Analysis of policies for electrifying India's four-wheeler ride-hailing fleet

ICCT

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India

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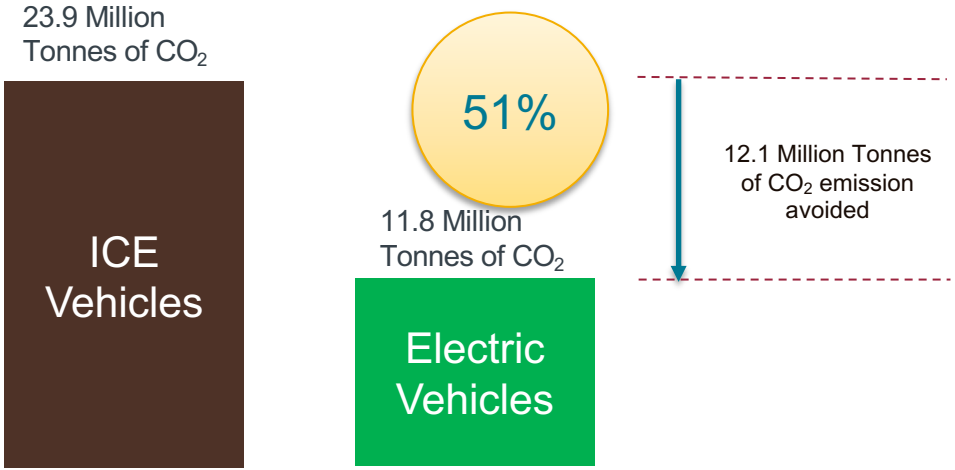
Zero emission ride-hailing is the best way to achieve “Green Vehicle Kilometers” in India



The Indian ride-hailing market is growing fast, with a compound annual growth rate (CAGR) of 19%

To achieve India’s EV mission, it is crucial to **electrify Ride hailing car fleets**

CO_2 emission avoided by 100% electrification of ride hailing cars – Year 2030

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Source: WBCSD, 2019, https://www.wbcsd.org/contentwbc/download/10238/153424/1

Discussion agenda

- Analysis of impact of fiscal incentives on TCO of electric cars in India's ride-hailing fleet
  - Baseline scenario analysis – 2020
  - Comparing baseline scenario of 2020 to 2019
  - Sensitivity analysis of additional policies
  - Policy recommendations
- Analysis of non-fiscal policies to drive adoption of EVs in India's ride-hailing fleet
- Q&A

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Research methodology

Baseline Scenario

Step 1 – Analysis of Total Cost of Ownership 5-year (TCO) 2020

- Selected cities: Delhi City, Hyderabad City, Bangalore City
- Selected vehicle models: Mahindra eVerito D2 (BEV), Tata Nexon (BEV), Maruti Suzuki Dzire LXI (gasoline), Hyundai Aura S (diesel), Maruti Suzuki Tour S (CNG)

Step 2 – Comparison of costs per km 2020 versus 2019

- Selected cities: Delhi City, Hyderabad City
- Selected vehicle models: Mahindra eVerito D2 (BEV), Maruti Suzuki Dzire LXI (gasoline)

Hypothetical additional policy scenario

Step 3 – Effects on costs per km 2020

- Selected cities: Delhi City, Hyderabad City, Bangalore city
- Selected vehicle models: Tata Nexon (BEV), Mahindra eVerito D2 (BEV), Maruti Suzuki Tour S (CNG)

Non-fiscal Policy Analysis

Step 4 – Analysis of Non-fiscal policies for ride-hailing electrification in India and abroad

Baseline Scenario Analysis-2020

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Key assumptions on *purchase cost* – Baseline scenario

BEV Purchase and Finance cost

- Purchase based on ex-showroom prices
- Interest rates for BEVs 0.2% lower than conventional cars
- Vehicle finance costs are estimated based on a 5-year loan

Applicable BEV Purchase incentives from Central & State Government for 2020

- FAME II from the central Government of India
- Upfront purchase incentive from the Delhi Government
- No purchase incentive from the state governments of Telangana and Karnataka

Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

Key assumptions on *taxes, fees & insurance*– Baseline scenario

Taxes and fees considered for BEVs

- National one-time goods and service tax (GST),the compensation cess, and the tax collected at source (TCS) for vehicles
- GST for BEVs less than conventional cars and are exempted from compensational cess
- BEVs exempted from registration fee and road tax

Applicable insurance premium for BEVs

- Covers mandatory *third-party damage policy*, *personal-accident policy*, and an *own-damage cover*
- Discounted rates on *third-party damage policy* applicable for private electric cars only

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Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

Key assumptions on *fueling and re-fueling cost*- Baseline scenario

Fueling Cost

- 6-month average price in respective cities for gasoline, diesel and CNG cars
- A 25% increase over the certified energy consumption value per km of use
- BEV Home charging – Over night charging for BEV Tata Nexon and BEV Mahindra eVerito D2

Re-fueling / Recharging time and *Opportunity Cost

- Gasoline car - 5 minutes, Diesel car – 5 minutes, CNG car - 30 minutes
- BEV Tata Nexon – 68 minutes (avg.), BEV Mahindra eVerito D2 – 101 minutes (avg.)
- Wage- INR 112 per hour (sedan drivers) & INR 89 per hour (compact car drivers)
- Vehicle utilization – average 200 kms/day, 67% on trips, 12-hour workday

