

# SSE Enterprise

## E-Mobility Infrastructure Overview and Capabilities



# Introduction to SSE





# We're part of the SSE Group

Supporting the low-carbon transition

SSEN Transmission

SSEN Distribution

Enterprise (B2B)

SSE Renewables

Energy  
Customer  
Solutions

Thermal  
Energy

Energy Portfolio Management  
and Investments

## Our vision

To be a leading energy provider in a low carbon world

## Our purpose

Provide energy needed today and strive for a better world of energy for tomorrow

## Our strategy

To create value for shareholders and society from developing, owning and operating energy and related infrastructure and services in a sustainable way



Distributed Energy



Rail



Contracting



Telecoms

# Distributed Energy's strategic direction

**Mission:** Construct, own, operate, maintain and optimise local energy infrastructure for Smart Cities in the UK and Ireland

Asset Ownership

Smart Enablement

Integrated Local Energy Systems

Develop opportunities in the Public Sector, Private Sector, focusing on Transport, Utilities Commercial and Industrial



**Vision:** Be the leading low-carbon localised smart energy infrastructure solution provider in the UK and Ireland









# Distributed Energy

SSE intends to be a leader in the emerging **£20bn** distributed energy market.

Employing technological advances in **flexible generation and storage, digital platforms, consumption and energy management** to deliver resilient, optimised energy infrastructure closer to the point of need.

Our long-term investment ensures security of sustainable energy supply and helps our clients meet their economic, social and environmental goals.

-  Electricity, heating and cooling networks
-  Building and site energy optimisation
-  Distributed generation and storage
-  Smart city and smart place solutions
-  Electric vehicle charging infrastructure
-  Energy as a Service

“We are delighted to be working with SSE Enterprise, a company that shares our core values of sustainability and customer service excellence.”

**Gerry Walker,**  
Regional Development Director at A2Dominion

# Multi-utility infrastructure

Developers face the challenge of building essential energy-related services and solutions into their construction projects.

We offer new and innovative ways to deliver, manage and invest in energy infrastructure.

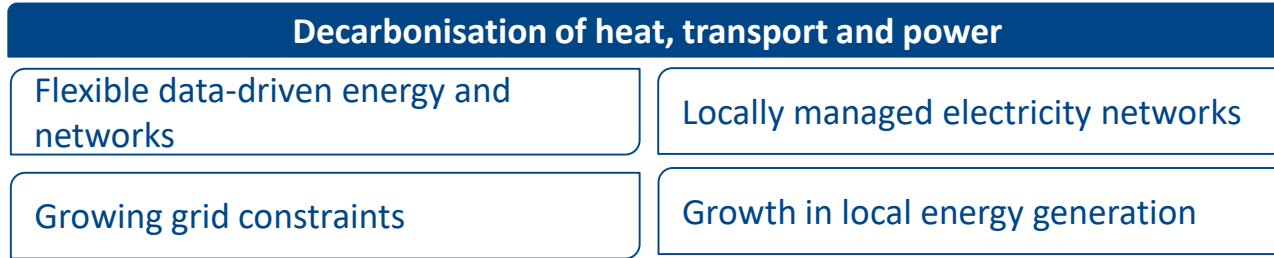
- **We invest** directly in energy infrastructure, reducing the capital cost of your project.
- **Staged payment** plans, tailored to the needs of each individual project.
- **Innovation** through addition of DG&S; EV; Heating and cooling; Energy management.

We have over a decade's experience delivering energy infrastructure solutions.

