

Decarbonizing Road Freight Transport: Zero Emission Vehicles Availability

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Webinar

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The project has received funding from the European Union's Horizon 2020 research and innovation program under Grant Agreement N°101006681.



ABOUT PNO – The Group

PNO CONSULTANTS

From our start-up roots, we have grown to become **EUROPEAN MARKET LEADER IN FUNDING AND INNOVATION SERVICES** with offices in **8 EUROPEAN COUNTRIES**.

Our company is connected to a **GLOBAL NETWORK OF NATIONAL AND REGIONAL CREATIVE PARTNERS**: multinationals, start-ups, RTOs and universities as well as sector and public organisations.

KEY BUSINESS FOCUS

- **RD&I STRATEGY** design with recent insight in technology, market and policy trends
- **OPEN INNOVATION** : tap into external innovations and partners, by building collaborative projects and scouting solution providers and potential partners
- **FINANCE**: securing and funding projects through co-development, business modelling, grants, finance and realisation

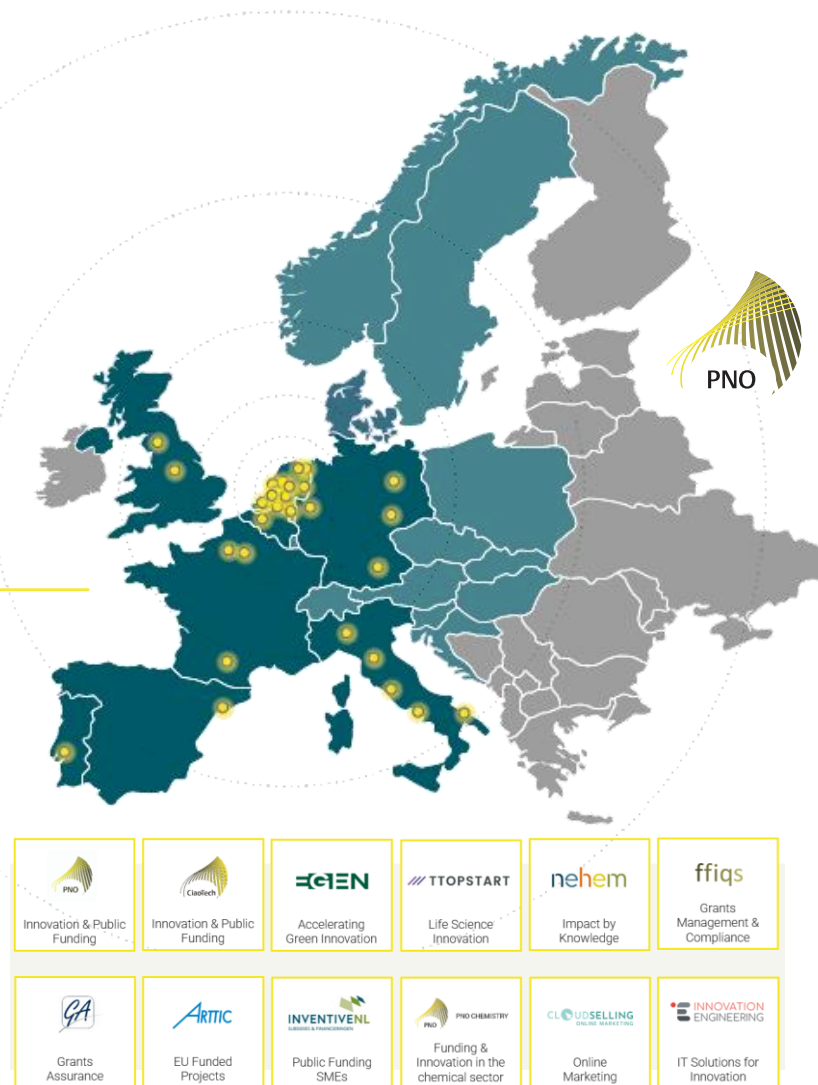
- ⚙️ Founded in 1985
- 🌐 Offices in 8 countries
- 👥 2000+ direct clients
- 🌱 10.000+ organisations network
- 💰 Over € 1 billion total funding value
- 🎯 Success rate 3 times higher than average

