

BEIS INNOVATION PROGRAMME: BEYOND OFF STREET SMART METER ELECTRIC VEHICLE CHARGING TRIAL

Up to ~£5M funding available to procure up to two SBRI projects to develop and trial Electric Vehicle (EV) chargers that utilise the Smart Metering system to perform smart charging in contexts beyond the existing smart meter roll out scope.

Smart Meter Delivery, BEIS

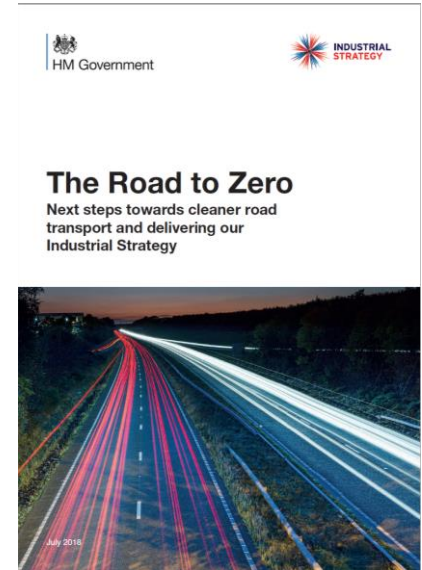
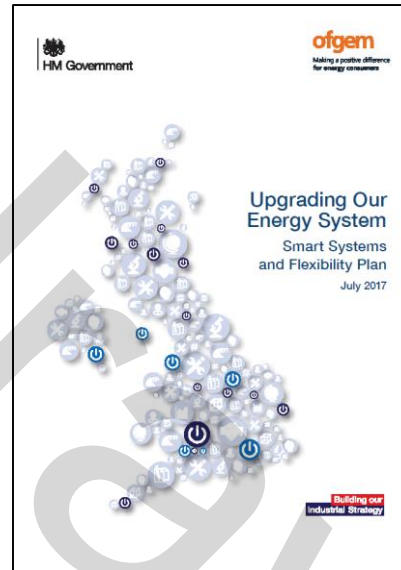
March 2020

Innovation Funding

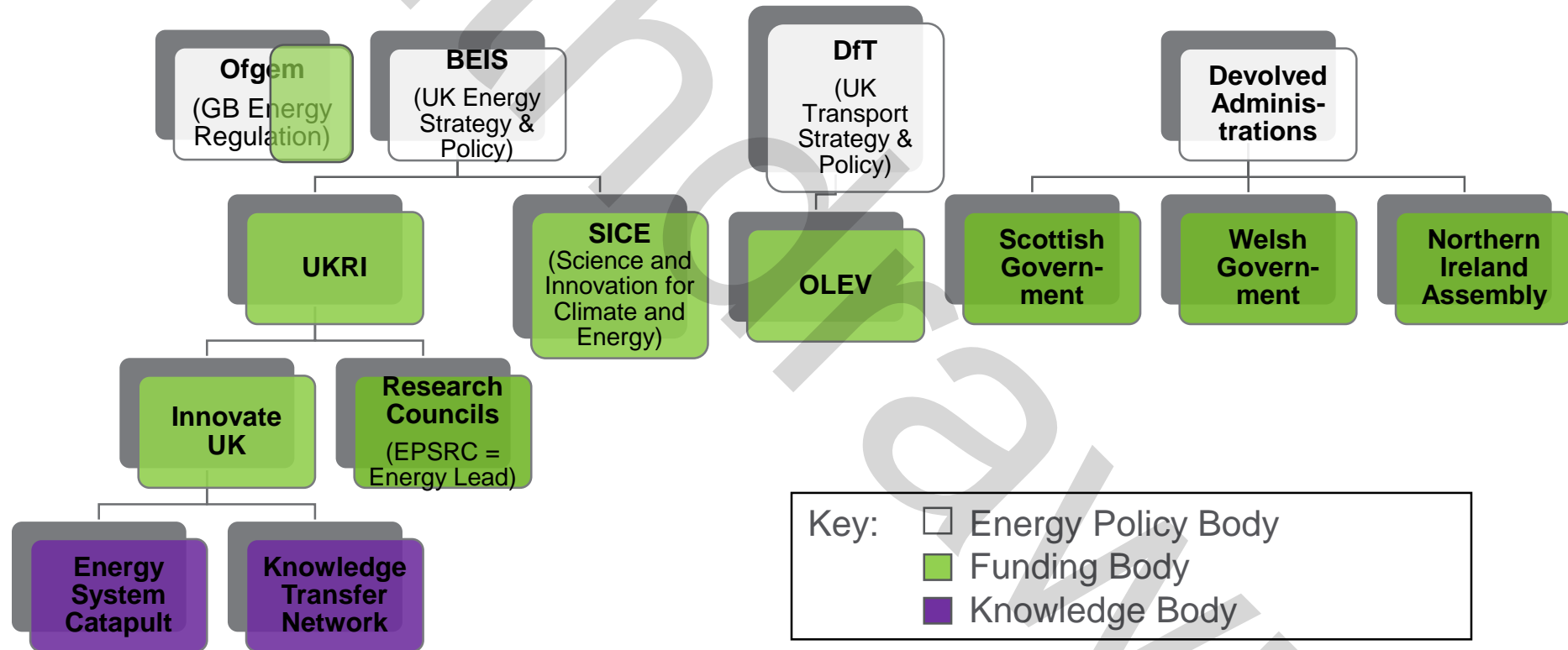
Science and Innovation for Climate and Energy
BEIS



