

Development of an EV Financing Tool and Business Model to Enable the Scaling up of EV Uptake in Bangladesh

Road to a Green Bangladesh - 'সবুজ বাংলাদেশের পথে'



Lead Partner



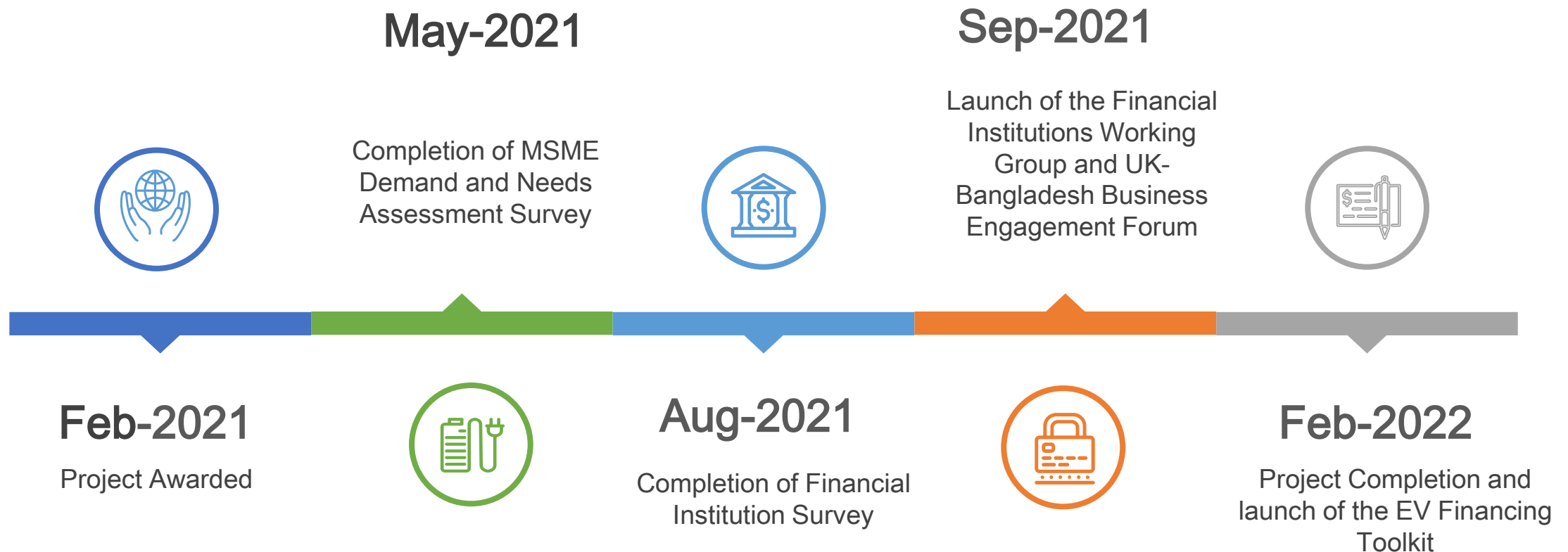
Consortium Partners



16 February 2022

Project Timeline

Project Objective: Identify scalable business models and a financing ecosystem for individual transport providers, SMEs and cooperatives with an aim for EV uptake in Bangladesh



Discussion Agenda

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Global EV Landscape

2

Bangladesh Electric
Mobility Market

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EV Demand and Need
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EV Viability Analysis and
Key Takeaways

Global EV Landscape

01

Transition to Electric Mobility - Climate Goal

“We commit to advance our work individually as well as collectively to increase electro-mobility to levels compatible with a less-than 2-degree pathway.” *Paris Declaration on Electric Mobility, 2015*

