

IS YOUR FLEET eREADY?

All you need to know about eMobility
powered by MAN Transport Solutions



GOING **CLIMATE NEUTRAL?** HOW DO YOU GET INTO TOP GEAR?

Climate neutral by 2050: that's the ambitious target that the EU has set for Europe, with the goal of making it the first climate-neutral continent. Electric mobility clearly has a major role to play. Whether it's road freight or public transport, the question many businesses face is how do we get there. Where do we start? Are electric vehicles suitable for our routes? What changes do we need to make?

MAN Transport Solutions has extensive knowledge of the feasibility and introduction of eMobility from various consultancy projects in food, beverage and general cargo logistics as well as public transportation all over Europe. From our MAN eReadyCheck to a broad range of consulting services, MAN can help you assess the applicability of eTrucks, eVans and eBuses for your business, so you can make decisions based on real data.

In the following pages, we'll answer most relevant questions about fleet electrification and support you in taking the next steps.

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I'M GOING ROUND IN CIRCLES! ARE MY TOURS SUITABLE FOR ELECTRIC VEHICLES?

MAN eReadyCheck

Before you can even start to think about the details of electrification, you need to be sure that eTrucks are even suitable for your business. You need to know how far you can get with MAN electric vehicles.

Because every business and every route is different, we developed MAN eReadyCheck for you. Our online tool provides you with essential findings to guide you in decision making and taking the first steps towards eMobility. Simply enter your routes and some additional data like vehicle plus body or trailer, payload, ambient temperature and city/inter-city/highway driving etc. to find out if you are eReady.

The MAN eReadyCheck offers you a graphic display of one or more of your routes and provides initial results about the potential for eMobility. Using simple sliders, you can adjust parameters such as types of road, load weight, route length, etc. as well as the energy consumption of auxiliary units.

Scan the QR code to open the MAN eReadyCheck online application and take the first step in finding out if your business is eReady.



* currently only available for eTrucks

With our MAN eReadyCheck app, you can find out in 3 easy steps which of your tours can be electrified with our MAN eTrucks.



The screenshot displays the MAN eReadyCheck app interface, which is divided into three main sections:

- 1. SELECT A TRUCK:** This section allows users to choose a vehicle type from a dropdown menu. Below the menu, there are several buttons for different vehicle configurations, such as 'MAN TGS 2020', 'MAN TGS 2021', and 'MAN TGS 2022'. A 'GO TO STEP 2' button is located at the bottom right of this section.
- 2. SELECT YOUR PARAMETERS:** This section features three sliders to adjust key parameters: 'Average Payload', 'Outdoor Temperature', and 'Type of Road'. Each slider has a numerical scale and a red indicator bar. A 'GO TO STEP 3' button is positioned at the bottom right.
- 3. ENTER A TRIP:** This section shows a map with a red route highlighted. Below the map, there is a search bar and a 'GO TO RESULTS' button. The bottom of the screen displays 'OUR POWERFUL ELECTRIC VEHICLES' with a 'YOUR INPUT' section showing the user's selected parameters and a 'OUR SOLUTIONS' section listing recommended vehicles with their respective ranges.

Step 1:

Select the vehicle you want to use for this tour.

Step 2:

Use the sliders to adjust parameters such as payload and outdoor temperature.

Step 3:

Enter a tour by selecting the start/finish points and waypoints in between.

Your personalised results: We show you how the selected tour can be completed by a MAN eTruck and give you details of the recommended vehicle.

WILL MY TAIL LIFT LOWER MY VEHICLE RANGE?

Range influencing factors

Big trucks, small vans, regular city buses: all commercial vehicles have auxiliary power consumers. Whether it's a refrigeration unit or simply a multimedia system, they all draw electrical energy from the vehicle batteries. And that inevitably leads to a reduction in the range of your electric vehicle. Plus, topography, climate, payload and driver style have a further impact on range and consumption. How strong this effect is depends on both the type of vehicle and the intensity of its use. For all electric vehicles, the extend of their influence on range depends on the vehicle's configuration and must be considered on a case-by-case basis.

