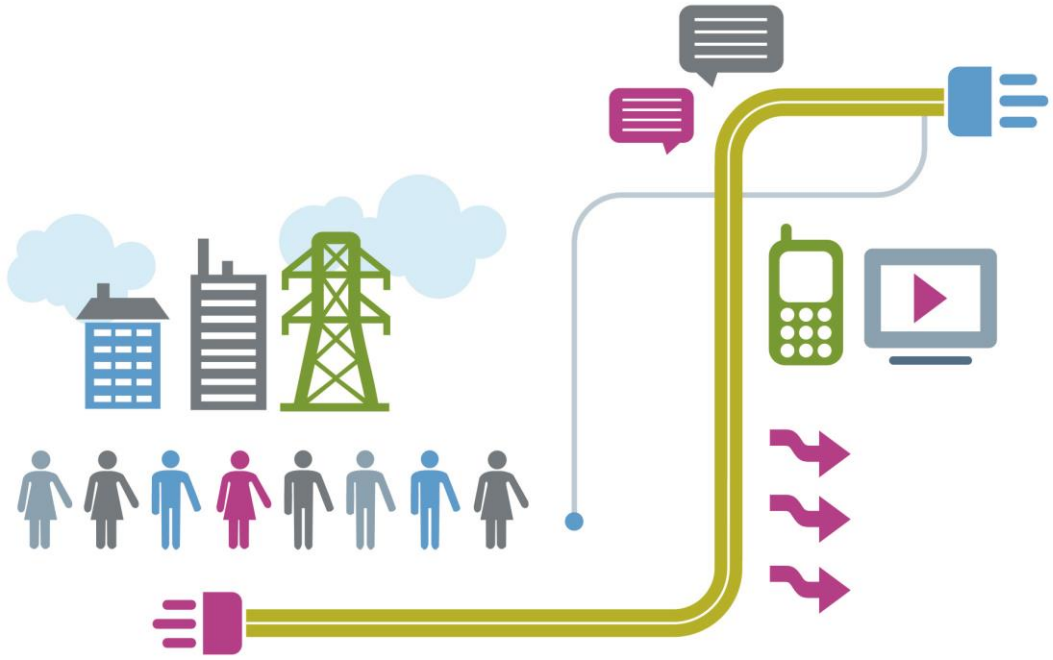
Future Ready Homes

Technologies to make us ready to meet net zero



About us

BEAMA is the UK trade association for manufacturers and providers of energy infrastructure technologies and systems.

Heating and Ventilation

- Heating Controls
- Building Automation & Control Systems
- Heat Pumps
- Electric Heat & Hot Water
- Underfloor Heating
- Water Safety & Hygiene
- Water Softeners
- Water Treatment
- Ventilation

Building Electrical Systems

- Industrial Single Phase Products
- Cable Management
- Engineered Systems
- Cut Out & Feeder Pillar

Networks

- Principal Products
- Network Automation & Protection
- Cable Accessories & Fittings
- Overhead Transmission Line Contractors
- Power Quality
- Tools & Ancillary Equip for Electrical Working

Flexible Energy System

- Building Energy Storage
- Consumer Energy Display Industry Group
- Connected Homes
- Electric Vehicle Infrastructure
- Mandated Metering
- Metering Solutions