Table: Goals Announced by Selected Countries

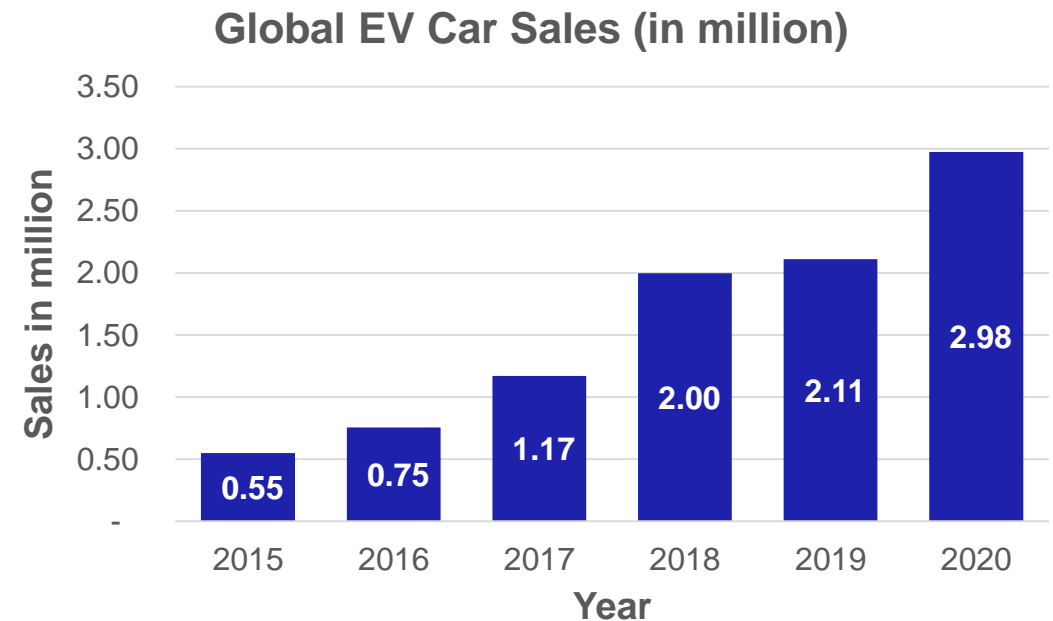
Country	Target	Target Year	Vehicle Type
Canada	100% electric vehicles	2040	All types of vehicles
Germany	100% electric vehicles	2050	Passenger cars
United Kingdom	Ban sales on fossil fuel vehicles	2030	Passenger cars and vans
South Korea	33% electric vehicles	2030	Passenger cars
India	30% electric vehicles	2030	Passenger cars
Sri Lanka	100% electric or hybrid vehicles	2040	All types of vehicles

“We will work towards all sales of new cars and vans being zero emission globally by 2040, and by no later than 2035 in leading markets.” *COP26 Declaration on Transition to Electric Mobility, 2021*

Global EV Status-Current Stock

“There are now 12 million passenger EVs, 1 million commercial EVs (including buses, delivery vans and trucks), and 260 million two- and three-wheelers on the road globally.” *(BNEF, 2021)*

- The global market for all types of car has been significantly affected by COVID-19. Car registrations dropped by 16 percent in 2020 from previous year.
- Despite the reduction in overall market, global electric car sales rose by 41 percent in 2020.
- 2.98 million electric cars were registered in 2020.
- 97% of the global electric car registrations are in three major markets (2020):
 - Europe: 1.4 million
 - China: 1.2 million
 - United States: 295,000
- Electric three-wheelers are a popular mode of transportation across Asia. China is the leading electric three-wheeler market.



Source: IEA EV Outlook 2021

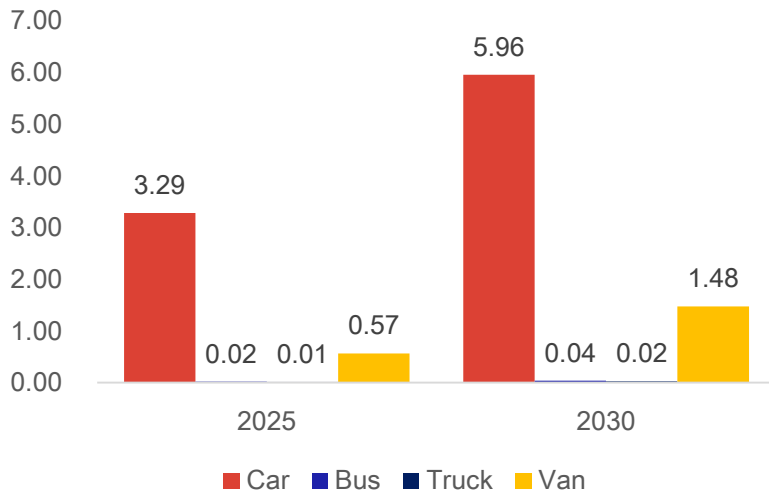
EV Transition Outlook

“EVs will take longer to spread in India and Southeast Asia, where policy support is limited and low-cost Internal Combustion Vehicles are cheaper. Sales are expected to grow rapidly in the 2030s with policy and market support”. *BNEF EV Outlook 2021*