*Opportunity cost- Potential revenue loss due to idle time spent during vehicle re-fueling/recharging

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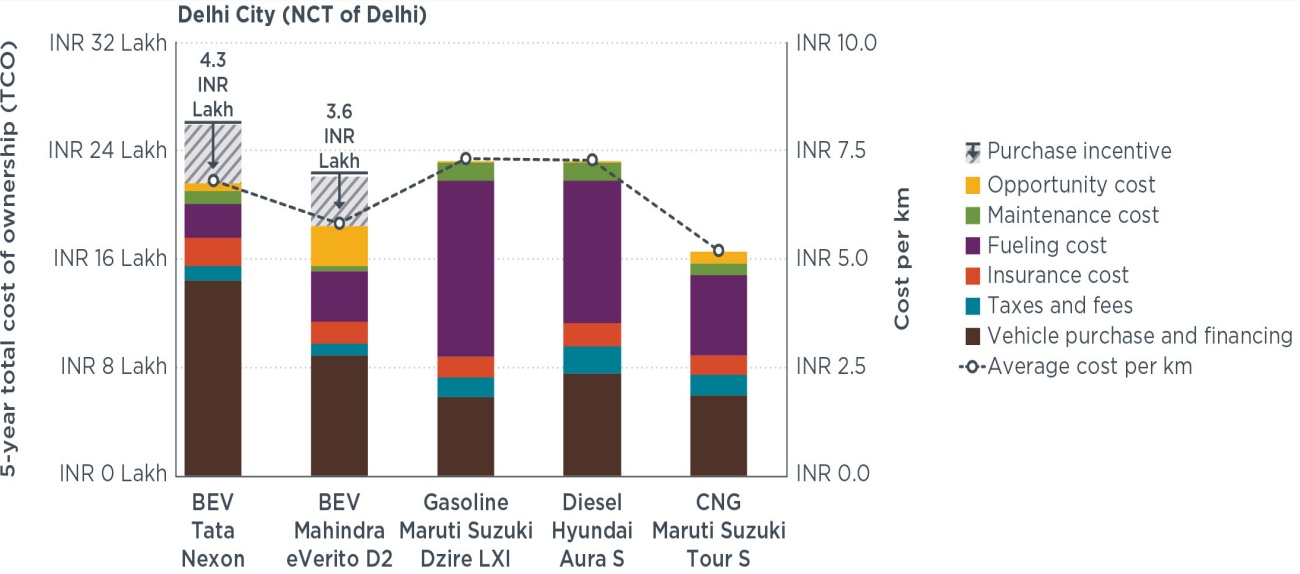
TCO for BEV adoption in ride-hailing is competitive in India (Delhi city) but has some challenges



Challenges to Adoption

High Vehicle upfront cost (53%-69%)

High Vehicle finance cost (10%-14%)

High opportunity cost due to loss of business (2%-16%)

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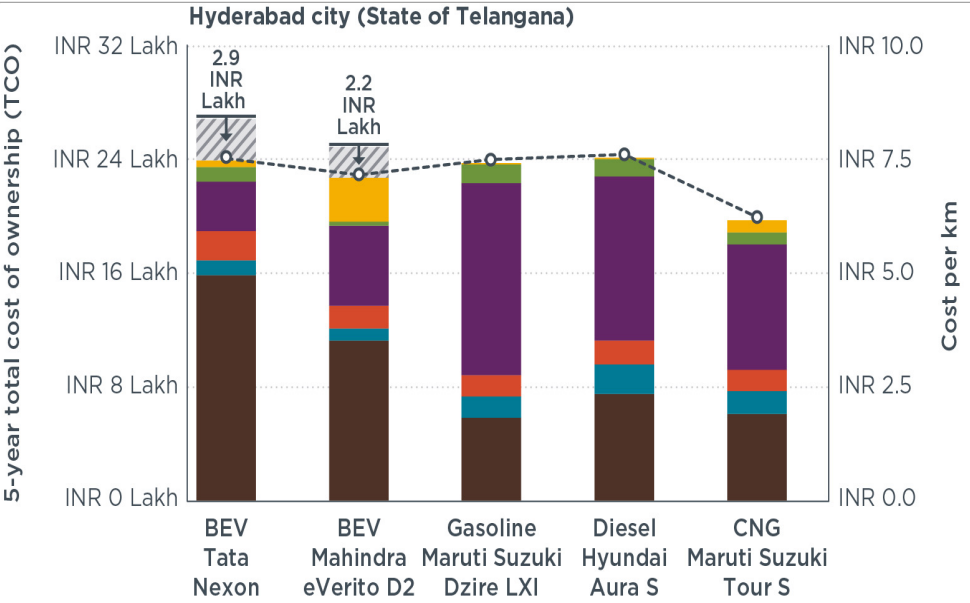
Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

High upfront and finance cost in Hyderabad too!!



