Fossil free transport - 2040

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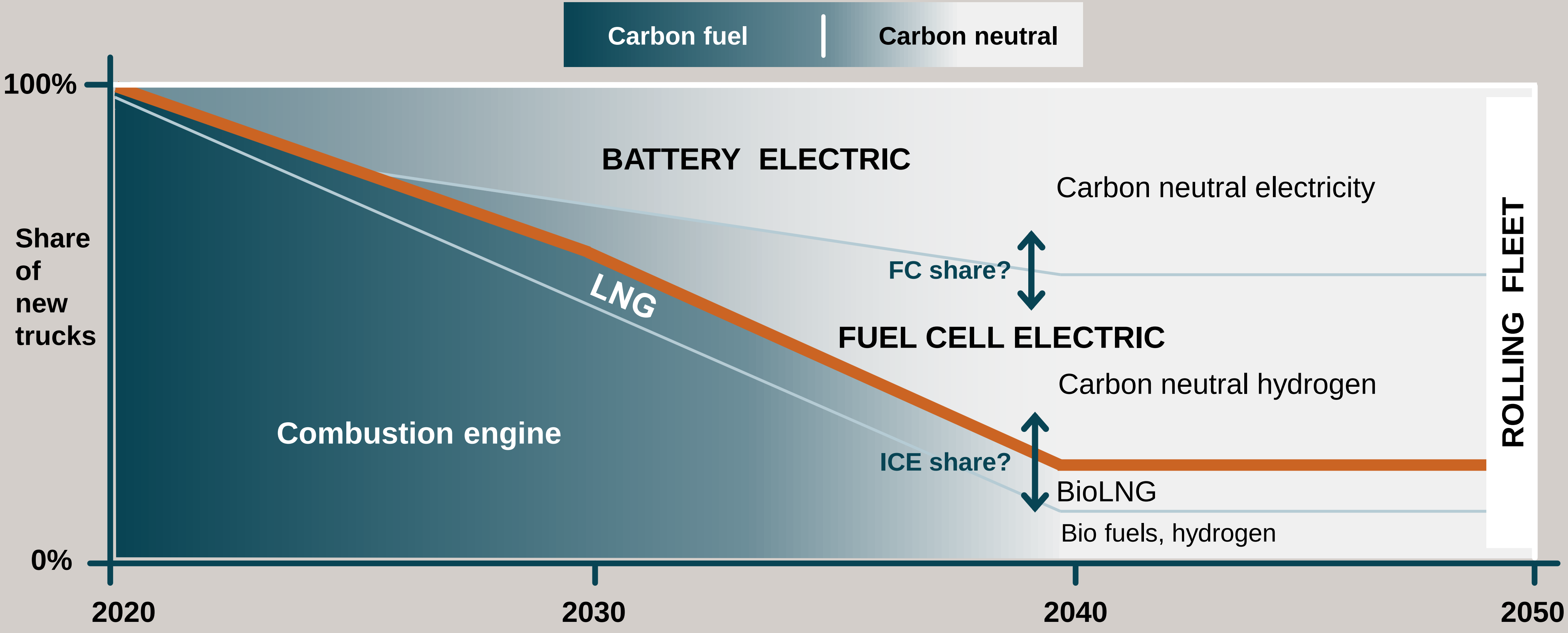
AGENDA

