



VAMA
HIỆP HỘI CÁC NHÀ SẢN XUẤT Ô TÔ VIỆT NAM
VIETNAM AUTOMOBILE MANUFACTURERS' ASSOCIATION

xEV- DEVELOPMENT TREND IN VIETNAM



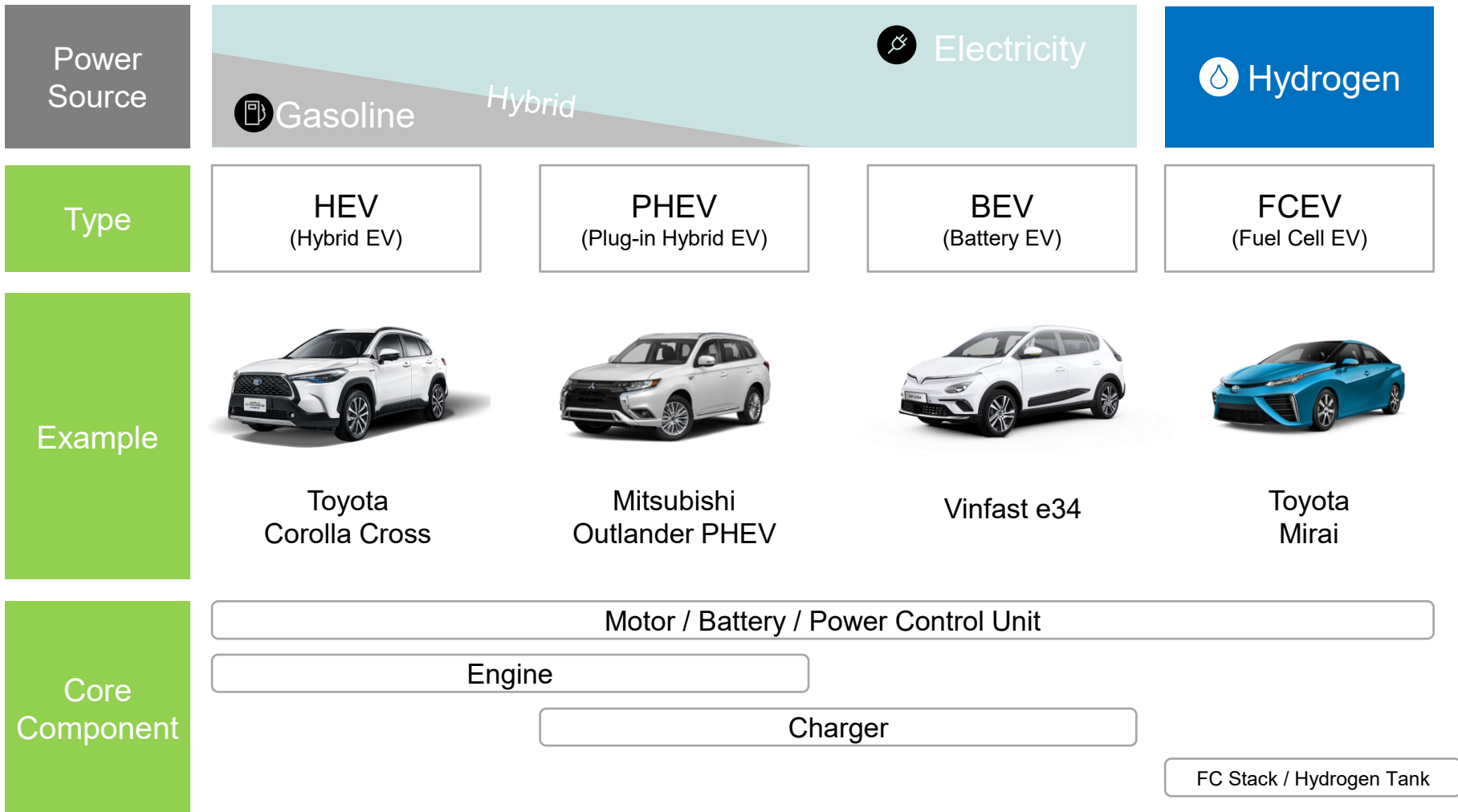
February 2022

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- DIFFERENT TYPES OF xEV
- GLOBAL OVERVIEW
- TRANSITION TO xEV: FACTORS
- PROPOSED ROADMAP & POLICIES