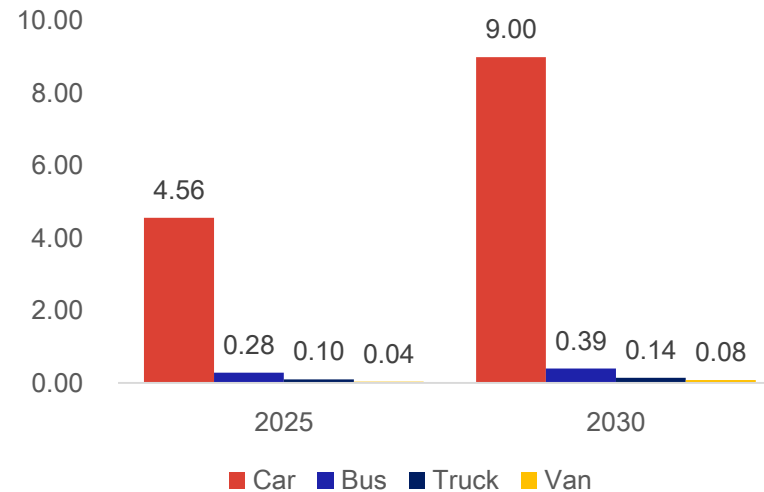
EU CO2 Fuel Economy Standards and UK’s ban on ICE vehicles by 2030 are expected to maintain the region as the most advanced EV market in the coming years.

EV Sales in Europe (in million)



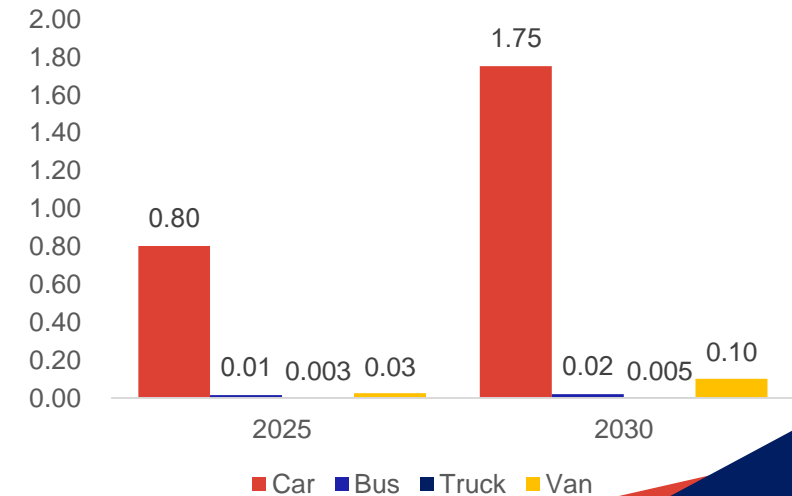
China will lead the electrification of the transport sector globally. It is expected to have the biggest electric bus sales share due to its leadership in e-bus manufacturing.

EV Sales in China (in million)



EV deployment in India will mainly be achieved through electrification of two- and three-wheelers. EV sales share across all models is expected to be above 30% by 2030.

EV Sales in India (in million)



Private Sector Commitments in EV



AMAZON

Orders 100,000 BEV light commercial vehicles. The company aims to be net-zero emission by 2040.

Toyota

Carbon Neutral by 2050
70 electrified models by 2025
8 million EVs by 2030



FedEx

Transition to an all zero-emission vehicle fleet and carbon neutral operations by 2040.

