



Autobus a idrogeno: sviluppo del mercato e trend in Europa

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Bologna | July 3rd 2025

Energy transition, together, today!

- › An engineering company in Cologne since 2009
- › Approx. 20 employees
- › More than 15 years of experience in practical development and service work

Since 2009, EMCEL has been actively supporting Germany's energy transition policy and developing ideas and concepts to ensure the success of sector coupling



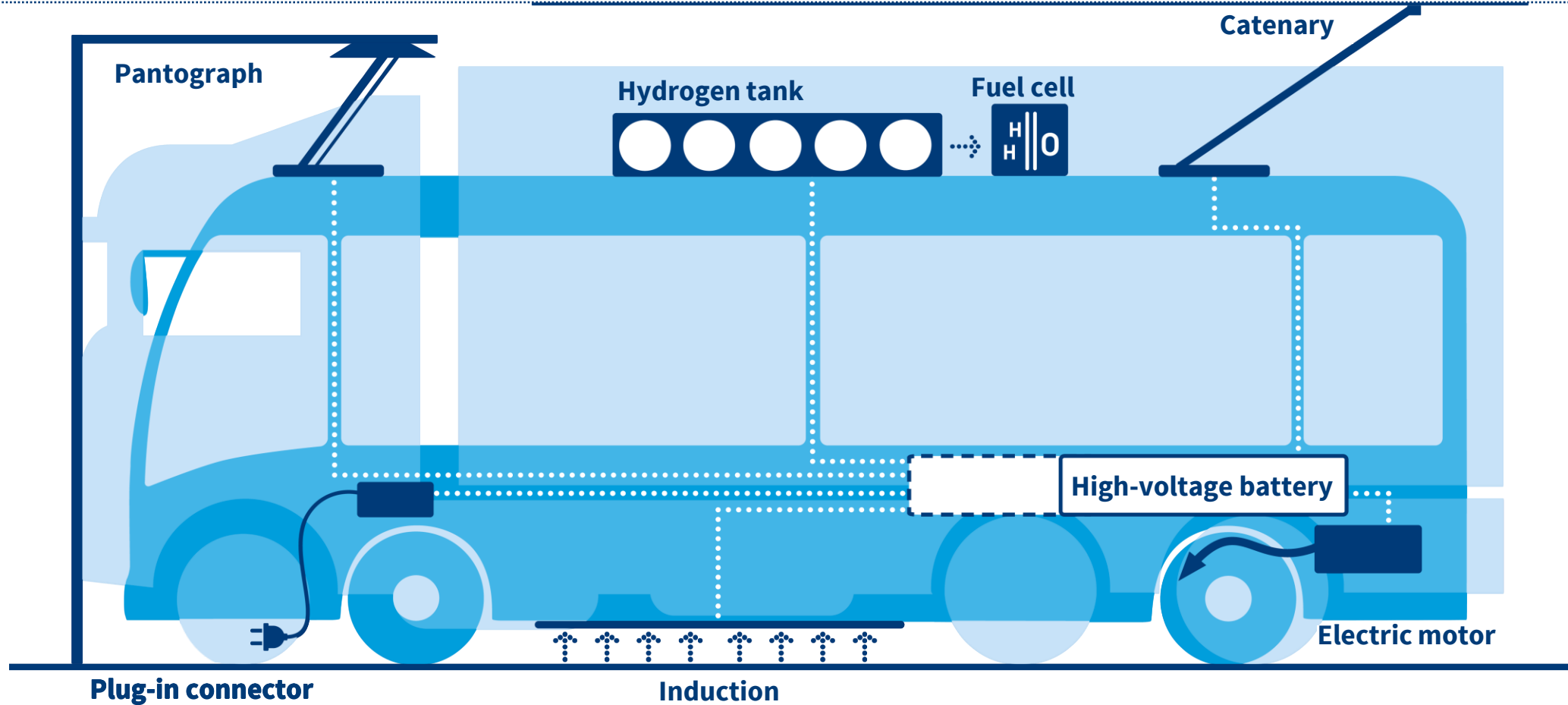


BASICS		PLANNING	ACQUISITION	OPERATIONAL PREPARATIONS	OPERATION
Consulting					
Initial consultation	Feasibility study	Consulting on funding	Depot retrofit	Accompanying research	
Technology consulting	Driving performance / circulation analysis	Funding application	Workshop retrofit	Operating data analysis	
Hydrogen / high-voltage safety	Fleet analysis	Drafting of specification sheets	Staff training		
Market analysis	Life cycle cost analyses (TCO) / guidance related to costs	Offer evaluation	Support in drawing up risk assessments		
Engineering					
	Optimisation of electric vehicles	Construction support infrastructure			
	Support in the design of H ₂ refuelling stations and charging infrastructure				
	Assistance with the approval of H ₂ refuelling stations and charging infrastructure				
	Preparation / review of technical documentation				
Service					
	Commissioning				
	Start-up support				
	Service and maintenance of fuel cell- and battery-powered vehicles				
	Staff training				

