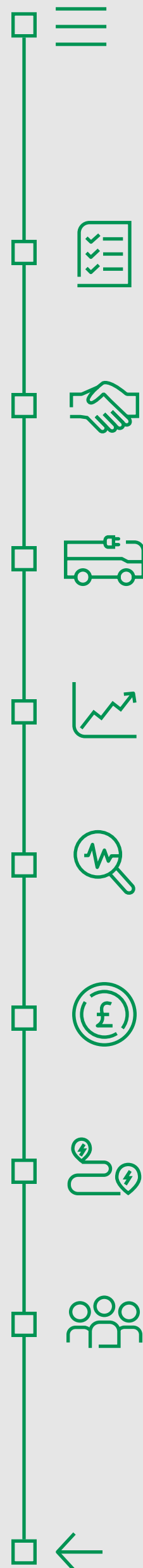




Accelerating to a scaled electric fleet

Key considerations for your transition to a fully electrified bus fleet.

[Click to enter](#)



Executive Summary

[Find out more](#)



Introduction

[Find out more](#)



Powering your fleet

[Find out more](#)



Delivering for your customers

[Find out more](#)



Case Study

[Find out more](#)



Investing in your fleet

[Find out more](#)



Managing your fleet

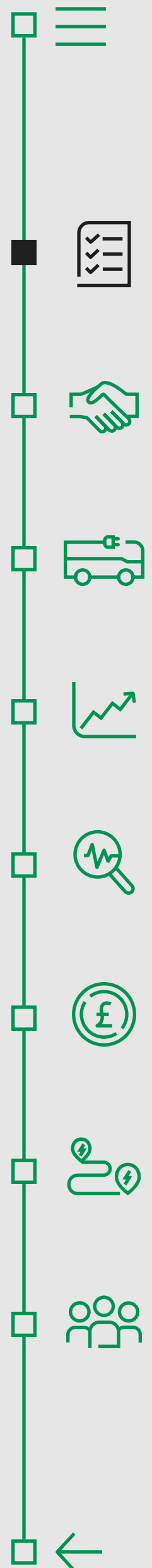
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About VEV

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Executive Summary

Over the last few years, UK bus operators have been gradually decarbonising their fleets however now in 2024, the time has come for bus fleet operators to put the pedal to the metal and fully embrace electrification.

Not only do electric buses produce zero carbon emissions, they improve the air quality in our local communities, reduce noise pollution, provide a more comfortable ride, and lower fleet maintenance and operating costs.

In this guide, we outline the key factors to consider when transitioning your bus operations to Battery Electric Vehicles (BEV) - with or without a government subsidy. All the while, we'll keep your local community at the forefront of your transition strategy.

Embracing bus electrification is a long-term change and it will impact the service you provide. However, it's also critical to helping you meet your net-zero targets, locally and nationally. As well as having a positive impact on your local environment, it will improve the comfort of your passengers as they enjoy a smoother and cleaner journey.

Mike Nakrani
CEO, VEV





Introduction

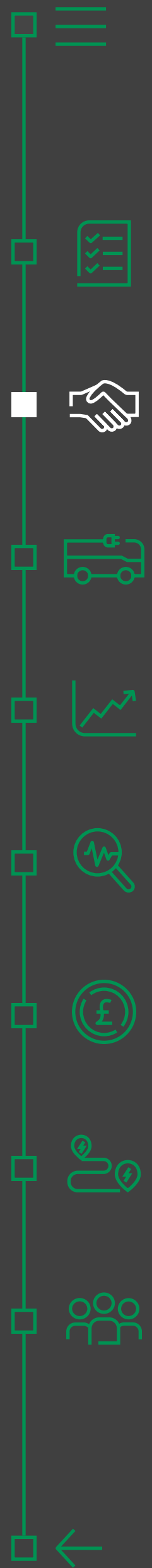
Electric buses were first introduced on a national scale in China in the 2010s. In the years that followed, BEVs were slowly introduced throughout Europe and North America as pilot projects.

