



Department
of Energy &
Climate Change

How GB smart metering will support Demand Side Response?

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What we will cover

- Smart metering benefits in context
- Overview of End-to-end smart metering system
- How will the system design support:
 - Demand side response via Auxiliary switches
 - Demand side response via tariffs, load limiting and max demand registers;
 - Demand side response via CADs
- How can a third party (including non-suppliers) use the E2E system design to provide demand response services?
 - via Auxiliary Load Control switches
 - via CADs

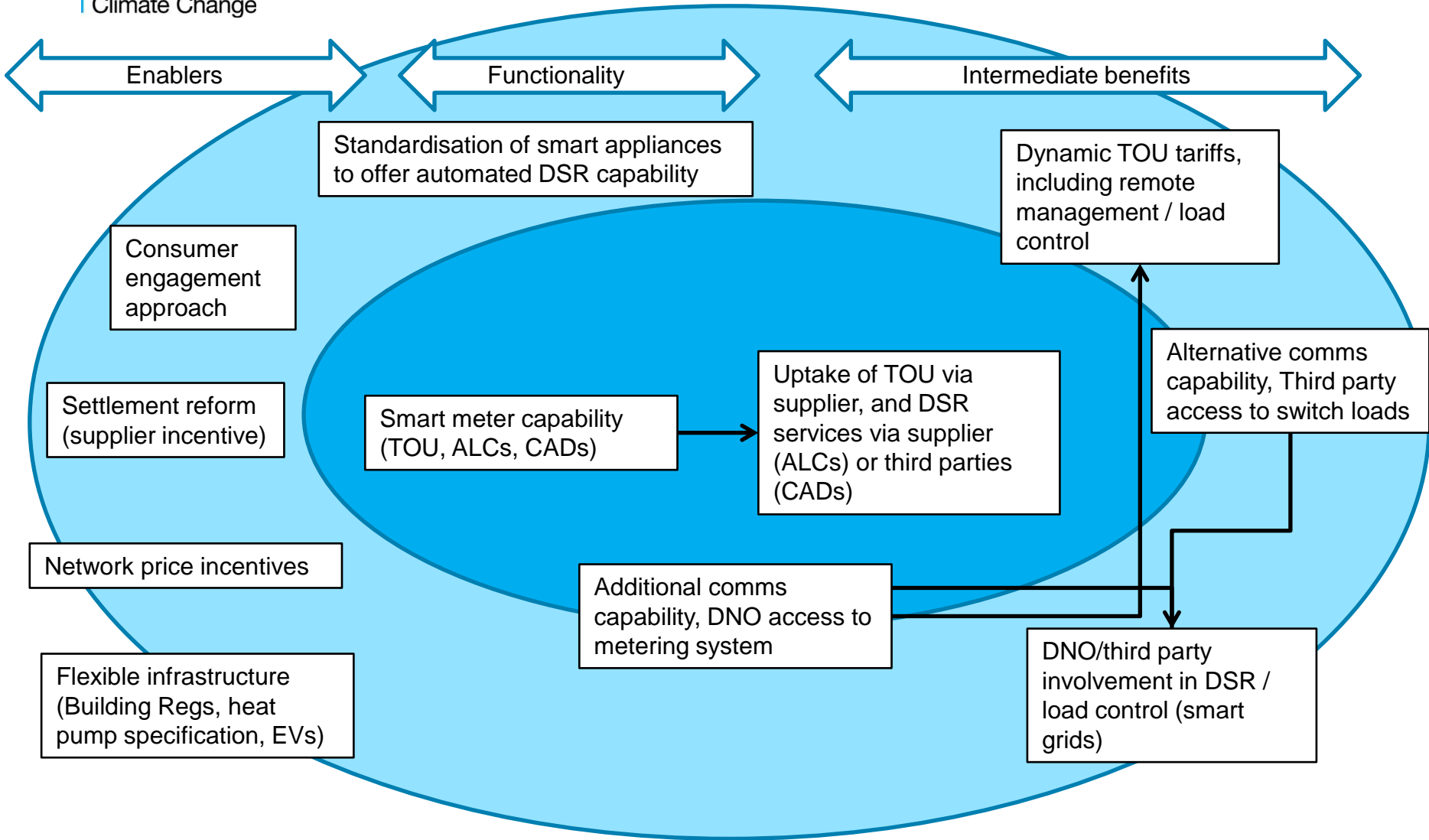


Overview of Programme objectives

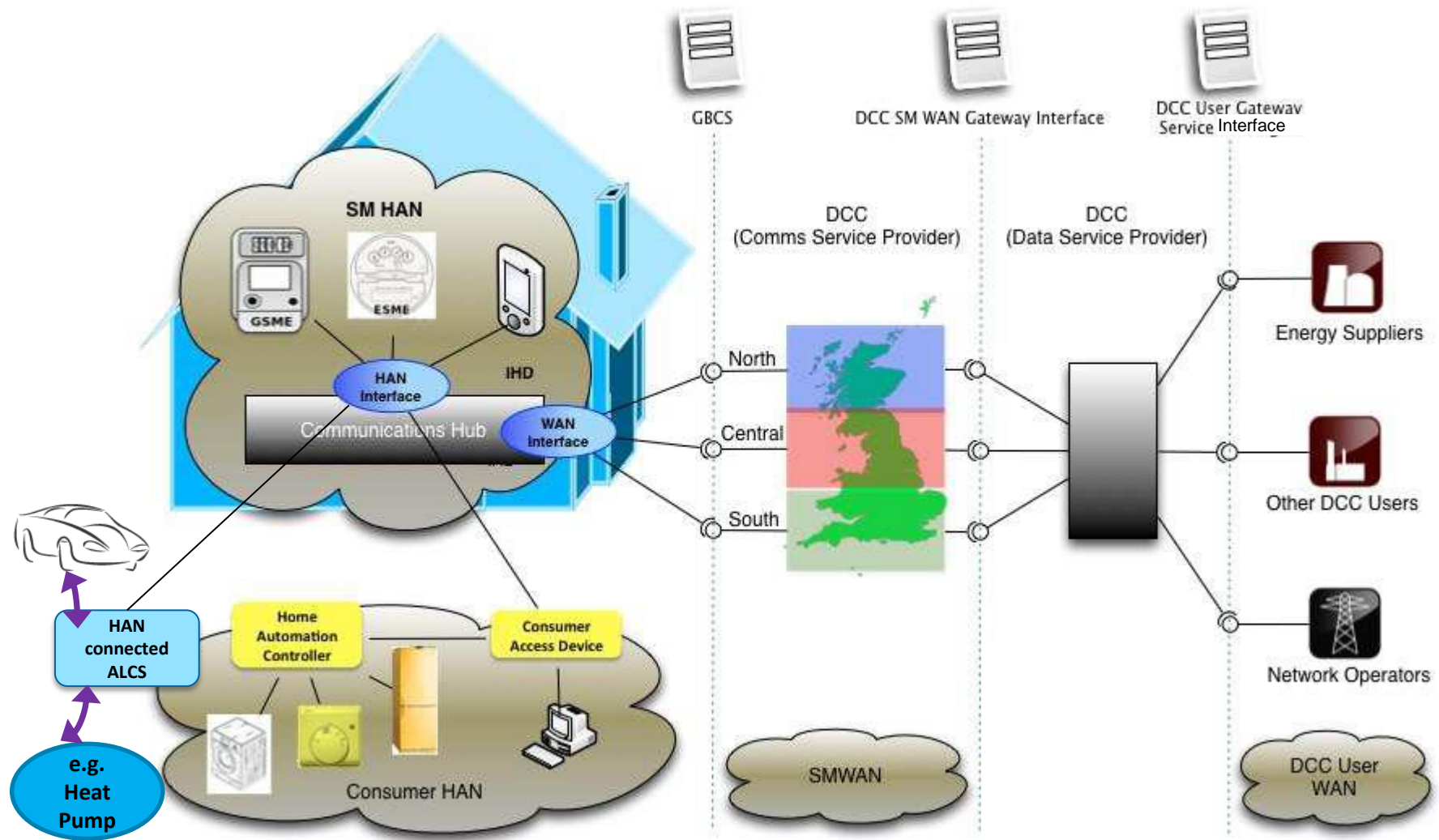
- Smart meters will support more efficient use of electricity infrastructure by providing better information and improving communication between consumers, electricity suppliers and network companies, including the ability to shift demand to match supply (“demand side response”)
- The smart meter programme has sought to provide this platform by:
 - Ensuring that the metering and associated equipment that is installed in premises provides the required physical functionality
 - Procuring DCC communications services with the required functionality and which are scalable (given uncertainty relating to the development of DSR)
 - Architecture which facilitates remote firmware upgrades to equipment to deliver new services