BMW

2 million EVs by 2025
By 2030, half of global sales will be battery cars



WALMART

Electrify whole vehicle fleet by 2050

Mercedes-Benz

Carbon Neutral by 2039
All new segments EV only from 2025



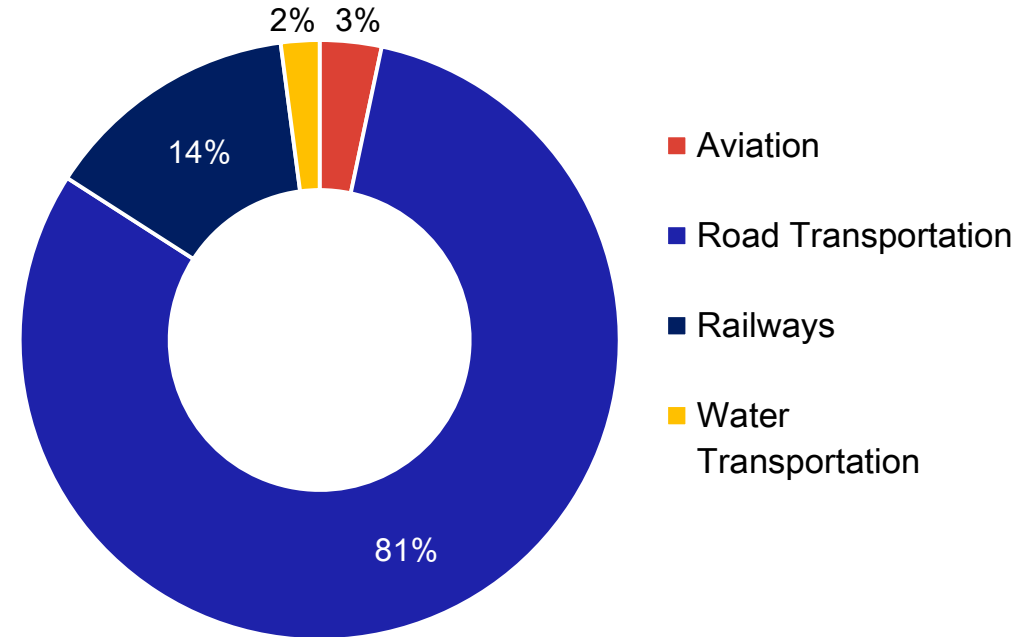
**Bangladesh
Electric Mobility
Market**

02

Bangladesh Transport Sector: Climate Context

Transport sector accounts for 9.92% (16.77 MtCO_{2e}) of the country's total GHG emissions in 2020 and is projected to grow to 36.28 MtCO_{2e} in 2030.

- ❑ The Third National Communication to UNFCCC for Bangladesh shows that 81% of the transport sector emission is from Road Transportation.
- ❑ Among the Road Transportation emissions, 57.84% is from heavy-duty trucks and buses, 22.10% from passenger cars, 19.62% from light-duty trucks and 0.44% from motorcycles.



- ❑ The Updated NDC of Bangladesh has committed 3.39 MtCO_{2e} below BAU emissions (unconditional) and further 6.33 MtCO_{2e} below BAU emissions with international support (conditional) from transport sector by 2030.
- ❑ Mitigation measures include establishing charging station networks and promoting electric vehicles in major cities.

Bangladesh Electric Vehicle Market

Bangladesh's electric vehicle market primarily comprises of: electric bikes, e-rickshaws and hybrid vehicles.

- ❑ As on Dec 2021, there are 3.5m motorcycles, 0.31m CNG auto-rickshaws, 0.03m delivery vans and 0.38m private passenger cars (including hybrid) registered in Bangladesh.
- ❑ While no definite source is available, it is estimated that 2m electric two/three wheelers are on road, primarily serving the last mile connectivity.
- ❑ The first locally manufactured electric three-wheeler was introduced in 2004 by a local company which later partnered with Bangladesh Diesel Plant, a subsidiary of Bangladesh Army in 2008 to import and market electric three-wheelers from China. However, the operation was discontinued in 2010 when the National Road Safety Council banned the operation of electric three-wheelers in the highways.
- ❑ Various local companies including battery manufacturers are currently assembling and manufacturing local electric three-wheelers.
- ❑ Some city corporations and municipalities facilitate operation of electric two- and three-wheelers by providing local registration numbers. Dhaka, Narayanganj and Gazipur City Corporations have banned the electric three-wheelers within their city limits.