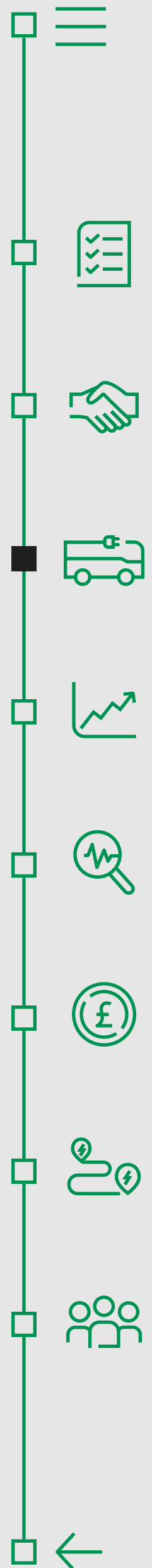
In recent years, the number of bus fleets transitioning to electricity has increased globally. In Europe, as fleet electrification evolves from pilot projects to full-scale rollouts, we're starting to see more tenders requesting zero emission bus fleets.

The UK itself is leading the way to zero emission buses. As of 2024, there are 3,055 battery-operated buses in service in the UK, with 1,529 in London and more than 500 in Scotland.

Following the UK Government's target to make all new cars zero emission by 2035, a consultation was launched into ending the sale of all new non-zero emission buses from 2025 to 2032. Since then, the Government has pledged £200 million towards delivering zero emission buses across the UK, making transitions more accessible than ever before.

As the transition to BEVs gathers pace, now is the time for bus fleet operators to start planning their strategy for electrification at scale.








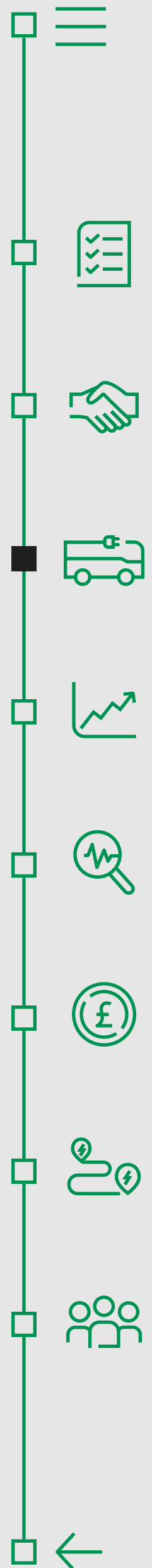
Powering your fleet

Whether you need power at your depot, or charging on the move, there are many options out there for powering your fleet - and there's no one-size-fits-all approach.

The most important consideration as an operator is how you'll keep your service running to schedule. So whatever power options you choose, they should be accessible, reliable and convenient.

At depot	On the move	At shared hubs
<p>Using data gathered from smart charging devices, fleet managers can determine the viability of converting their depot into an e-depot. Other factors that need to be considered include power and grid capacity, and the layout and the design of your depot.</p> <p> The first step involves assessing the viability of transforming your depot into an electric charging facility, which includes looking at your space and power availability</p>	<p> By analysing your current fleet data, you can determine the electrification readiness of your fleet</p>	<p> Based on analysis of real time data from your operations, you can make informed decisions about your electrification roadmap</p>





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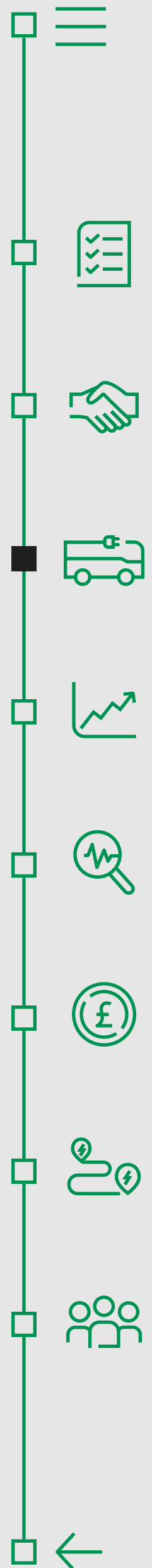
In October 2022,

pantograph technology

was introduced to London to rapidly charge buses on the all-electric route 132. The arm-like structures attach to the roof of buses to deliver a quick, high-power charge.