Partners PNO

GIA Sweden, Sweden
www.giasweden.com

BMGZ, USA
www.bmgzstrategies.com

Rödl & Partners, Central and East Europe
www.roedl.com

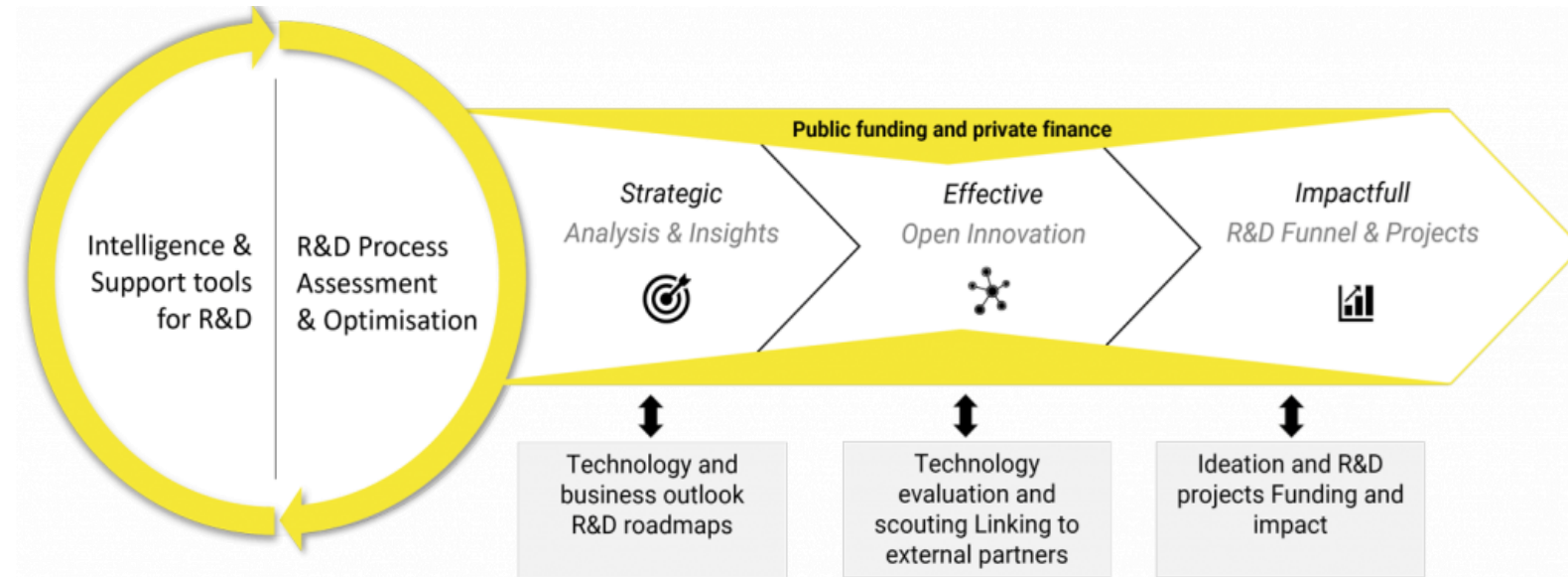


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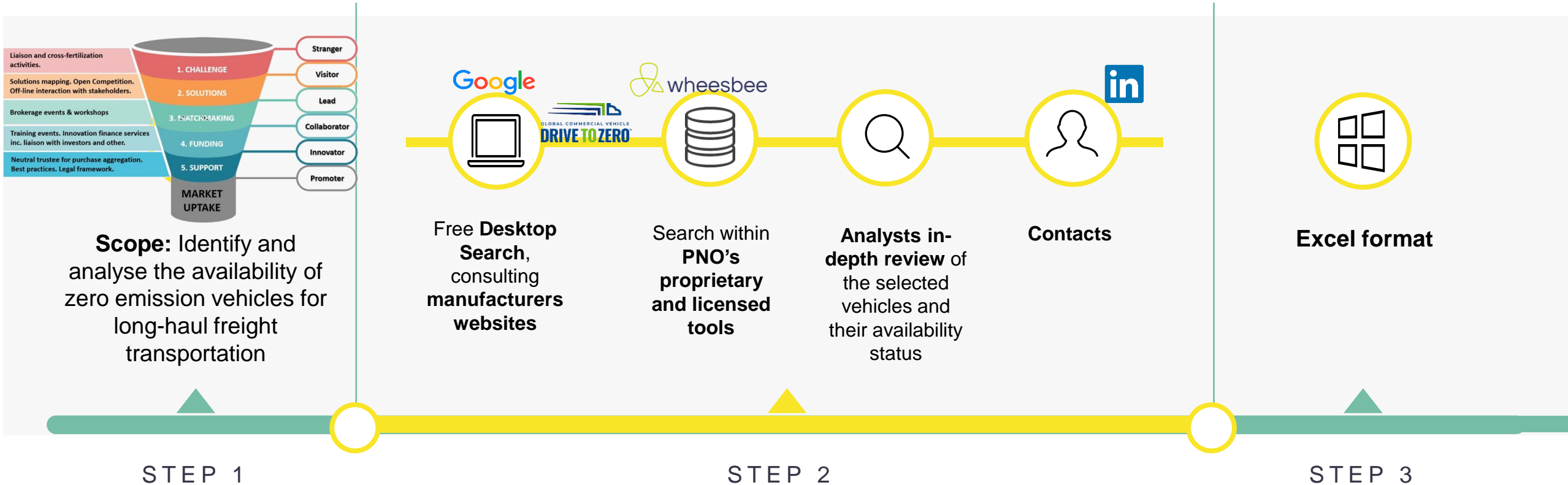
ABOUT PNO – The R&D Advisory Team

PNO R&D ADVISORY makes innovation processes intelligence based, more focused, faster and funded.