Smart Energy Innovation Support – Policy Drivers



Energy Innovation Support Landscape - Organisation Overview



BEIS Energy Innovation Programme

The overall aim of the £505m BEIS Energy Innovation Programme is to accelerate the commercialisation of innovative cheap, clean, and reliable energy technologies by the mid 2020s and 2030s.

Within each theme the budget is allocated to a mix of development and demonstration projects focused on specific objectives, underpinned by a programme of open, cross-cutting support

£180m
Nuclear

Driving down costs and building new UK supply chains and skills

£15m
Renewables

Driving down the cost of low carbon electricity at scale

£100m
Industry

Low carbon options for industry, lowering energy costs

£90m Built Environment

More cost effective energy efficiency and low carbon heating

£70m Smart Systems

Cost effective flexibility for a smarter, flexible, more efficient low carbon UK energy system

£50m Cross Cutting Supporting disruptive innovations (particularly for SMEs), including using innovative finance.

BEIS Smart Energy Innovation Programme

Smart Energy Innovation Programme: (~£70m budget)

www.gov.uk/guidance/funding-for-innovative-smart-energy-systems

Energy Storage Competitions (£30m)

Focused on cost reduction and large scale demonstration

Demand Side Response & Reduction Competitions (£20m)

Engaging domestic & commercial consumers with innovative DSR and demand reduction applications

Vehicle-to-Grid Competition (£18m + £12m OLEV)

Innovative technology and business approaches to harness vehicle-to-grid

Flexibility Markets Competitions (£4.6m)

Innovative approaches to value and trade flexibility at local levels (Flex Competition running until March 2021)

Smart Meter Application Competitions (£13m)

Public EV Smart Chargepoints, Smart Meter Load Control and Smart Energy Savings Programmes (running until March 2021)

International Collaboration Competitions (£9m)

Smart energy focus, announced to date: UK-South Korea - £3m (+£3m South Korea); UK-Canada - £6m (+\$10m Canada)

Supporting innovation – Smart Energy

Committed **up to £70m funding to support smart energy innovation** up to 2021. (Within the BEIS £505m Energy Innovation Portfolio)

Delivery of **Smart Energy Innovation competitions**, such as Smart Meter Load Control (£2.7m) and Vehicle-to-Grid (£20m).

£102.5m Prospering from the Energy Revolution programme

Launched to develop integrated local energy solutions across power/heat/ transport.

4 demonstrators and 10 energy system design projects already funded. ([see link](#))

£274m Faraday Battery Challenge to lead R&D and manufacture of EV batteries.

Looking at all aspects of the supply chain, battery research and support.

The UK's involvement in the **international Mission Innovation programme**

Joint innovation competitions with S. Korea and Canada, with a focus on smart energy systems and technologies.



Policy Context

EV Smart Charging Consultation & Smart Metering Implementation Programme

Smart Metering Implementation Programme

BEIS



OLEV EV Smart Charging Consultation

Phase 1

- Proposals for **device-level regulations** mandating that all private chargepoints are smart
 - Included proposal that chargepoints meet BSI standards, to be published in early 2021
 - Legislation to follow
-

Phase 2

- Contained a **call for evidence on long-term operational requirements** beyond the device
 - Suggested that a holistic approach, covering all contexts should be considered
 - Proposed smart metering infrastructure as a lead option
 - Decision point between 2020 and 2022
-

