Innovate UK

Department for Business, Energy & Industrial Strategy

Office for Zero Emission Vehicles

# Learnings from the UK's V2G Programme

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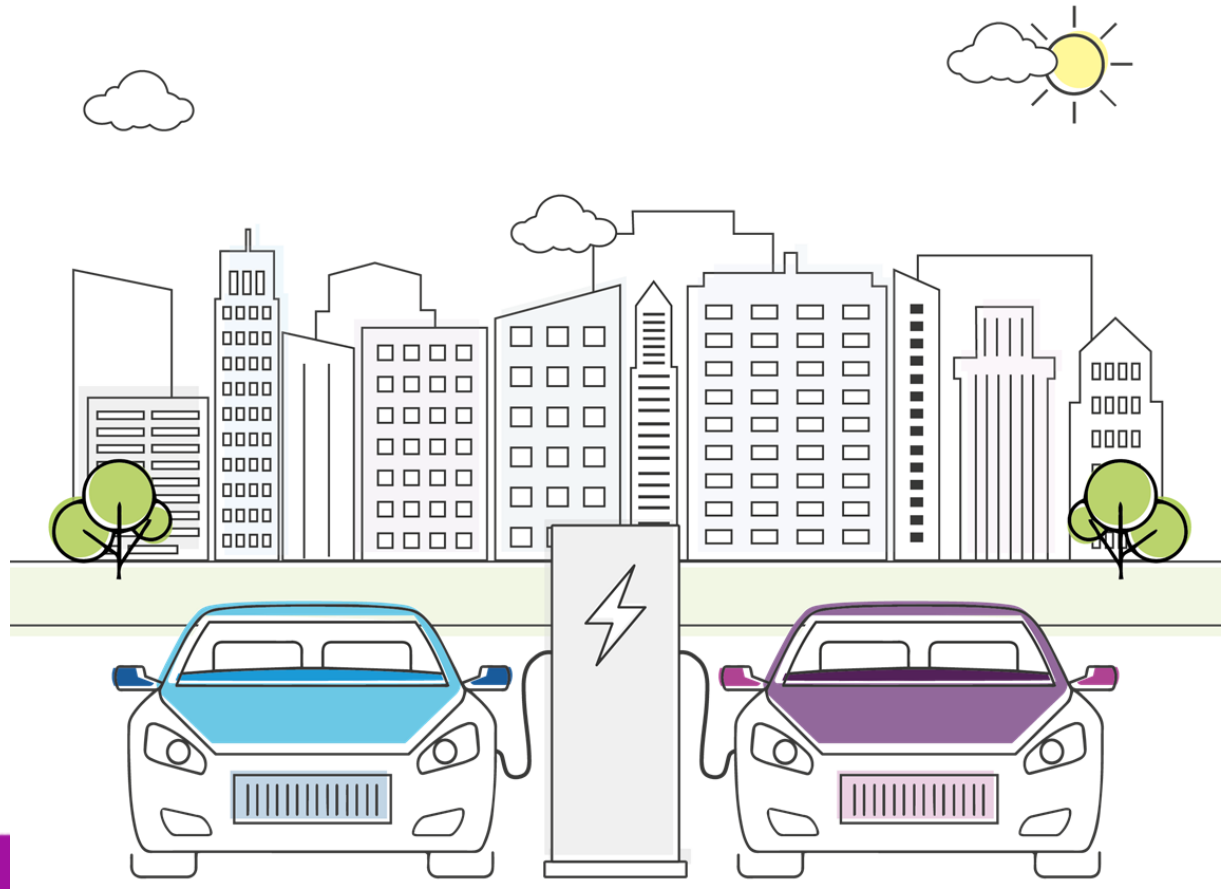
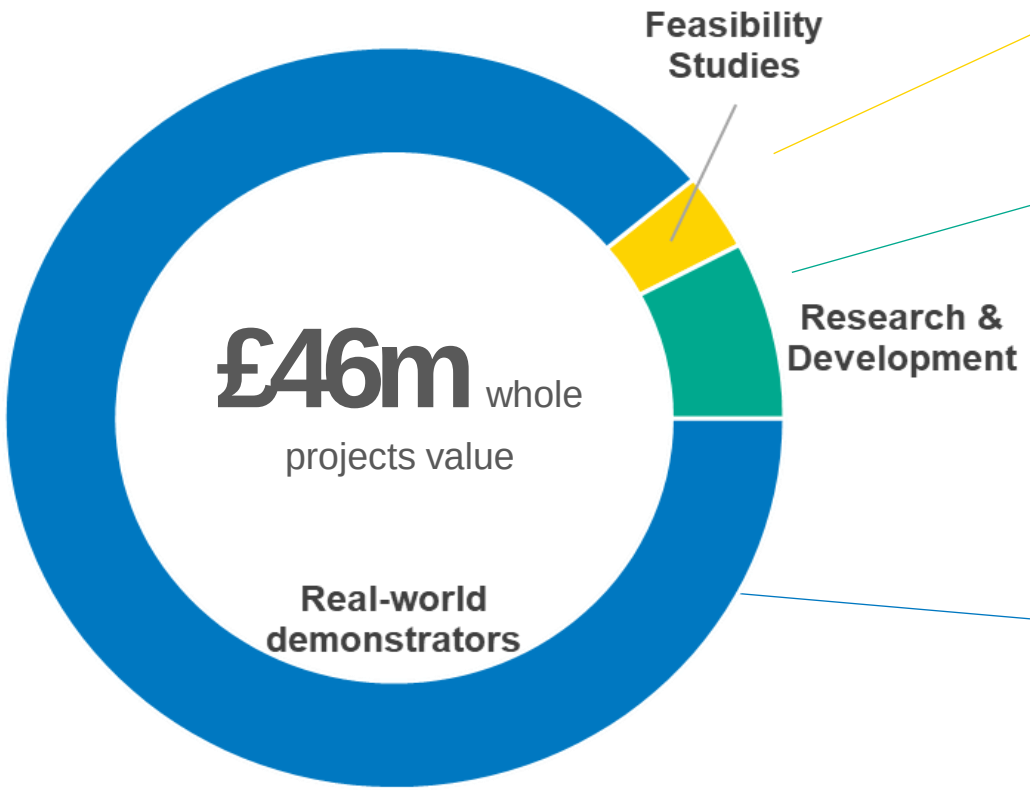