Recent BEAMA publications

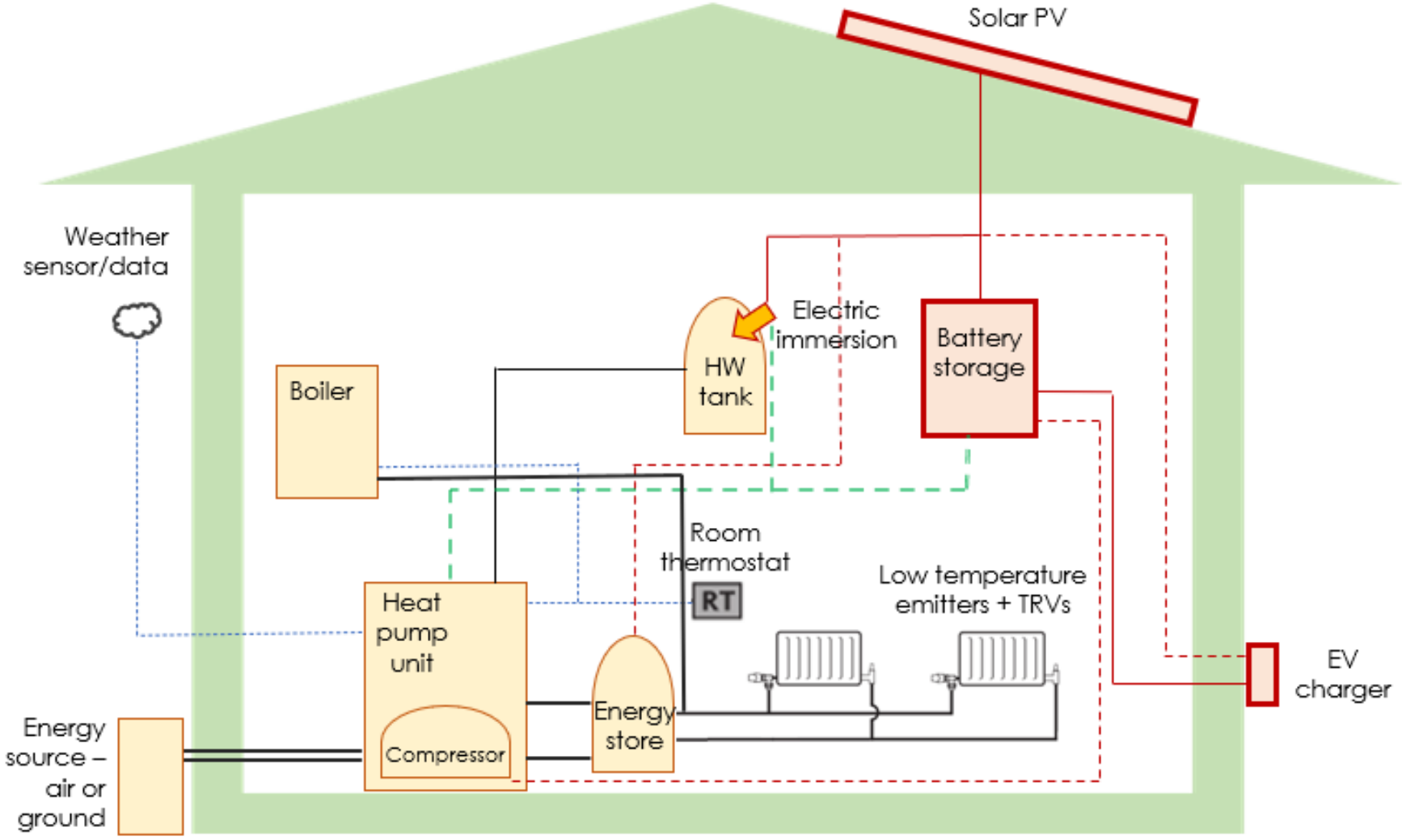
Net zero by design report – Sep 2019

- Setting out an industry commitment to the net zero emissions target.
- Outlining areas where we believe ambition is lacking and action needed.

Future Ready Homes paper – Nov 2020

- Identifying actions that need to happen for net zero homes to be delivered.
- Focus on what products and can deliver.

The net zero home



Future Ready Homes

Ready for low carbon heating

Best practice heating controls

- The efficiency of current heating systems can be increased significantly.
- Less wasted heat means less heating infrastructure is needed.
- Future low carbon heating appliances require optimal systems.

Heat emitters upgraded for low temperature operation

- Larger radiators or underfloor heating mean lower running costs now and in the future.
- Older radiators tend to be less efficient.
- The cost of future heat pump installations will be reduced.

Correctly designed heating systems

- Properly sized boiler replacements and emitters ensure system efficiency now.
- Sizing information will help future low carbon heating choices.

A rethink of hot water provision

- Hot water cylinders are rapidly being removed from homes without considering longer term needs.
- Hot water storage is needed for heat pumps and offers the potential for renewable hot water and thermal energy storage.

Ready for electrification

Mandatory electrical safety inspections

- Make sure homes are ready for changing electrification needs.
- Reduce current and future fire risk.