Challenges to Adoption

High Vehicle upfront cost (48%-62%)

High Vehicle finance cost (8%-12%)

High opportunity cost due to loss of business (2%-13%)

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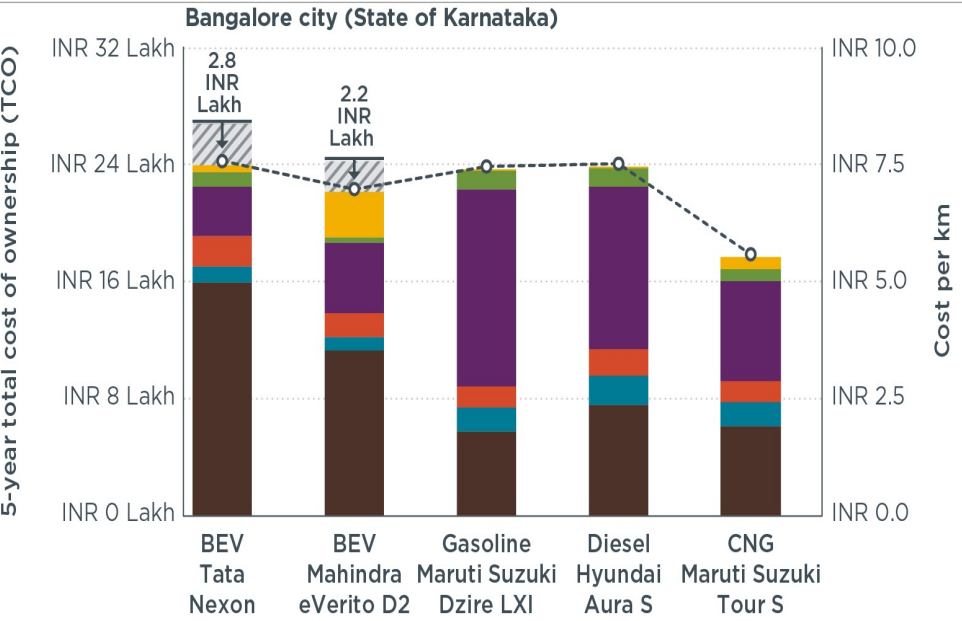
Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

Bangalore also has the same trend!!



Challenges to Adoption

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Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

Baseline Scenario Analysis (2020 versus 2019)

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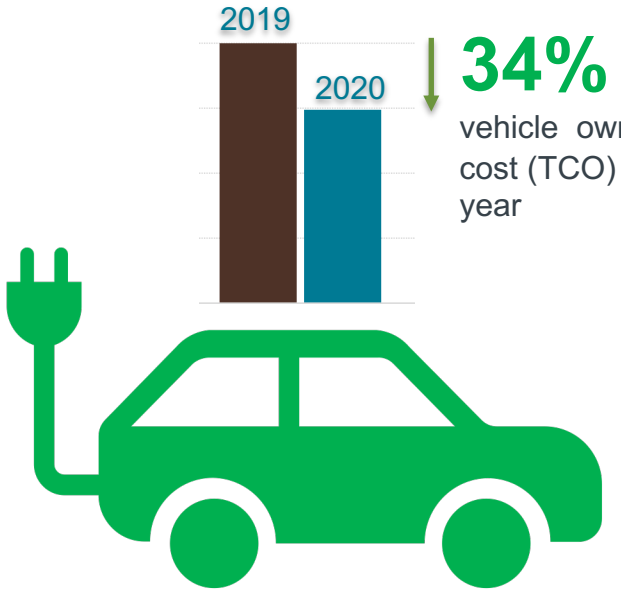
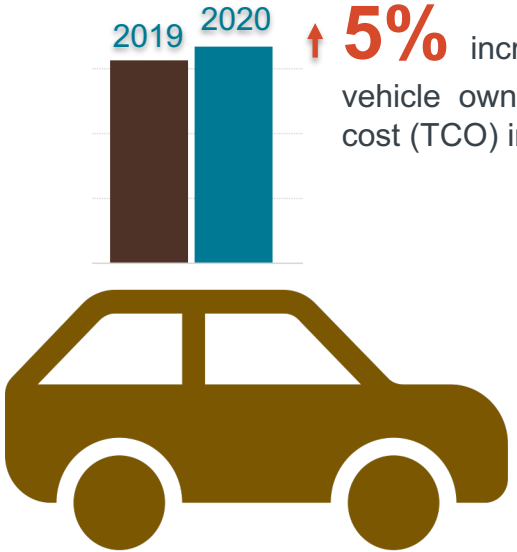
Ride-hailing BEVs are getting cost-attractive in Delhi – 2020 vs 2019



34% drop in vehicle ownership cost (TCO) in 1 year

Representative BEV car
Mahindra eVerito D2



5% increase in vehicle ownership cost (TCO) in 1 year

Representative Gasoline car
Maruti Suzuki Dzire (LXI)