Customers:

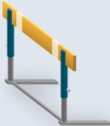
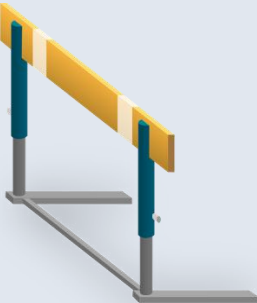
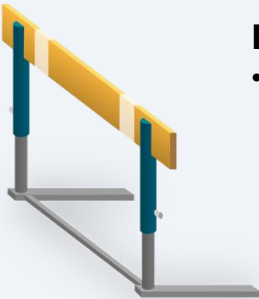
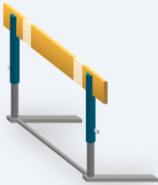
- Political authorities
- Awarding authorities
- Fleet operators
- Local public transport organisations
- Vehicle manufacturers
- Infrastructure manufacturers

Electrification of bus fleets



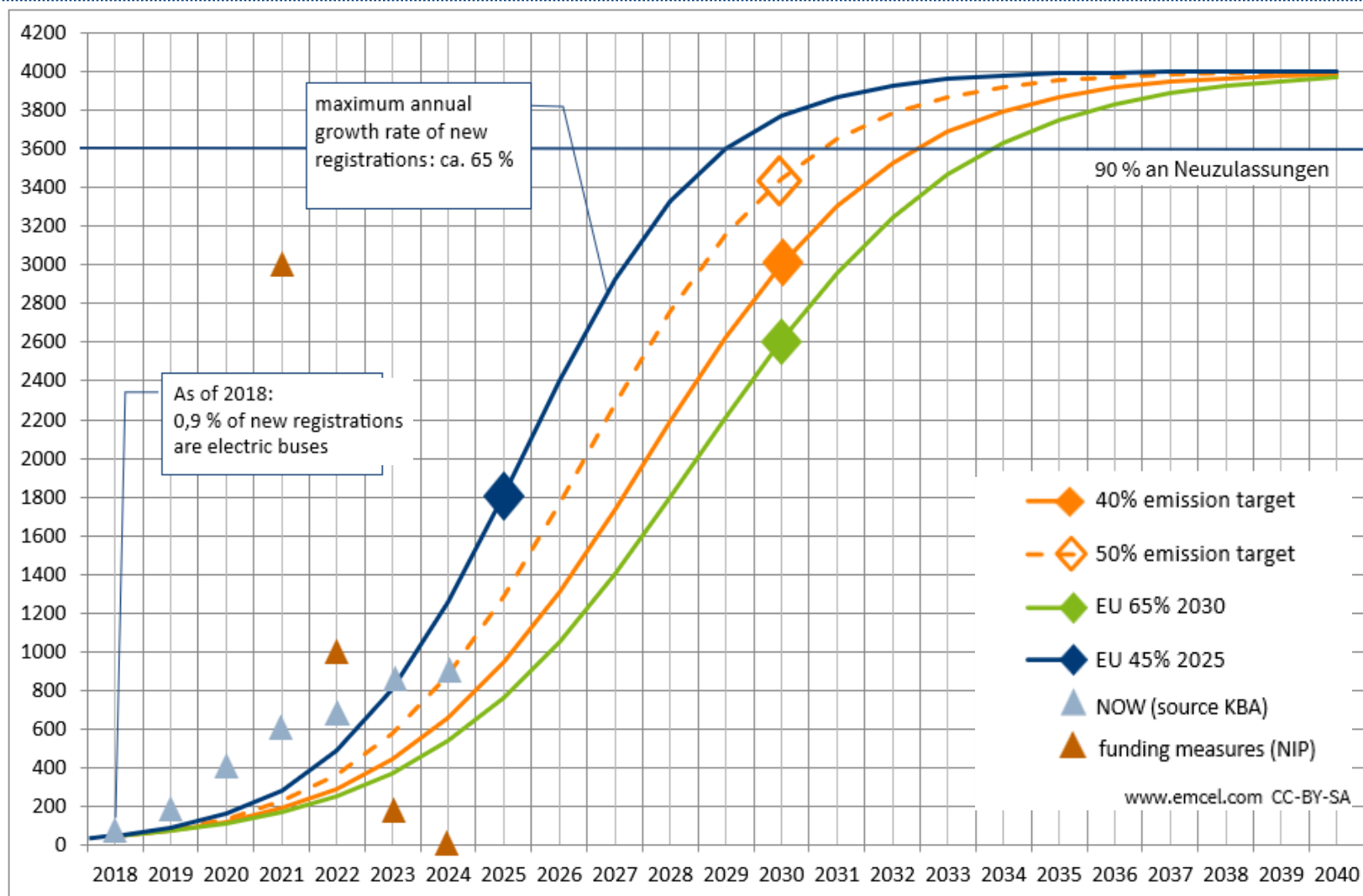
Depending on local conditions, all technologies are viable



