

# DECARBONISING BUS FLEETS

Smart electrification for bus fleets



# PROVIDING EV BUS INFRASTRUCTURE

The bus industry is currently facing continued decline and significant investment will be required to provide supporting infrastructure.

A wide range of challenges have led to the year on year decline in bus patronage since 2009. Innovative financing models are being developed by operators to enable the technology deployment, thereby reducing costs to depots. However, there are a significant number of depots where this is not possible

## Our solution

We develop, build, finance and optimise energy infrastructure: power & heat, storage, electric vehicle infrastructure and private network connections; working with partners and our colleagues in the SSE Group to aggregate, operate and optimise assets. Offering energy infrastructure services and solutions under one reliable operation, combining energy design and management know-how with selected supply-chain specialists we can bring breadth and depth to our innovative energy solutions.

### OUR CORE CAPABILITIES

- Finance
- Asset Ownership, O&M
- Project Design
- Project management
- Installation
- Working in wider partnerships
- Strong safety record
- Green energy tariff
- Dynamic Trading Platform

For you as a bus operator reducing carbon emissions and particulates is of the highest importance. As an energy services provider, this is integral to SSE Energy Solutions sustainable business practices.

We have a broad portfolio of solutions to meet your individual needs to maximise your energy savings and accelerate your journey to net zero:

- **Solar** On-site generation from the PV system to off-set the energy consumption or export to the local DNO to gain additional revenue
- **Solar/Battery Hybrid** Excessive energy generated from the on-site PV system can be stored and re-utilised to charge electric buses during peak electricity tariff hours or export to the grid and gain additional revenue
- **Community shared hubs** Providing shared access to charge points when not in use to support local businesses and gain additional revenue
- **Smart/5G optionality** Under the Smart Cities initiative, smart and 5G technologies would be value-adding to the bus operators
- **Opportunity charging** We can support en route charging from charge points to pantographs
- **Independent Network Distribution Operator** SSE can provide a point of connection service that owns and operates the on-site HV equipment and provides a financial contribution to build costs.



## CASE STUDY: WATERLOO BUS DEPOT – GO AHEAD LONDON

The project, led by Go Ahead London under contract to Transport for London, has been in development since 2013 with SSE appointed to design and install the network in spring 2016 in time for the official launch at the end of August.

- First fully electric depot in Europe
- HV/LV Charging Infrastructure for 47 electric buses
- 3 million electric kilometres safely operated
- Saving 700 tons of CO<sub>2</sub> per annum

*“The thing that impressed me the most was SSE’s willingness to find a resolution to any issue that arose. The staff have a work ethic that any employer would be proud of and their communication was excellent. I trusted SSE to deliver what they promised within a tight timescale and I was not disappointed.”*

Richard Harrington || Engineering Director, Go Ahead London



# BRINGING INNOVATION TO BUS FLEET INFRASTRUCTURE

Bus2Grid is a first of a kind large scale, multi-megawatt, demonstration of Vehicle-to-Grid (V2G) technology in electric bus depots in London.

## BUS2GRID

Close to 30 e-buses will be enabled to provide bi-directional charging connected to an aggregation platform that enables the e-bus batteries to interact with the energy system.

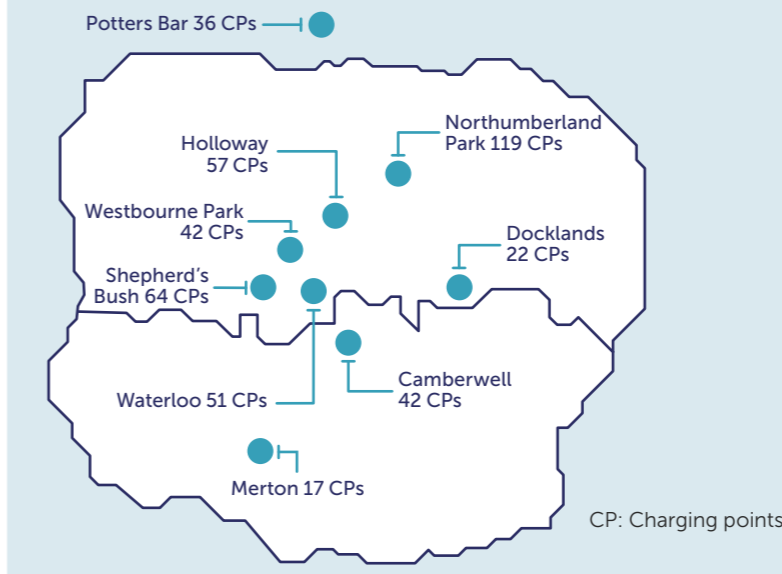
The project is exploring the commercial value and social benefits to the energy and passenger transportation systems developing services to National Grid, local DNOs, bus operators and transport authorities accompanied by the consumer engagement approaches necessary for its implementation.

This is being delivered by a consortium led by SSE Energy Solutions with the SSE Group bringing knowledge of wholesale electricity markets, and comprises BYD, global leader in e-bus manufacturing providing V2G enabled electric buses; UKPN, providing DNO use cases and local network modelling intelligence; and Leeds University, leading on business model design and barriers to market analysis.

## WE'RE PROUD TO BE WORKING WITH

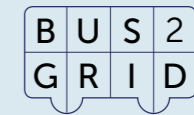


## STRONG SUPPORT INNOVATION IN LONDON



We're proud to be working with

**Innovate UK**



## TFL EV TASKFORCE

We're also proud to be playing our part in helping Sadiq Khan with his establishment of the world's first Electric Vehicle Infrastructure Taskforce, bringing together representatives from many areas so the capital continues to be one of the world's leading zero-emission cities. Being a part of this wonderful initiative keeps us at the forefront of exciting changes at the heart of the country.

