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OF NORTH AMERICA

Nissan's Sustainabilty and Light Duty FE Strategy 2025-2035

Remarks by Chris Reed to
NASEM Committee on
Assessment of Technologies for
Improving Fuel Economy of
Light-Duty Vehicles—Phase 3

October 15, 2018
Ann Arbor, MI

Introduction

Background

- **Renault-Nissan is a top three global automaker with over 10M annual units sold**
- **Global CO2 and emission regulation are tightening, due to climate change and air pollutant concerns**
  - **38% CO2 reduction needed by 2025 (compared to 2016) to comply with CAFE (Europe market)**

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- **Global Nissan powertrain strategy is based on 2 main pillars**
  - Continuous ”ICE (Internal Combustion Engine) evolution”
  - BEV (Battery Electric Vehicle) expansion to promote ”Zero Emission”
- **Electrified powertrain will take a major role globally beyond 2025**
- **Nissan is considering bridging technology to Battery EV**
- **OEM and policy roles for EV success**

Global Emission Trends and Nissan Sustainability Vision Drive our Powertrain Strategy

- **Globally, CO2 and emission regulations are strengthening, due to climate change and air pollutant concerns**
- **Nissan's vision is a zero-emission, zero-fatality society**

Corporate vision
Nissan : Enriching people's lives

Realizing a
zero-emission, zero-fatality society

Nissan Sustainability 2022

E Environmental | S Social | G Governance

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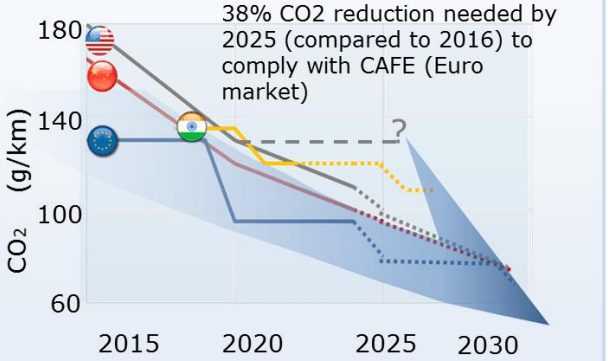
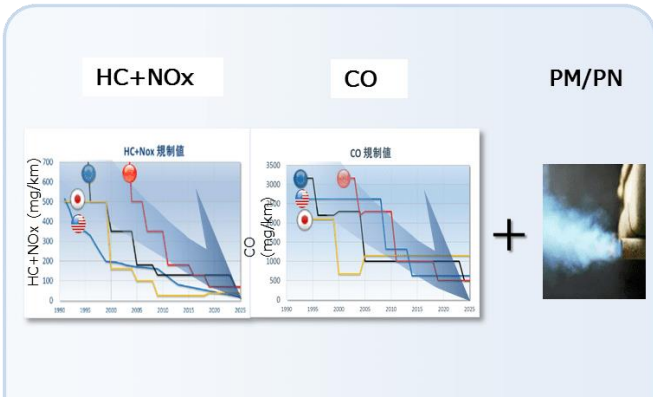
Climate Change

Air Pollution

CO2 regulation



Emission regulation



Zero Emission

Nissan Zero Emission means No More CO_2 Emissions

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Global Nissan Powertrain Strategy is Based on 2 Pillars