Electric Vehicle Policies in Bangladesh

Automobile Industry Development Policy 2021

Issuing Authority: Ministry of Industry

Targets to transform majority of the passenger cars, bus, trucks and three-wheeler auto rickshaws to EV by 2030.

The proposals are as follows:

- ❑ 10 year tax holiday for local EV assembling and manufacturing.
- ❑ Proposes financial incentives, purchase subsidies, waiver of road tax and EV registration fee, reduction of VAT/Import Duty.
- ❑ Proposes incentives to set up battery recycling industry and charging station networks.
- ❑ Proposes establishment of an EV Cell in Bangladesh Road Transport Authority.
- ❑ Proposes establishment of "Energy-Efficient Vehicle Manufacturing Fund" where fines and taxes collected from environment polluting vehicles will be deposited.

Electric Vehicle Registration & Operation Policy - 2021 (Under Review)

Issuing Authority: Road Transport and Highways Division

- ❑ Electric vehicles will be granted registration under "E" or "EV" category.
- ❑ The registration fee of an EV will be determined on the basis of the motor capacity (kW) similar to ICE vehicles which is presently fixed on the engine CC.
- ❑ Imported EVs must be brand new. Import of reconditioned EVs may be allowed in future after analyzing the technical development of EVs.
- ❑ EVs have to use lithium ions or more advanced highly efficient and eco-friendly batteries. However, lead-acid batteries can be used in EVs until 31 December 2025.
- ❑ The manufacturer/assembler of the EVs have to register with the Bangladesh Investment Development Authority (BIDA) for operation.

Electric Vehicle Charging Policies in Bangladesh

Tariff for Battery Charging Station

Issuing Authority: Bangladesh Energy Regulatory Commission

Issue Date: 27 February 2020

Type	Energy Rate/Charge (BDT/kWh)	
	Low Tension (230/400 Volt)	Medium Tension (11 kV)
Residential	9.94 (401-600 unit)	8.40
Irrigation	4.16	5.00
Battery Charging Station	7.64	7.56
Commercial	10.30	9.12

**Flat rates are considered*

Electric Vehicle Charging Guideline (Under Review)

Issuing Authority: Sustainable and Renewable Energy Development Authority (SREDA)

- Charging stations have to follow the proper safety standards set by SREDA.
- A monitoring platform will be set where all the charging stations will have to provide weekly operational data.
- Service charge on top of electricity tariff will be determined by the relevant authority.
- Operators eligibility for financial incentives shall be determined by the Government upon receiving application.
- Priority establishment of EV charging station network will be assessed in major cities and highways

Private Sector EV Assembling and Manufacturing Initiatives



- ❑ Bangladesh Auto Industries Limited (BAIL) has completed setting up a factory in one of the economic zones and secured financing of BDT 1.67 billion (US\$ 19.47 million) from five local banks.
- ❑ Targets to launch the first product in July 2022.
- ❑ Retail price of an SUV would be BDT 2.5 million (US\$ 29,150), Sedan BDT 1.5 million (US\$ 17,490) and Hatchback BDT 0.8 million (US\$ 9,330)
- ❑ With a 20 minutes charge, the EVs will run 400 km.
- ❑ Battery capacity will be 50 kWh and a single full charging would cost BDT 400 (US\$ 4.7).



- ❑ Nitrol Motors Limited intends to invest BDT 3.5 billion (US\$ 40.81 million) to roll out a locally assembled EV plant with annual production capacity of 20,000.
- ❑ Targets to launch the first product in June 2023.
- ❑ Under the brand name 'Suvare', a sedan will run 200 km with 30 minutes of charging.
- ❑ Retail price of the Sedan would be BDT 1.2 million (US\$ 14,000).
- ❑ Battery capacity will be 25 kWh and a single full charging would cost BDT 170 (US\$ 2).