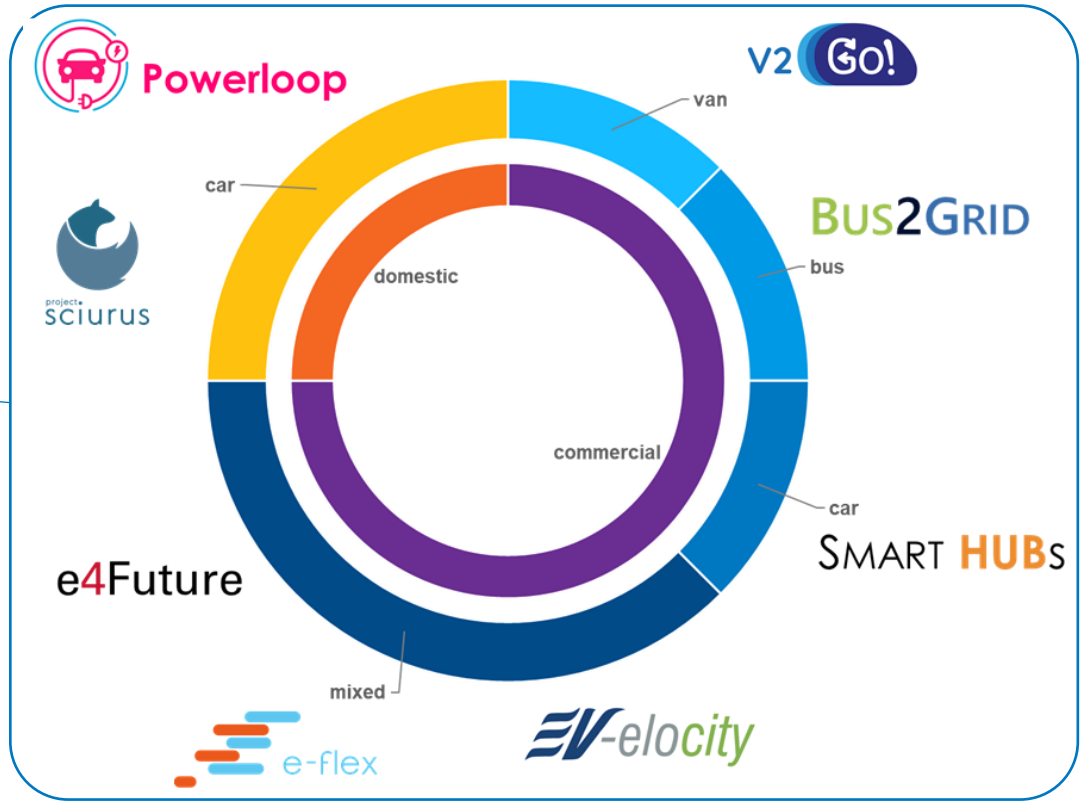
# The UK V2G programme

£30m funding from UK Government (BEIS and OZEV)