- Strategic Technology Intelligence and Analysis
- Design Thinking
- Business modeling and planning
- Market research
- Innovation scouting
- Roadmap development
- R&D process optimisation, portfolio creation and co-development



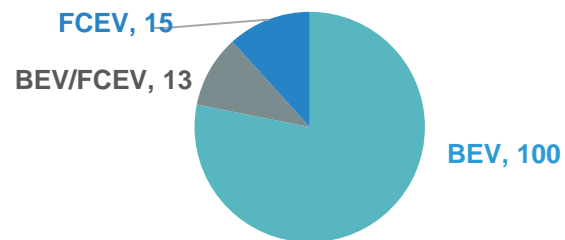
Scope and Approach



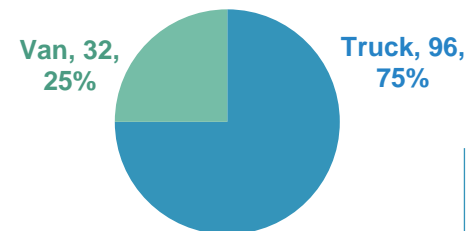
Zero Emission Vehicles for Road Freight Transport Results Overview

The analysis led to the identification of **128 different models**, provided by **74 different manufacturers** divided between OEMs and retrofit solution providers.

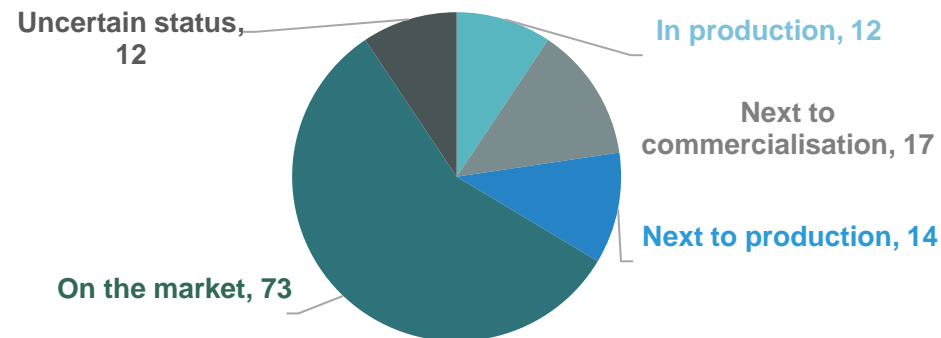
Number of Models by "Fuel" Type



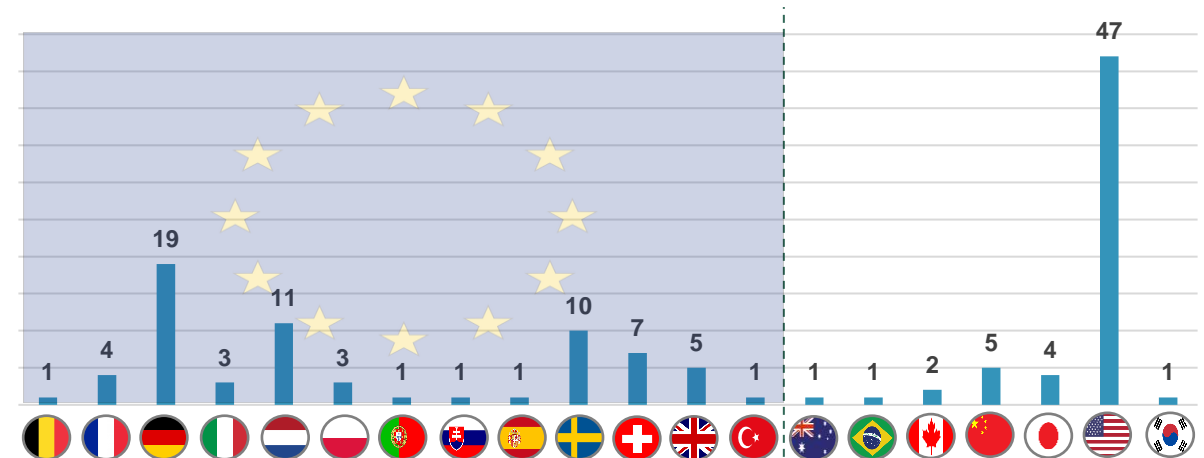