Type of xEV: HEV, PHEV, BEV & FCEV



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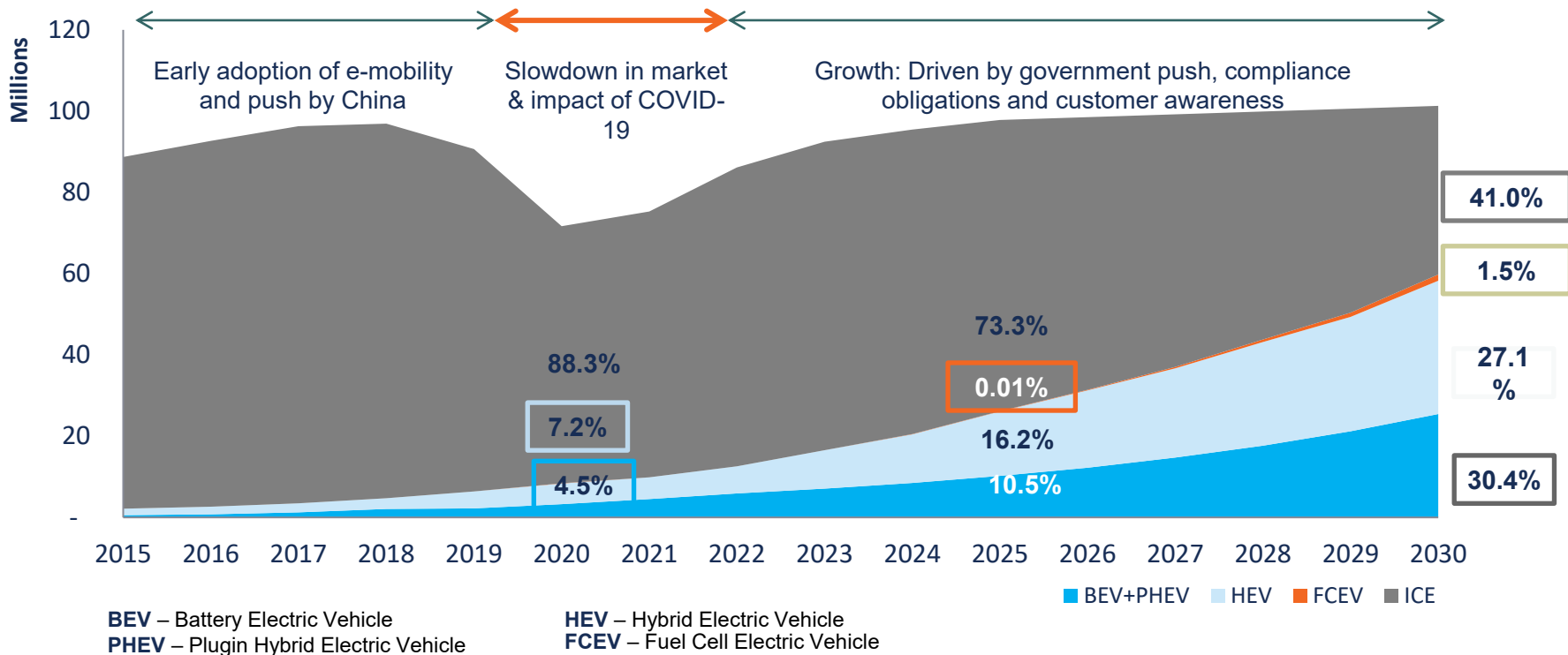
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GLOBAL OVERVIEW