4 Policy Objectives Spanning Both Phases

Consumer Protection

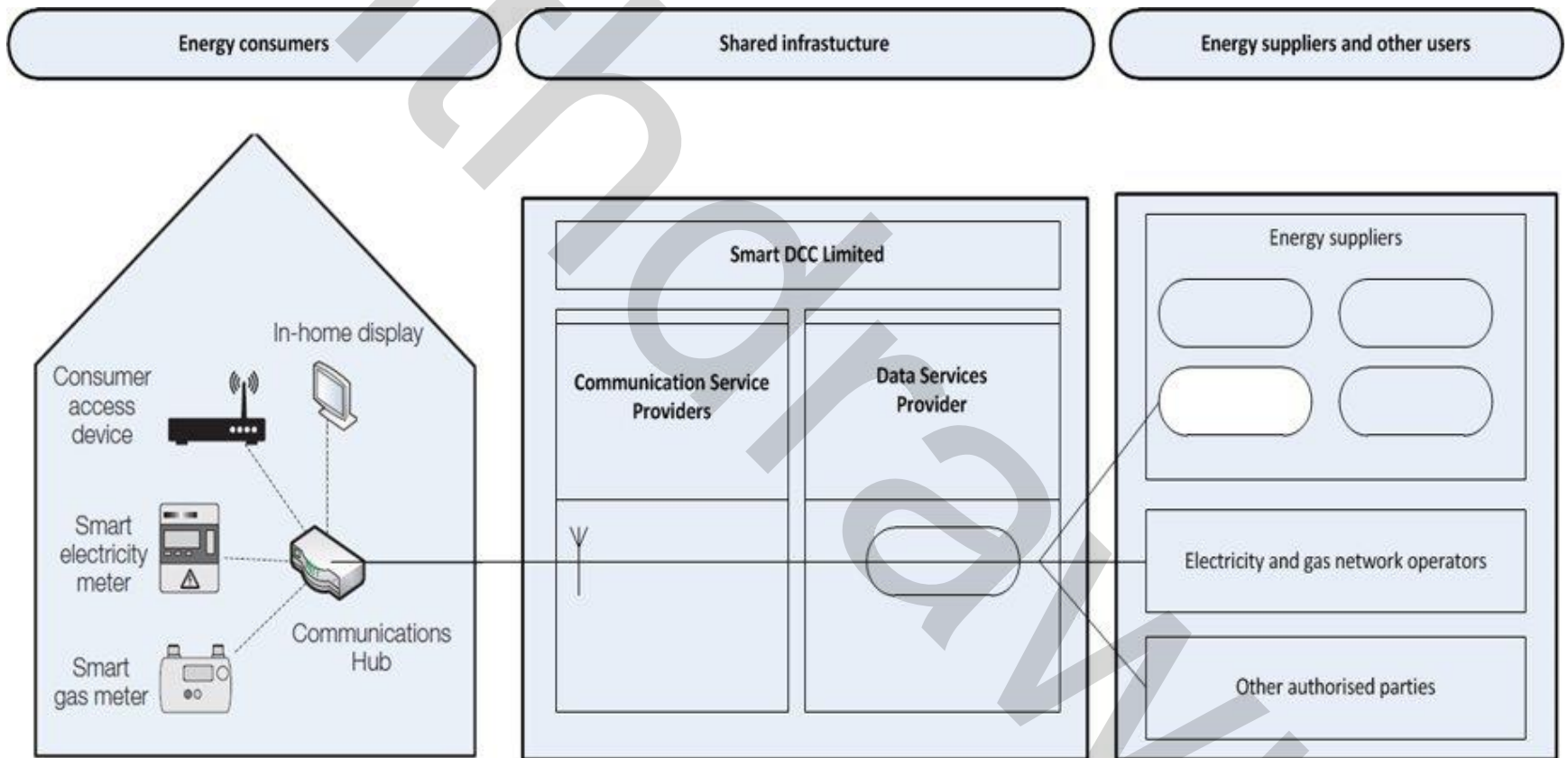
Grid Protection

Innovation

Uptake



Smart Metering System Overview



Smart Meter Roll Out and Meter Availability

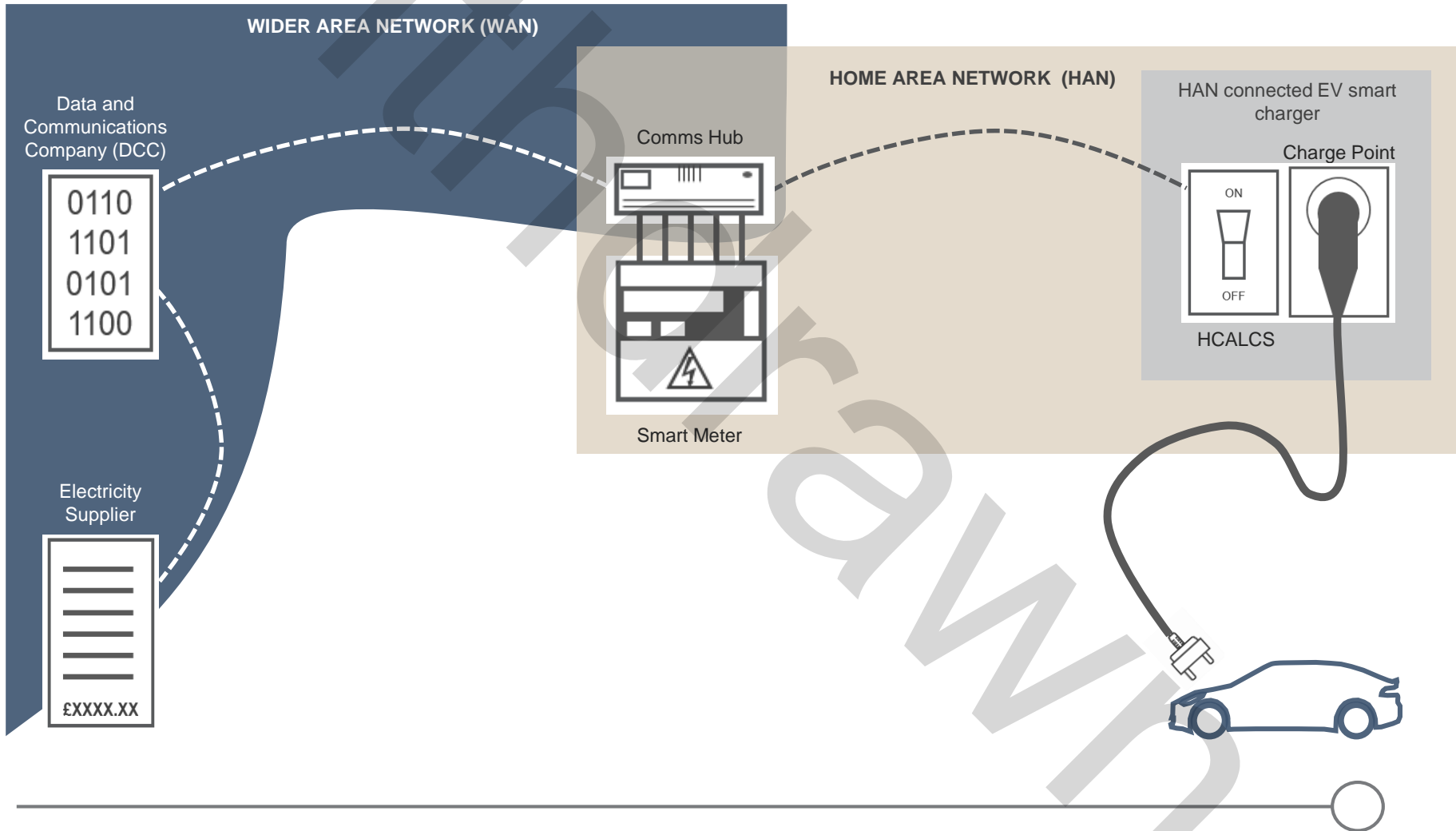
- 16.5M smart and advanced meters in operation in GB at end 2019.
- SMETS2 meters installed at an average rate of 18k per day.
- The government has consulted on a policy framework for smart metering from 1 January 2021.
- The current obligation on energy suppliers to take all reasonable steps to install smart meters to all homes and small businesses in GB by the end of 2020 remains in place.
- >7 Meter Manufacturers currently vending SMETS2



Smart Metering Against the Four Smart Charging Policy Objectives

Grid Protection	<p>Multi Layered approach:</p> <ul style="list-style-type: none"> •Device level requirements and assurance •Encryption and multi-party verification •Annual independent assessment of risk, system and users
Consumer Protection	<p>Interoperability</p> <ul style="list-style-type: none"> •Devices built to common specifications setting out minimum functionality •Publicly available interface specifications allowing system access •Active industry governance
	<p>Data Access</p> <ul style="list-style-type: none"> •Established privacy and protection framework on management of data •Consumers have control over who can access their data
Consumer Uptake	<ul style="list-style-type: none"> •A minimum of 99.25% of GB premises via the DCC Wide Area Network •Smart Meters offered to every home by 2020 obligation
Innovation	<ul style="list-style-type: none"> •A communications platform with ability to adapt to new requirements •Established industry process for adding new functionality while maintaining interoperability

EV Smart Charging Using Smart Meter Communications Infrastructure



Smart Metering Load Control Initiatives

Load Control Demonstration Projects under way

- Demonstrating existing load control functionality of the smart metering system
- Two projects one ALCS (EDMI), one HCALCS (EDF)

Proportional Load Control Functionality

- Adding flexibility and precision into the smart metering load control functionality
- Anticipated to be incorporated into the smart metering system by November 2020
- Device Specifications available currently
- May not be feasible to incorporate into these projects (additional complexity, time)



The Beyond Off Street Programme

Objectives, scope and outline

Smart Metering Implementation Programme

BEIS



The Beyond Off Street Programme

Objectives, scope and outline

- Rationale, programme objectives
- Programme scope and stages
- Technical and bid requirements
- Governance structure



Why do we need a “Beyond Off Street” Smart Meter EV charging solution?