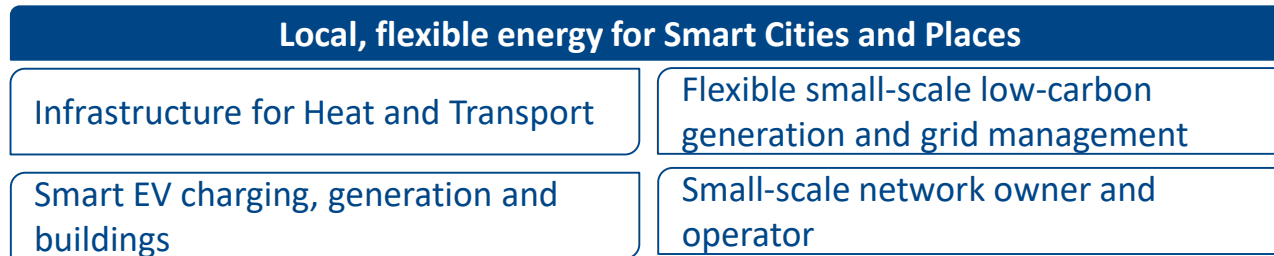


# On the road to decarbonisation, Distributed Energy will be SSE's local, flexible energy arm...

## *Market changes affecting SSE*



## *DE is positioning to be a leader in the potentially disruptive markets...*





**sse**  
Enterprise

# SSE Enterprise Fleet Update





# Scotland has set ambitious transport targets...

**NEWS**

Home | UK | World | Business | Election 2019 | Tech | Science | Health | Family & Edu

Scotland | Scotland Politics | Scotland Business | Edinburgh, Fife & East | Glasgow & West

## Climate change: Scotland to set faster target for net-zero emissions

By Kevin Keane  
BBC Scotland's environment correspondent

Scotland aims to phase out petrol and diesel by 2032

### Police Scotland proposes all-electric vehicle fleet

Police Scotland is planning to become the first UK emergency service to go fully green by replacing its entire vehicle fleet with electric or hybrid vehicles.

Sep 12, 2019

By Tony Thompson



Scotland to 'phase out' petrol and diesel cars and vans in public sector fleets by 2025

# Accelerating growth through investment and partnerships

SSE can provide asset financing models or, if the client has sufficient funding, then offer a design, install and operate solution as appropriate.

## e-Fleet model

SSE's e-Fleet proposition delivers an end-to-end solution to workplaces, taxis fleets and depot-based operators looking to electrify their fleet, from planning and provision of EV charging infrastructure, O&M and energy supply with SSE's sustainable EV business tariffs.

# Best Advice



## Full consultancy, design & project management for transitioning to electric vehicles

Our service provides you with specialist guidance to help you reach and sustain your corporate objectives including cost reduction and mitigating environmental impact. With experience, expertise and innovative thinking in a variety of disciplines, incorporating EV hardware and software, design and planning, grid infrastructure, HR and tax implications, procurement and funding options. Our consultants take a holistic approach when reviewing your strategic requirements:

- ✓ tailored features
- ✓ bespoke solutions
- ✓ charging pattern
- ✓ distributed energy
- ✓ optimising charging demand
- ✓ charging infrastructure

**Depots - EV Hubs - Workplaces**

# Our Strengths

- Integrated end-to-end solution
- Hardware agnostic
- Open Charge Point Protocol
- Flexible Back office/online tools
- Apps, RFID and Contactless Payments
- Future-proofed
- First class partnerships
- Nationwide coverage
- Safety record

# Client Benefits

- Future proofed
- Hardware agnostic
- Open Charge Point Protocol
- Flexible Back office/online tools
- Apps, RFID and Contactless Payments
- Operation and maintenance
- Warranty
- Finance options
- Integrated end-to-end solution
- Strong safety record
- First class partnerships
- Nationwide coverage



# Innovative Solutions adding Value



## Revenues

*Generation of revenues through energy sales, DSR and ancillary services supply, 3<sup>rd</sup> party charging*



