About Us

Innovate UK KTN exists to connect innovators with new partners and new opportunities beyond their existing thinking – accelerating ambitious ideas into real-world solutions.

UKRI Innovate UK KTN

V2X Innovation Programme
Phase 2 Market Engagement Event
Agenda

- Welcome   Eleanor Marshall   InnovateUK KTN   14:00

- Event Introduction   Kate Robertshaw   BEIS   14.05

- V2X Policy Context   Dave Barker   BEIS   14:10

- V2X Innovation Programme   Kate Robertshaw &   BEIS   14:20

   Jona Ramadani

- V2X Phase 1 overview   Sophie Randall   InnovateUK   14:30

- V2X Phase 2 proposals   Josey Wardle   InnovateUK   14:40

- Request for feedback   Josey Wardle   InnovateUK   14:50

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V2X INNOVATION PROGRAMME PHASE 2 MARKET ENGAGEMENT EVENT

V2X POLICY CONTEXT
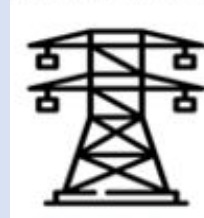
The electric vehicle revolution will increase electricity demand, but also useful energy flexibility

- **Smart charging –** shifting EV charging to off-peak periods or periods of abundant renewables

- **Vehicle-to-X technology (V2X) –** bidirectional smart charging, enabling export of energy from an EV battery to X = home, building or the grid

Reduce network and generation costs, lowering prices for all consumers
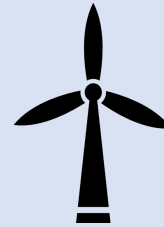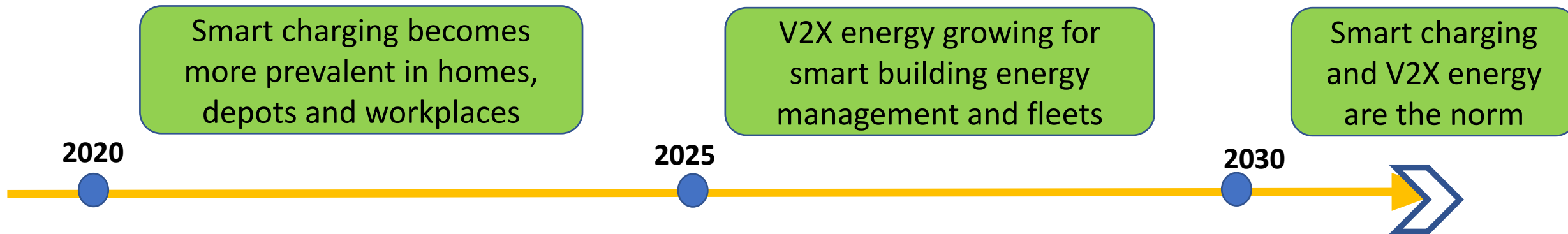
Maximise use of variable renewables

Reduce cost of charging for EV drivers (ca. £500 saving for average driver by smart charging)

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The smart charging vision

Smart charging becomes more prevalent in homes, depots and workplaces

V2X energy growing for smart building energy management and fleets

Smart charging and V2X energy are the norm

2020

2025

2030

Identified barriers:
- Consumer awareness and incentivisation
- Cyber security and grid stability risks
- Public smart charging
- Commercialisation of V2X energy

NET ZERO INNOVATION PORTFOLIO

£385m Advanced Nuclear Fund

£1bn+ Net Zero Innovation Portfolio (2021~)