Encourage innovation to utilise Smart Metering technology in new contexts

- Current scope: domestic and micro business premises (“off street”)
- Need to demonstrate **Smart Meter** system’s ability to perform EV smart charging “**beyond off street**”
- A single system which works in all contexts, offering: Grid Protection, Consumer Protection, Innovation and Consumer Uptake



Outcomes

Programme **outcomes** and **policy links**

Prove smart meter load control functionality in different contexts beyond domestic and microbusiness off street charging

Improved evidence base for Government decisions on long term options for EV smart charging

Smart Systems & Flex Plan

Road to Zero

Smart Meters Cost benefit analysis

Industrial Strategy

Clean Growth Strategy

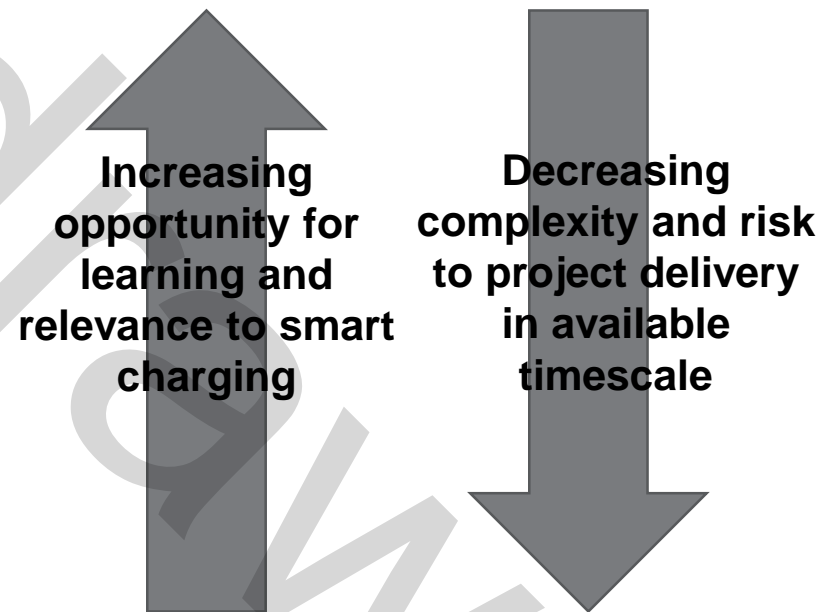
Net Zero



Target Charging Contexts

Trade off between different contexts and complexity

- **Primary** target (highly desirable): on street parking outside homes
 - where chargepoints and associated power may be provided by the local authority
- **Secondary** target: (desirable): work place charging
- **Other contexts:** other locations beyond domestic and microbusinesses will be considered e.g. retail




Programme Scope

First phase: Device Development – May 2020 to March 2021

- Complete detailed design of chargepoint device and manufacturing / production plan
- Manufacture at test scale (c. 10 devices)
- Device Certifications excluding Commercial Product Assurance
- Test the device in conditions simulating the charging contexts
- Establish arrangements for implementing second phase trial
- **Assessment of outcome of first phase – break clause – second phase contingent on success and funding**

Second phase: Trial – April 2021 to March 2022

- Complete Commercial Product Assurance
 - Manufacture at trial scale (c.100 chargepoint devices)
 - Design a field trial to deploy devices in a real-world setting
 - Implementation of trial including installation and use of devices in real world setting such as on-street parking context
 - Successfully demonstrate that the smart metering platform can perform load control of smart EV chargepoints in contexts other than domestic and microbusiness
 - Evaluation programme and sharing of lessons
-
- 

Programme Scope – does not include:

Feasibility stage

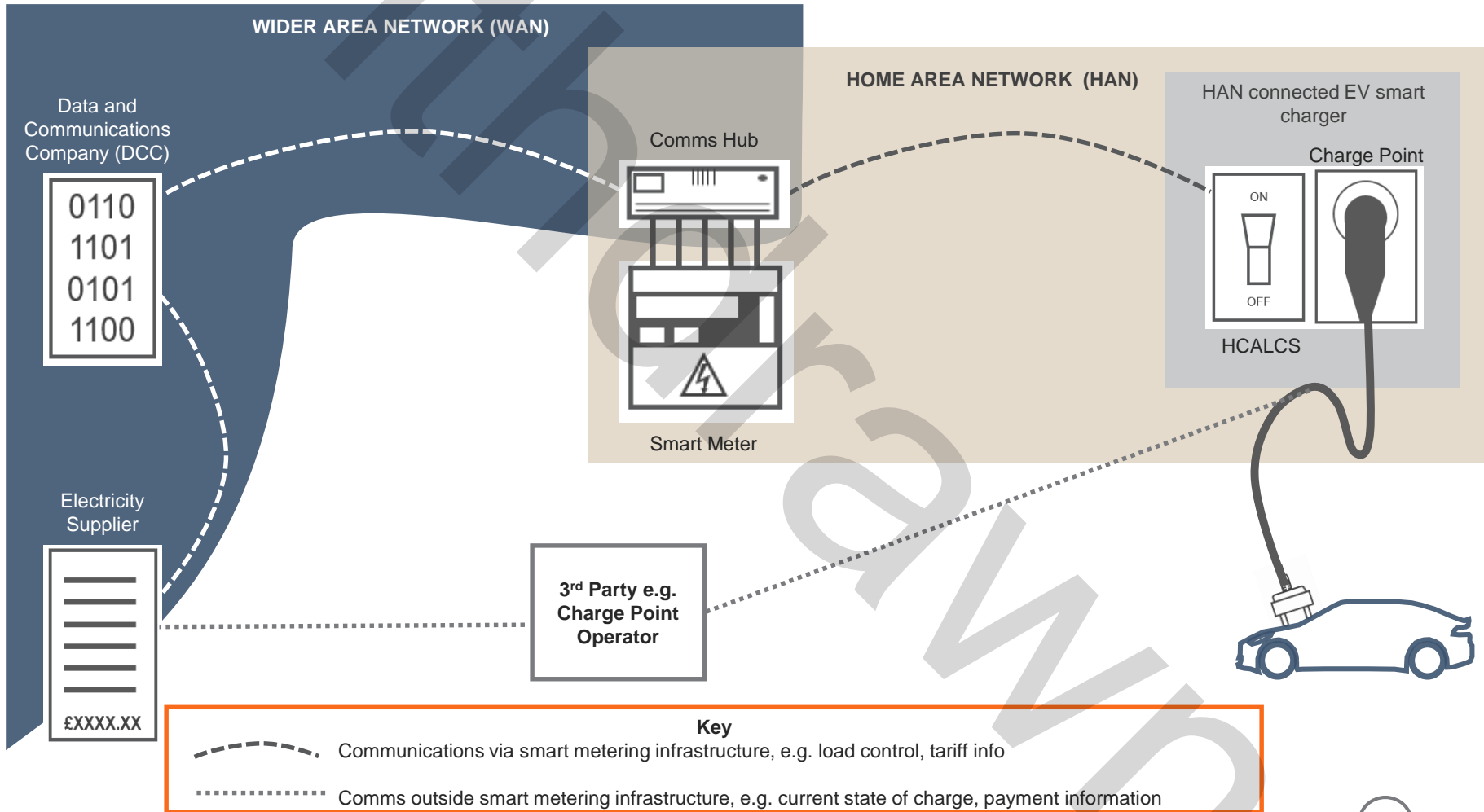
- The technology and main componentry exists already
- The innovation is in the integration of elements and application in a different context
- Applicants will need to present a high level preliminary design for the bid
- Applicants will need to present a plan for securing EV charging locations and associated partnerships

Infrastructure upgrades

- Funding will not cover the cost of extensions to or reinforcement of electricity supply infrastructure



Potential communications in and outside smart metering under this project



Device Functionality to be demonstrated at trial

Must have functionality	Potential functionality that could be included in the trial
<p>The ability for an energy supplier to securely control load using a charger connected to the smart metering system</p>	
<p>The ability to remotely configure two levels of charging through ALCS/ HCALCS smart meter functionality - expressed as a percentage of the maximum charging capacity of the supply to the charger (e.g. 100% and 75% of full charging capacity)</p>	<ul style="list-style-type: none"> • Proportional load control • Demonstrate 'concept' of a third party influencing or controlling load e.g. DNO • Non-load control functions e.g.: payment mechanism communications, battery state information • Other SMETS functionalities demonstrating innovation
<p>The ability to facilitate at least one DSR Use Case scenario, e.g.:</p> <ul style="list-style-type: none"> • Demand shifting for peak avoidance / response to price signals / capture low carbon electricity • Local network constraints management (i.e. DNO use cases) • Provision of Ancillary services to system operators (i.e. NG use cases) 	<p>More than one of the use cases</p>
<p>The ability to log and communicate the dates and times of: load control events; and enablement/ disablement of frequency response</p> <ul style="list-style-type: none"> • The ability to monitor and record energy consumption (either using smart meter data or another out of band method) • Compliance with SMETS requirement for ESME • Easy-to-use user interface 	