## Savings

*Energy management platform to minimise the risk of commodity volatility*



## Carbon Savings

*100% green energy tariff and solar generation on site*



## Resilience

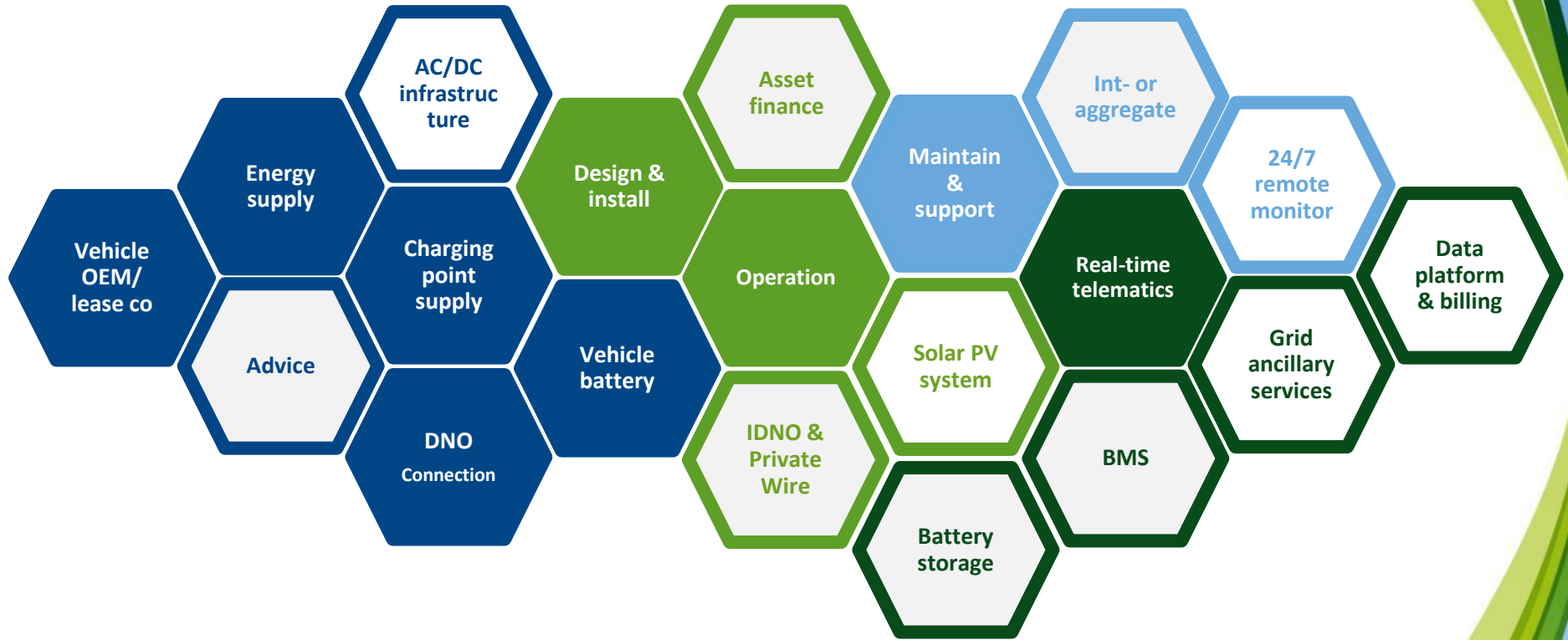
*Our design, build and maintain complex infrastructure to ensure security of supply*



## Grid constraints resolution

*Resolution of problematic grid connections, savings of money and time*

# Integrating the Building Blocks for E-Mobility Solution



# UK EV Engagement



## Current Partnerships

- **Bus Depots and Operators** – electrified 298 of 300 buses in London. Delivered World's first fully electrified Depot. In discussion with 3 major national operators for exclusive delivery for their UK roll out
- **Source London** – 6,000 ChargePoint roll-out
- **Bus2Grid** – first of its kind multi-MW demonstration of technical and commercial potential of e-buses to support the electricity system via V2G
- **Oxford Park and Charge** – 35 sites/ 250+ charge points



# UK EV Engagement

## Working with...

- London based client – 75,000 vehicle EV fleet nationwide solution
- **Gridserve** strategic partnership (electric forecourts)
- **West Cumbria Consortia** to deliver 200 CP's with battery and smart technology
- National Car lease and Rental Enterprises – UK Rollout solutions
- National Car Park Operators with 5000 CP requirement
- Utilisation of 3<sup>rd</sup> Party Land for EV Hubs for Fleet
- **EV100** – 2030 electrification objective
- **Go Ultra Low** – OLEV 2019 / 2020 campaign
- Senior partner in **TfL Infrastructure Taskforce**





# Strong Support of Innovation in London

first fully  
electric depot  
in London

Potter's Bar  
39 CPs

Total ~300 e-bus  
operating in  
London

Holloway  
55 CPs

Shepherd's Bush  
60 CPs

Northumberland Park  
36 CPs

Camberwell  
30 CPs

Waterloo  
43 CPs  
World First



We are members of  
the TfL EV Taskforce

# Waterloo 43 CP's World's First Fully Electrified Bus Depot



# Shepherd's Bush 50 CP's





# Creating smart electrification networks to unlock revenue from infrastructure assets

## Northumberland Park

91 e-buses

2x2.5MVA loading  
(peak)