- **8 Feasibility Studies:** feasibility of innovative business models and applications for V2G

- **4 R&D Projects:** onboard charger development, V2G in on-street applications, gamification for V2G

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# UK V2G Programme Aims

1. Investigate technical and commercial feasibility of V2G technologies
2. Demonstrate V2G technologies in a commercial setting with real UK customers
3. Bring energy and automotive stakeholders together to make V2G a success
4. Develop the V2G customer proposition and advance engagement methods

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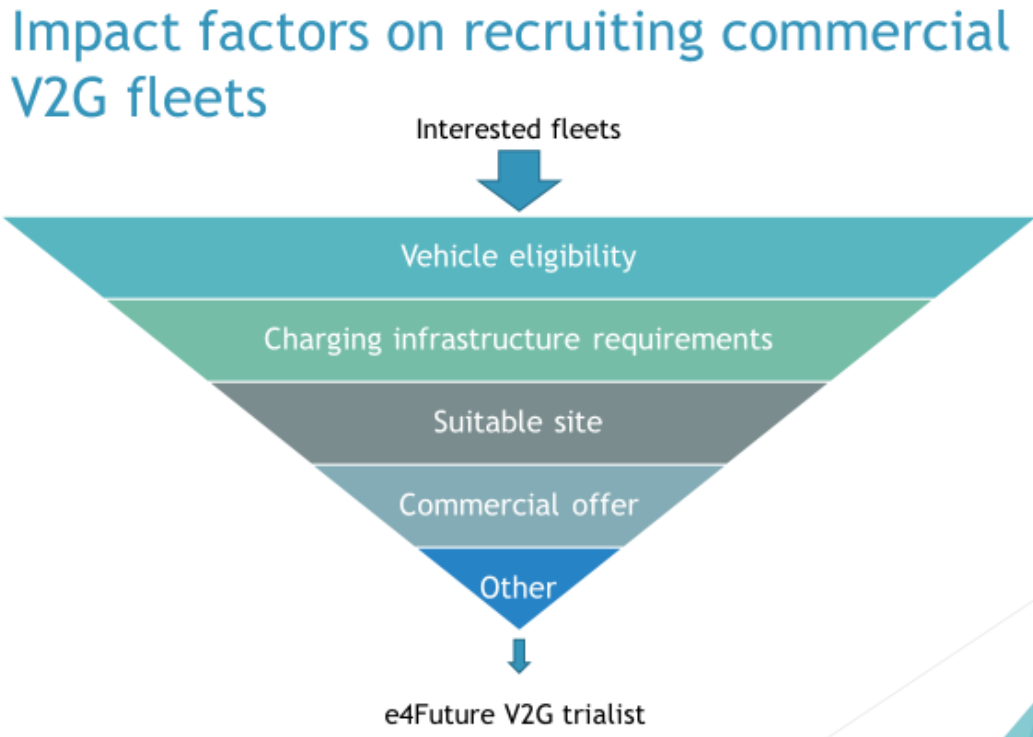
# Consumer lessons