Whatever your vehicle requirement, we begin by analysing in detail the relevant factors that impact range and consumption in your specific application and use case. This information flows directly into the range calculation and further steps of our 360° eMobility Consulting.

Typical range influencing factors

eTruck 	eBus 	eVan 
<ul style="list-style-type: none"> Vehicle payload customer application bodies, e.g. Cooling body/refrigeration Cab air conditioning/heating 	<ul style="list-style-type: none"> Passenger load Air conditioning/heating 	<ul style="list-style-type: none"> Vehicle payload Customer application bodies Cab air conditioning/heating
<ul style="list-style-type: none"> Topography Air temperature/climate Driving style 		

Auxiliary consumers vary according to vehicle type but they all have an impact on the vehicle's range.



The MAN eVan. Its auxiliary power consumers are designed for maximum energy efficiency and only have a noticeable impact on range if they continue to operate at full capacity during longer stops. The eVan's economy mode is designed to reduce that consumption.

Taking care of the climate – before and during operations

Electric drives produce significantly less waste heat than a combustion engine. The MAN eTrucks, eVans and eBuses use highly efficient, purely electric heating and air-conditioning systems on top. We'll show you how, with the right strategy, you can still reliably complete your daily tours: for example, by selectively pre-tempering your electric vehicle during charging time.

Heating and air conditioning are crucial factors, especially in the operation of electric buses. At very cold temperatures, restrictions in range are to be expected, particularly in purely electric heating mode. To ensure the most efficient operation of your electric vehicle, we analyse marginal climatic conditions in detail and give you options, such as the use of an auxiliary additional heater.

WITH US, IT'S ALL STOP-AND-GO. WILL THAT PUT THE BRAKES ON OUR PLANS?

Range around the city and beyond

If you operate in the city, stop-and-go traffic is no longer a burden on your energy balance. Thanks to their regenerative braking systems, MAN electric vehicles return energy to the battery with every braking manoeuvre. With the future MAN eTruck generation, intelligent use of break times for intermediate charging will make daily ranges up to 800 kilometres possible.



Long range or high payload? Our modular battery system makes it possible to choose from different battery configuration options that fits the application of the MAN eTruck best. In addition, the highly efficient temperature management has a positive effect on the vehicle range.



While topography and climate conditions affect the range of all electric vehicles, temperature has a particular impact on eBuses. Driving around up to 350km per day, their continuous cycle of doors opening and closing puts extra demands on heating and air conditioning, making a deeper analysis of range and electric energy consumption essential.

MORE THAN A ONE-WAY TICKET.



Comprehensive 360° eMobility Consulting

When it comes to electric vehicles, putting together an optimal fleet mix calls for detailed analyses of the specific use cases. The range required for the respective routes, the topography, the climate conditions as well as the space available in the depot are important factors to consider when deciding for or against electric vehicles.

The comprehensive **360° eMobility consulting service** by MAN Transport Solutions shows how eMobility can be successfully mastered.

Analysis “as of today” under customer's specific conditions



- What daily range is required?
- What are the climatic and topographical conditions?
- How often do you need to heat or to cool?
- Derivation of achievable ranges

Definition of a possible “should be” eMobility scenario



- Can the required daily range be achieved?
- If not, what is an alternative scenario?
- Are there enough idling times to recharge?
- How many electric vehicles do we need?

ALL THIS **GOING GREEN**. WILL IT PUT OUR ACCOUNT IN THE RED?

Financial services you can count on

Sustainability doesn't just apply to the environment. It goes for your business, too. That's why our services extend beyond just the choice of suitable vehicles. Once we've decided together, that is a viable option for your routes, we can support you with financing solutions to provide you with a complete package.

MAN Financial Services integrates the vehicle and financing solution into one concept tailored to your business needs.

Depending on your location, governmental subsidies or tax benefits might apply for your electric vehicle. A TCO analysis can often be used to support and improve these. Please contact us for advice.



The new MAN eTruck.
Efficient, reliable, first-class.
Exactly the same qualities
as we build in our financial
solutions.