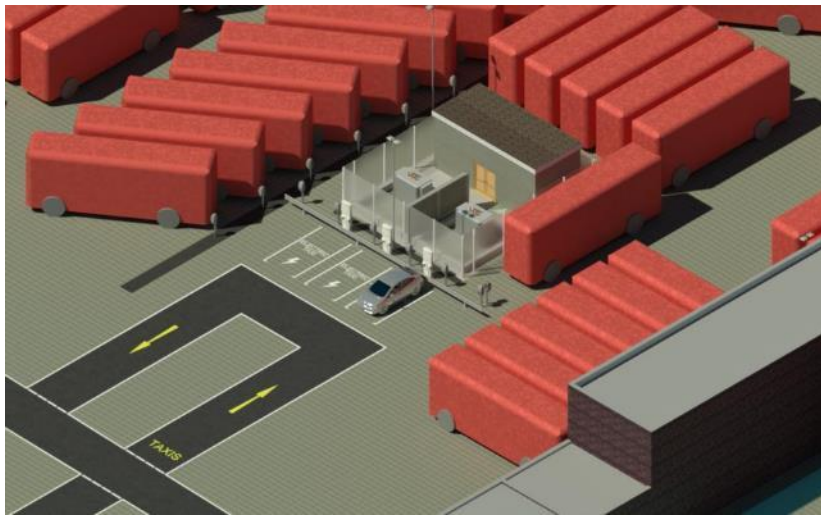
Daytime bus service

3<sup>rd</sup> party charging for  
fleets and V2G trial

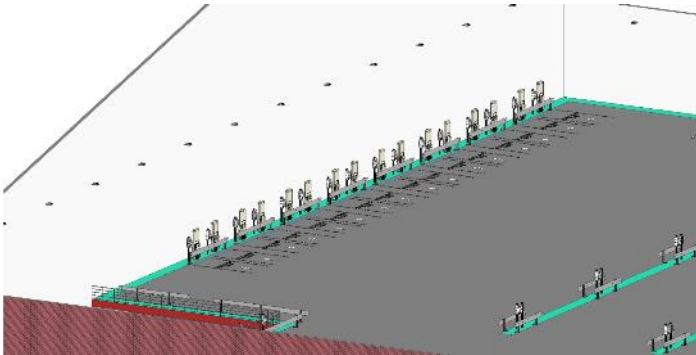
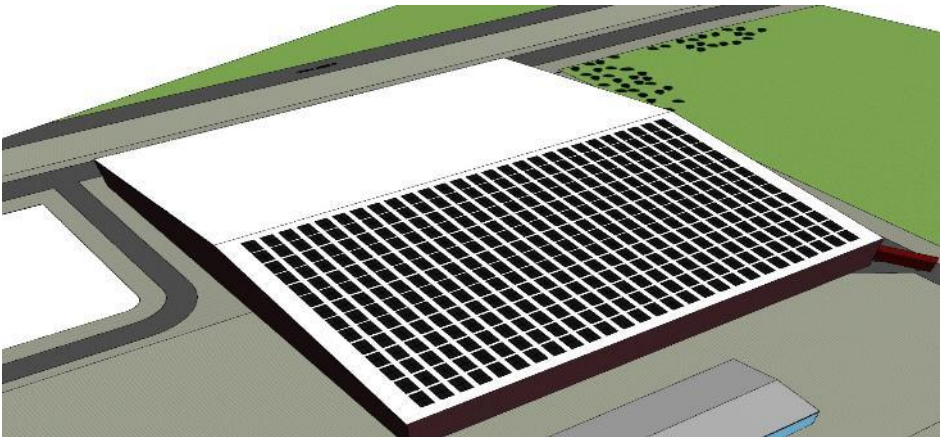
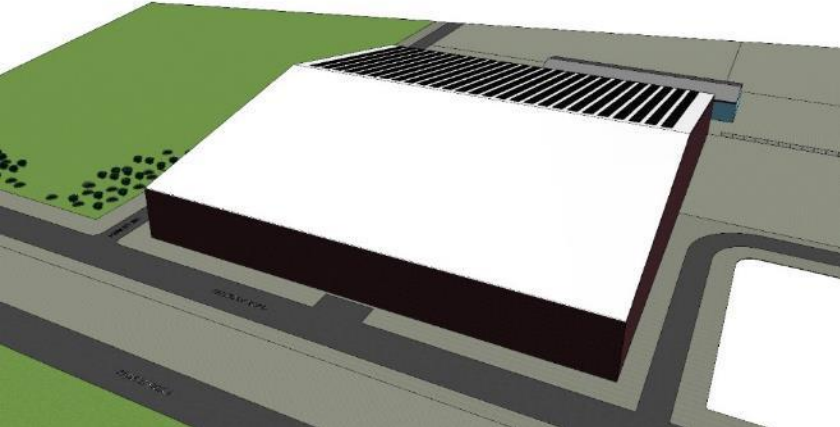