- Introduction
- Volvo Strategy 2040
- Questions
- Discussion


Long-term ambition:
100%
Safe
Fossil free
More productive

100% fossil free Volvo Group vehicles from 2040

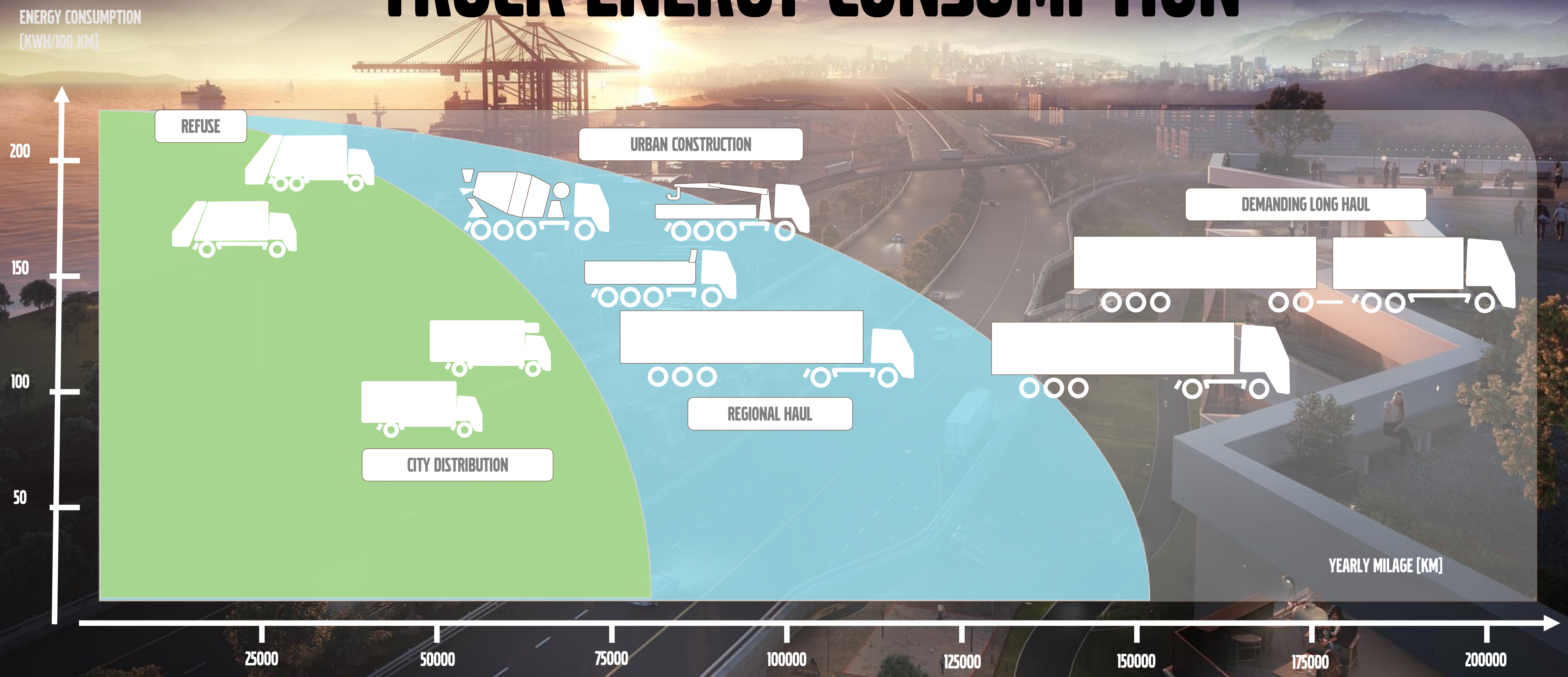


Focus on Battery Electric <u>and</u> Fuel Cell Electric Vehicles

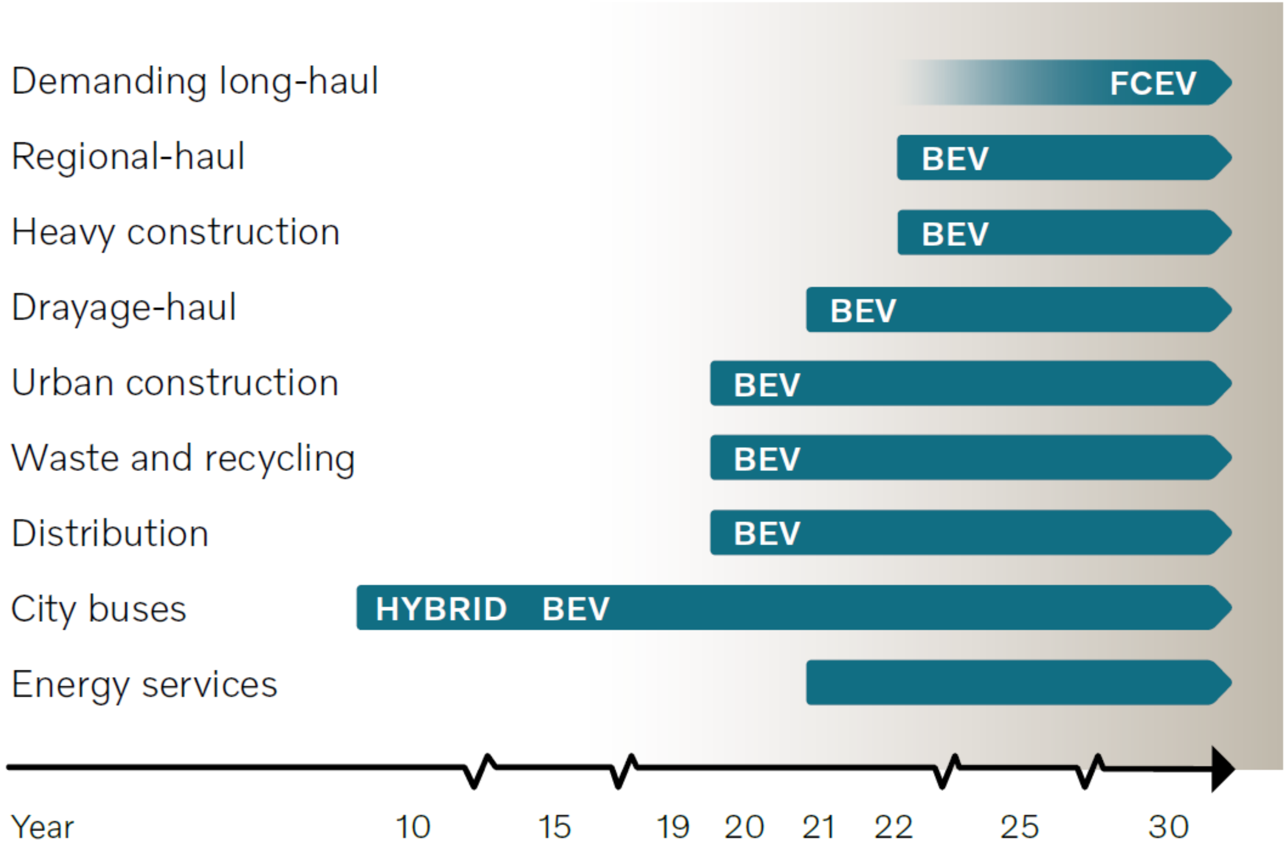
- Battery Electric Vehicles will be optimized for distribution / city applications and regional haul.