HYDROGEN POWER. IS IT THE NEXT BIG THING OR JUST HOT AIR?

Hydrogen vs. electric: weighing up the costs

How does electric power compare to a conventional internal combustion engine when it comes to cost of ownership? Is hydrogen a viable alternative? These are important questions to consider before making a decision for one or other energy source.

In addition to the initial investment, cost of fuel, energy efficiency, maintenance costs as well as the charging or refuelling infrastructure need to be considered.

While fuel cell electric vehicles (FCEVs) have use cases in specific applications and hydrogen is an abundant energy source, other factors such as the cost of fuel cells and hydrogen tanks and refuelling infrastructure mean that battery electric is the most cost-effective option when considering total cost of ownership. Furthermore, series readiness and load capacity of FCEV drives are not yet comparable with the other drives.

Electric drives are less maintenance intensive than both internal combustion engines with their many parts, and hydrogen vehicles with their fuel cells, gas tanks and numerous additional lines.

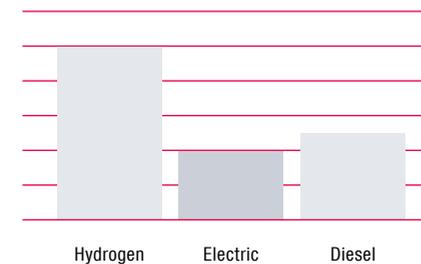
Our TCO tool considers all relevant costs to provide a meaningful comparison for your own fleet.



Advantages of battery-powered electric vehicles

- € most economically costs per km
- lowest maintenance costs
- energy efficiency – BEVs have very low conversion losses
- batteries remain the most efficient energy storage
- procurement and components
- Battery electric vehicles (BEV): ahead on all counts**

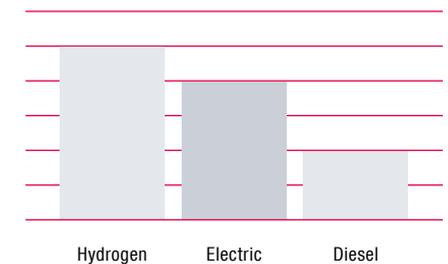
Energy costs per km



During operation, battery electric vehicles are the most economical alternative.

To achieve cost parity, the price of hydrogen would need to be around € 3.10/kg. The forecast for 2030 however is between € 5.00 and € 7.50.

Procurement cost*



Vehicles powered by hydrogen fuel cells are between 2.5 and 3 times more expensive than commercial diesel vehicles, whereas battery electric vehicles are only about twice as expensive. A TRATON Group internal study predicts cost parity of BEVs for all application segments by 2025 at the latest.

* Respective subsidies and tax reductions can influence the purchasing price in a positive manner

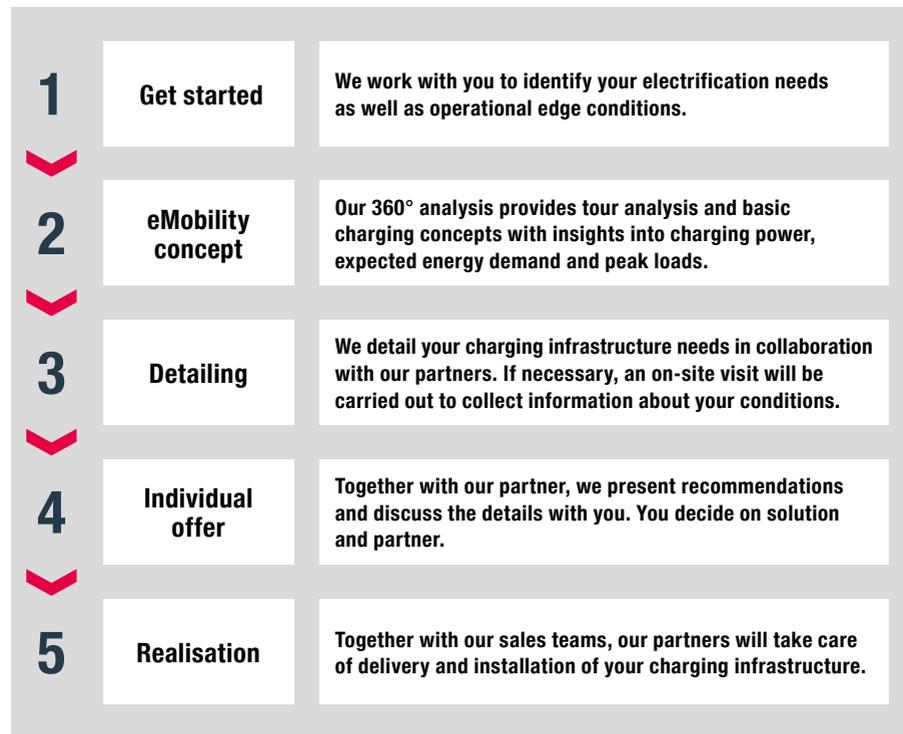
For many businesses, electric vehicles are already a viable option, economically and operationally. Not to mention, a significant contribution to quality of life and sustainability.