Floating Offshore Wind

Energy Storage & Flexibility

Built Environment

Disruptive technologies

Greenhouse Gas Removal

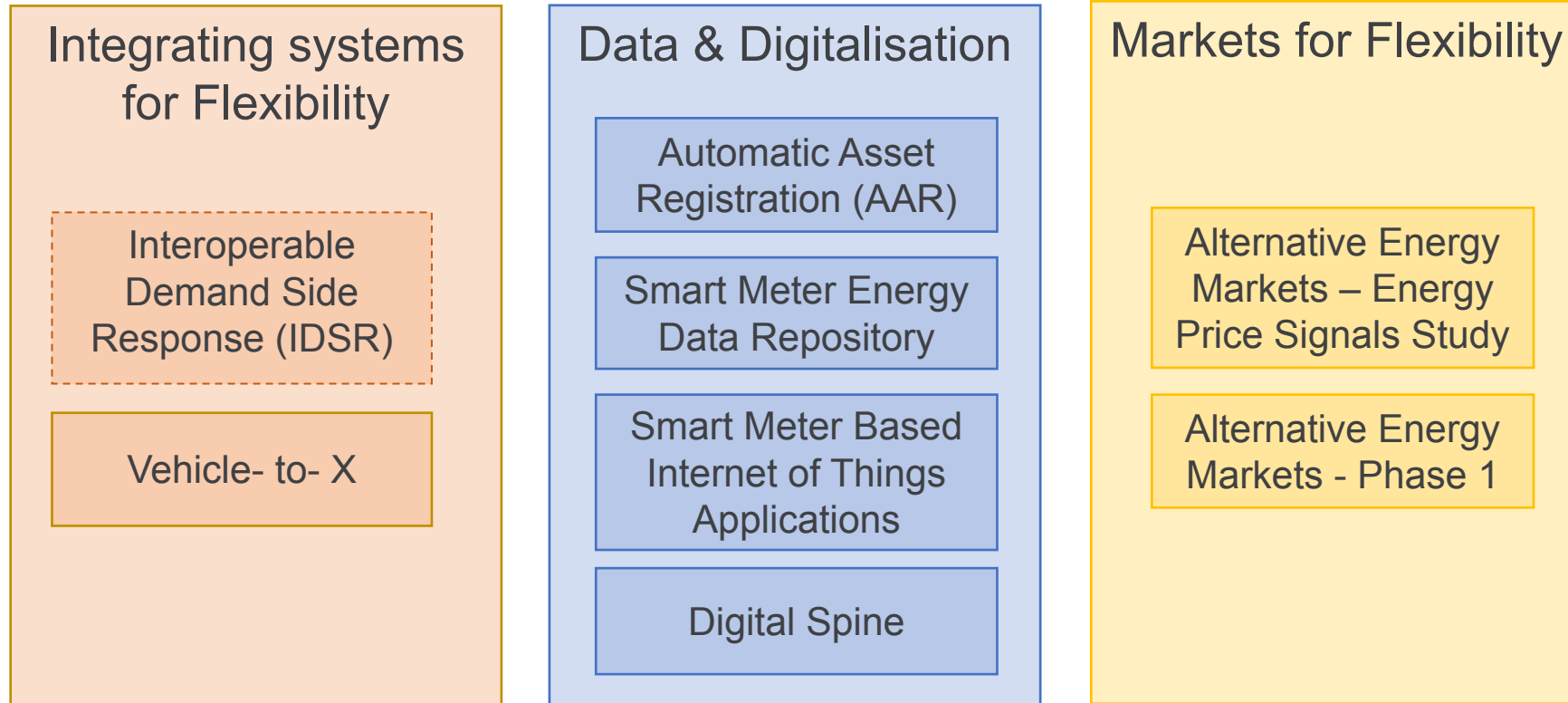Bioenergy

Advanced CCUS

Industry

Hydrogen

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Flexibility Innovation Programme

Seeks to enable large-scale widespread electricity system flexibility through smart, flexible, secure, and accessible technologies and markets

Integrating systems for Flexibility

Interoperable Demand Side Response (IDSR)

Vehicle- to- X

Data & Digitalisation

Automatic Asset Registration (AAR)