Consider three phase electrical supplies to new homes

- Develop a rapid charging infrastructure for electric vehicles.
- Enhance suitability for heat pumps and other electrification.

Consumer units upgraded to a 'Domestic Energy Centre'

- Facilitate homes with renewable generation, battery energy storage, electric vehicle charging, increased levels of home automation and surplus electrical energy flowing into the grid.
- Ensure extra connection points and the associated circuit protection to accommodate the new functions.

Accelerated heat pump installations in suitable homes

- Drive standards and consumer acceptance.
- Raise awareness of the beginning of heat decarbonisation.
- Develop skills and technologies for hybrid applications.
- Define opportunities for efficient electric heating in highly insulated homes.

Ready for grid flexibility

More homes with broadband WiFi

- Empower more households to access the benefits of smart technology and system flexibility services.
- Ensure that less advantaged households, including the fuel poor, don't miss out.

SMETS 2 meters plus in-home displays fully rolled out

- Clearer communication to consumers and better targeted solutions and services.
- Unlock the potential for domestic, distributed flexibility.

In-home or local energy storage capability

- Enable homes to use smart tariffs and participate at scale in the flexibility market.
- Engage consumers in using and providing flexibility from and to the grid.
- Enhance connections to on-site or local renewable energy generation.

EV charging as a natural part of the home system

- Install private EV charge points in homes where possible.
- Increase the rate of installing public charge points on streets, in hubs and at destinations.

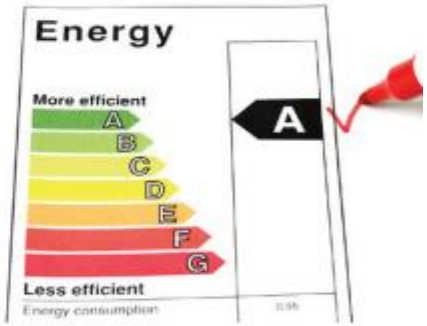
Other elements

Make homes healthy and safe

- Develop plans for retrofitting that take a holistic approach to maximising health and wellbeing.
- Continue to improve regulatory standards for ventilation to ensure that homes have good indoor air quality.

Prioritise all energy saving measures

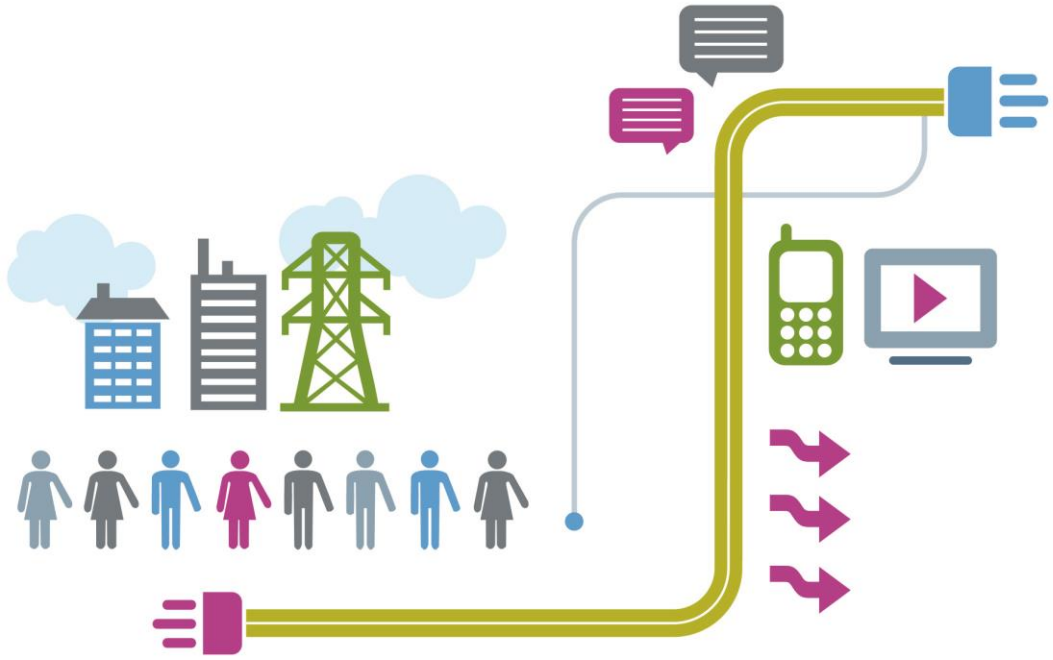
- Ensure consistent compliance with and enforcement of the regulatory requirements that contribute to efficiency (e.g. balancing and water treatment of heating systems).
- Require heat recovery wherever possible (e.g. for ventilation and hot water).
- Provide a clear path for the incorporation of innovative energy saving technologies into regulation.
- Ensure that product standards and requirements drive consumers towards efficient and truly smart products.