## INTEGRATING THE BUILDING BLOCKS FOR E-BUS SOLUTION

In order to help you achieve a zero emission bus fleet, we offer complete end-to-end sustainable solutions to bus operators incorporating the key elements of financing, installation and management of the infrastructure.

Vehicle OEM/ lease co	Energy supply	Charging point supply	DNO grid supply	Design and install
Consultancy services	IDNO and private wire	Real-time telematics	Operation	Maintain and support
Asset finance	Solar PV systems	Battery storage	Grid ancillary services	Data platform

## BUSINESS ENERGY

SSE Energy Solutions provides renewable energy direct from our UK based assets. All our green electricity is backed by Renewable Energy Guarantees of Origin (REGOs) and with independent verification by EcoAct <https://eco-act.com/>, an Atos company, it's easy to report zero carbon emissions for the electricity used to power your fleet.

For customers who want to take a proactive approach to energy procurement, SSE Energy Solutions has a range of flexible contract structures which we can guide you through.

## Next Generation Green

Choose 100% renewable energy direct from one of our UK wind farms and help lead the transition to net zero carbon emissions, demonstrating your commitment to sustainability with your SSE Next Generation certificate naming your local wind farm.

All our renewable electricity is sourced from wind and hydro assets wholly or partly owned by SSE Renewables, our sister company in the SSE Group. With SSE Next Generation, you'll continue to get your electricity through the national grid as normal, and we'll match your consumption to REGOs from a specific SSE Group wind farm. Choice of wind farm subject to availability.

# SMART DISTRIBUTED ENERGY INFRASTRUCTURE SOLUTIONS

Designed to meet local energy needs and drive Net Zero.

SSE Energy Solutions is part of SSE plc, a UK based FTSE 100 company with 75 years' experience operating in the fast-changing energy industry.

SSE Energy Solutions plays a major part in the emerging consumer-led energy system, and provides key services to enable users to benefit from new ways to optimise and manage their low carbon energy use.

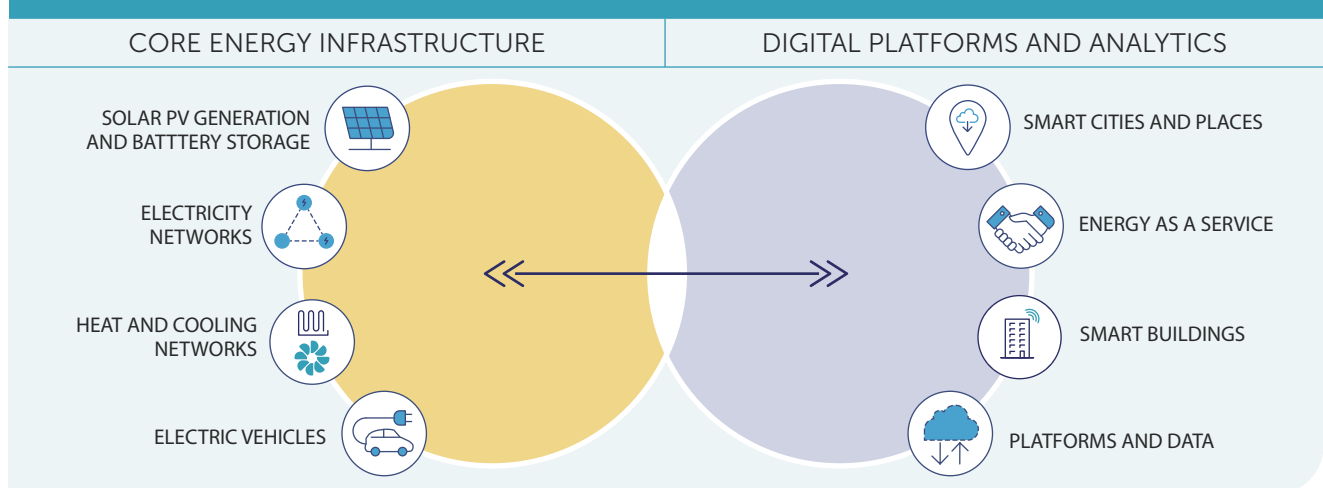
Our Distributed Energy business teams adopt a whole system approach by investing in, building and connecting your localised, flexible energy assets to accelerate your path to net zero and create a more resilient energy system for the long-term.

Right now, your decision to pick SSE Energy Solutions, part of an established renewable energy company investing in all our futures, will be the right choice for you and for our environment.

Our energy solutions include:

- Electric vehicle infrastructure for public transportation and vehicle fleets
- Local electricity infrastructure including building, owning and adopting private HV networks
- Heating and cooling networks for residential, commercial and industrial consumers
- Local energy generation, including funded offsite/ onsite solar PV
- Energy storage solutions, including battery storage
- Optimising building energy consumption and use
- Data platform services to support smart buildings, places and cities
- SSE Enhance, our aggregation and trading platform for small energy assets
- A growing suite of green energy supply solutions, including corporate power purchase agreements.

## WHOLE SYSTEM THINKING – ACCELERATING THE JOURNEY TO NET ZERO



## FOR A BETTER WORLD OF ENERGY

Get in touch with our team to find out how we can help you

[distributedenergy@sse.com](mailto:distributedenergy@sse.com) || 0345 070 2019 || [sseenergysolutions.co.uk](https://sseenergysolutions.co.uk)

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