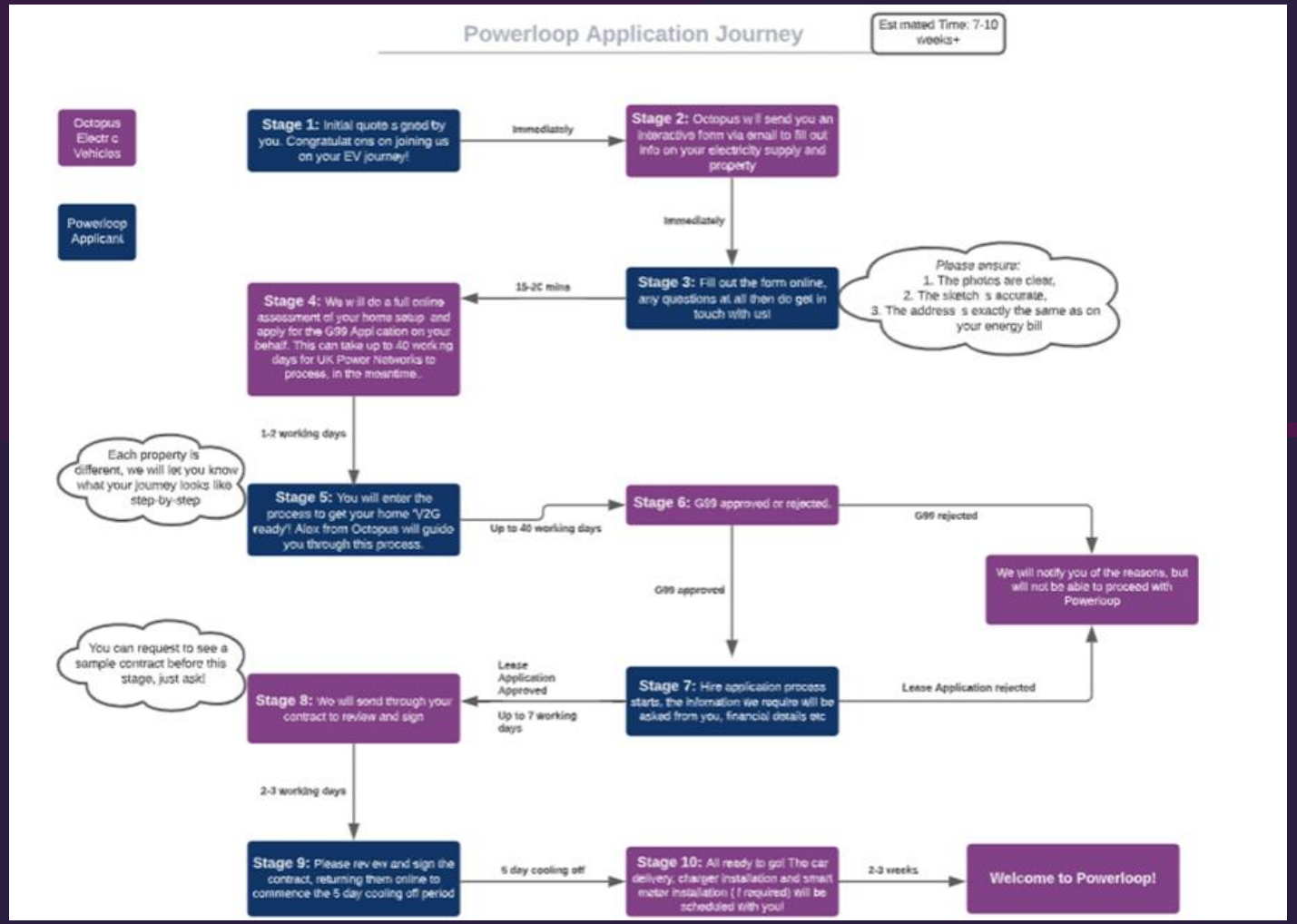
1. Lots of demand for V2G but customers still need reassurance:
   - Private consumers - vehicle availability and battery degradation
   - Fleet customers - operational impacts and sound investment business case
2. Customer interest is constrained by the few V2G vehicles currently available