Smart metering benefits in context

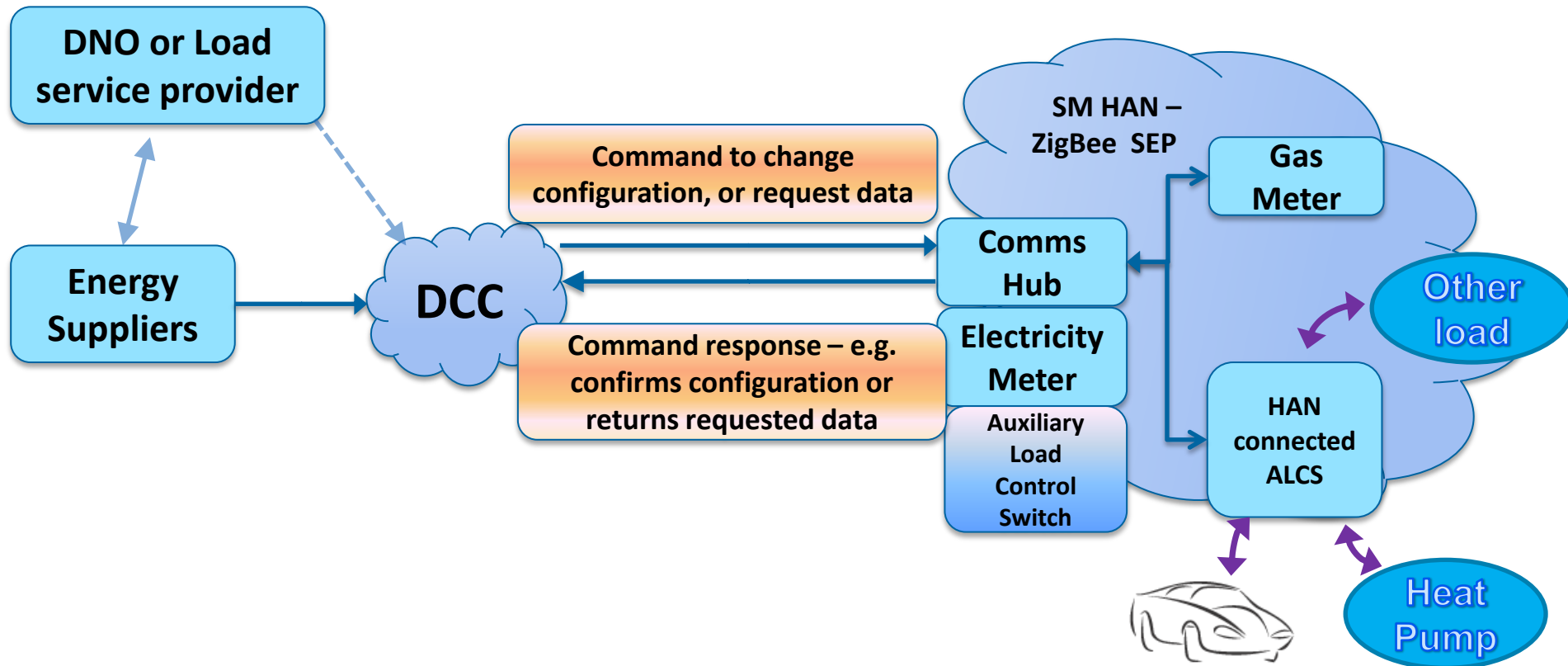


Overview of End-to-end system





ALCS Architecture: DSR achieved through calendar and ad-hoc control of ALCS





Auxiliary Load Switching Commands

- Set the Auxiliary Load Control calendar
 - Sets the calendar on the ESME that controls ALCS
- Activate Auxiliary Load
 - Ad hoc command from supplier to turn on
- Deactivate Auxiliary Load
 - Ad hoc command to turn off
- Reset Auxiliary Load
 - Command to restore switch back to calendar switching regime



Key points - ALCS

- Supplier choice but likely that existing ALCS in dumb installations will be replaced by variant SMETS2 meters with built-in ALCS;
- All SMETS2 meters will be 'future-proofed' to support up to 5 HAN connected ALCS;
- In-built or HAN connected ALCS can be switched according to a calendar held in the meter or by ad-hoc command;
- Supplier will receive confirmation that ad-hoc switching has occurred or that the calendar has successfully updated;
- Currently only the registered supplier can send ALCS-related commands.



Other support for DSR functionality

Meter functionality (Electricity meters):

- Tariffs
 - Time-of-Use;
 - Block;
- Load limiting;
- Max demand registers;
- Randomisation.



Other support for DSR functionality

Meter functionality (Electricity meters):

- TOU Tariffs: Recording consumption in up to 48 different time bands (SMETS1 and 2); and in up to 4 time bands for consumption on the second element of a Twin Element variant meter
- Block tariffs: Maintaining an additional count (on 'counters') of how much of the consumption during a time band was consumed at different block rates (either rising or falling blocks) (SMETS1 and 2)
- Load limiting (Elec only): Capability to switch supply off (or increment a counter) when an 'instantaneous use' threshold is crossed (SMETS1 and 2)
- Max demand registers (Elec only): Capability to record the maximum demand in any 30 minute period **and** during a configurable 'peak' period (SMETS2 only)
- Randomisation: All meters will be capable of applying a randomised offset value to switching of ALCS and between tariff registers



Other support for DSR functionality

DCC services:

- Configure tariff configuration and read billing data;
 - Allows a **supplier** to update switching times between registers and the associated prices, and to take billing reads.
- Configure load limiting threshold, configure action and read counter;
 - Allows a **supplier** to configure a meter to alert and count, or disable once threshold crossed and to set the threshold, receive alerts and read data;
- Configure Max demand periods, take readings and reset;
 - Allows a **supplier or DNO** to read max demand values and the **supplier** to configure the 'configurable' period and reset the register.