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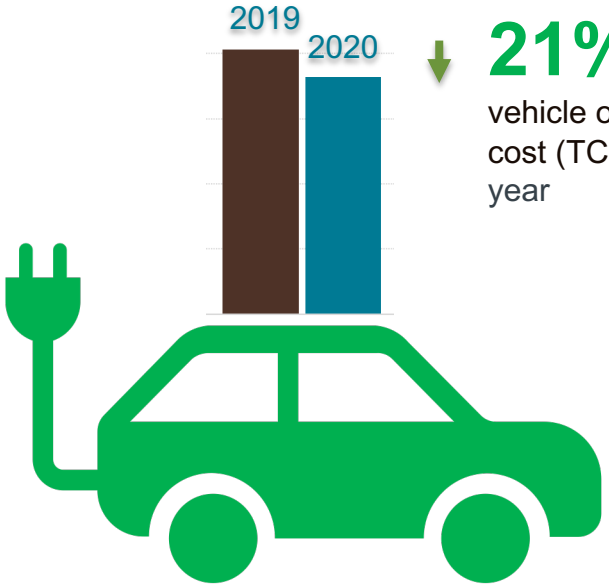
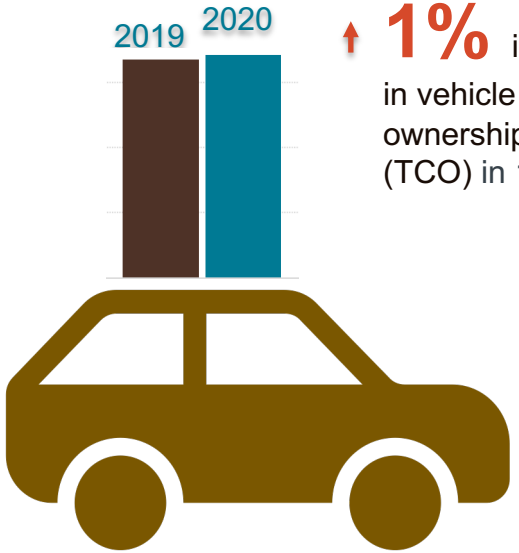
Blog source: https://theicct.org/blog/staff/electric-4w-ride-hailing-india-may2021

Similar trend in Hyderabad too! – 2020 vs 2019



21% drop in vehicle ownership cost (TCO) in 1 year

Representative BEV car
Mahindra eVerito D2



1% increase in vehicle ownership cost (TCO) in 1 year

Representative Gasoline car
Maruti Suzuki Dzire (LXI)

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Blog source: https://theicct.org/blog/staff/electric-4w-ride-hailing-india-may2021

Baseline analysis shows that BEVs are comparative to diesel and gasoline cars in terms of Total Cost of Ownership (TCO)

- With the current cost and incentive structures in place, **BEV cars** are **either as costly as or cheaper** than the **Diesel and Gasoline cars** in three cities over a 5-year holding period
- In terms of **upfront purchase cost**, BEVs are still more **expensive** than conventional cars
- However, **CNG cars** are still **cheaper** than the **BEV car** models in terms of 5-year TCO
- We further analyze **additional policies** that could bring down the cost per-km difference b/w BEV-CNG cars

Additional Policy Analysis- Sensitivity analysis

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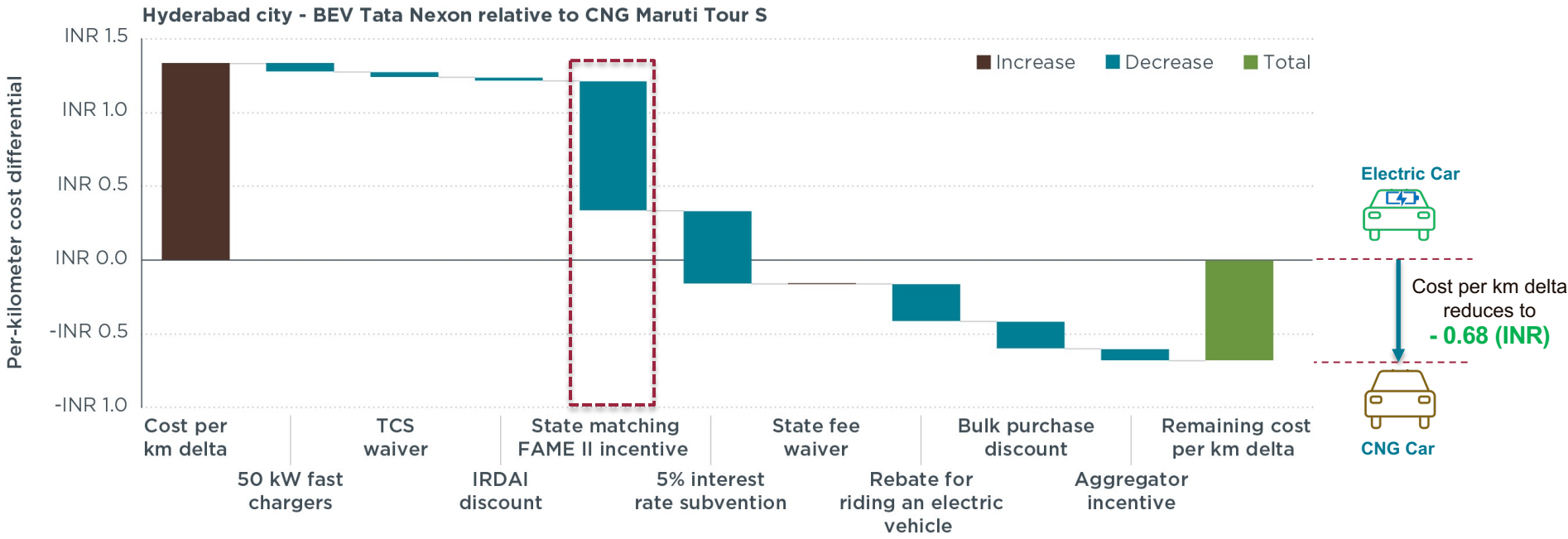
Key assumptions under the hypothetical additional policy scenario