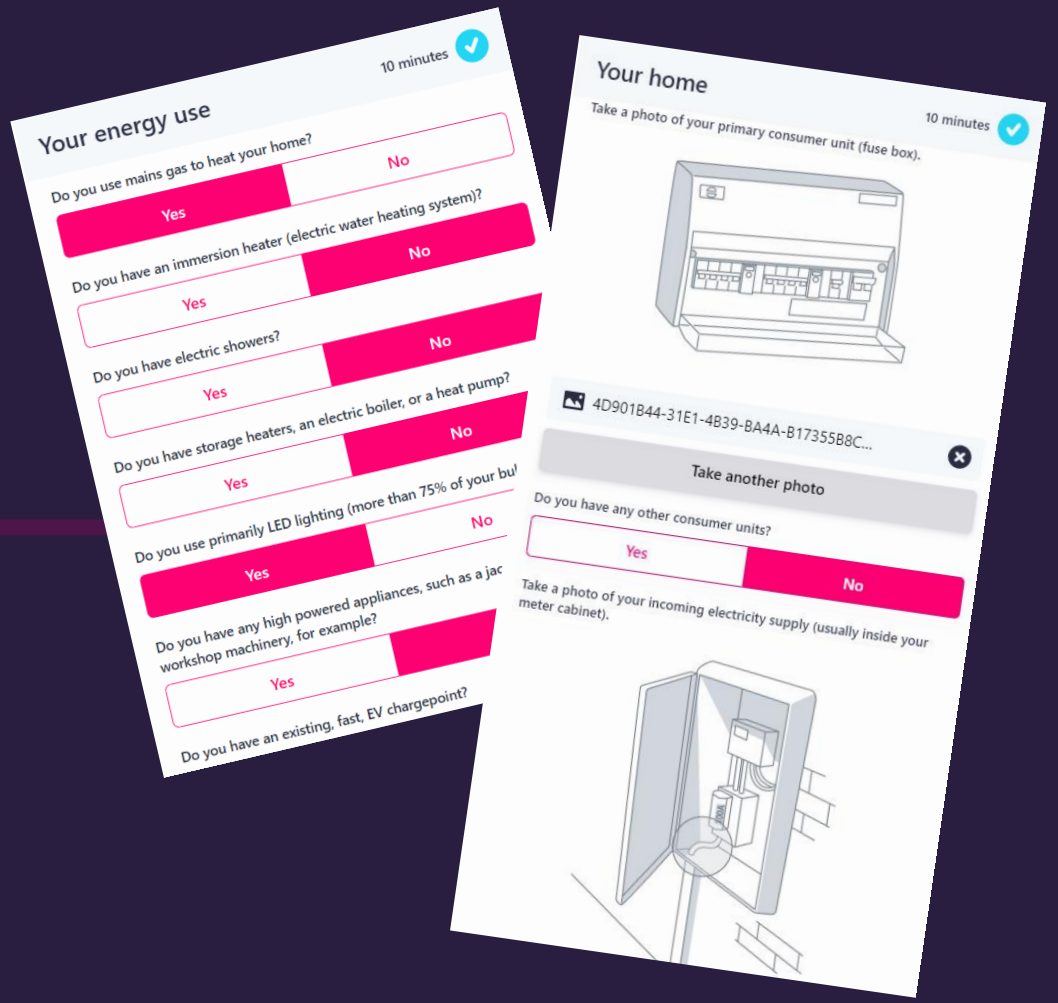
## What can be done?

- More V2G capable vehicles are required
- Educate consumers in V2G benefits
- Make customer V2G propositions easy to understand
- Link V2G interfaces with other smart technologies



# Setting expectations - from sales to delivery




octopus electric vehicles

# Commercial lessons

1. V2G business case works, but not for every user type
2. Costs and supply are still a constraint, making business case uncertain
   - grid connection, installation, equipment
3. Mostly frequency regulation and behind-the-meter services currently in use
4. Whole-system benefits worth £3.5bn/year by 2040 are available with V2G
   - Source: Imperial college/OVO Energy: “Blueprint for a post carbon society”

## What can be done?

- Focus on locations and use cases with best potential
- Drive down V2G costs & gain grid operators buy-in
- Complete UK’s DNO to DSO transition & confirm pricing to enable local flexibility markets