Smart Meter Energy Data Repository

Smart Meter Based Internet of Things Applications

Digital Spine

Markets for Flexibility

Alternative Energy Markets – Energy Price Signals Study

Alternative Energy Markets - Phase 1

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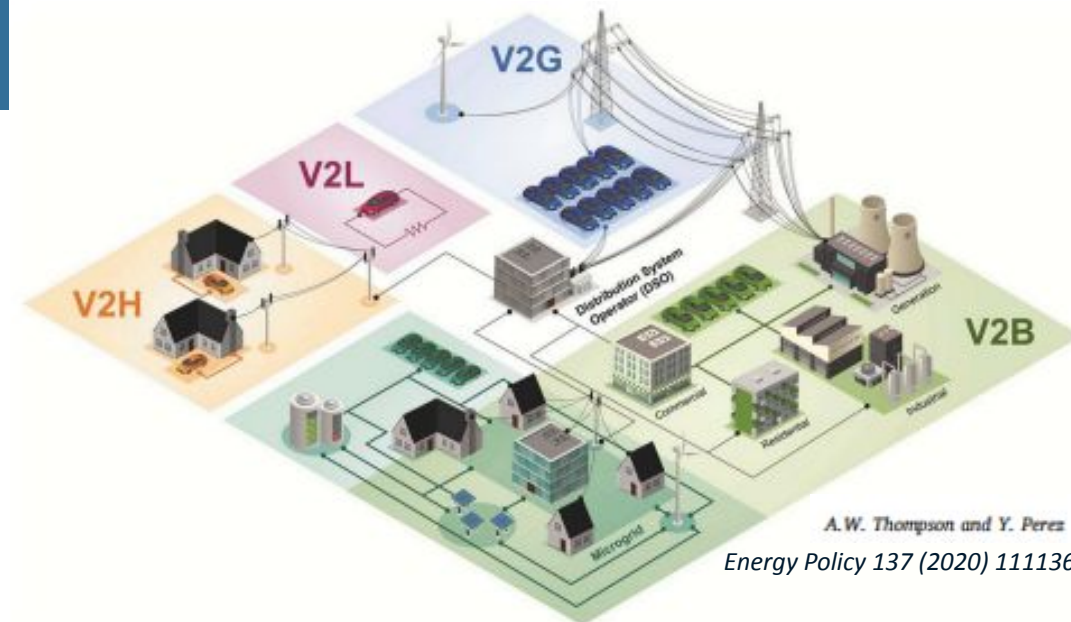
Flexibility Innovation Programme

Seeks to enable large-scale widespread electricity system flexibility through smart, flexible, secure, and accessible technologies and markets

Data & Digitalisation

Markets

7 sub-progra mmes launched

Integrating systems

Over £49m launched

Over 40 projects supported

13 events, **>800** engaged

www.gov.uk/government/publications/flexibility-innovation

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V2X Innovation Programme Summary

A.W. Thompson and Y. Perez
Energy Policy 137 (2020) 111136

Programme Funding: Up to £ 12.6 million

Timing: September 2022 – March 2025

Phase 1:   17 research & development projects
                     Awarded £3.2 million funding
                     Running September 2022 - August 2023

Phase 2:   **Anticipated £ 9.4 million funding available**
                     for small-scale demonstration projects

https://www.gov.uk/government/publications/v2x-innovation-programme

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V2X Innovation Programme

Programme Objectives

- **Motivate, enable and incentivise** a range of consumers

- Address business & consumer **barriers & concerns**

- Inform **future V2X policy decisions**

- Facilitate an **increase in V2X capacity**

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V2X Innovation Programme Objectives

Phase 1:

• **Design and develop** new V2X components, sub-systems, products & services, including business models

Phase 2:

• **Test and demonstrate** new V2X products & services

• Demonstrate **V2X as source of flexibility** in markets and services

• Demonstrate **V2X integration** with building/micro-grid energy management, and with the wider digital and energy systems

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V2X Phase 1 Projects

- Delivering prototype hardware, software or business models which can reduce entry barriers for domestic or non-domestic use of V2X bi-directional chargers to provide energy flexibility services

- Addressing one or more of the following challenges:
  - Reduce the cost gap between V2X and single direction smart charging without compromising safety or capability
  - Develop next generation on or off-vehicle bi-directional charging using DC Combined Charging System (CCS), DC Charge de move (CHAdeMO) or AC V2X technology
  - Develop innovative V2X commercial propositions different to the grid services and business models demonstrated in the UK to date
  - Improve consumer experience of V2X operation
  - Investigate V2X energy barriers and challenges to innovative solutions that increase the deployment and uptake of V2X

Phase 1 projects – scope analysis

Range of challenges addressed:

- Cost reduction
- New technologies
- New use cases
- Improving the customer
- experience
- Energy barrier solutions

Range of charging protocols:

- AC
- DC
- DC CHAdeMO
- Megawatt

Range of use cases:

- V2H
- V2V
- V2B
- V2G
- Heavy freight
- Public spaces (on-street and destination car parks)

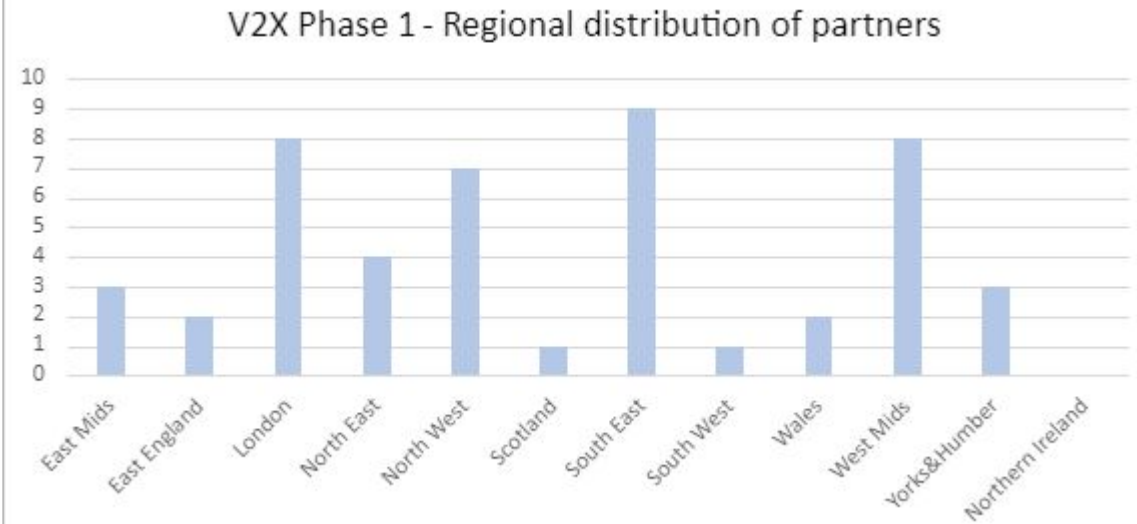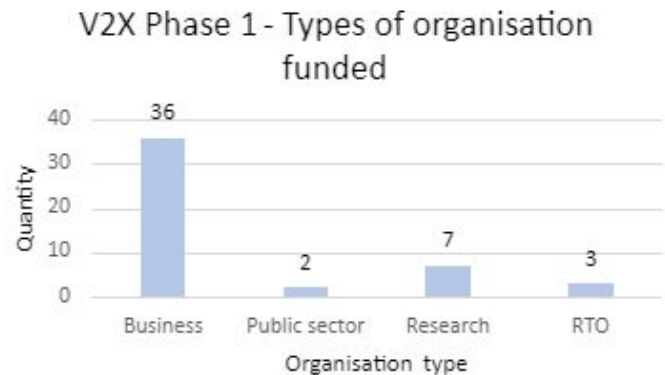# Phase 1 Projects – partner analysis

V2X Phase 1 Partners

- Passiv UK Limited
- Active Building Centre Ltd
- Ev.Energy
- Energy System Catapult Limited
- Indra Renewable Technologies Limited
- DevTank Ltd
- Entrust EV Technology Ltd
- University of Huddersfield
- Otaski Energy Solutions Ltd
- Northumbria University
- Miralis Data Limited
- Turbo Power Systems Limited
- Gridicity Ltd
- DoubleMSC Solutions Limited
- University of Warwick
- Arcadis Consulting (UK) Limited
- Element Energy Limited
- Wallbox UK Limited
- Kaluza Ltd
- OVO Energy Ltd

- Volkswagen Group UK Limited
- Syselek (UK) Ltd
- Levistor Ltd
- Compound Semiconductor Applications Catapult Limited
- Smart Power Networks Ltd
- EDF Energy R&D UK Centre Limited
- Loughborough University
- Urbanomy UK Limited
- Oxfordshire County Council
- Agile Charging Ltd
- HiyaCar Limited
- Hangar19 Ltd
- Crowd Charge Limited
- Petalite Limited
- RTS Technology Solutions Limited
- Gengame Ltd
- Evergreen Energy Ltd
- Chameleon Technology (UK) Limited
- Enappsys Ltd
- QBots Energy Ltd
- Keele University
- University of Nottingham
- EV Mobiliti Limited