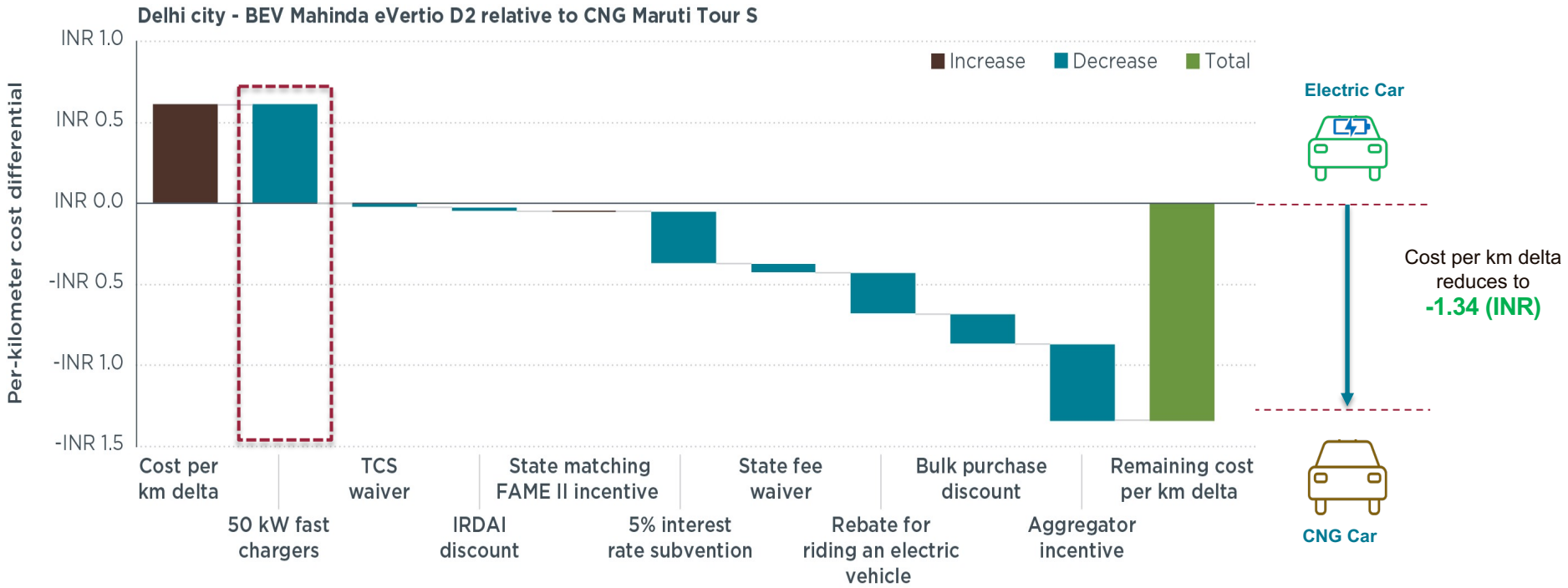
- Deployment of DC fast charging infrastructure @**50kW,** *example USA and Europe*
- States matching FAME II incentive for Hyderabad and Bangalore (**INR 10,000 /kWh**), *example-Delhi EV Policy 2020*
- Interest rate subvention on electric vehicle loan financed amount @**5%,** *example- Delhi EV policy 2020*
- Tax collected at source (TCS) waiver in electric vehicle purchase @**0.75%,** *possible tax exemption*
- Discount on IRDAI insurance rates for commercial BEVs @**15%,** *example- insurance discount to private EV car owners*
- Parking fee waivers on electric vehicles, *fee exemptions*
- Rebates on trip taken to electric vehicle ride-hailing cab drivers (**INR 5 per trip**), *example- Uber green, London*
- Bulk purchase discount for electric ride-hailing vehicles (**INR 60,000**), *example- bulk discounts to CNG drivers in Delhi, Ola platform*
- Opportunity cost rebate to electric ride-hailing vehicle drivers (**INR 50 per hour**), *example- compensation to BEV drivers, OMI*

Policy Recommendation 1: Central purchase incentives matched by state funding will reduce cost gap and drive electric vehicle adoption in India's ride-hailing fleet