Number of Models by Vehicle Type



Status of the Identified Vehicles



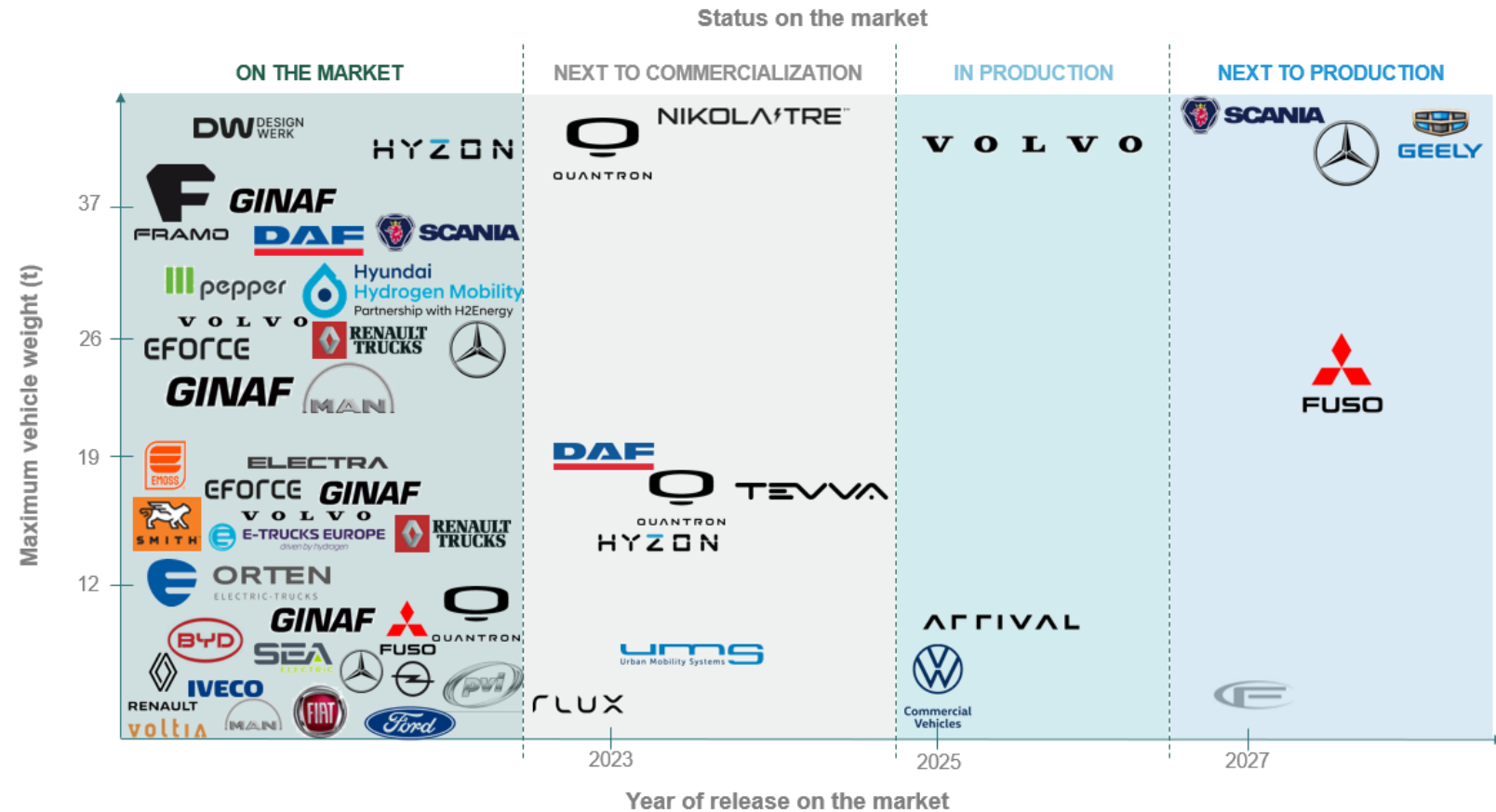
Manufacturing / Production Location of the Identified Vehicles



Zero Emission Vehicles for Road Freight Transport - Focus on Availability in Europe

Focusing on availability in Europe, we have identified **71 different models**, provided by **45 different manufacturers**.

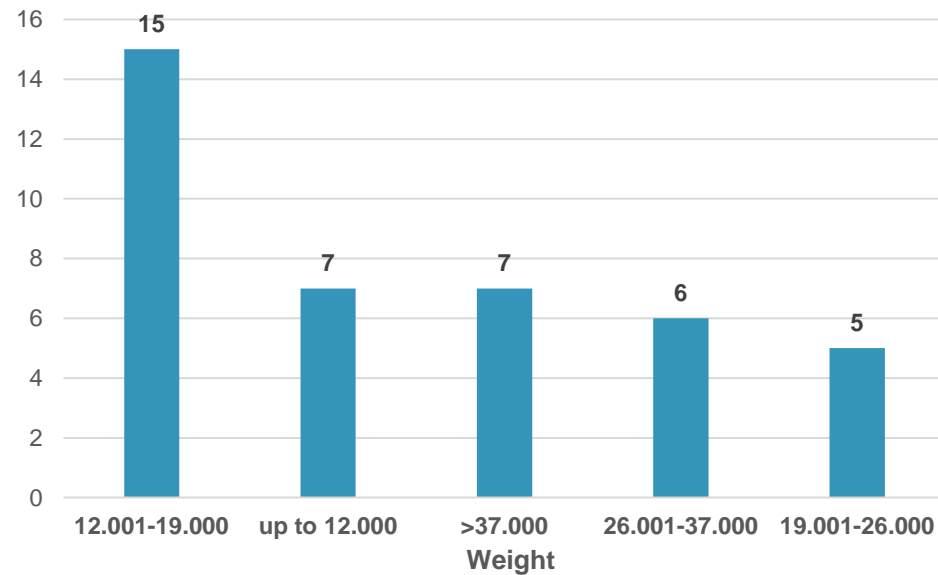
Of these, 45 are already on the market (delivered to customers), 9 are next to commercialization (available to order), 4 are in production and 6 are next to be produced. 7 of the identified models have been presented or designed but there has been no update.



