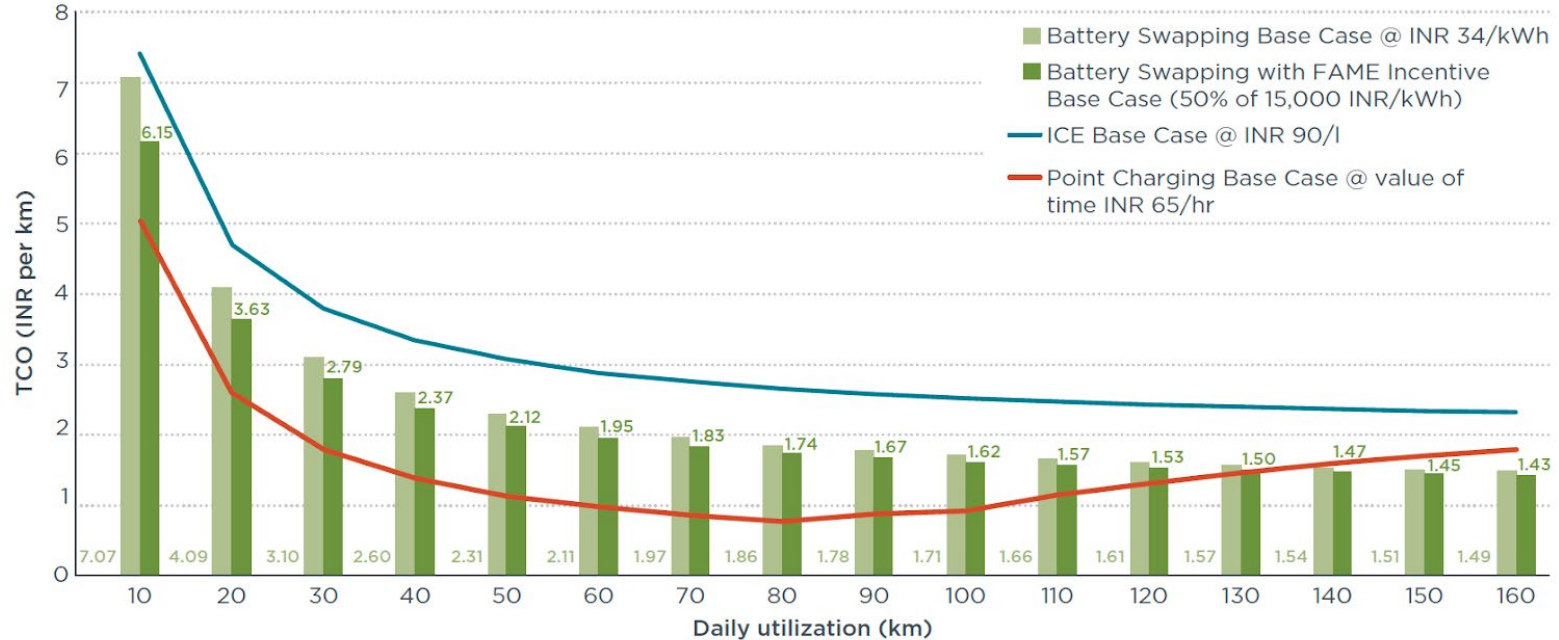




# Total cost of ownership for petrol and electric two-wheelers at various utilization levels



# Battery swapping with and without a hypothetical subsidy



# Summary

- Electric two-wheelers are cleaner than ICE even with current grid
- Electric two-wheelers are more cost-competitive than petrol models
- Zero tailpipe emission will be a significant health benefit for society at large
- Battery swapping is an important innovation, and a lot will depend on the success of the pilots
- Battery swapping will play a complementary role in the near term and will not be replacing point charging

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