At depot	On the move	At shared hubs
<p>Keeping your vehicles moving and on schedule is the number one goal. So, returning to base to charge isn't always the most efficient option, especially where duty cycles are long, or cover rural routes. As an alternative, you can choose to charge 'on the go', using opportunity charging methods such as pantographs. A pantograph offers high-capacity charging between 150 kW and 550 kW</p>		
 <p>The charging technology has advanced in recent years, with connectivity now available above and below buses</p>	 <p>Where inverted pantographs are installed at bus stops, drivers can easily recharge their vehicles by parking under the overhead parking stations</p>	 <p>Charging on the move distributes your fleet's power requirements more evenly, creating a more robust, reliable, and sustainable strategy</p>









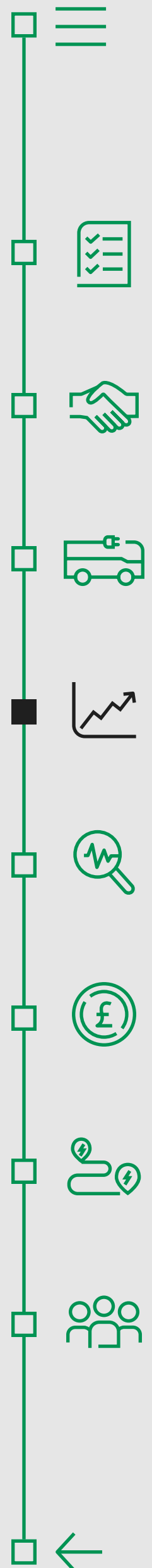
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At depot	On the move	At shared hubs	
<p>For smaller bus operators, investing in a single depot can be too large an undertaking, especially with the growing pressure on margins as operating costs rise.</p> <p>That's why collaborating with other fleet operators in different sectors to create several smaller shared hubs is often the preferred choice.</p>			
 <p>Collaborating with other fleets to create shared hubs expands the number of charging locations your buses can access</p>	 <p>Sharing hubs means dividing the risk and reward more evenly between fleet operators, in turn meeting everyone's charging needs</p>	 <p>Accelerate your transition to an all-electric bus fleet and start reaping the environmental and financial benefits sooner</p>	 <p>Expand your revenue stream by collectively pursuing opportunities with other fleets across different sectors</p>



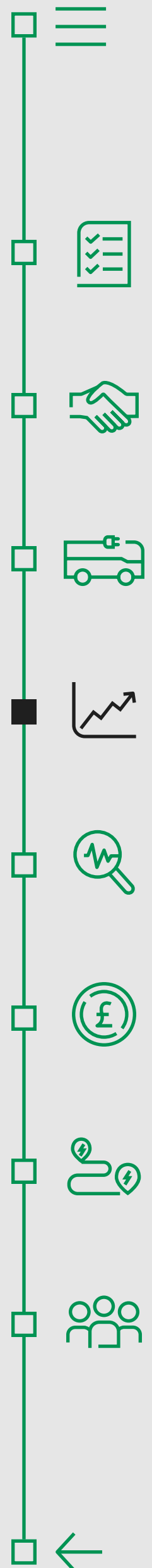


Delivering for your customers

Community transport, local buses, intercity, commuter coaches, and even tourist buses are all vital to our local environments. Maintaining service levels and delivering the best possible customer service is a top priority for all bus operators.

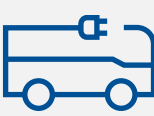
Reliability	Experience
<p></p> <p>BEVs encounter less service and maintenance issues, making them more reliable. VEV's total cost of ownership (TCO) research already shows that electric vehicles have the potential to reduce maintenance costs by half. With buses out of service for less time, operators can optimise their fleet, as fewer vehicles are required to meet service demand. What's more, some locations have Bus Transit Routes, which provide a more reliable, uninterrupted service. These routes are suitable for installing pantograph technology.</p>	





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Reliability	Experience
 <p>BEV fleets offer customers increased comfort and a smoother ride. They also enhance the driving experience as electric vehicles typically have a lower centre of gravity, which provides better handling and responsiveness. EVs reduce noise pollution, and with zero tail pipe emissions, they eliminate exhaust fumes, which makes for a more positive passenger experience.</p>	





TOOTBUS

Smart Energy Management for Green Tourism Buses

VEV enabled Tootbus to power their existing EVs with 100% renewable energy and is installing 10x chargers plus onsite solar generation that could power 60,000 KM of bus travel per year.

“We had been talking to other potential suppliers, but VEV was a step ahead of everyone else. They offered a turnkey solution, and most importantly listened to us and understood the pillars of our business.”