Global Uptake of xEV – 2015 to 2030

Total xEV Market: Sales Forecast of xEV, Global, 2015–2030



Source: Frost & Sullivan

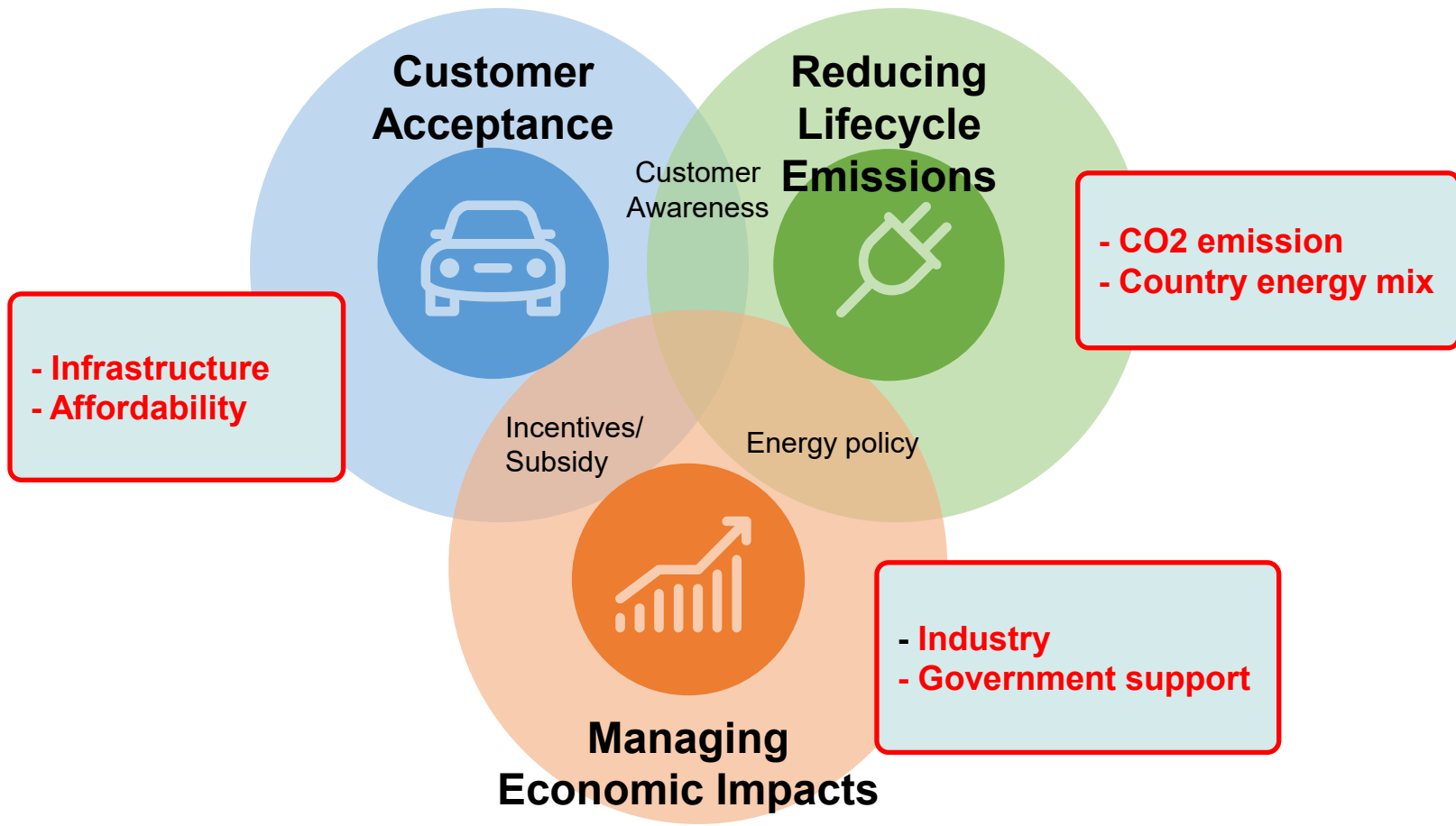
xEV is a global trend. What is the current status and the roadmap for xEV in Vietnam?