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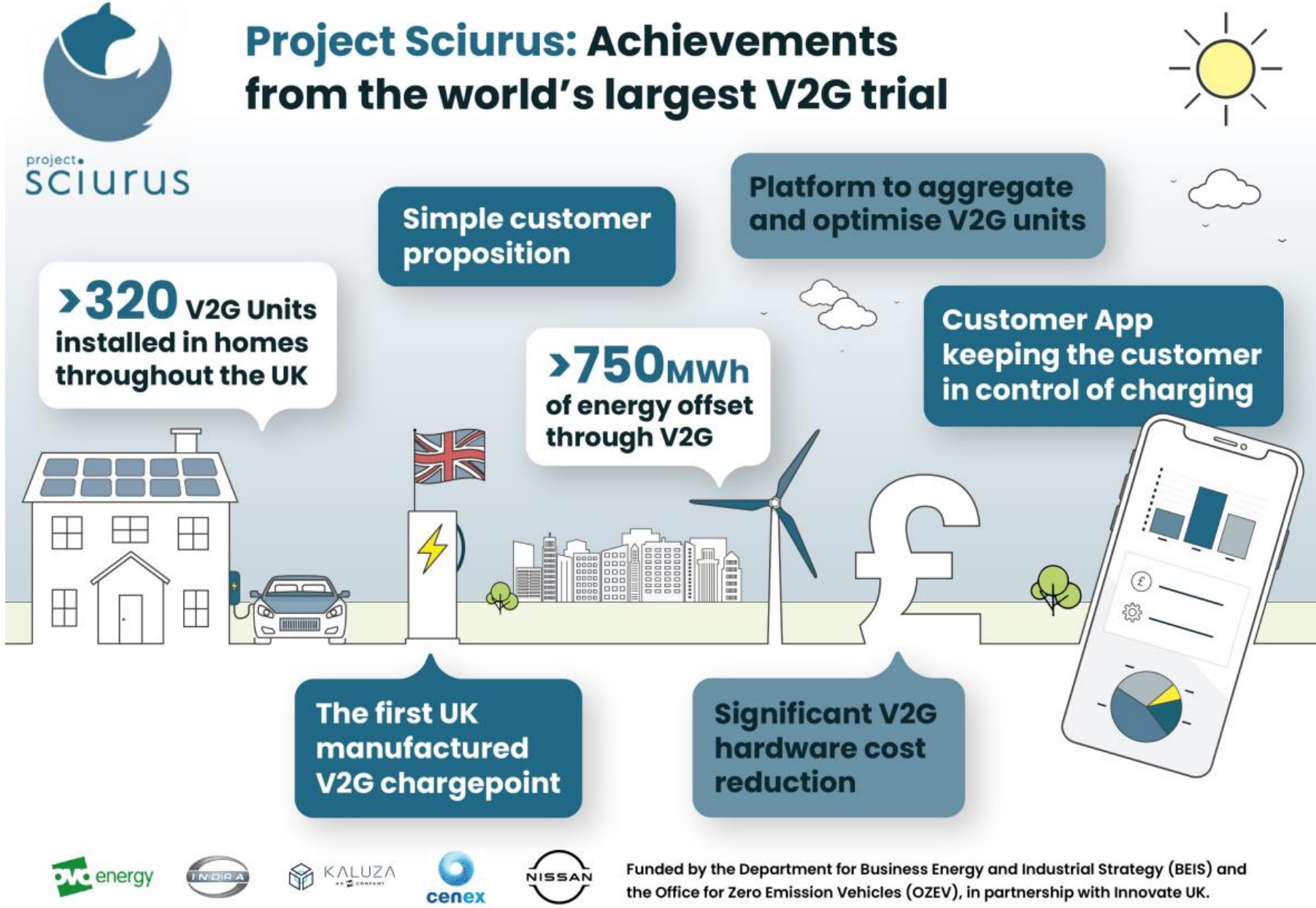
# Results – domestic V2G

**Project Sciurus Offer**
Existing EV drivers
30p/kWh energy exported

**Customer savings**
£360 annual energy bill savings

**Customer feedback**
>70% trial participants want V2G on their next EV



# Energy Lessons

1. Grid connection process is complex & takes too long
2. Export devices required to avoid network disruption in some areas
3. Moves towards smart charging can improve receptiveness to V2G
4. Ongoing reform of UK Energy Regulations impacts V2G business case

## What can be done?

- Improved Grid connection process
- Coordination of smart devices to optimise energy system benefits
- Encourage smart charging until V2G enabled vehicles are mainstream
- New V2G revenue streams will become available from 2022-2023

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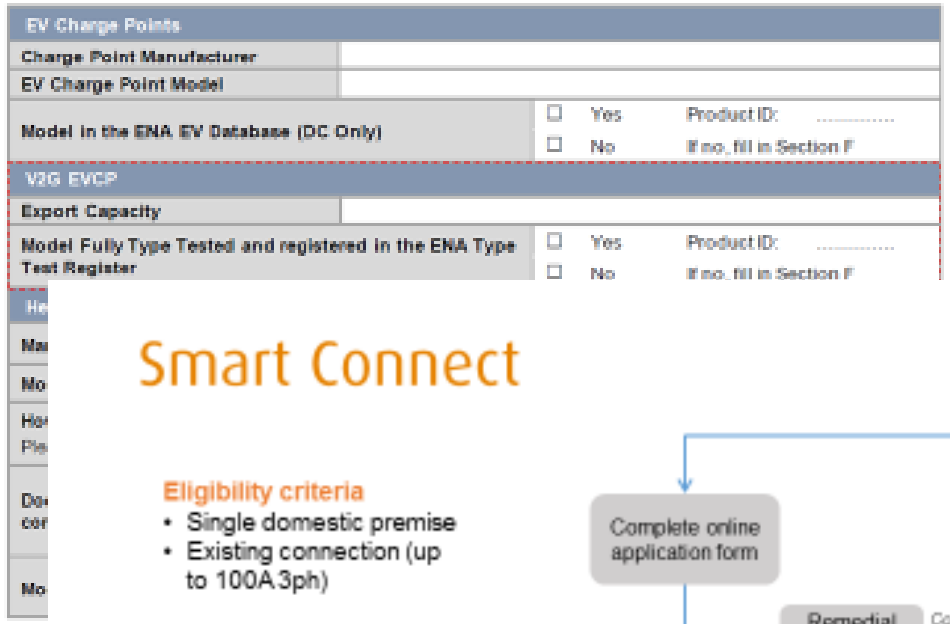
# ENA EV/HP Connection Form

**The relevant sections of G98/G99 have been drafted into the ENA EV/HP form.**

The proposed revisions have been included in the DCODE storage consultation which closes in February.