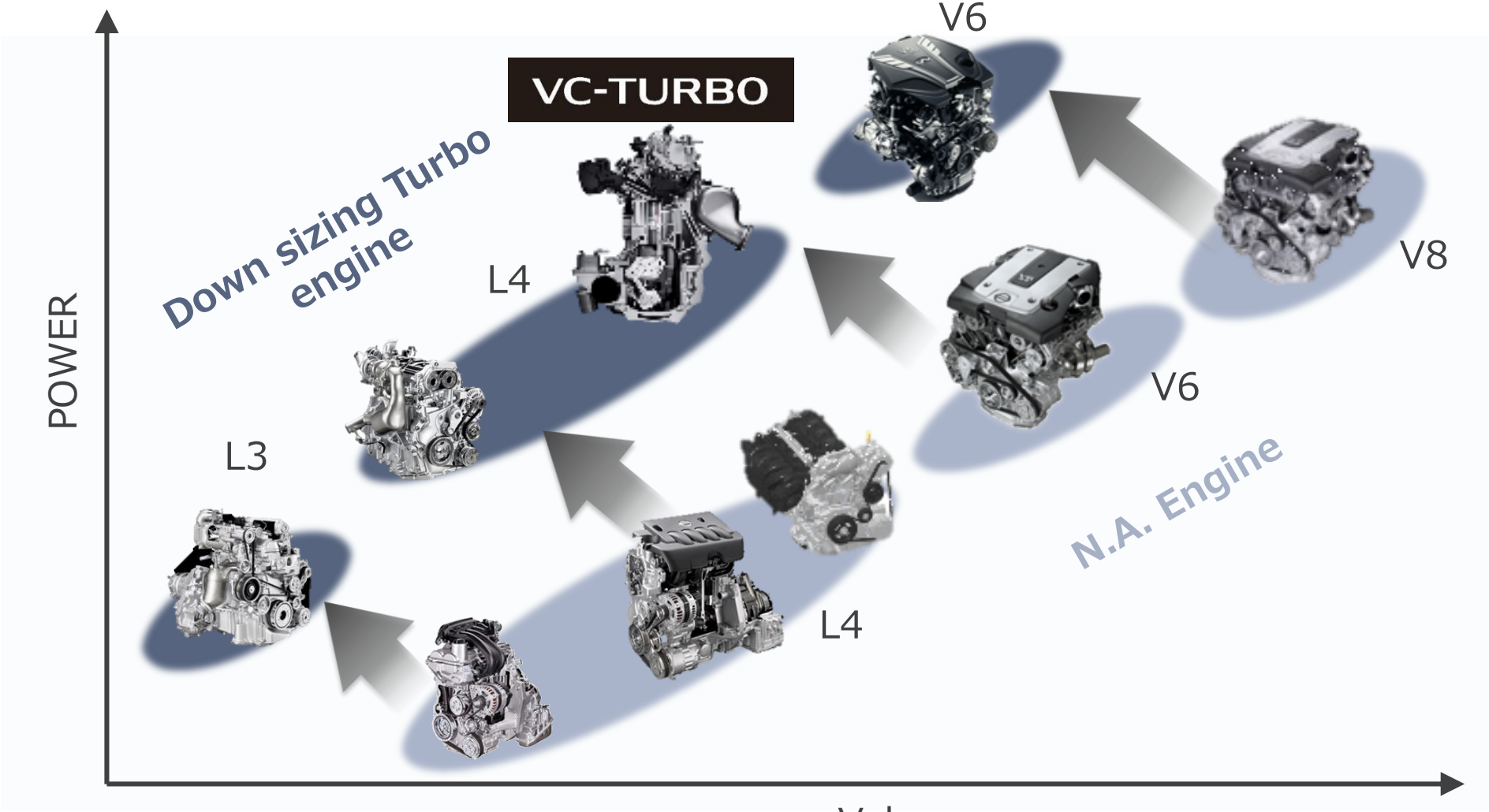
- **Two pillars support movement towards sustainable mobility**
  - ✓ Continuous **Internal Combustion Engine Evolution**
  - ✓ BEV expansion to promote **Zero Emission**