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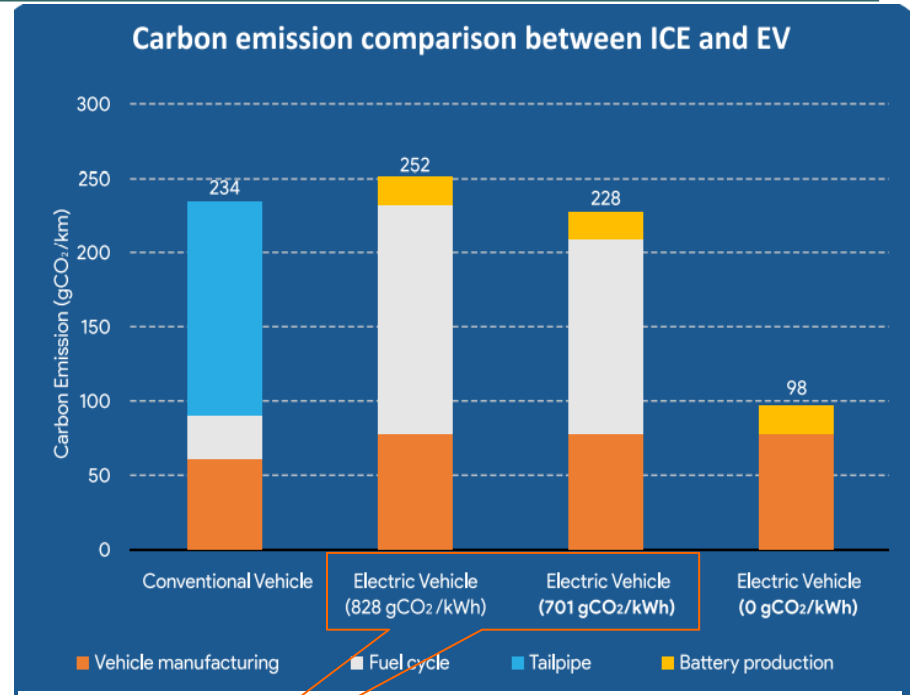
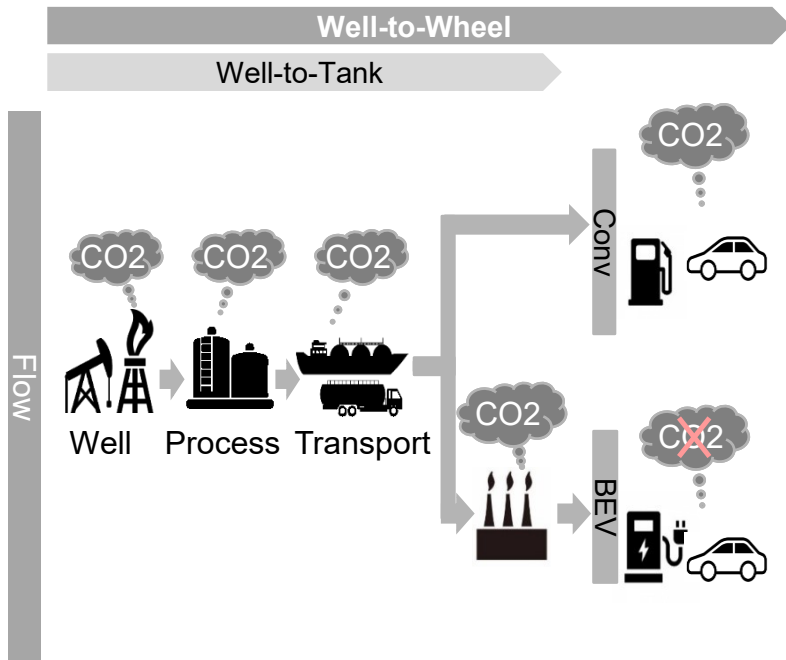
TRANSITION TO xEV- FACTORS



THE FACTOR OF POWER COMPOSITION



CO2 emission concept in automobile industry



Life-cycle GHG emission comparison between ICE vehicles and BEV, under different electricity emission factors

Source for the graph on the right: "A Transition Towards Low Carbon Transport In Indonesia: A Technological Perspective" by IESR (Indonesia, 2020)

Comparing with VN's grid electricity emission factors

(unit: gCO₂/kWh)

Year	2016	2017	2018	2019
Emission	918	864	913	846

- When countries set target to reduce CO2 emission, they should consider CO2 impact of "producing vehicles stage (including Engine/Battery)" and "producing vehicle power source (Gas/Electric)".
- According to the data in 2016-2019, the emission factors of VN's grid electricity were so high that ICEs may have been greener than EVs in terms of **life-cycle GHG emission**.