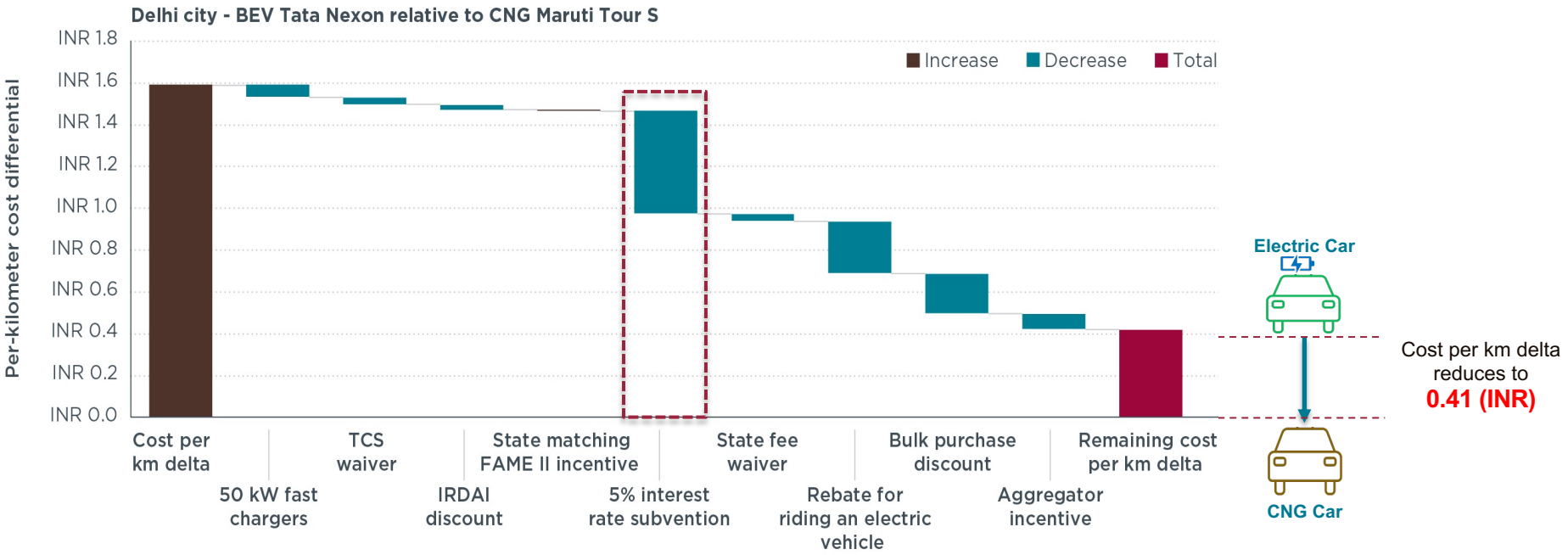
Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

Policy Recommendation 2: Investment in Fast charging infrastructure will reduce opportunity cost and motivate drivers to transition to BEVs



Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

Policy Recommendation 3: Waiver on annual interest payments towards loans taken for electric vehicle purchase would help to further attract electric vehicles in ride-hailing operation



Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

Additional policy analysis shows that BEVs are getting competitive to CNG cars in terms of Total Cost of Ownership (TCO)

- Including **state incentives of the same value as FAME II** can substantially bridge the gap between the BEV and the conventional vehicles
- **Discount on the interest rate** could bring down the **vehicle finance cost**, **second highest cost component** in the 5-year TCO after procurement cost
- **Fast charger technology deployment** could further reduce the cost per kilometer difference because it would mean less charging time and thus **less opportunity cost**

Discussion agenda

- Analysis of impact of fiscal incentives on TCO of electric cars in India's ride-hailing fleet
  - Baseline scenario analysis – 2020
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Analysis of Non-Fiscal policies

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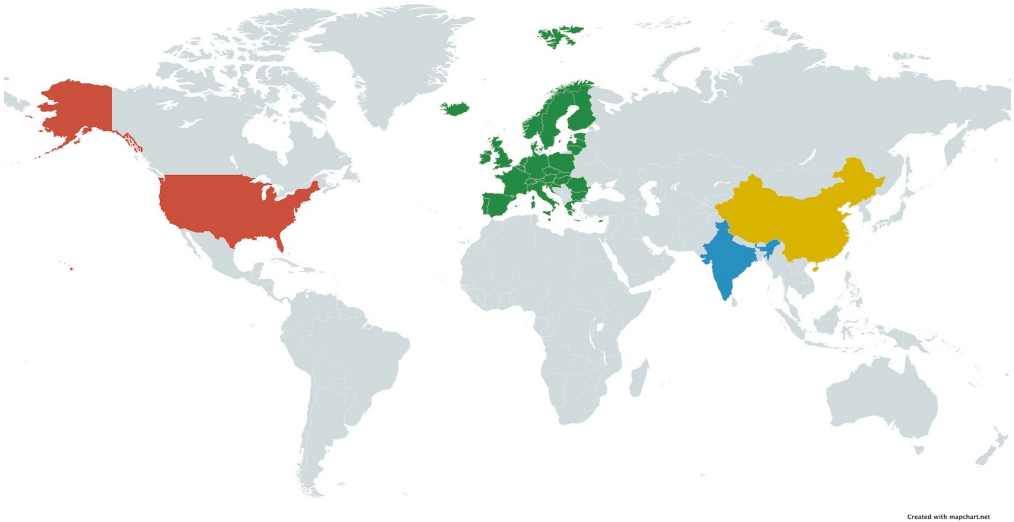
Monetary policies should be supplemented with non-monetary policy measures to drive fast adoption of EVs in ride-hailing fleets



Revenues from ride-hailing and taxi
Top 4 (2020) in million US$

1. China	79,100
2. United States	35,100
3. Europe	22,400
4. India	21,200

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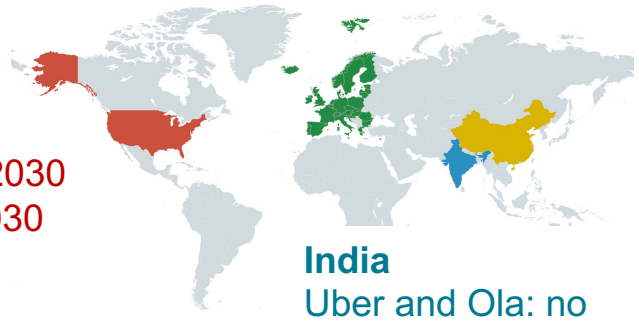
Source: Statista (2021), Ridehailling & Taxis, https://de.statista.com/outlook/mmo/mobilitaetsdienste/ridehailing-taxi/weltweit?currency=USD