ICE Evolution

Zero Emission

Continuous ICE Evolution

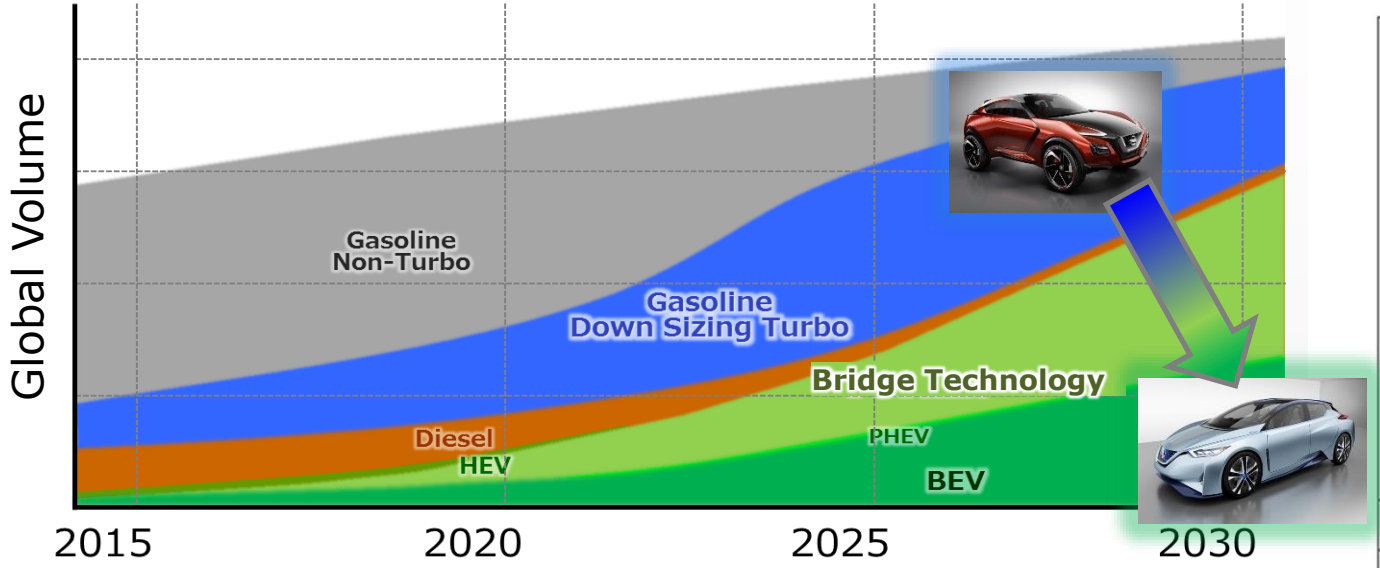
- **Shift to Downsized Turbo (DST) engine reduces CO_2 while ensuring power**