	Entry / Pilot project	Fleet expansion
Battery electric bus	 <p>Small hurdle:</p> <ul style="list-style-type: none">• Low effort when testing a few electric vehicles	 <p>Big hurdle:</p> <ul style="list-style-type: none">• High effort for the entire fleet conversion
Fuel cell bus	 <p>Big hurdle:</p> <ul style="list-style-type: none">• High effort due to the construction of the refilling station	 <p>Small to medium hurdle:</p> <ul style="list-style-type: none">• No additional refilling station needed• Existing refilling station can be expanded• Additional refilling station

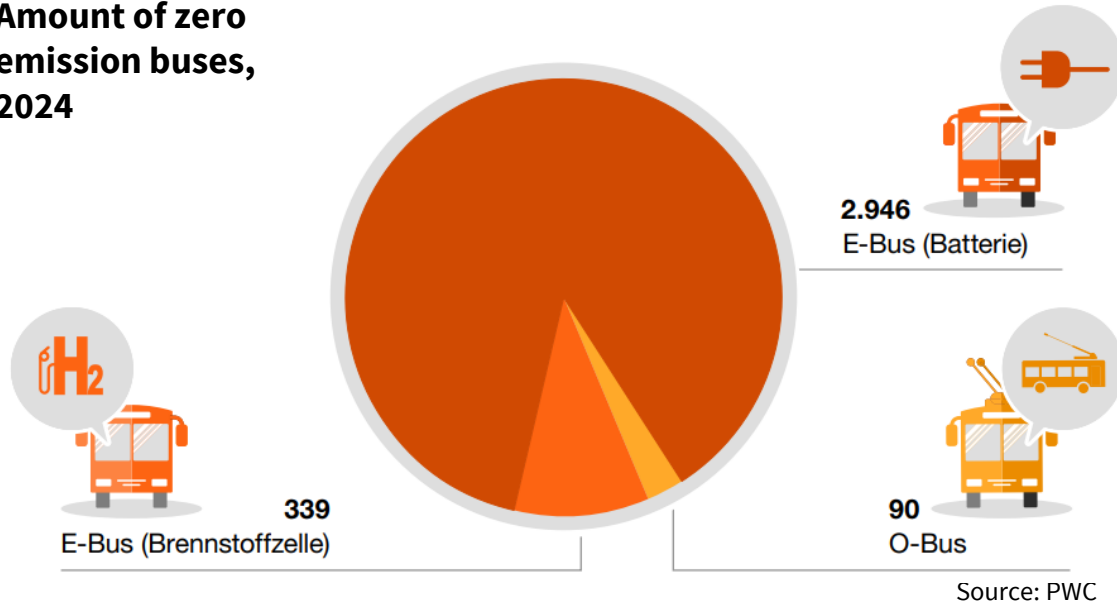
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Demand for electric buses in Germany