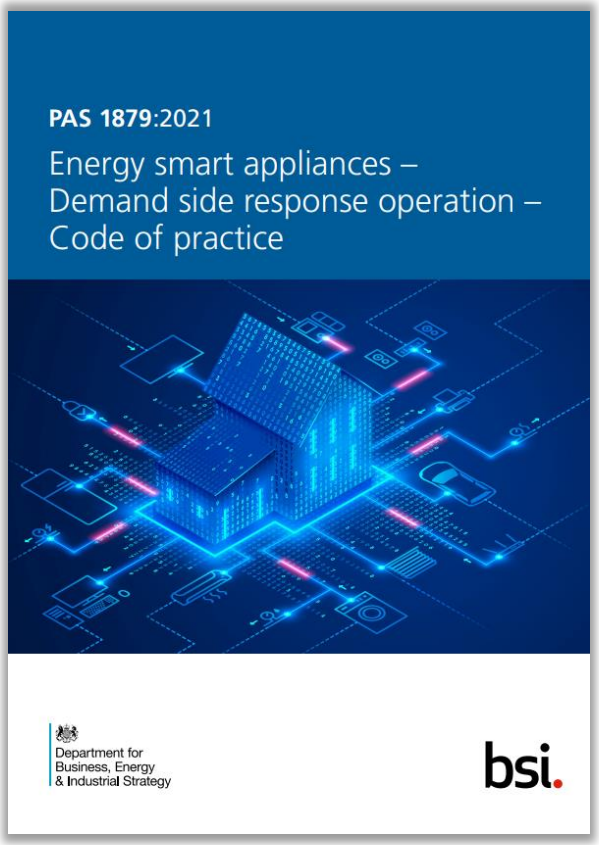
Help installers on this journey

- Skills need to reflect new technologies and their integration.
- The context for developing skills needs to be broadened beyond, for example, a traditional heating installer role.
- The need for skills can become a huge opportunity for long term 'green jobs.'

Delivering flexibility



PAS 1878 and 1879



Published on 19 May 2021

- Free downloads available at the Energy Smart Appliances programme webpage

Purpose

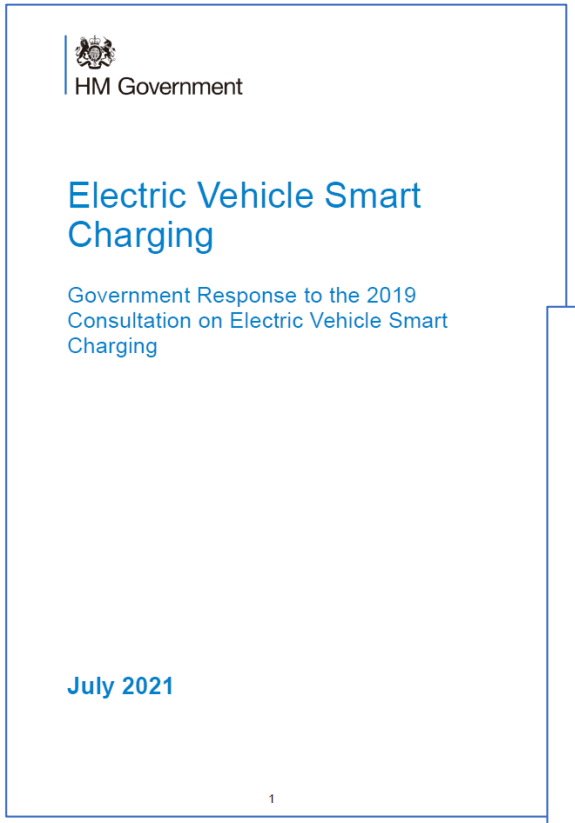
- PAS 1878 provides a technical specification that allows domestic appliances to operate in a Demand Side Response (DSR) system
- Intended to be read in conjunction with PAS 1879, which provides recommendations for the provision of DSR services by service providers.