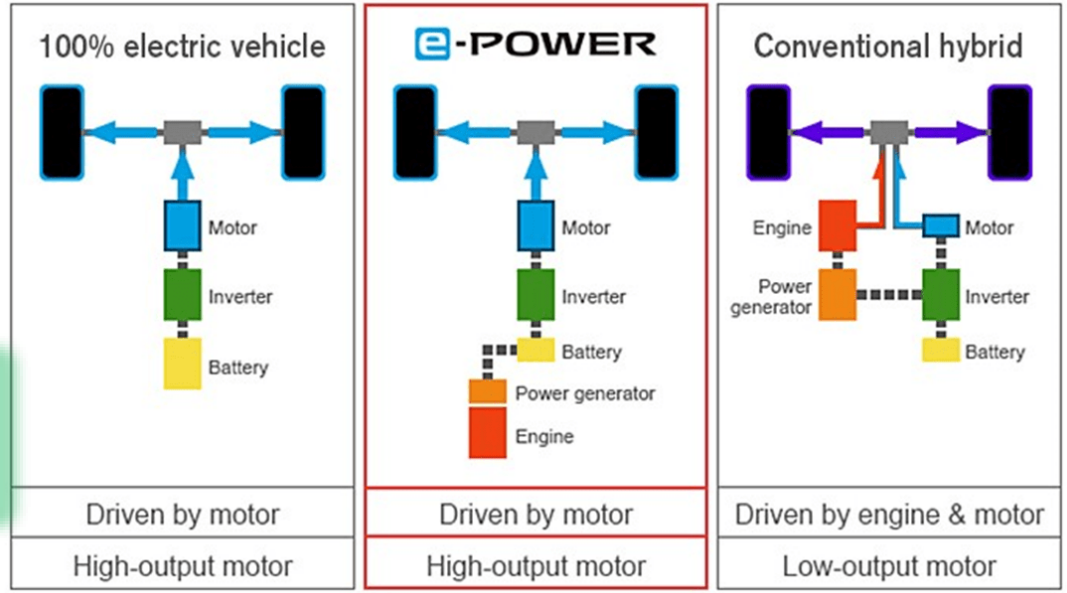


Electrified Powertrains Will Take a Major Role Globally Beyond 2025

- **Bridge Technology is key to transition from ICE to BEV**
  - ✓ **ICE shift from Naturally Aspirated to Downsized Turbo increases engine efficiency**
  - ✓ **Shared system configuration with BEV.**
    - ✓ 100% Motor Drive
    - ✓ High commonality with BEV
  - ✓ **Key challenge is engine thermal efficiency for series hybrid application**
    - ✓ High US highway speeds and miles travelled makes thermal efficiency even more important

Significant thermal efficiency gains are possible by limiting an engine's operating range with hybridization