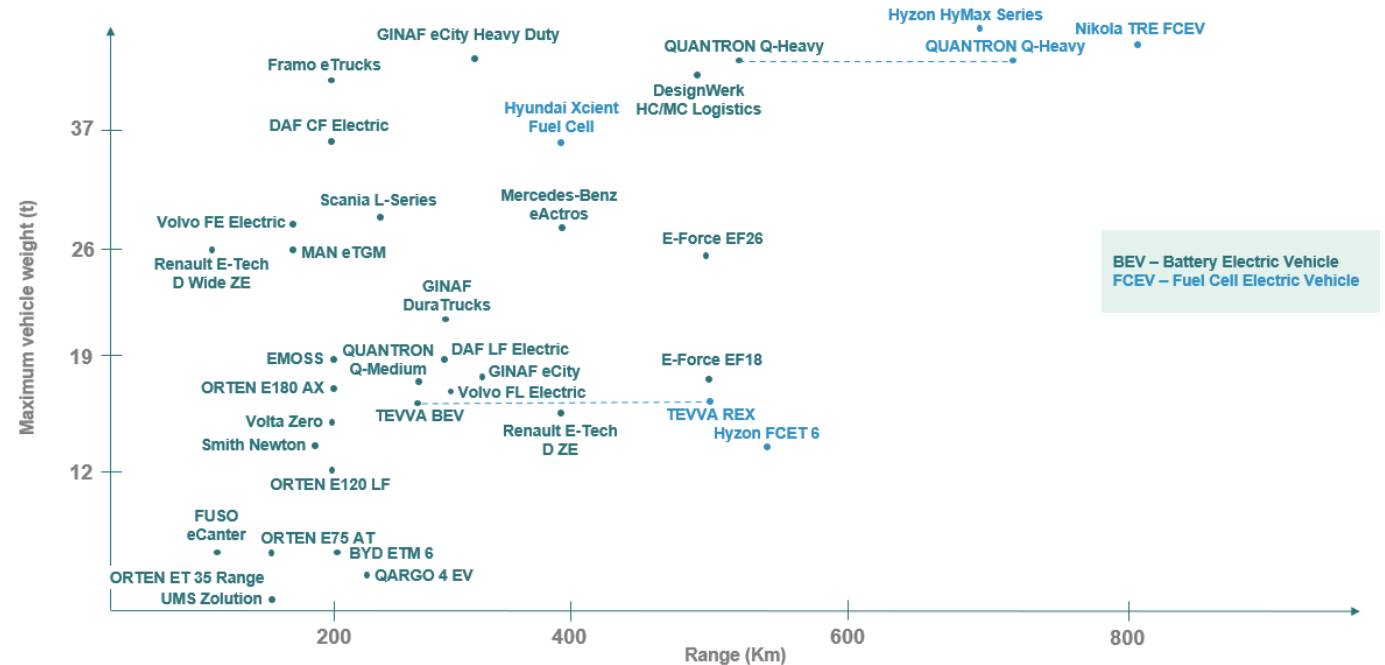
Zero Emission Vehicles for Road Freight Transport - Focus on Availability in Europe

Out of the 71 identified vehicles, **55 are trucks** (on which we will focus in this presentation).
Of these, 40 models are already on the market or next to commercialization.