Gavin Brooking, Managing Director, Tootbus UK

[View The Case Study](#)



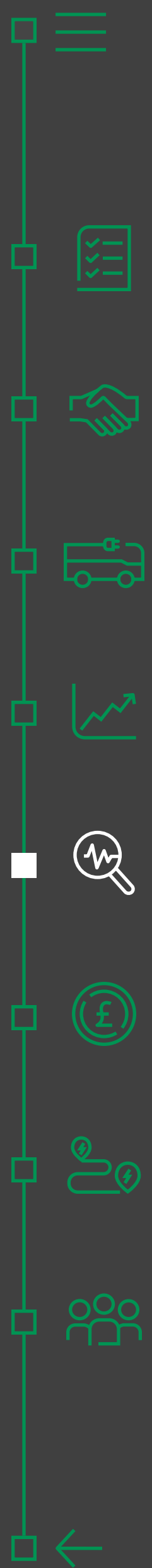
TRANSMILENIO S.A. COLOMBIA

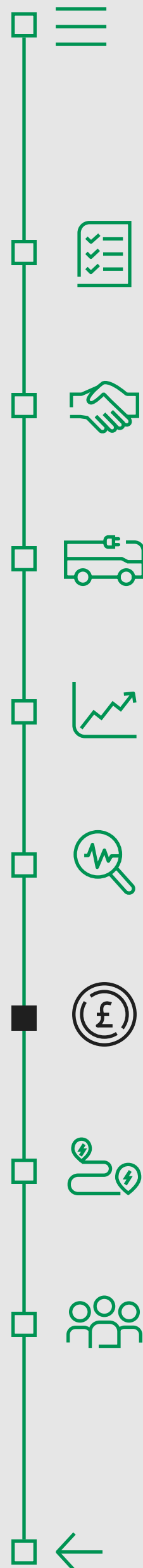
Turnkey Bus Fleet Electrification

Transmilenio engaged VGMobility to replace part of their aging diesel bus fleet but faced large challenges in terms of capex requirements, power availability and operational risk.

We worked in partnership with bus and charger manufacturers, bus operators and local authorities to design and deliver the end-to-end solution to meet their GHG emission reduction goals

[View The Case Study](#)








£ Investing in your fleet

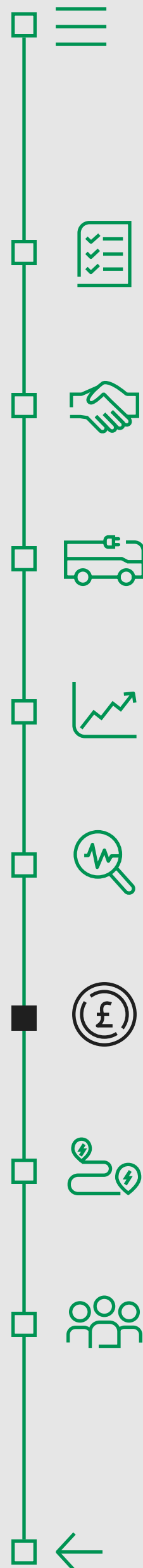
The biggest investment for fleet operators, is of course, the vehicles themselves. And with the tight financial constraints associated with bus and coach operations, making the move to an electric fleet requires careful financial planning.

However, when fleet managers consider the total cost of ownership (TCO) of electric fleets and realise that tax, fuel, maintenance, and insurance costs are lower, it becomes clear that transitioning to BEVs is a smart move.

15%
of buses are expected to be Zero Emissions Buses by 2025 (according to Zemo)

Subsidised	Non-subsidised	
 <p>The UK Government has many initiatives that support the transition to zero emission vehicles</p>	 <p>Fleet operators need to ensure that funding applications are aligned with the needs of the local community</p>	 <p>Funding applications also need to demonstrate the tangible benefits to local communities</p>








£ Investing in your fleet

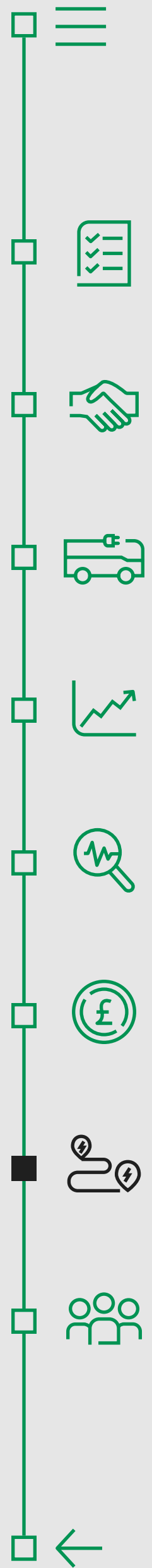
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The Government subsidies and grants are all aimed at helping the UK achieve its goal of decarbonising road transport by **2040**