THE FACTOR OF INFRASTRUCTURE (CHARGING STATIONS)



Infrastructure : Sufficient coverage required at affordable costs

Sufficient coverage of charging points

Norway



Slow Charge

- Support 100% or €3000 on charging installation



Fast Charge

- Up to 100% of installation cost
- Public tender to have charging every 50 km

Low cost of installation & charging critical



Denmark: Support home charging [Since ~68% of all households can park on own land]



Support cost for **Home charging installation**

Tax rebate €2,400 (฿72k) from installing a private EV charger



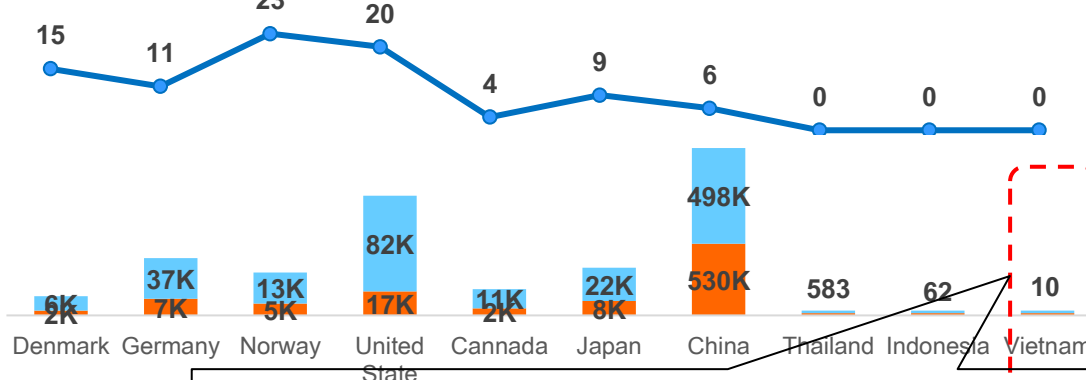
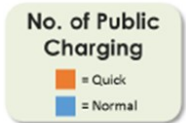
Support electric rate for **charge at home**

Tax rebate €0.13 (฿3.92) per kWh



Charging needs and installation strategies vary across the world

- China has the largest no. of fast chargers (due to high no. of EV fleet & cheaper charging hardwares)
- Norway & USA have much higher ratio of EVs per charging point vs. global average of 7.5



According to Vinfast's plan, as end of 2021, they would completed 2,000 stations nationwide

Source: LMC automotive & internal source - 2020

With countries to develop xEV, **infrastructure** is mandatory. Infrastructure needs to be accessible nationwide at affordable cost for customer