Number of Trucks Available or Next to Commercialization in Europe per Size

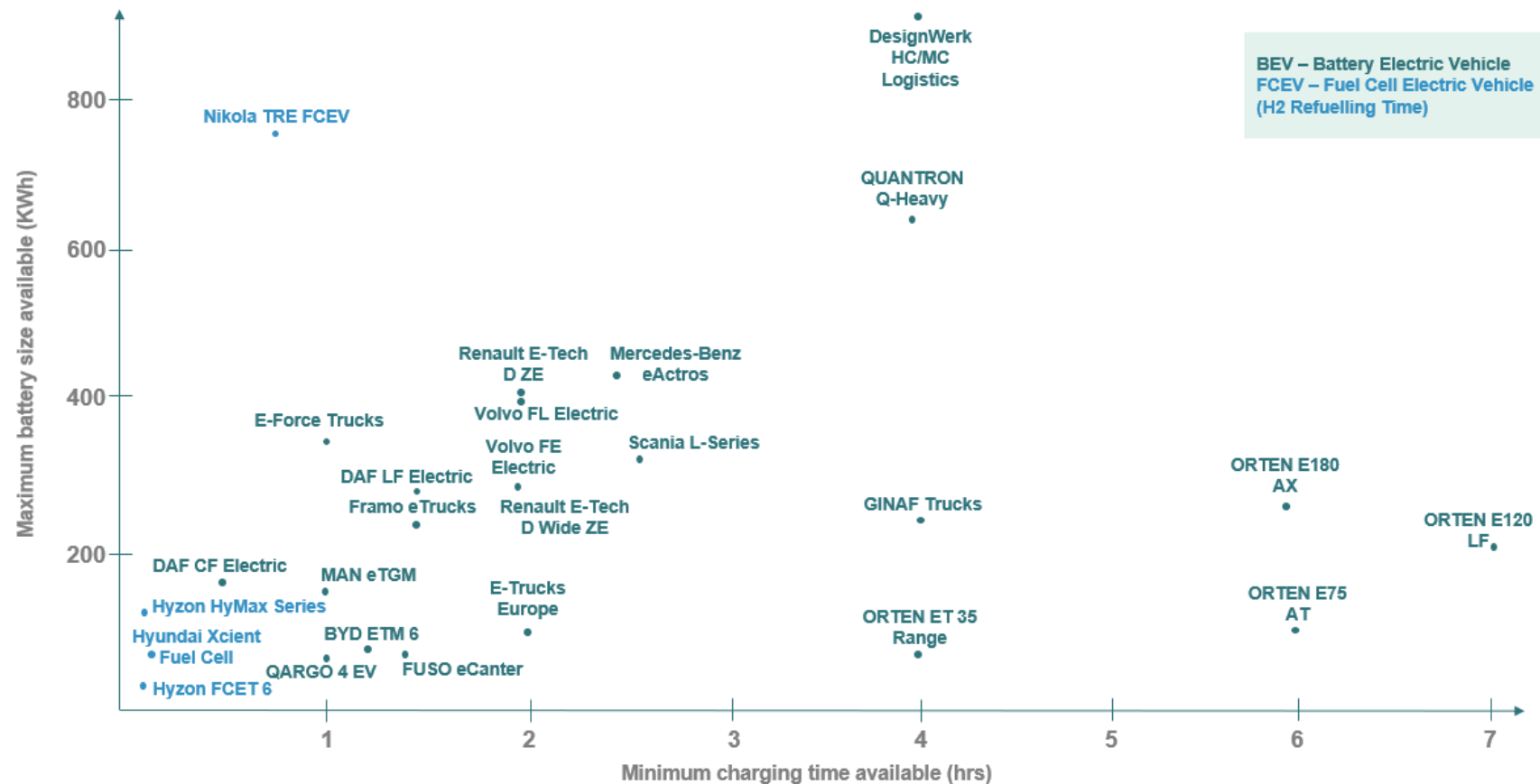


Already Available or Next to Commercialization Identified Models in Europe, per Size (tonnes) and Autonomy Range (km)



Zero Emission Vehicles for Road Freight Transport - Focus on Availability in Europe

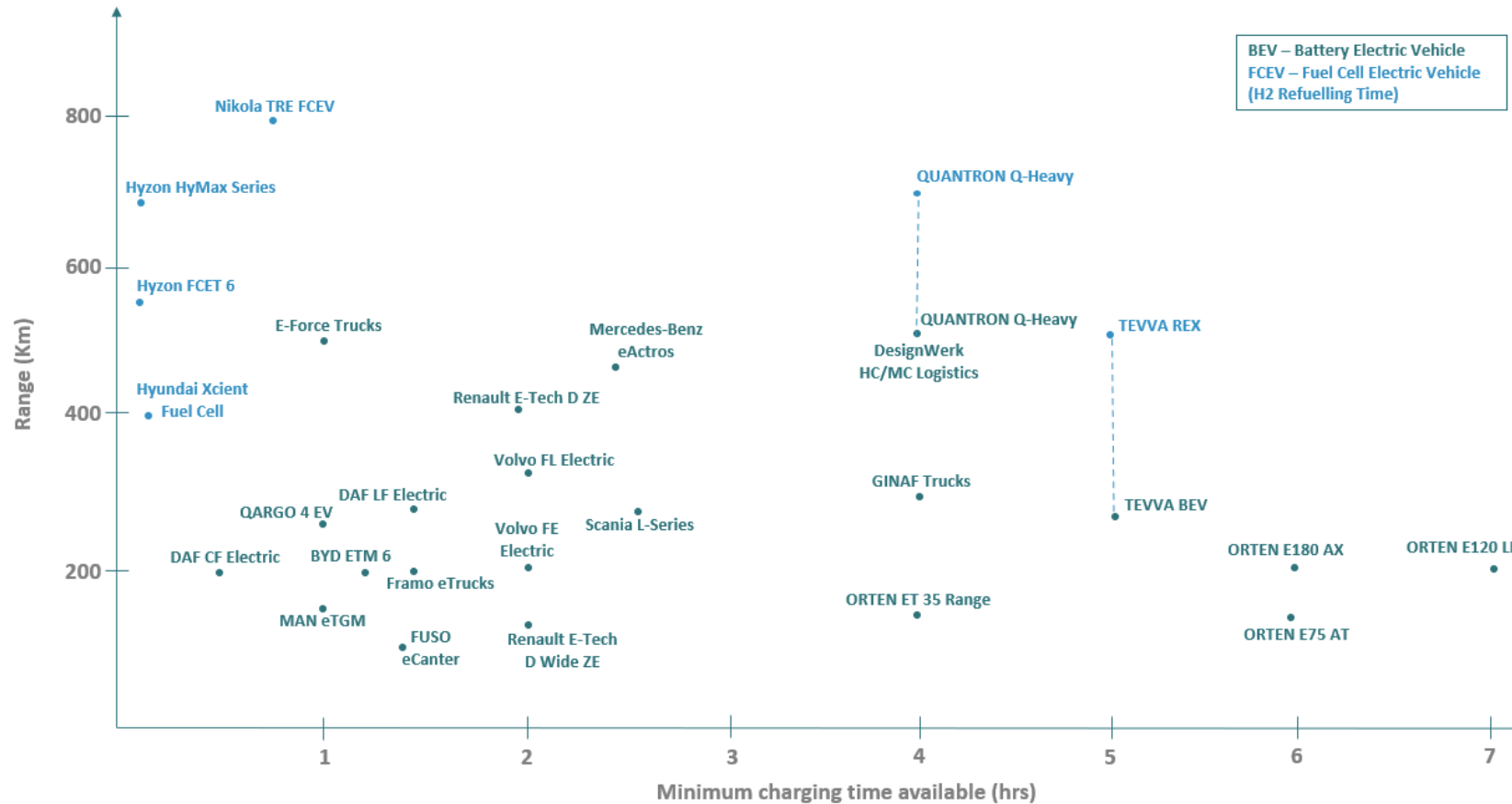
Already Available or Next to Commercialization Identified Models in Europe,
per Maximum Battery Size (KWh) and Minimum Charging Time* (hrs)



* The minimum charging time specified per each vehicle present in the chart is related to the battery size considered. More vehicles mentioned in the chart have different battery configurations and consequently different charging times.