Subsidised	Non-subsidised	
<p>Budget constraints will make it more challenging to transition without help from subsidies or grants, however there are other options</p> <ul style="list-style-type: none"> Bus fleet owners can move to an OpEx financing model, reducing the need for high capital investment	<ul style="list-style-type: none"> You can join forces with other operators to create shared infrastructure	<ul style="list-style-type: none"> Explore other revenue opportunities such as advertising, allowing others to charge at your depot, or consider partnering with local businesses who also support the move to decarbonisation






Managing your fleet

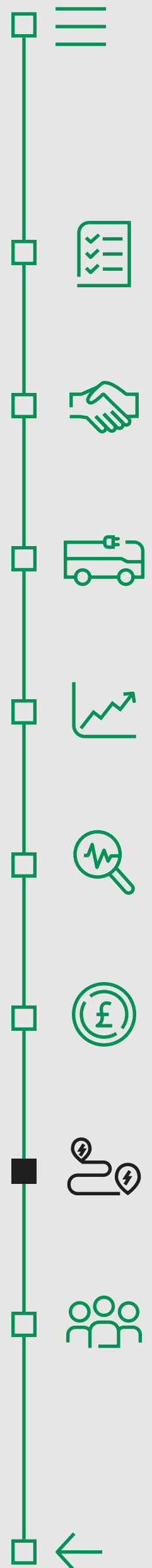
Delivering an uninterrupted service throughout the year and keeping your fleet on the roads with skilled drivers is essential.

While drivers are out providing a service to local communities, operators back at base need to have access to data in order to support drivers in any situation.

With data-driven insights, bus fleet managers can plan, schedule and manage buses more effectively.

Integrated	Smart charging	Issue resolution
 <p>Your management platform needs to provide valuable telematics, charging and energy data</p>	 <p>Fleet managers need visibility across the entire operation, from vehicles and drivers to energy consumption and charger performance</p>	 <p>Data should be used to make performance decisions and drive actions such as rotating buses through routes to protect battery health</p>








Managing your fleet

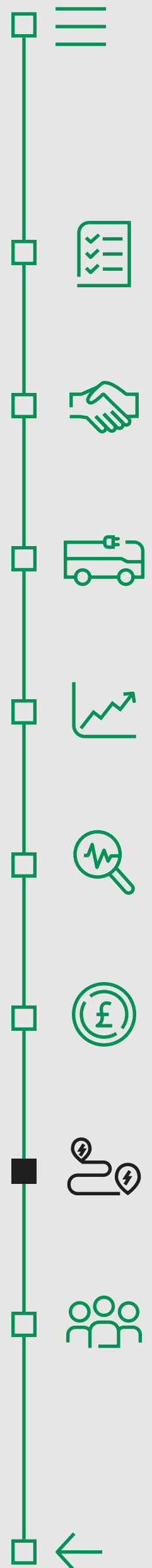
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Integrated	Smart charging	Issue resolution
 <p>With smart charging, you can collect data that helps you manage the energy flow to your vehicles, ensuring you have enough charge to complete critical fleet operations</p>	 <p>Buses are charged quickly, and with dynamic load management they can be charged safely using maximum charging speeds</p>	 <p>Fleet charging times are optimised based on market prices, which balances the supply and demand of electricity, lowering costs, and benefiting the environment</p>








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Integrated	Smart charging	Issue resolution
 <p>With a data-driven charger and energy management system, managers will have access to diagnostic tools that can identify (and often resolve) operational and charging issues automatically</p>	 <p>Real-time fleet monitoring enables bus operators to run regular reports and proactively flag issues or identify opportunities to improve the service</p>	 <p>Fleet management systems track driver performance and behaviours, such as incorrect charging practices</p>





About VEV

VEV helps organisations deliver on their carbon reduction ambitions with an end-to-end fleet electrification solution that integrates across vehicles, charging infrastructure and power.

VEV is owned by Vitol, a world leader in energy, which to date has committed circa \$2 billion to sustainable energy initiatives worldwide.

VEV navigates the complexities of EV transformation to design and implement cost-effective EV fleets optimised for specific fleet requirements. We support EV fleet operations to guarantee resilience and keep mission-critical fleets running at scale.

Bespoke, scalable business solutions are designed around the client's own fleet data analysed by a powerful assessment tool and our experts in energy and sustainable e-mobility. VEV sets businesses up for success in an electrified future.

More information at [VEV.com](https://vev.com)

Contact us ask@vev.com

VEV