**EV Demand and
Need Assessment
Survey**

03

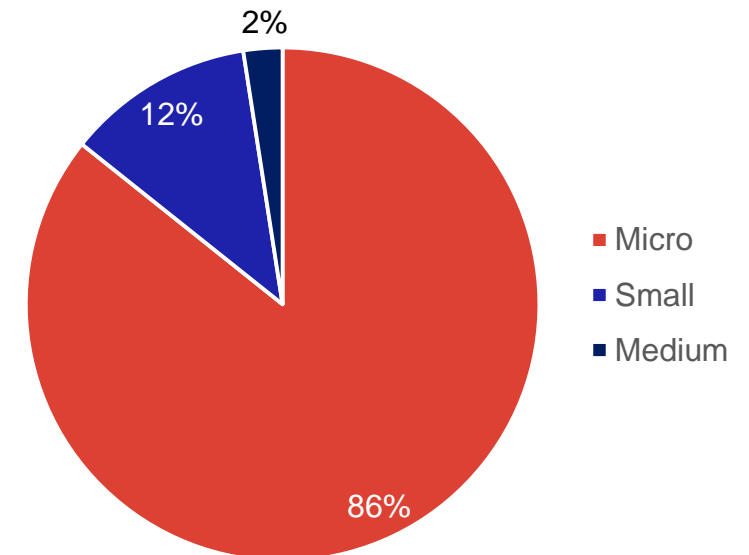
Survey Objective

A demand and need assessment survey was conducted among 450 micro, small and medium sized enterprises (MSMEs) in Bangladesh.

Objective of the Survey:

- Assess the transportation requirement of the enterprises operating in the MSME segment
- Assess the level of Electric Vehicle related knowledge
- Identification of business support activities required by the MSMEs
- MSME's current experience with financial sector

Type of Surveyed MSMEs



Key Survey Findings

- ❑ Survey indicates that two-third (67%) of the respondents do not have enough knowledge on EV.

- This presents an opportunity to build awareness among MSMEs on EV's benefits and functionality.

- ❑ Daily transportation demand indicates that 55% of the respondents have their usage well below 50km/day with majority falling in the range of 20~50 km/day.

- ❑ Highest incident for daily demand is between 10 AM and 4 PM which drops steeply after 5 PM.

- Nature of transportation demand indicates that the MSME segment is a promising target group that has good potential for early adoption of EV.

- ❑ Intent to buy EVs among MSMEs is high - 56% of the respondents showed their intent to buy an EV in near future.

- Low cost financing schemes for MSMEs for EV purchase may catalyze EV adoption in this segment.

**EV Financial
Institutions Survey**

04

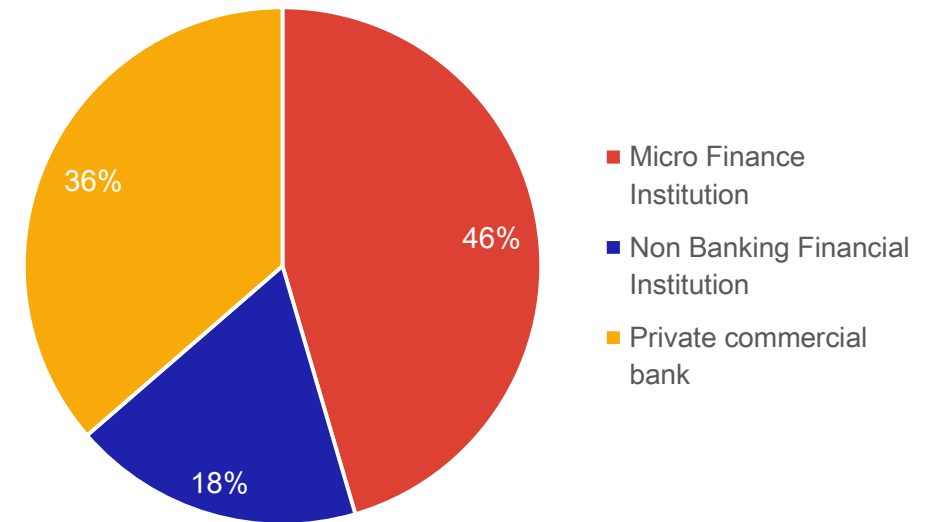
Survey Objective

A total of thirteen (13) financial institutions were surveyed which include micro finance institutions (MFIs), non-banking financial institutions (NBFIs), and private commercial banks.

Objective of the Survey:

- Processes and methods followed by the financial institutions in loan processing
- Existing views on low carbon products and the associated financing
- Views and observations of financial institutions in relation to financing MSMEs
- Level of attention given to the women customers

Type of Surveyed FIs



Key Survey Findings

- ❑ MFIs provide micro-finance loans to their network of MSMEs and women groups. 3 out of the 5 MFIs surveyed offer at least one loan product aimed at financing EV purchase.