Demand Side Response

Consumers with ESAs can:

- Reduce their electricity costs by using time of use (ToU) tariffs from electricity suppliers to encourage use of appliances outside of peak demand or when excess generation capacity is available.
- Earn revenues by allowing direct control of appliances by other grid-side actors for the overall benefit to the network.

Government policy on flexibility


HM Government

Electric Vehicle Smart Charging

Government Response to the 2019 Consultation on Electric Vehicle Smart Charging

July 2021

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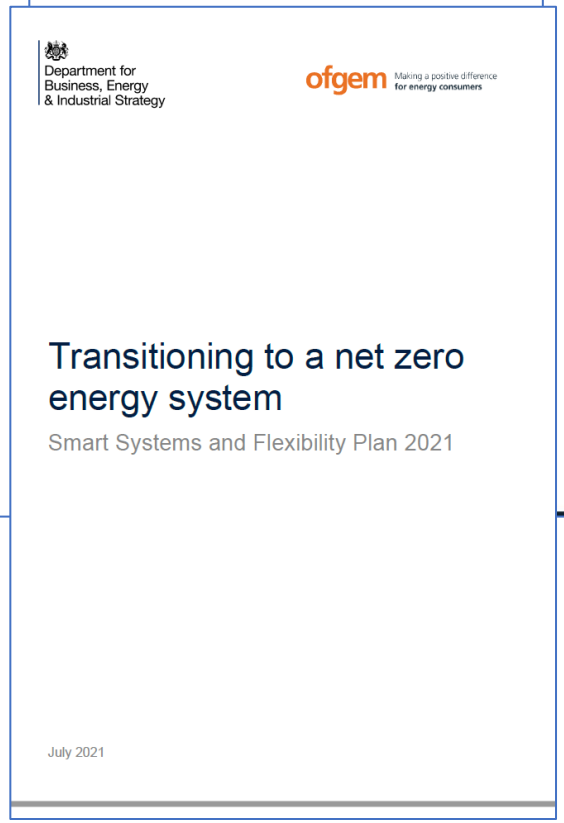
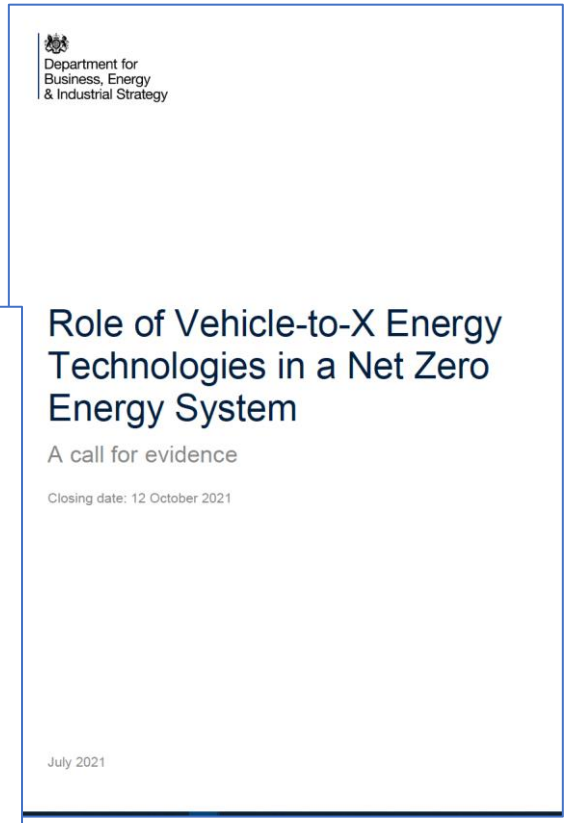