Ride-hailing companies are increasingly committed to electrify their 4-wheeler fleets in key markets such like U.S., China, and Europe

Europe
Uber: 100% by 2030

Amsterdam, Berlin, Brussels, Lisbon, London, Madrid, Paris
Uber: 50% by 2025

Global
Uber: 100% by 2040



United States
Uber: 100% by 2030
Lyft: 100% by 2030

China
Didi: 10 million by 2028

India
Uber and Ola: no commitments for 4-wheelers

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Source: Bloomberg (2021), Hyperdrive Daily: Uber, Arrival and the Architecture of Ride-Hailing EVs, https://www.bloomberg.com/news/newsletters/2021-05-11/hyperdrive-daily-uber-arrival-and-the-architecture-of-ride-hailing-evs

National, state, and local government in Europe, China, and the U.S. have set various non-monetary policies to electrify ride-hailing platforms

	Example policy action	Actor	Example city, state, county
Electrification of ride-hailing fleet	Electrification goals and strategies for ride-hailing companies	National government	France
		Local government	Shenzhen, Guangzhou, Zhengzhou, Wuhan, Xi'an (China)
	Emission standards for ride-hailing fleets	State government	California (United States)
	Green standards for ride-hailing companies for access to transportation hubs	Local government	Seattle-Tacoma International Airport (Washington State, United States)
	Licensing requirements for ride-hailing companies	Local government	London (United Kingdom), New York (United States)

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Beyond, non-monetary policies to electrify the passenger car fleet overall support these actions

	Example policy action	Actor	Example city, state, county
Electrification of passenger car fleet	Phase-out sale or registration of new combustion engine cars	National government	Canada, Cape Verde, Denmark, France, Iceland, Ireland, Netherlands, Norway, Singapore, Slovenia, Spain, Sweden, United Kingdom
		State government	British Columbia (Canada), California (United States), Massachusetts (United States), Quebec (Canada)
	Zero-emission vehicle regulations	National government	China, South Korea
		State government	British Columbia (Canada), California (United States)
	Labelling of electric vehicles and access to benefits	National government	France, Germany, Spain, United Kingdom
		State government	California (United States)
	Urban vehicle access regulations	Local government	Amsterdam (Netherlands), London (United Kingdom), Oslo (Norway), Oxford (United Kingdom), Paris (France)
	Non-fiscal registration benefits for electric vehicles	Local government	Beijing (China), Shanghai (China)

In India, similar non-monetary policy actions and their enforcements on ground are still inadequate

	Policy action	Notification status	Implementation status
Electrification of ride-hailing fleet	Setting targets for the uptake of ZEVs in shared mobility	✓	✗
	Electrification targets in motor vehicle aggregators guidelines	✗	✗
Electrification of passenger car fleet	CO_2 emission standards for passenger cars	✓	✓
	Green tax exemption for BEVs in upcoming Vehicle Scrappage Policy	✗	✗
	Green coloured registration plate with yellow font	✓	✓
	Permit requirement exemption for electric vehicles plying as transport vehicle	✓	✗

✓ - Notified without specification ✓ - Notified but not stringent ✓ - Notified ✗ - Not notified or implemented

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Conclusions

Driving the electric 4-wheeler ride-hailing market requires governments a system of regulation, fiscal and non-fiscal policies, charging infrastructure, and local action

Electrification of the passenger car fleet

- Regulation: Long-term CO_2 and electric vehicle regulations ensure investment, model availability
- Fiscal incentives: Address short-term (~5 year) market cost barrier
- Charging infrastructure: Provide convenience, consumer confidence, education
- Cities: Promote electric vehicles locally (urban restrictions, preferential access)

Conclusions (continued)

Driving the electric 4-wheeler ride-hailing market requires governments a system of regulation, fiscal and non-fiscal policies, charging infrastructure, and local action

Electrification of the ride-hailing fleet specifically

- Regulation: Set emission standards for ride-hailing fleets
- Targets: Commit to electrification goals for ride-hailing companies/aggregators
- Non-fiscal policies: Set licensing requirements

Thank you!

“Glad that riding an environment friendly electric car is possible today at the same cost of riding the fossil-fuelled cars. It is a win-win for commuters as they get to contribute their part in cleaner cities.”

- A ride hailing commuter

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Annex

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Vehicle Models considered in the study

Manufacturer	Model	Fuel type	Ex-show-room price with tax (INR)	Peak power (kW)	Tailpipe CO_2 emissions (g/km)	Length (mm)	Battery capacity (kWh)	Certified fuel consumption (per 100 km)	Adjusted fuel consumption (per 100 km)
Mahindra	eVerito D2	BEV	9,12,515	31	0	4,247	21.2	14.6 kWh	18.3 kWh
Tata	Nexon	BEV	13,99,000	95	0	3,993	30.2	10.6 kWh	13.3 kWh
Maruti Suzuki	Dzire LXI	Gasoline	4,45,000	66	111.8	3,995	N/A	4.3 Liter	5.4 Liter
Hyundai	Aura S	Diesel	7,73,800	55	104.5	3,995	N/A	3.9 Liter	4.9 Liter
Maruti Suzuki	Tour S	CNG	5,99,000	61	103.0	3,995	N/A	3.7 kg	4.7 kg