Zero Emission Vehicles for Road Freight Transport - Focus on Availability in Europe

Already Available or Next to Commercialization Identified Models in Europe, per Minimum Charging Time* (hrs) and Range (Km)



* The maximum range specified per each vehicle in the chart is related to the minimum charging time necessary to cover the mentioned kilometers. More vehicles in the chart have different battery configurations and consequently different charging times and range extension.

Zero Emission Vehicles for Road Freight Transport - Example 1

DAF CF ELECTRIC



Power Supply	Battery
Weight (tonnes)	29-37
Payload	-
Chassis / Body Type	Rigid, Tractor + Trailer
Power / Output Engine	210 KW
Battery Size	170 kWh
Charging Time	Fast 30 minutes; Normal 90 minutes
Range	200 km
Availability	On the market
Comment	Released in 2019 initially for Belgium, Netherlands and Germany markets. Successively it is expanding in other EU countries that are improving their infrastructures



Zero Emission Vehicles for Road Freight Transport - Example 2

HYZON HYMAX SERIES



Power Supply	Fuel Cell
Weight (tonnes)	24-70
Payload	-
Chassis / Body Type	Rigid, Tractor + Trailer
Power / Output Engine	250 KW + 80 KW or 450 KW + 240 KW
Battery Size	70-140 kWh
Charging Time	8 minutes for refuelling
Range	400 km
Availability	On the market
Comment	Models already available and can be ordered (the quantities available are not clear). At least 20 trucks are going to be delivered by the end of this year (2022)



Zero Emission Vehicles for Road Freight Transport - Example 3

MERCEDES-BENZ eACTROS



Power Supply	Battery
Weight (tonnes)	19-40
Payload	10,6-17
Chassis / Body Type	Rigid, Tractor + Trailer
Power / Output Engine	330-400 KW
Battery Size	315-420 kWh
Charging Time	From 20% to 80% in 1 hour
Range	400 km
Availability	On the market
Comment	Series production started in October 2021 and already delivered some trucks for German clients



Mercedes-Benz



Zero Emission Vehicles for Road Freight Transport - Example 4

NIKOLA TRE FCEV



Power Supply	Fuel Cell
Weight (tonnes)	40
Payload	-
Chassis / Body Type	Tractor + Trailer
Power / Output Engine	480 KW
Battery Size	753 kWh
Charging Time	45 minutes
Range	800 km
Availability	Next to commercialization
Comment	One previous BEV version is available in North America since 2021, while the FCEV version is scheduled for entering the European market in 2024. The production has started last year in Germany in collaboration with IVECO.



Zero Emission Vehicles for Road Freight Transport - Example 5

QUANTRON Q-HEAVY



Power Supply	Battery, Fuel Cell
Weight (tonnes)	44
Payload	-
Chassis / Body Type	Rigid, Tractor + Trailer
Power / Output Engine	235-500 KW (+240 KW Fuel Cells)
Battery Size	130-630 kWh
Charging Time	1 hour per 150 KW
Range	500 km (BEV); 700 km (FCEV)
Availability	Next to commercialization
Comment	The FCEV truck will be available from the second quarter of 2023. It is not clear if the BEV model is already available for sale or if it will be marketed shortly



Zero Emission Vehicles for Road Freight Transport - Example 6

SCANIA BATTERY ELECTRIC TRUCK (L-SERIES)



Power Supply	Battery
Weight (tonnes)	19-29
Payload	-
Chassis / Body Type	Rigid
Power / Output Engine	295 KW
Battery Size	165-300 kWh (5-9 batteries)
Charging Time	2,5 hours (130 KW with DC)
Range	250 km
Availability	On the market
Comment	A truck already delivered in Norway and some in Sweden. Einride has ordered 110 trucks which will be delivered between the second half of 2022 and the beginning of 2023



Zero Emission Vehicles for Road Freight Transport - Example 7

TEVVA BEV/REX



Power Supply	Battery, Fuel Cell
Weight (tonnes)	7,5-19
Payload	2,8-12,3
Chassis / Body Type	Rigid
Power / Output Engine	-
Battery Size	275 kWh (battery + fuel cells)
Charging Time	5 hours (10% to 90%)
Range	250 km (BEV); 500 km (FCEV)
Availability	Next to commercialization
Comment	The BEV model can be delivered in Q3 of this year. REX model deliveries are scheduled for: 7,5t in Q1 2023; 12t in Q3 2023; 19t in Q1 2024. All models are reservable