THE FACTOR OF COST

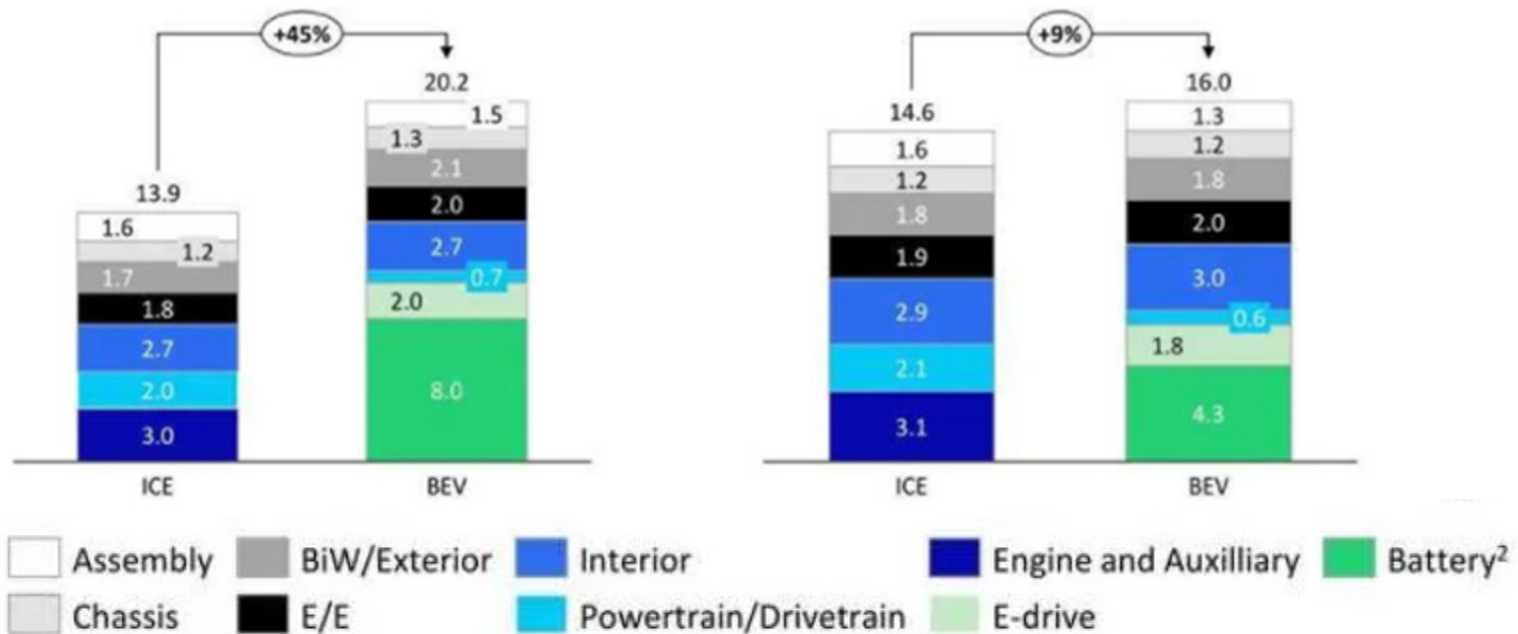


Comparison of direct costs ICE vs xEV – 2020 & 2030

Comparison of direct costs ICE vs. BEV – European compact-class vehicle¹
In thousand EUR

2020

2030



For popularization, price offered to customers is also the key. In 2020, BEV production direct cost is 45% higher than that of ICE. However, in 2030, the gap will be expectedly reduced to 9%.

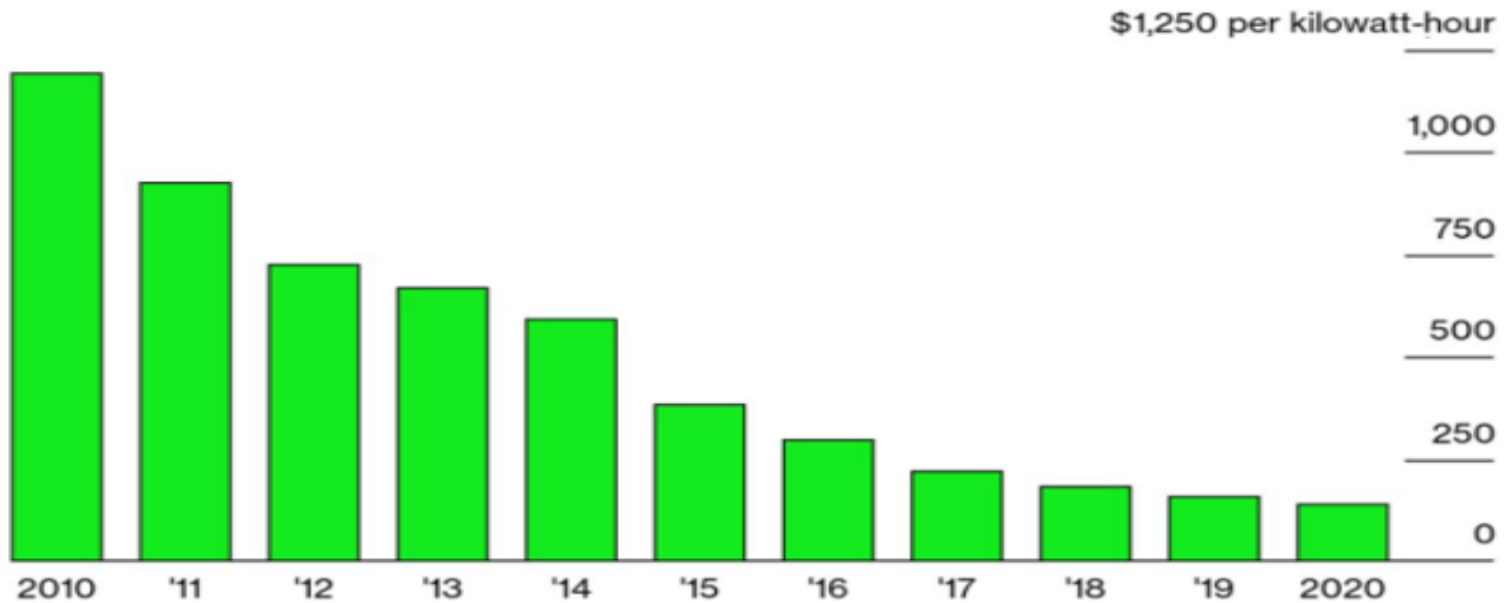
THE FACTOR OF COST



Battery price 2010 - 2020

Consistently Down

Lithium-ion battery price, volume-weighted average, all sectors (real 2020 dollars)