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Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

Current central and state policy incentives for EV considered in the study

			BEV Tata Nexon	BEV Mahindra eVerito D2
Central Government Incentive - Fame 2		One-time purchase incentive for electric 4-wheeler commercial passenger cars	10,000 INR per kWh of battery capacity capped at 20% of cost of vehicle	10,000 INR per kWh of battery capacity capped at 20% of cost of vehicle
State Government Incentives	Delhi	Road tax waiver for electric 4-wheeler commercial passenger cars	yes	yes
		Registration Fee waiver for electric 4-wheeler commercial passenger cars	yes	yes
		One-time Purchase Incentive	10,000 INR per kWh of battery capacity subject to maximum 1,50,000 INR	10,000 INR per kWh of battery capacity subject to maximum 1,50,000 INR
	Telangana	Road tax waiver for electric 4-wheeler commercial passenger cars	yes	yes
		Registration Fee waiver for electric 4-wheeler commercial passenger cars	yes	yes
	Karnataka	Road tax waiver for electric 4-wheeler commercial passenger cars	yes	yes
		Registration Fee waiver for electric 4-wheeler commercial passenger cars	yes	yes

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Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

Baseline scenario analysis results at a glance - TCO per km values

Delhi		
		Average cost per km
BEV	Tata Nexon	6.8
BEV	Mahindra eVerito	5.8
Gasoline	Dzire LXI	7.3
Diesel	Aura S	7.3
CNG	Tour S	5.2

Bangalore		
		Average cost per km
BEV	Tata Nexon	7.6
BEV	Mahindra eVerito	7.0
Gasoline	Dzire LXI	7.5
Diesel	Aura S	7.5
CNG	Tour S	5.6

Hyderabad		
		Average cost per km
BEV	Tata Nexon	7.6
BEV	Mahindra eVerito	7.2
Gasoline	Dzire LXI	7.5
Diesel	Aura S	7.6
CNG	Tour S	6.2

Source: "Update on the electrification of India's ride-hailing fleet ", ICCT Working Paper, (2021), https://theicct.org/publications/update-electrifying-india-ride-hailing-fleet-apr2021

Electrification goals and actions of Leading ride-hailing entities

Company	Markets	Target	Target year	Key milestones and actions
Uber	Worldwide	Fully zero-emission platform	2040	• $800 million funding to help drivers transition to electric vehicles by 2025 • Partnering with local governments like London and Paris, electric vehicle manufacturers, charging service providers, advocacy groups • Incentives to drivers and riders for electric vehicle adoption • Expanding Uber Green to more cities
	U.S, Canadian, European cities, and major global cities	100% of rides in BEVs	2030	
	London	100% all-electric passenger service	2025	
	Amsterdam, Berlin, Brussels, Lisbon, London, Madrid and Paris	50% of vehicles to be electric	2025	
	India	No specific target for India	NA	• Although, previously Uber India made announcements regarding collaboration with other entities towards electrification of its fleet, the results on ground were not promising
Lyft	United States	Transition 100% vehicles to all-electric or other zero-emission technologies	2030	• Negotiations with auto manufacturers to increase the selection and supply of affordable long-range electric vehicles • Engagement with regulators, utilities, local governments, charging partners • Providing electric vehicles at the same or lower weekly rental price as comparable gasoline vehicles
Didi Chuxing	Operational markets	10 million electric cars	2028	• Launch of co-designed electric ride-hailing electric car in cooperation with BYD in November 2020 • Joint venture with British Petroleum to provide electric vehicle charging stations in China for both Didi and non-Didi car owners
Ola	India	No specific commitments towards electrifying 4-wheeler ride-hailing fleet	NA	• Not much action and EV adoption happened beyond the EV project in Nagpur in 2017 with 200+ BEV Mahinda eVerito cars

Select non-fiscal government policies to promote electrification in ride-hailing platforms in India

Policy action	Implementation Status
Green registration plate with yellow font for battery operated transport vehicles including ride-hailing vehicles for distinct identity	Notified by the central government to all states. However, no benefits like priority parking, waiver on toll-fee and parking fee etc are passed on to electric vehicles by the state and local governments
Exemption of electric vehicles from the permit requirement for plying as transport vehicle	Notified by the central government to all states. However, state governments have not stopped asking for permits from electric transport vehicles
Increase the share of zero emission electric vehicles (ZEV) in shared mobility	Notified by the central government to all states. However, no time-based targets for inducting ZEVs have been specified by the central government. As a result, there is no effect of this policy measure on ground
Electrification targets in motor vehicle aggregators guidelines	The guideline was released by the central government in November, 2020. However, it does not specify anything about environmental standards or electrification targets to be achieved by the vehicle aggregators in India
CO_2 emission standard	This policy is in effect. But, India's emission standards are not as stringent as that of EU. Therefore, manufacturers in India are not pushed enough to deploy electric vehicles in market
Green tax exemption for BEVs in the upcoming voluntary vehicle scrappage policy	Upcoming policy from the central government. This is not in effect yet. Also, in the draft policy there is no mechanism linking scrappage of conventional vehicle and replacing it with BEV