Department for Business, Energy & Industrial Strategy

ofgem Making a positive difference for energy consumers

Transitioning to a net zero energy system

Smart Systems and Flexibility Plan 2021

July 2021


Department for Business, Energy & Industrial Strategy

Role of Vehicle-to-X Energy Technologies in a Net Zero Energy System

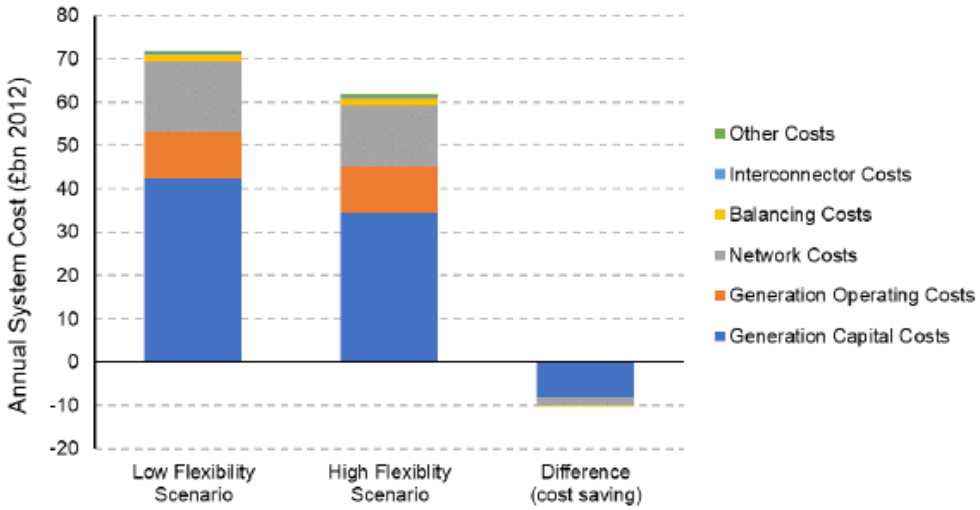
A call for evidence

Closing date: 12 October 2021

July 2021

Government Policy Position on Flexibility

Figure 1: Illustrative system costs in 2050, showing that the system cost in a high flexibility scenario is ~£10bn lower than in a low flexibility scenario



Smart Systems and Flexibility Plan 2021

Phase 1 to 2022

- No mandate for PAS 1878

Phase 2 2022 onwards

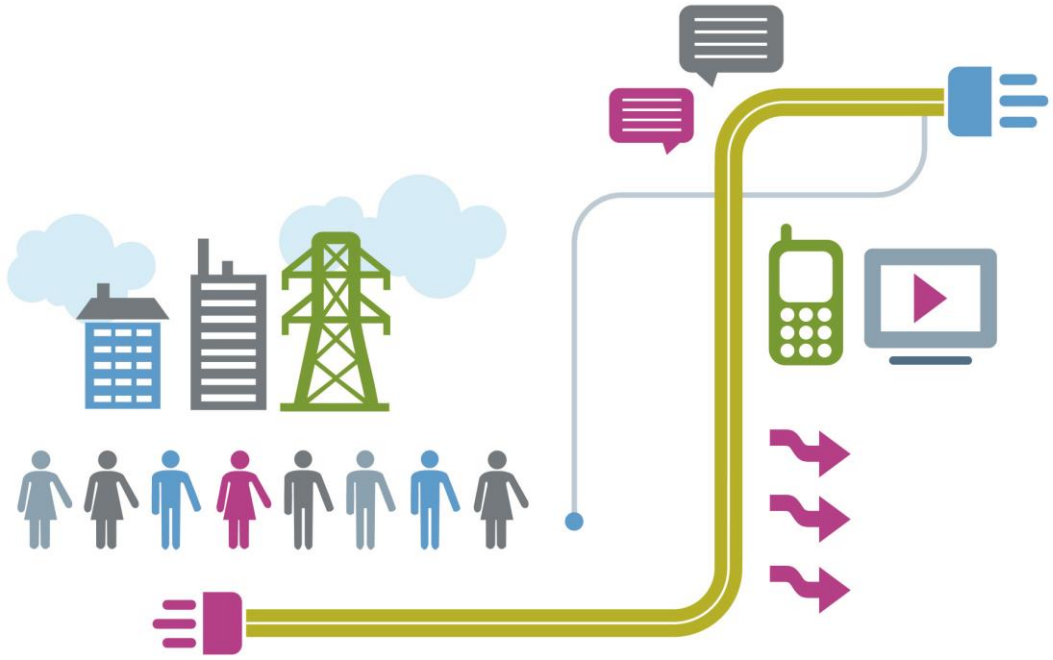
- Reconsider mandate of PAS 1878
- Minded to base DSR on SM
- Single DSR process for all ESAs
- Interoperability for
  - ESA
  - DSRSP
- Focus now is on network constraints - DRSSP
- Becomes energy supply constraint - Supplier