- Low-cost financing with flexible terms as well as capacity building support for the MFIs can be sourced through development partners.

- ❑ Conventional banks and financial institutions presently do not offer loan for EV financing.
- ❑ The banks and FIs identified lack of registration process as the main issue while providing loans to EVs.

- Banks should have EV loan products similar to the conventional car loans. Low-cost refinancing schemes for EV loans may be channeled from Bangladesh Bank and/or DFIs.
- EV registration process is to be streamlined along with supporting legislations on taxes and standardizations.

- ❑ Above 40% of the surveyed institutions see gender of the entrepreneur / applicant as a risk factor.
- ❑ Uncertain revenue flow along with beneficial owner risk are seen as the major risks in processing loan applications by women owned businesses.
 - Women entrepreneur focused capacity building initiatives may be initiated for strengthening merits of their loan applications.
 - Further subsidized interest rate can be provided to the women owned businesses.

**EV Viability Analysis
and Key Takeaways**

05

Purpose of the Assessment

A financial viability assessment was conducted comparing EVs with their ICE equivalents for two-wheelers, three-wheeler passenger and cargo vehicles from the perspective of the users.

2W

ICE Model: Bajaj Discover 100
EV Model: TVS iQube



3W-P

ICE Model: Bajaj RE
EV Model: Mahindra Treo HRT



3W-C

ICE Model: Bajaj RE Maxima Cargo
EV Model: OSM Rage+



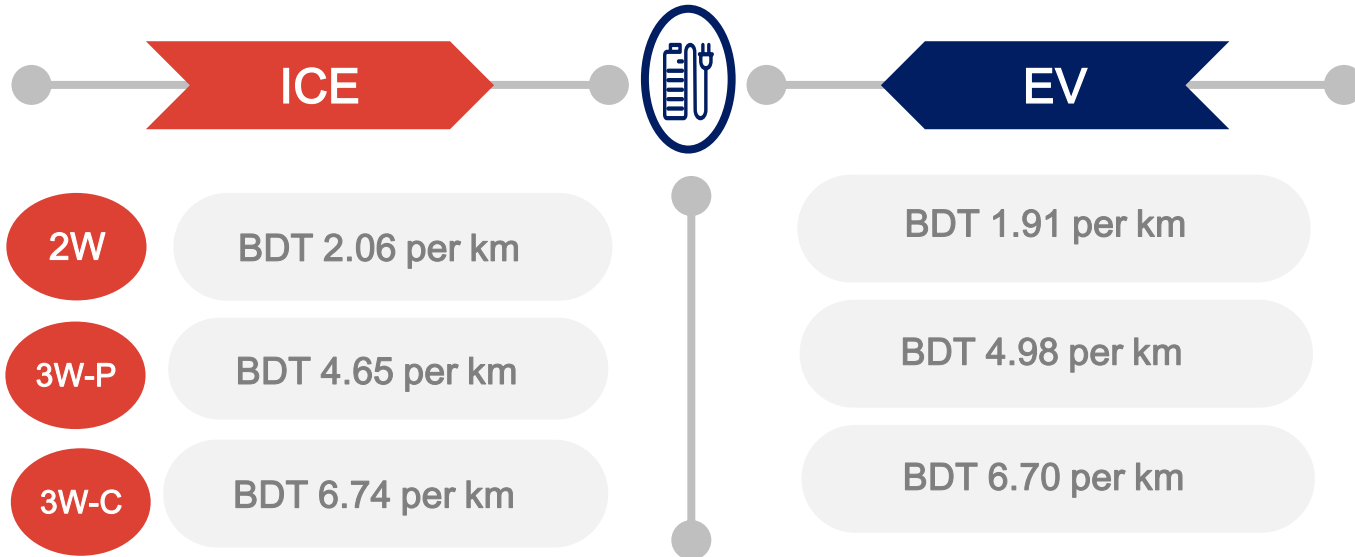
Comparison of Vehicle Features

	2W		3W-P		3W-C	
	Bajaj Discover 100	TVS iQube	Bajaj RE	Mahindra Treo HRT	Bajaj RE Maxima Cargo	OSM Rage+
Fuel	Octane	Electric	CNG	Electric	Diesel	Electric
Max Speed (km/h)	95	78	53	55	58	45
Mileage	75 km/L	75 km/charge	30 km/kg	130 km/charge	30 km/L	75 km/charge
Total Tax Incidence	58.6%	58.6%	89.32%	89.32%	58.6%	58.6%*
Economic Life	12 years		10 years		10 years	