A revised form will be issued following the consultation.



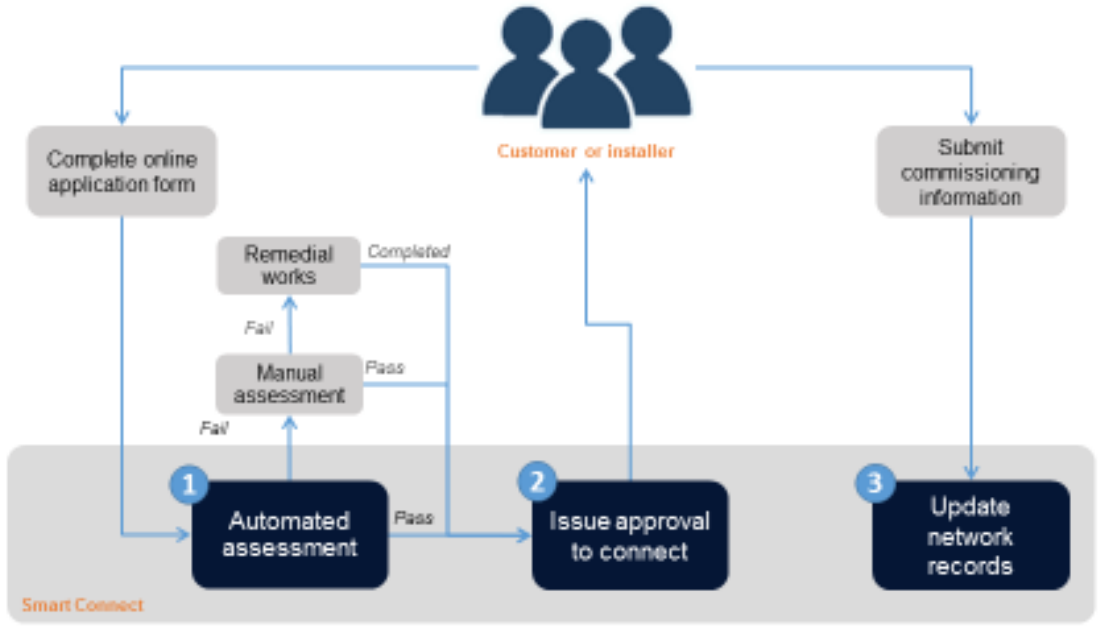
| EV Charge Points | | | |
|---|---|---|---|
| Charge Point Manufacturer | | | |
| EV Charge Point Model | | | |
| Model in the ENA EV Database (DC Only) | ☐ Yes<br>☐ No | Product ID: .....<br>If no, fill in Section F | |
| V2G EVCP | | | |
| Export Capacity | | | |
| Model Fully Type Tested and registered in the ENA Type Test Register | ☐ Yes<br>☐ No | Product ID: .....<br>If no, fill in Section F | |

## Smart Connect

**Eligibility criteria**
- Single domestic premise
- Existing connection (up to 100A 3ph)

**Equipment types**
- Solar PV
- Battery storage
- EV charge point
- V2G charge point
- Heat Pump

**Automated checks**
- Adequacy of supply
- Equipment eligibility
- Voltage rise
- Load screening
- Cut-out image




**http://www.dcode.org.uk/consulta**

**Simpler, faster LCT connections for domestic customers**

UK Power Networks

# Deliverables

cenex

Lowering your emissions through innovation in transport and energy infrastructure

Transport
Energy Infrastructure
Knowledge & Enterprise

## A Fresh Look at V2G Value Propositions

June 2020

UK Power Networks

## Press Release

23 March, 2021

### 'Game changing' digital portal for green technology launched

UK Power Networks has launched a new online portal that is making it quicker and easier for installers to connect clean technologies to customers' homes.

Smart Connect will give many technology companies an instant decision on whether they can connect domestic electric vehicle charge points, heat pumps, battery storage or solar PV, to the local electricity network. It removes the need for multiple paper forms and streamlines the process.