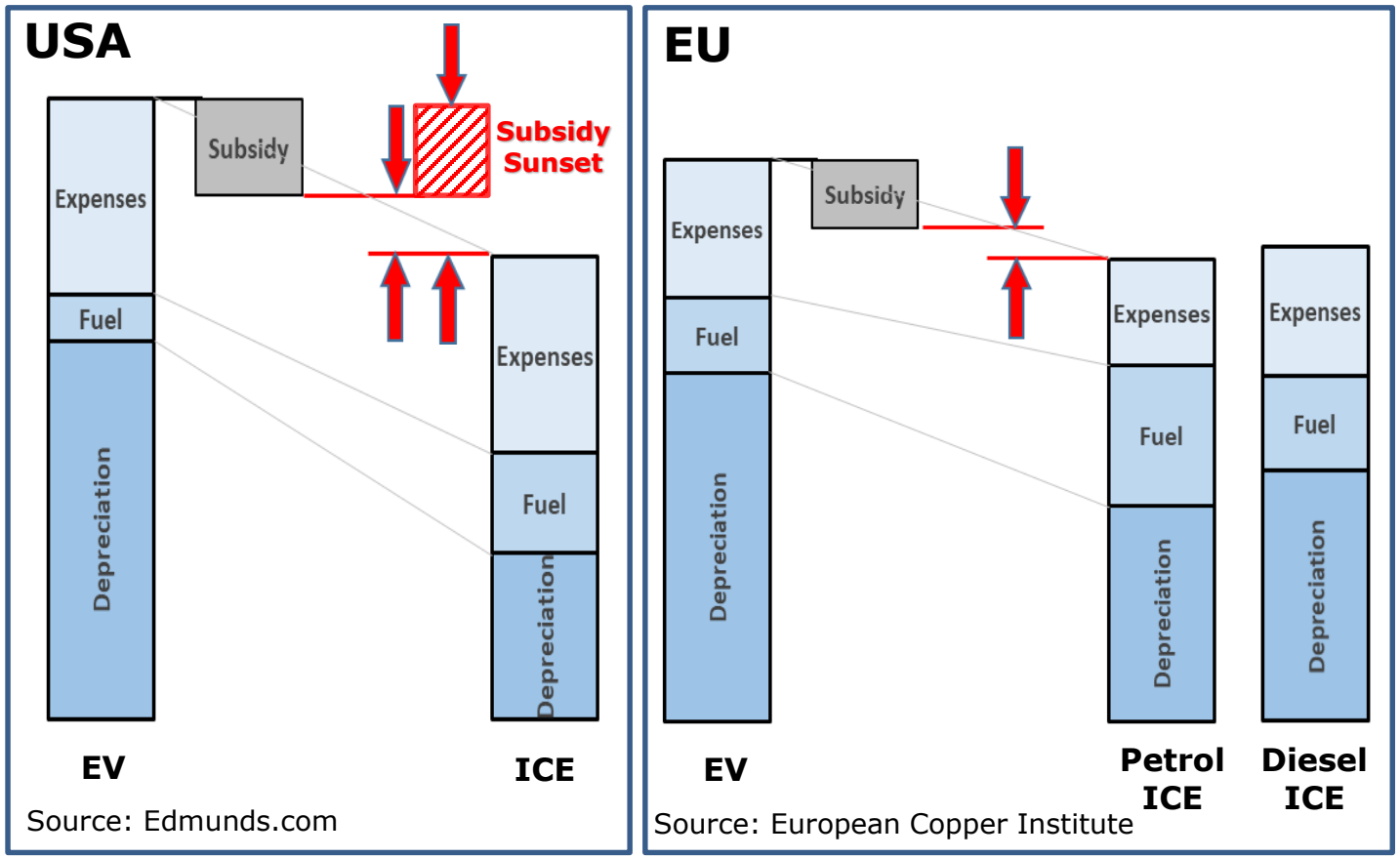




Total Cost of Ownership for EV Needs to be Improved

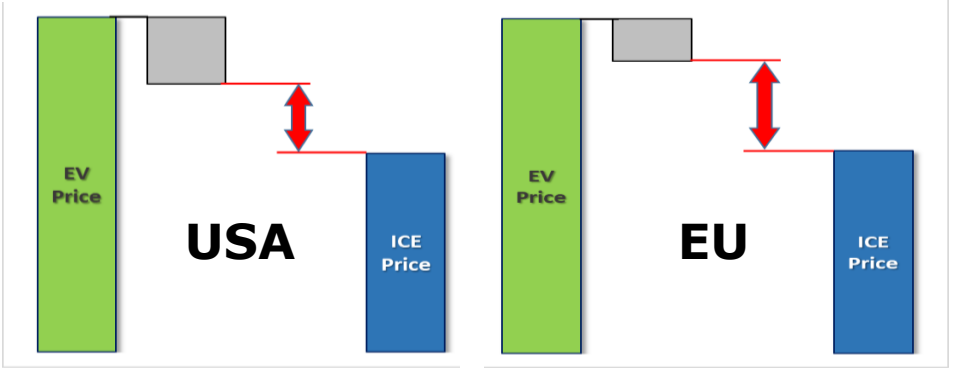
- **Automakers and Policy Makers need to work together for EV market success**

C-Segment Cost of Ownership



US to EU vehicles are not comparable. Charts are not to scale.

C-Segment Purchase Prices and Subsidy



Reducing the Cost of Ownership Gap

	Automakers	Policy Makers
Decrease Depreciation	• Improve "Fun-to-Drive" reputation • Improve Range • Decrease Cost	• Improve charging infrastructure • HOV lane access and other "perks"
Tax Credits		• Extend/Expand credits
Fuel Price	• Charging networks	• Gas Tax • Electricity subsidies
Tax and Fees		• Reduce registration fees for EV
Other Expenses	• Maintenance plans • Detailing • Other benefits	

Summary

Background

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- Global CO2 and emission regulation are tightening, due to climate change and air pollutant concerns
  - 38% CO2 reduction needed by 2025 (compared to 2016) to comply with CAFE (Europe market)

Key points

- Global Emission Trends and Nissan Sustainability Vision Drive our Powertrain Strategy
- Global Nissan powertrain strategy is based on 2 main pillars
  - Continuous ”ICE (Internal Combustion Engine) evolution”
  - BEV expansion to promote ”Zero Emission”
- Electrified powertrain will take a major role globally beyond 2025
- Nissan is considering bridging technology to Battery EV
- Cost is the largest barrier to EV success

Nissan’s Message

- Nissan will keep developing technologies for sustainable mobility

Thank you very much for your attention.

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