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V2X Phase 1 Projects

- Vehicle to Heat Pump
- V2X-Flex
- Next Generation V2X Power Module
- Entrust V2H Charger
- Bi-directional MIMO DC-DC Converter
- V2X Local Network Fleet Solution
- EV-shAIR
- ENSTOREL-V2X
- Zero Carbon Tariffs with Cashback for V2X
- V2BUILD

- INFLEXION
- Megawatt Charging Multidirectional microgrids
- VEhiCle TO energy communitieS (VECTORS)
- Leasy V2H
- BEVScanV2X
- Secure-V2B
- V2VNY

Press Release:
https://www.gov.uk/government/news/new-plan-for-smart-electric-vehicle-ev-charging-could-save-consumers-up-to-1000-a-year

Find out more about the V2X Phase 1 projects:
https://www.gov.uk/government/publications/v2x-innovation-programme-successful-projects

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V2X INNOVATION PROGRAMME PHASE 2 MARKET ENGAGEMENT EVENT

V2X PHASE 2 PROPOSALS
SUBJECT TO CHANGE

V2X Innovation Phase 2 - Anticipated Competition Aims

In a real world environment:

- Demonstrate new V2X bi-directional charging technologies which can deliver increased flexibility from Electric Vehicles at lowest cost

- Demonstrate new viable V2X business propositions that engage different types of consumers in V2X – behind-the-meter or grid services

- Demonstrate new V2X propositions which integrate Electric Vehicles with other sources of energy flexibility

In order to:

- Accelerate commercialisation of V2X energy technologies and services

- Bring together diverse stakeholders across the energy and transport sectors to overcome barriers to V2X deployment

- Raise awareness & increase business and consumer interest in V2X energy

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Phase 2 competition proposals

Anticipated £9.4 million funding available for up to 6 demonstration projects

Demonstration requirements:

- Demonstrate a new V2X flexibility proposition using <u>EITHER</u>:

  - 10-20 NEW bi-directional charging units installed (using CCS, CHAdeMO or AC protocols) <u>OR</u>

  - 50-100 EXISTING installed V2X units

- 6-month minimum trial period - including data collection & project analysis leading to a Trial Report for public dissemination

- Real-world trial locations – domestic or non-domestic, public or private access, single or multiple users

- Test the viability of a new V2X business model

Phase 2 competition proposals

Timing:

- Proposed application period – March to May 2023

- 18-month project duration – Oct 2023 to March 2025

- Phase 2 projects won't start (Oct 23) until Phase 1 is complete (Aug 23)

Eligibility:

- On-road EVs only - Cars, vans, freight, RCVs

- Consortia applications only – stakeholders from across the transport and energy markets

  e.g. vehicle manufacturers, charging providers, DNOs, energy suppliers, flexibility operators, end-users and infrastructure owners

- OPEN competition – DO NOT NEED to be involved in Phase 1

Trial Report proposals

Projects to collect & analyse trial data & report findings for public dissemination

- Proposed minimum content:

  o description of the V2X use case and market proposition being trialled

  o tariff information and commercial viability

  o trial location information

  o charging and discharging behaviour exhibited

  o perception & behaviour change

- Proposed data needs:

  o Charging/discharging activities – all locations

  o Vehicle telematics

  o Input from trial participants

  o Economic transaction data

Key Questions

Are the timescales reasonable?

- A minimum 6 month trial?
- Is an unfunded trial period of interest?

How many units are sufficient to:

- trial new V2X technology?
- trial new flexibility propositions?
- Is the option of using EITHER New OR Existing bi-directional charging units attractive?

Is the data study proposal reasonable?

- Content
- Data sources
- Timing

Will these areas of support increase V2X interest & accelerate adoption ?

- Behind the meter services and Grid services
- All charging protocols
- Use cases – private, public charging & fleet
- Integration with wider energy system
- Anything else we should be considering?

Who needs to be involved in consortia?

- Any barriers to participation?

Please feedback on these proposals

Please send any feedback to
flexibilityinnovation@beis.gov.uk
by Wednesday 8th February 2023

Thanks for your attention

For further support please contact:

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