HOW CAN WE RECHARGE OUR BATTERIES WITHOUT TAKING A LONG WEEKEND OFF?

Getting power where it's needed

Is the vehicle standing time sufficient for battery charging? What charging power is required? How does the charging concept harmonise with the existing load profile? Together with our charging infrastructure partners, we'll help you answer these questions and provide tailored solutions.



Our charging infrastructure partners:



CAN I IRON OUT THE WRINKLES WHEN MY BATTERY SHOWS SIGNS OF AGEING?

The power to keep going

The lifetime of a vehicle battery is governed by the total energy throughput. That's defined by the energy consumption of the vehicle over the usage period. MAN batteries have been specially developed for commercial requirements. Experience shows that their typical service life is up to 10 years or longer, depending on the application. At MAN Transport Solutions, we'll analyse your tours and advise you on factors such as optimal charging and other measures that can extend the battery lifetime.

Getting the most out of vehicle batteries

Just like any battery, commercial vehicle batteries age over time. With MAN commercial vehicle batteries, that doesn't mean they have to be thrown out. To get the most out of them, we are working on strategies to extend battery life. Options include remanufacturing and second use in the vehicle. Thereafter, batteries are used in second-life energy storage systems and only then recycled with certified recyclers or service providers.



CHALLENGE eMOBILITY. ACCEPTED!



MAN Training Services

From the high voltage components and wiring in your vehicles to the driving style needed to optimise efficiency, switching to electric vehicles has implications for your organisation. Our training services are there to help you get the most out of your vehicles safely and efficiently.

MAN ProfiDrive and MAN Academy offer exactly the right training for your staff on the subject of eMobility.

MAN ProfiDrive

Our experienced trainers will show your drivers how to improve efficiency in daily operation and get the most out of their electric vehicle.

> [MAN ProfiDrive](#)



Driving with foresight saves energy. With electric drive, a well-trained driver can achieve a considerable increase in range.

MAN Academy

We train your employees to ensure they have the knowledge needed to maintain high voltage systems reliably and safely.

> [MAN Academy](#)



At the MAN Academy, your mechanics will learn about potential risks and how to handle electric vehicles properly.

I'M READY TO ELECTRIFY. HOW DO I PROCEED WITHOUT BLOWING A FUSE?

MAN Transport Solutions – empowering you all the way

At first glance, eMobility looks as if it could be a viable option for you. How do you move on from here? At MAN, we're here to help. Our eMobility consulting services will take you from pre-sales through implementation to optimising your network once your fleet is in operation.

Our eMobility Consulting services include:



360° eMobility Consulting

Initial, customised analysis based on example routes and edge conditions.



Full fleet assessment

Detailed analysis of your entire network and development of an eMobility scaling strategy.



Data-based optimisation

Ongoing adjustment, considering all relevant changes to your transportation network, to ensure cost optimisation.

Ready to go? Contact your local sales person or visit us at www.man.eu/transportolutions



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