*TTI presently not available. ICE equivalent TTI was considered

Model Results

Total Running Cost Comparison



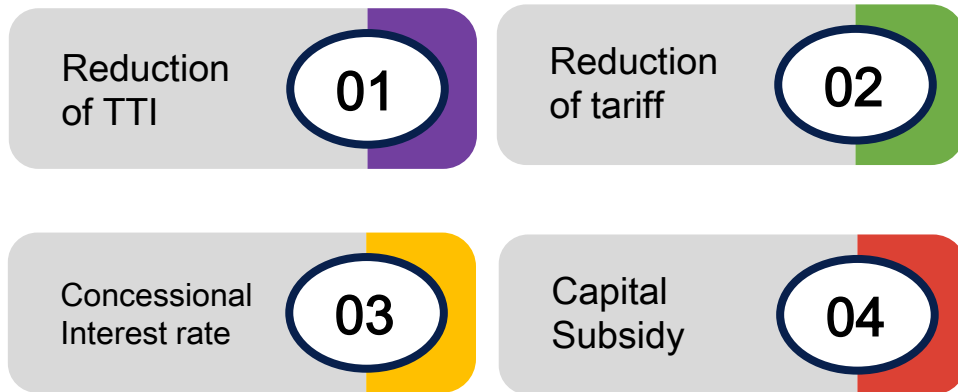
Decision Criteria

- Positive: Payback period of additional cost of EV < Economic life
- Negative: Payback period of additional cost of EV > Economic life

Category	2W	3W-P	3W-C
Additional Cost for EV	BDT 90,688	BDT 93,789	BDT 153,320
Annual Cost Savings (Loss) per year	BDT 3,654	(BDT 6,862)	BDT 819
Payback Period (Years)	24.82	-	187
EV PURCHASE ATTRACTIVE?	Negative	Negative	Negative

Sensitivity Analysis

Following sensitivity factors were analyzed to assess possible options for making EVs viable:



- ❑ Tariff has the least sensitivity on commercial viability
- ❑ Changes in interest rate alone will not make the EVs commercially viable

Following scenarios make EVs financially viable:

Criteria	2W	3W-P	3W-C
Setting a maximum TTI (%)	43%	63%	45%
Minimal Capital Subsidy (% of Cost)	10%	15%	9%
Max. viable TTI if Interest Rate is set @ 5%	55%	75%	55%
Min. Subsidy Needed if Interest Rate is set @5%	2%	8%	2%

Contribution to Climate Commitments

**NDC Transport Sector
Emission Reduction Target
by 2030**

Unconditional

3.39 MtCO₂e

Conditional

6.33 MtCO₂e

Scenario	Emission Reduction by 2030	% of Unconditional Target	% of Conditional Target
Replacement of 10% Newly added 2Ws, 3W CNGs and Delivery Vans from 2024	0.40 MtCO ₂ e	12%	6%
Replacement of 15% Newly added 2Ws, 3W CNGs and Delivery Vans from 2024	0.61 MtCO ₂ e	18%	9%

Key Takeaways

- ❑ As a country, it is high time that Bangladesh sets a time-bound country target for adoption of EV.
- ❑ EV registration process is to be streamlined along with supporting legislations on taxes and standardizations.
- ❑ Targeted reduction of Total Tax Incidence and/or smart subsidy scheme may be considered to encourage EV purchase and remove viability gap.
- ❑ Support may be provided to the private sector for setting up charging station network in major cities (i.e. concessional land lease, grant for purchase of charging equipment, incentives for renewable energy-based solutions etc.)
- ❑ Low-cost financing and/or capacity building support may be provided to various EV stakeholders (i.e. vehicle owners, manufacturers/assemblers, banks/FIs).

Thank You!

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