Bid Requirements

Evidence to include in your tender

- Description of the delivery consortium
- Evidence of partnerships established, and a plan for delivery of trial (including hosting of installations)
- High level preliminary device design, including e.g.:
 - Schematic diagrams (2D representation)
 - Core functions and components
 - Design configuration defining in broad terms how components will interface
 - Outline production plans / approach
- Device functionality specification
- Charging contexts
- DSR use cases
- Plans for results analysis (including assessment of host and user experience)



Technical Solutions

Looking for ideas and innovation

- Solutions may be based on existing chargepoint designs and existing (SMETS) smart metering equipment
- Possible approaches:
 - New chargepoint unit design manufactured and installed in new locations
 - Retrofit smart metering equipment into existing (i.e. installed) chargepoints
 - Replace installed chargepoints with otherwise similar smart meter-integrated units
- Innovative use of other SMETS functionalities (beyond the minimum requirements), relevant to the principal objectives and charging contexts
- Must satisfy all applicable and over-arching standards and regulations pertaining to design, operation and location in real-world settings
- Commercial Product Assurance (CPA) from the National Cyber Security Centre (NCSC)



Consortium Members

What does the ideal consortium look like?

Must have	Beneficial (in consortium or as delivery partner)
<ul style="list-style-type: none">• Meter manufacturer OR (preferably and):• Chargepoint manufacturer / operator• Electricity supplier (DCC user)	<ul style="list-style-type: none">• Chargepoint operator• Aggregator• Distribution Network Operator• Local Authority / Authorities• Employer• EV manufacturer

Outcomes and analysis

Planning for the end of the trials

Analysis of results must show that the device has:

- achieved all the performance requirements
- demonstrated its use in the specified charging context
- demonstrated application to at least one DSR Use Case

Assessment of host and user experience (phase 2, trial):

- To assess potential acceptance and impact of SM integrated EV charging eg:
 - experience of host organisation, chargepoint users, residents etc
 - benefits and detriments observed during trial
 - long term benefits expected to accrue or potentially available
 - likelihood that host would expand implementation (+ barriers, mitigation etc)

Required:

- Planned maintenance and support including help desk and reactive maintenance and repair
- Project exit plan – eg: leave in place with full support, or remove and make good



BEIS Programme Analysis

Key Performance Indicators

Outcomes and continuing legacy will be assessed by BEIS against KPIs

KPI 3 - Number of organisation/ SME or other supported

KPI 4 - New Business relationships and Collaborations

KPI 5 - Advancement of Low Carbon Solutions (TRL)*

KPI 7i – Reduced unit cost of energy (LCOE)

KPI 7ii – Increased energy efficiency/ Reduced peak demand

KPI 7iii – Increased system flexibility

KPI 8 - Products and services sold**

*Technology Readiness Level: TRL 4 to 5 in the first phase; 5 to 7 in the second phase

** KPI 8 over the longer term – related targets not assessed for tender, nor for completion of contract
- obligation to update progress annually, for 3-5 years



Governance Structure

BEIS – contract holding party

Contract Manager – 3rd party support provided by Mott MacDonald

Consortium A:

- Design, Build and Trial a Device
- Single contract with BEIS with one of the essential consortium members

Consortium B:

- Design, Build and Trial a Device
- Single contract with BEIS with one of the essential consortium members



SBRI Procurement Process

Science and Innovation for Climate and Energy

BEIS



SBRI Procurement Process

What is an SBRI?

- Small Business Research Initiative;
- Pre-commercial procurement – aimed at solutions which are not yet ready for the commercial market;
- Sharing of risks and benefits – suppliers receive financial support and retain arising IP (certain rights of use retained by BEIS). SBRI contracts are therefore expected to be priced below market rates, reflecting these benefits to the supplier;
- This programme is focussed on Phases 2 & 3 of a SBRI:
 - ~~Phase 1 – Feasibility~~
 - Phase 2 – Development
 - Phase 3 – Demonstration

Eligibility

- Open to **all** organisations which can demonstrate a route to market for their solution, however projects requesting funding for commercialisation activities are not eligible;
- This includes both SMEs and large organisations; organisations from the public, private and third sectors; academic and research organisations;
- Applications from consortia (with a single lead partner) are encouraged:
 - Only 1 bid is required per consortium; all partners must sign the application form
- Organisations **can** be involved in more than one consortium bid.



Intended Tender Timeline

Please note that dates are subject to change.