## V2GB
## Vehicle to Grid Britain

Project coordinator:
elementenergy

Element Energy Limited
Energy Systems Catapult
Cenex
Nissan Technical Centre Europe
Moixa
Western Power Distribution
National Grid ESO

## THE DRIVE TOWARDS A LOW-CARBON GRID

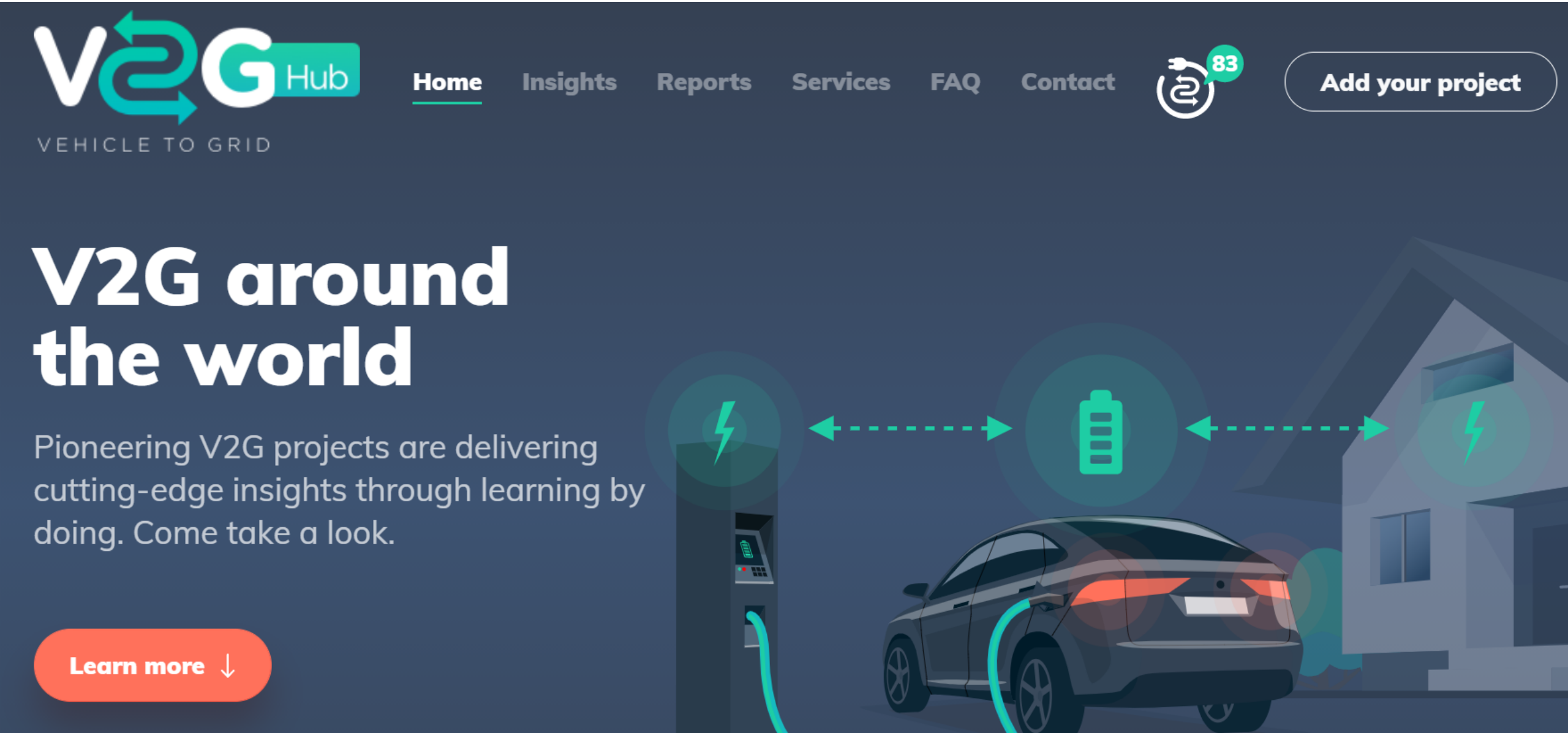
Unlocking the value of vehicle-to-grid fleets in Great Britain

NISSAN
e·on Drive
Imperial College London

## Commercial Viability of V2G:
## Project Sciurus White Paper

# Deliverables

**V2GHub Website:** https://www.v2g-hub.com/



# Thank you

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