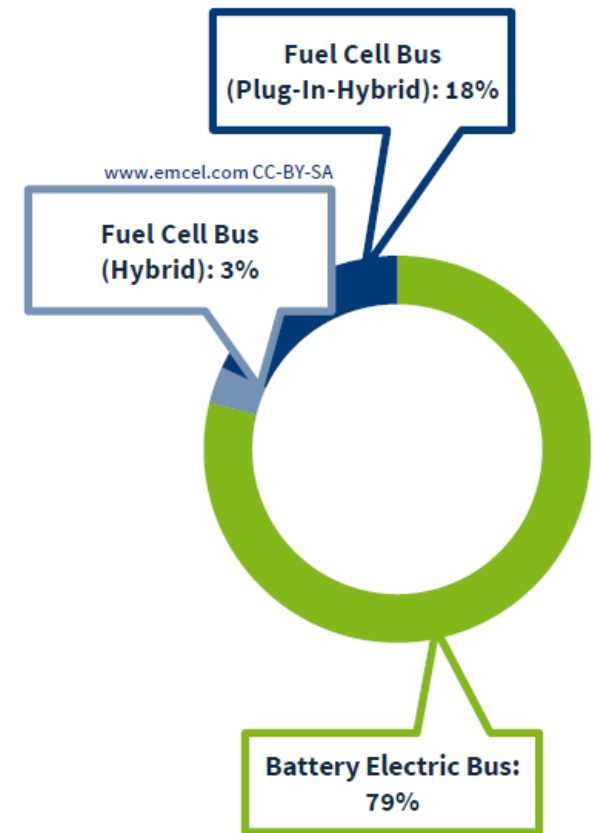
Electric bus technologies in Germany, 2024

Amount of zero emission buses, 2024



- › Electrification rate approx. 8% of national bus fleet
- › The majority of the buses are battery electric (approx. 90%)
- › FC buses made up to 10% of zero emissions bus technology
- › In 2024, every fifth zero emission bus was a fuel cell electric bus

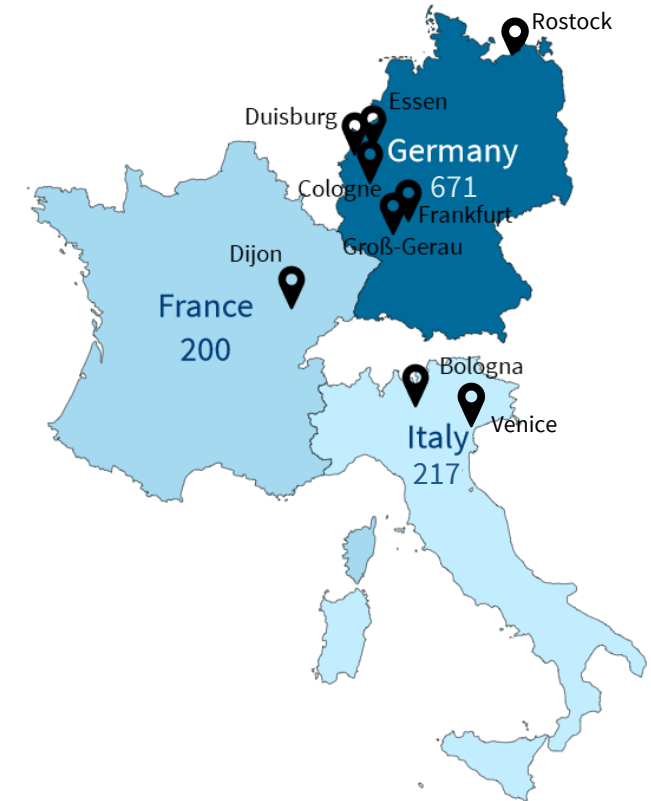
Bus registrations, 2024



Forecast and conclusions

Selected list of further projects planned in the EU since 2021

- › 100 FC-Buses for DVG (Duisburg, Germany) until 2030
- › 120 FC-Buses for RVK (Cologne, Germany) until 2025
- › 52 FC-Buses for rebus (Rostock, Germany) until 2025
- › 200 FC-Buses for Ruhrbahn (Essen and Mülheim, Germany) until 2033
- › 127 FC-Buses for Bologna City Council (Italy) until 2026
- › 90 FC-Buses for Venice (Italy) until 2026
- › 200 FC-Buses for Dijon City (France) until 2030
- › 100 FC-Buses for Frankfurt City (Germany) until 2030
- › 99 FC-Buses for Groß-Gerau (Germany) until 2028



Other cities are currently planning additional projects and others may not have their plans made public

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- › All zero-emissions technologies are viable options for decarbonising the transport sector - and they work well!
 - › Battery technology comes first, with hydrogen serving as a reliable alternative or complementary solution
 - › Fuel cell buses are suitable not only for regional routes, but also for urban operations
 - › Rate of hydrogen bus fleet exceeds today already 20% in some European regions

THANK YOU FOR YOUR ATTENTION

... to make your energy transition a success.

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