In the light of COVID-19, we have extended the key deadlines for registration, questions and tender submission (new dates marked with asterisk)

Tender Timeline – Device Development Phase	Date
Advertisement and full invitation to tender issued	06/03/2020
Briefing event for potential applicants	25/03/2020
Deadline for submitting registration emails	* 21/04/2020 17:00h GMT
Deadline for questions relating to the tender	* 22/04/2020 17.00h GMT
Responses to questions published	15/04/2020
Deadline for receipt of tender	* 29/05/2020 12.00h GMT
All bidders alerted of outcome	* week beginning 22/05/2020
Stand still period and due diligence complete	* June 2020
Contract awards on signature by both parties	* July 2020
Contract Phase 1 start date (Device Development phase)	* July 2020
Device Development Phase concludes (evaluation and review starts)	March 2021
Outcome notified (decision on initiation of Trial phase)	Q1 2021



SBRI Procurement Process

Terms and Conditions

- Suppliers retain the rights over any IP arising from the project;
 - BEIS reserves the right to take up arising IP if it has not been commercially exploited by the supplier within 3 years of contract end.
- Contracts will have a break clause between phases. Continuation beyond the break clause into phase 2 will be dependent on performance in phase 1, and availability of funds.
 - Standard public sector termination clauses will apply (including termination at convenience by either party with 90 days' notice)

Application process

- Once the schedule is finalised, any submissions made after these deadlines cannot be considered;
- All bids will be assessed against strict evaluation criteria;
- All submissions should be directed to smartmeterspmo@beis.gov.uk (“Beyond Off Street TENDER” in subject);
- BEIS will not cover any costs incurred in the application process.



Bid Assessment Criteria and Scoring

	Criteria	Weighting
1	Skills and expertise, market access	20%
2	Technical approach	30%
3	Project plan and operational delivery	10%
4	Engagement and innovation	15%
5	Analysis	5%
6	Cost	20%

To be eligible to receive funding, a project must score a minimum of 30% against each criterion, and a minimum total weighted score of 60%.

Score	Description
1	Not Satisfactory: Proposal contains significant shortcomings and does not meet the required standard
2	Partially Satisfactory: Proposal partially meets the required standard, with one or more moderate weaknesses or gaps
3	Satisfactory: Proposal mostly meets the required standard, with one or more minor weaknesses or gaps.
4	Good: Proposal meets the required standard, with moderate levels of assurance
5	Excellent: Proposal fully meets the required standard with high levels of assurance



Bid Assessment Criteria - detail

- **Skills and expertise, market access**
 - design and manufacturing capability applied in smart energy / metering / charging
 - project team including structure (delivery partners)
 - Access to facilities (eg testing) and charging locations
- **Technical approach**
 - Preliminary design, and approach to key challenges
 - Show how complies with SMET specification
 - Show how complies with applicable regulations
 - Additional functionalities
 - Trial scope and outcomes, analysis plan
- **Project plan and operational delivery**
 - Plan and timelines
 - Risks and mitigations
- **Engagement and innovation**
 - With host organisations and EV users; usability
 - Use cases and charging contexts
- **Analysis**
 - Impact on users / host locations / residents; end-of-life plan
 - Evaluation and dissemination of lessons



Bid Assessment Methodology

- **Step 1 – Individual Assessment:**
 - Eligibility criteria (pass/fail);
 - Assessment criteria (min. 30% against each criterion, min. total weighted score of 60%).
- **Step 2 – Moderation:**
 - Overall scores assigned;
 - All bids eligible and over the 60% threshold ranked according to overall score.
- **Step 3 – Notification:**
 - All applicants notified of outcome; two highest-scoring bidders within budget informed of success;
 - BEIS reserves the right to allocate less funding than requested in bids;
 - Written feedback provided.



Bid Instructions

Bidders are asked to submit:

- Registration Email smartmeterspmo@beis.gov.uk (“Beyond Off Street” subject)
 - by 07 April; confirmation of intent to bid; lead organisation
- Proposal summary (max two pages A4, pdf) providing an outline of the overall approach, with sub-headings:
 - consortium experience and market access,
 - technical solution,
 - project plan
 - engagement
 - analysis
 - overall costs
- Completed Application Form with outline risk assessment
- Completed past 3 years’ financial statements, and/or if not available, letters of support from project partners
- Declaration forms regarding non-collusion, conflict of interest and data security
- Supporting information

The completed application should be submitted in pdf format; please note the maximum size email you can send is 10MB.



Next Steps

- Copy of today's presentation
- Ongoing Q&A – questions from today and submitted by email
 - smartmeterspmo@beis.gov.uk (“Beyond Off Street” subject)
 - deadline for questions 08 April
 - full Q&A published 15 April
- Partnering profiles – template issued to all interested parties
 - deadline for return of profiles 31 March
 - compilation of profiles distributed 03 April
- Registration Email smartmeterspmo@beis.gov.uk (“Beyond Off Street” subject)
 - by 07 April; confirmation of intent to bid; lead organisation
- Bids received by 29 May, evaluated by 22 June (dates extended)

Note: dates are indicative