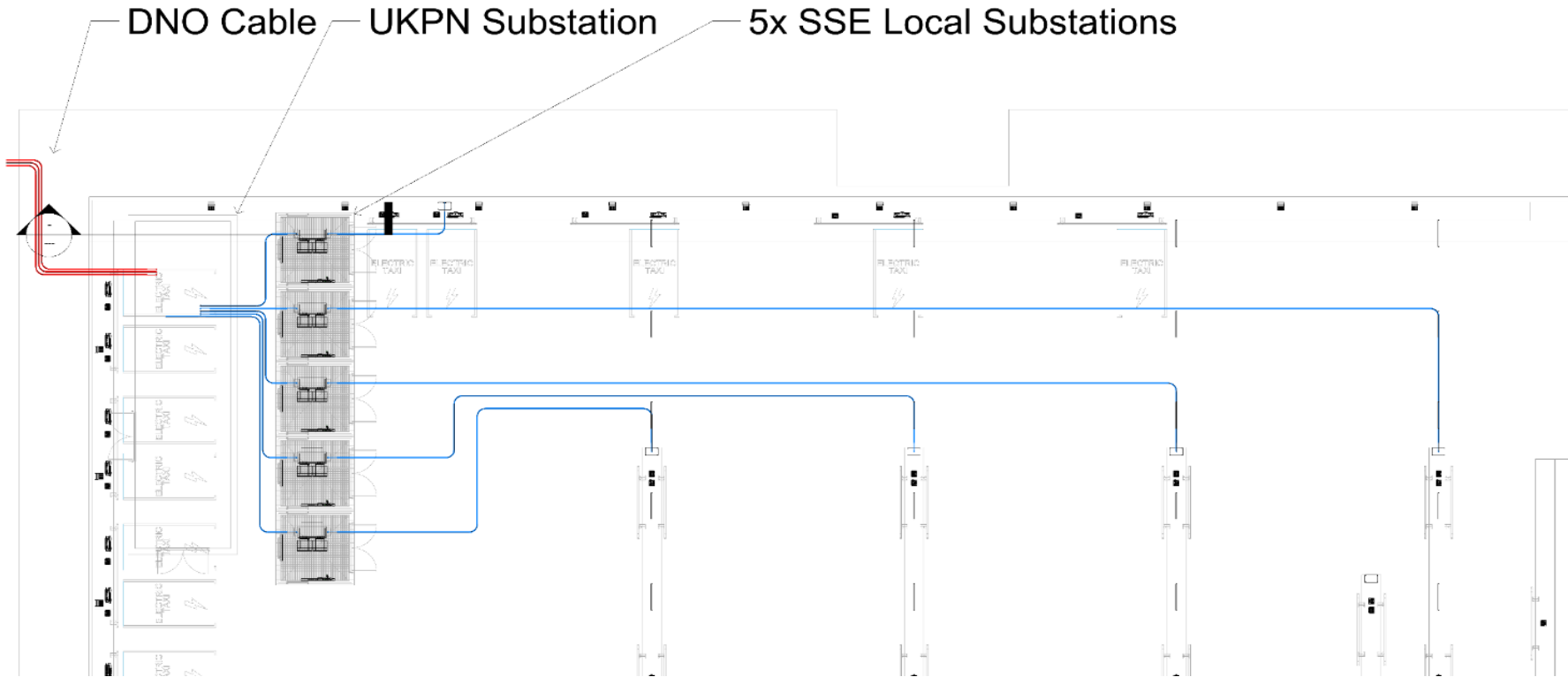




# Creating Innovation from the Ground Up

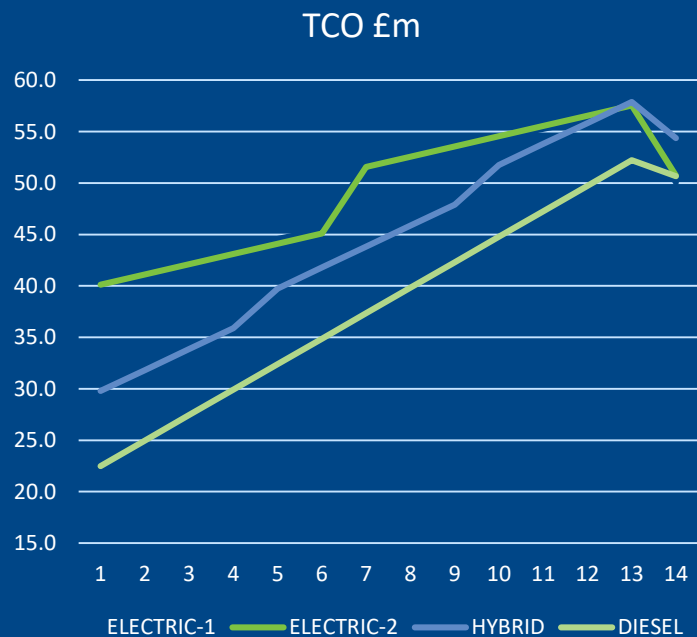


# We have the ability to design, install, own and operate complex networks on behalf of our clients





# 14yr Total Cost of Ownership



Year	1	5	7	10	14
<b>ELECTRIC-1</b> Depot Capex	1,091				
Bus Capex	39,130				
One-off Costs	0		5,460		-7,826
Annual Opex	872				
<b>TOTAL £K</b>	<b>41,093</b>	<b>44,581</b>	<b>51,784</b>	<b>54,400</b>	<b>50,062</b>
<b>£/mile</b>					<b>0.89</b>

<b>ELECTRIC-2</b> Depot Capex	0				
<b>Financed</b> Bus Capex	39,130				
One-off Costs	0		5,460		-7,826
Annual Opex	997				
<b>TOTAL £K</b>	<b>40,127</b>	<b>44,113</b>	<b>51,567</b>	<b>54,557</b>	<b>50,718</b>
<b>£/mile</b>					<b>0.90</b>

<b>HYBRID</b> Depot Capex	0				
Bus Capex	27,755				
One-off Costs	0	1,820		1,820	-5,551
Annual Opex	2,037				
<b>TOTAL £K</b>	<b>29,792</b>	<b>39,762</b>	<b>43,836</b>	<b>51,768</b>	<b>54,366</b>
<b>£/mile</b>					<b>0.97</b>

<b>DIESEL</b> Depot Capex	0				
Bus Capex	20,020				
One-off Costs	0				-4,004
Annual Opex	2,476				
<b>TOTAL £K</b>	<b>22,496</b>	<b>32,401</b>	<b>37,353</b>	<b>44,781</b>	<b>50,682</b>
<b>£/mile</b>					<b>0.90</b>

# SSE Solutions for EV Fleet Charging



# Charging Infrastructure Investments



At home



At Work



Depots

Fast Charging Point	Fast Charging Point	Rapid Charging Point
£359	£3k-£10k	£25-£40k
Charging point & installation	Charging point & installation	Charging point & installation
EO Mini Pro (smart, up to 7.2kW, 3yr warranty)	Supply chain: EO Charging, Alfen, Schneider, Ensto (smart, 7-22kW, 3yr warranty)	Supply chain: Tritium, Siemens (smart +50kW, yrs of warranty vary across OEMs)
(inc. OLEV EV Homecharge scheme, inc. VAT)	(inc. OLEV Workplace charging scheme)	Doesn't include potential DNO connection costs

# SSE Group Fleet Update



THE °CLIMATE GROUP



# SSE Group

## EV Roll-Out (EV100)

### Vehicle and charging expectation & experience:

- Drive cycle modelling and predictability
- Match vehicle range / specification to requirement
- Vehicle availability
- Vehicle asset/lease cost, depreciation, TCO
- Human factors of interaction with new fleet / journey planning
- Ensuring customer engagement and positive experience
- Being ready when things don't go as planned...