Zero Emission Vehicles for Road Freight Transport - Example 8

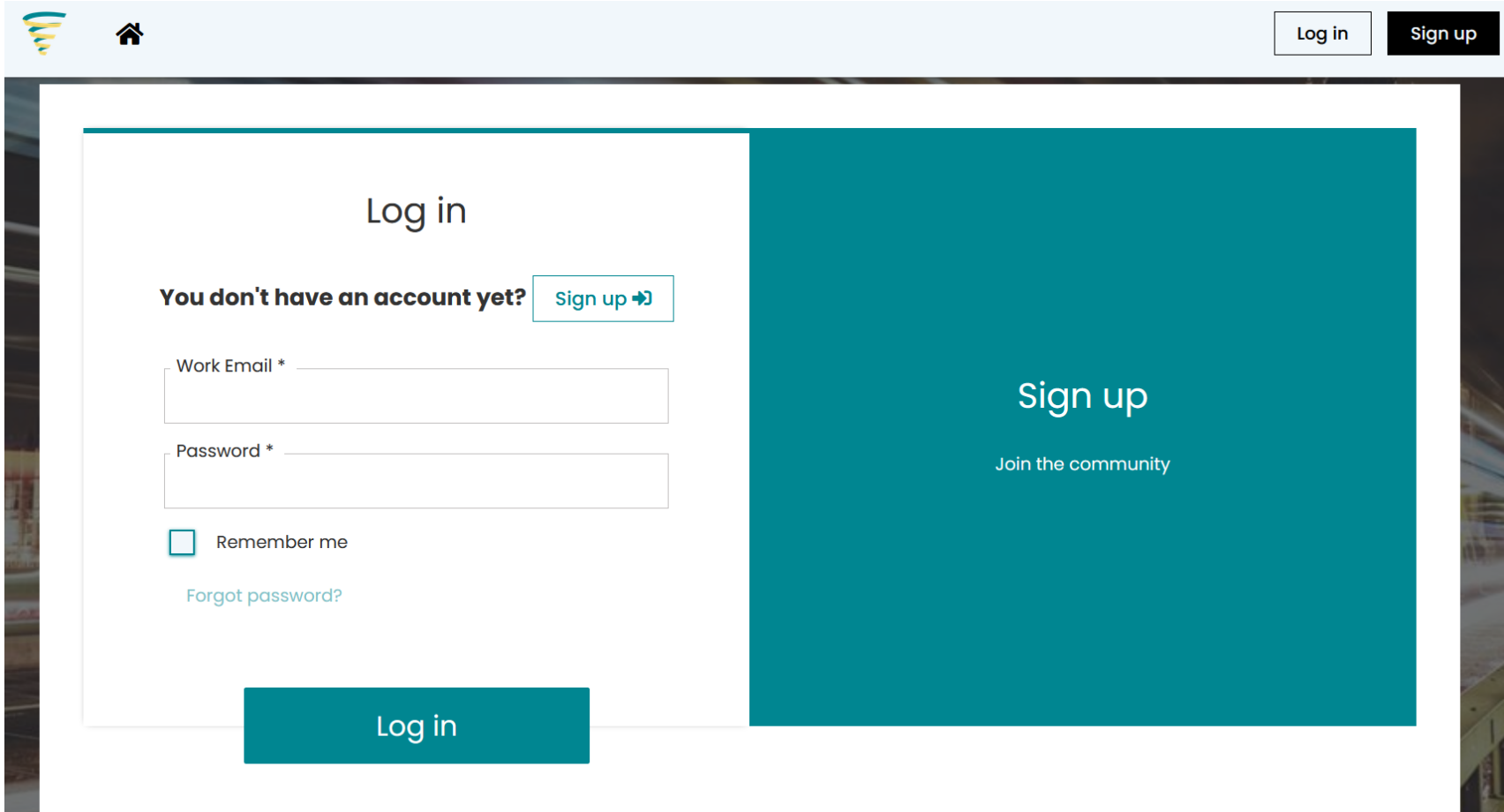
VOLVO FM ELECTRIC



Power Supply	Battery
Weight (tonnes)	44
Payload	-
Chassis / Body Type	Rigid. Tractor + Trailer
Power / Output Engine	330-490 KW
Battery Size	180-540 kWh (2-6 batteries)
Charging Time	2,5 hrs with DC (250 KW); 9,5 hrs with AC (43 KW)
Range	380 km
Availability	In production
Comment	Volvo Trucks has now officially opened the order system for its heavy-duty electric truck range. Serial production will start in autumn and gradually ramp up. Some already ordered by DHL and DFDS



REGISTER TO GET THE FULL DATA



The screenshot shows the ENTRANCE platform's login and sign-up interface. At the top, there is a navigation bar with the ENTRANCE logo, a home icon, and buttons for "Log in" and "Sign up". The main content area is split into two sections. On the left, the "Log in" section has a heading "Log in" and a link "You don't have an account yet? Sign up →". Below this are input fields for "Work Email *" and "Password *", a "Remember me" checkbox, and a "Forgot password?" link. A large teal "Log in" button is at the bottom. On the right, the "Sign up" section has a heading "Sign up" and the text "Join the community".

To register to the platform link [here](#)



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Thank you!



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