What to do?

Flexibility – Industry Issues

- Use PAS 1878/9 or not, if not, what?
- Communication via DCC or Internet
- One PAS 1878 ESA with two communications options
- Internationalisation – avoiding a UK niche market
- Smart charger as an ESA
- Allowing technical and commercial innovation

Smart metering and EV charging



What it is

- The Smart Metering Implementation Plan requires energy suppliers to offer every British home and small business:
  - a smart electricity and gas meter
  - a communications hub to receive tariff data and send usage data from the property to the supplier
  - an in-home display so consumers can see how much energy they are using, and how much it is costing, in near-real time

- Consumers will also be able to read their data through a consumer access device (CAD)

- Positive business case:
  - consumers have more control & visibility of their energy use
  - money saved from more effective use

- This is a fundamental part of the digitalisation of the energy sector

Why it is happening

- This is an essential upgrade of the British energy system
- Consumers will have reliable bills that reflect their energy use: no more estimated bills
- Smart metering system can provide some of the infrastructure to support smart, secure and interoperable energy appliances and systems
- This is a "key enabler" for smart energy management and demand-side response

What comes next

- Industry and Government to agree on the role of the smart metering system in cyber security and device interoperability in smart, zero-carbon homes
- Grid flexibility needs such as market-wide half-hourly settlement (MHHS)

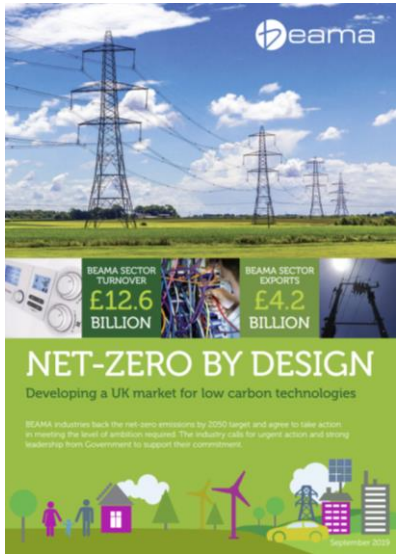
Why EV charging needs to be smart

- Road transport contributes about one quarter of all UK greenhouse gas emissions
- Replacing petrol and diesel vehicles with electric vehicles (EVs) could increase electricity consumption by 30% by 2050
- A "smart grid", with flexible EV charging in response to system needs (charging during times of surplus capacity, discharging when electricity is scarce) could save network & system operators £ billions
- Smart EV charging lets consumers:
  - control the level of charge in their vehicle
  - take advantage of ToU tariffs, to save money
  - contribute to system flexibility and decarbonisation
  - Government and Industry are working on the best ways to make smart EV charging safe, secure, private and interoperable

What comes next

- Sales of new petrol and diesel vehicles banned from 2030
- Roll-out of public and private charging infrastructure
- EVs becoming price-competitive with petrol and diesel
- Getting buildings and people ready for smart EV charging:
  - A technology journey
  - A consumer behaviour journey
- Government & Industry working together to define requirements for interoperability, cyber security, data privacy and grid stability
  - "Future of smart charging" - project to develop a worked example for how smart charging can work in practice in a domestic/SME premises (candidate architecture)

Support our autumn campaign
#NetZerobyDesign
#FutureReadyHomes



We are developing the previous papers reflecting on policy developments:

- Future Homes Standard, net zero spending review, UK Net Zero Strategy and the Heat and Buildings strategy

We will be engaging with BEAMA members on the development of these for publication in the autumn.