- Fuel Cell Electric Vehicles will be optimized for demanding long haul.

TRUCK ENERGY CONSUMPTION

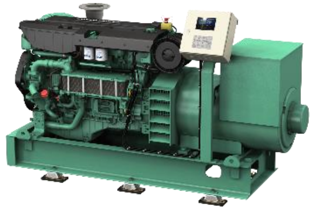


Zero emission roll out plan



Fuel cell EV technology for Heavy Haulage and Long Durability

- Most of the development of Fuel Cell vehicles has been focused on Passenger car products
  - A passenger car product design life is ~7000 hours
  - Most of the first wave of Truck products are trying to apply the pass- car technology on regional distribution truck, since the operation is limited in milage and in transport weight
- Volvo focus development of Fuel Cell Electric Vehicle technologies for heavy operation and durability of 20000+ h
- <u>To be used for the full Heavy Volvo product range.</u>



Main competitors in the heavy haulage range

- Daimler, Hyundai, IVECO/Nikola, TRATON, Toyota, HYZON
- Large scale production from 2024/25 earliest

	2020	2021	2022	2023	2024	2025	2026	2030
	TRUCKS							
IVECO / Nikola		Prototype Build Start	12 trucks for field test in three countries	SOP			30,000 truck production capacity per year on one shift	
Daimler		On-road tests		Customer Trials		Sometime in second half		
Hyundai	Deliveries start in Switzerland (50 trucks)	Planned annual production of 2100 Xcient Trucks for Europe, Chine and NA		Unknown date for a 1000km range, 44GCW Hydrogen Fuel cell truck for Europe				
Hyzon		Start of series production (incl buses) with capacity to produce 2000 trucks per year in NL				40000 vehcles annual production in USA, Europe and Asia		
Traton /Navistar	Emobility JV with Hino including fuel cells	Navistar commercial pilot (GM fuel cell)			-Scania 10 test truck for winter testing - Navistar commercial launch. (GM fuel cell)			
Traton / Scania					10 FCEV demonsration			
Traton/MAN		Prototype Vehicles Built		Customer Trials				
Toyota / Hino	H2 Business Unit for Europe Established	Demonstrator Vehicles for USA	Customer demonstration for USA. Road trials in Tokyo		Start of production for USA			
PACCAR / DAF	10 Fuel Cell Kenworth Trucks in Customer Demonstration (Toyota Fuel Cell)							







JOINING FORCES FOR HYDROGEN-POWERED CO_2-NEUTRAL TRANSPORTATION

DAIMLER

Daimler Truck

VOLVO

VOLVO GROUP

Technology leadership	Economy of scale	Society push	Infrastructure roll-out

CELLCENTRIC AS A STARTING POINT…

- The fuel cell system has an output of approx. 150kW and works at a voltage in the range of 800VDC.
- The geometry of the unit is based on the usual installation spaces of diesel engines.
- Two units can be installed in the engine compartments of heavy-duty commercial vehicles.
- Total output of approx. 300 kW.

Questions?