### Deployment of charging infrastructure:

- Charger distribution between home, office, depots
- Challenges of different installation requirements
- Charger specification and performance (as relates to usage case)
- Charger availability and scheduling to avoid excessive infrastructure build
- Parking policy integration
- Infrastructure planning, energy supplier engagement, works scheduling and contract management
- Awareness and behavioural change management

# Group Requirements

- 1 Member of Global EV100 = 2030 SSE fleet migration to EVs, infrastructure commitments and achieve zero emission fleet
- 2 Clyde Windfarm, Perth A9 requirements (Depot pilot for cars and fleet vehicles)
- 3 Develop group “parking strategy” including EV infrastructure requirements for 2020 and beyond
- 4 Reduce Group CO2 footprint and mitigate ULEZ / CAZ impact to operation and cost base

# Excellent end user experience...

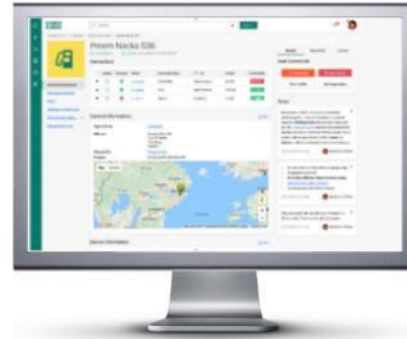
## 1. Interface for EV driver (app)



- Enables EV driver to:
  - locate charger and start/stop charging
  - Manage payments
  - Contact customer support
  - See charging history
- Offered as SSE White label



## 2. Back-end platform for business operations



- Connect & configure chargers
- Remote monitoring & diagnostics
- Remote firmware updates
- Technical error detection
- User management and RFID issue
- Price plan administration
- Enable business analytics
- Customer Service dashboard
- Reporting tools



## ...to satisfy managers and users needs, in continuous development

- Broad access to charging points at workplaces, public stations and home
- Ability to manage multiple fleets
- Manage fleet member accounts & vehicles
- Order RFID charging keys for delivery to fleet users

- Set charger access restrictions & visibility of chargers to drivers
- Full charging history for fleet managers and drivers
- One bill and total overview of fleet costs for charging at all stations
- Price control and transparency
- Automatic reimbursement for charging at home
- Customer support for fleet managers and drivers

# In Summary

# Innovation and collaboration are key

SSE Enterprise wins government funding to pilot Oxfordshire EV charging hubs



Up to 300 chargers installed in residential **'charging hubs'** using car parks located in residential areas. The pilot will provide drivers from across the county who don't have access to home charging, with chargers sited at a local 'hub' to overnight.



SSE Enterprise-led consortium wins funding to power the smart electric buses of the future

**Innovate UK**

UK Research and Innovation



**V2G technology** is key to manage increasing energy demand.

Testing in pilot test centre starting early 2020. Large scale demonstration operational by early H2 2020.



# World-class fleet solutions underpinned by exceptional partnerships

## Our achievements

Source London: >1,000 charging points delivered

Pioneer on bus depot electrification

Fleet pilot for Severn Trent Water

## Our current work and partners

Transport for London

SMMT and OLEV (Go Ultra Low)

Robust charging point supply chain

Partnership with world leader back office provider

## Our innovation

Bus2Grid/ Oxford Park and Charge

Solar Integration – DG&S

Smart Cities

Digital Service platform

# Broader SSE group engagement on EVs

## Project LEO

£40m project to test electricity market flexibility models and markets across Oxfordshire.

It will explore how the growth in local renewables, electric vehicles, battery storage, vehicle-to-grid technology and demand side response can be supported by a local, flexible and responsive electricity grid to ensure value for consumers and opportunities for communities and market providers.

## Optimise Prime

three-year innovation project that will develop practical ways of overcoming the up-front costs that are holding back many of the country's biggest commercial vehicle operators from making the switch to EVs.

Led by global data technology solutions provider Hitachi Vantara and electricity distributor UK Power Networks, the trial will see up to 3,000 electric vehicles take to the road, supported by distribution network operator, SSEN.



## SSEN's Optimise Prime project wins international environmental sustainability award

Community, Environment, Keeping the lights on, Making a difference / 07 October 2019

Scottish and Southern Electricity Networks (SSEN) is delighted to accept the Hitachi Transformation Award for the Optimise Prime project, which is the world's largest commercial EV project dedicated to accelerating the transition to electric vehicles (EVs).

# Our EV Offer – to be the integrator