Source: BloombergNEF 2020 Lithium-ion Battery Price Survey

Bloomberg Green

FACTORS INFLUENCING xEV DEVELOPMENT IN VIETNAM



- **Expansion of xEV** in countries generally depends on their energy mix. **The cleaner the energy, the more xEV**; However, the Government incentives play a significant role.
- **VN's infrastructures for EV is not likely to be ready soon:**
 - No charging stations, either public or private;
 - Power consumption for EV charging requires that VN's electricity supply be increased a lot;
 - **Most families in VN can't have home charger on their own land while charging at home should be a common form of EV charging.**
- Production cost of EV is generally 45% higher than that of ICE, thus **the price for EV is higher without supporting policies**

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PROPOSED ROADMAP AND SUPPORTIVE POLICIES



Supportive policies to buyers of xEV in the world

Area/Country	Policy
Europe (Denmark, Germany, Norway)	Favorable policies for: <ul style="list-style-type: none"> - Acquisition - Ownership tax - Company cars - Purchase
US, Canada	
Asia (Japan, China)	
South East Asia Thailand	<ul style="list-style-type: none"> - 4 items as above - CO2 based tax for xEV: 8%
Indonesia	<ul style="list-style-type: none"> - 4 items as above - 100% discount to update xEV, interest rate 3.8%
Việt Nam	Only for BEV: <ul style="list-style-type: none"> - Reduction of SCT - Exemption or reduction of ownership tax No favorable policies for HEV, PHEV

In countries where xEVs are popular, governments have strongly supportive policies for buyers.

PROPOSED ROADMAP AND SUPPORTIVE POLICIES



- Based on the experience of electrification of means of transport of other countries;
- Pursuant to the plan to eliminate gasoline vehicles in countries based on the power structure of each country;

VAMA proposes the route options for electrified vehicles in Vietnam as follows:

Scenario	Starting year for xEV	Year for 100% xEV	Reference
Ambitious	2025	2035	Thái Lan
Moderate	2025	2045	
Basic	2025	2050	Indonesia

Starting year: from this year, what percentage of new cars must be sold at least as environmentally friendly vehicles, including electrified vehicles

Year for 100% xEV: from this year, 100% new cars sold are xEV

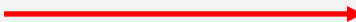


- VN 2045: National Day 100 Year- Anniversary, target to be basically a developed country
- VN estimation target: Carbon neutral country in 2050 (Statement of PM Phạm Minh Chính in COP26)

PROPOSED ROADMAP AND SUPPORTIVE POLICIES

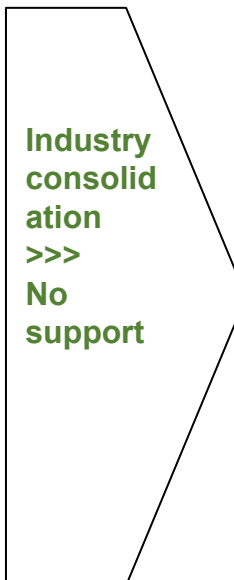


xEV development

	2021-2030	2031-2040	2041-2050
Period	Market entry	Rapid growth	Stable growth
Market volume			 100% xEV (private car and bus)

Supportive policies

Item	Market entry (2021- 2030)	Rapid growth 2031-2040	Stable growth (2041-2050)
Sales	Favorable policies for SCT, ownership tax and other tax, fee for each type of xEV	Continued favorable policies with adjustment for tax, fee for each type of xEV	Subsidy for BEV usage
Charging station	Regulation and standards for infrastructure (quick charger, home charger)	Financial support (production & operation)	Financial support (production & operation)
Manufacturing	Building plants Supporting R&D	Financial support	





THANK YOU FOR YOUR ATTENTION!



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