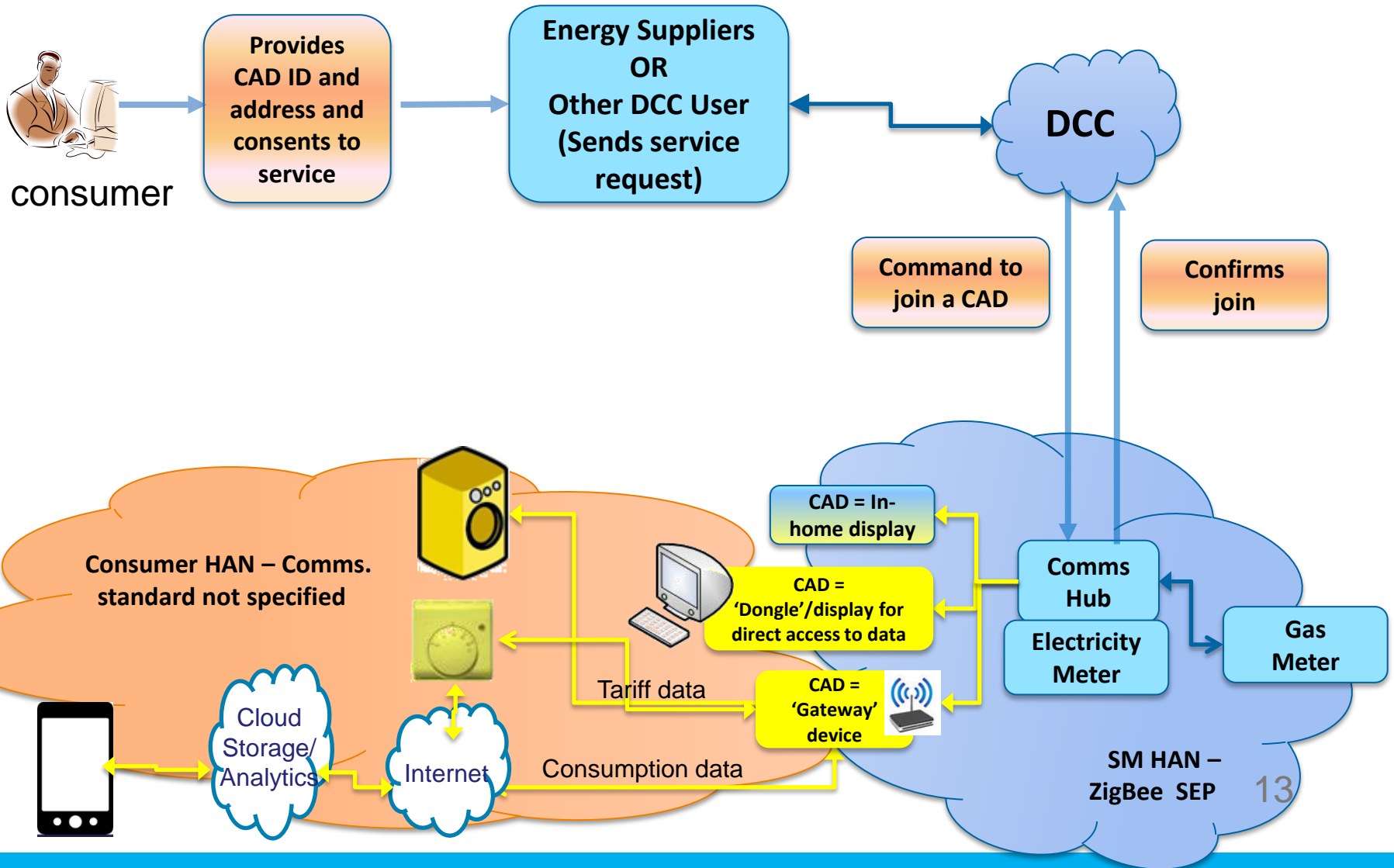
What is a CAD?

Any Device with a ZigBee SEP1.2 Interface and ZigBee features defined in GBCS

- In-home Displays;
- Gateways (eg ZigBee/WiFi)
- Smart Appliances;
- Smart Energy Hubs/gateways;
- Laptop dongles;
- Thermostats

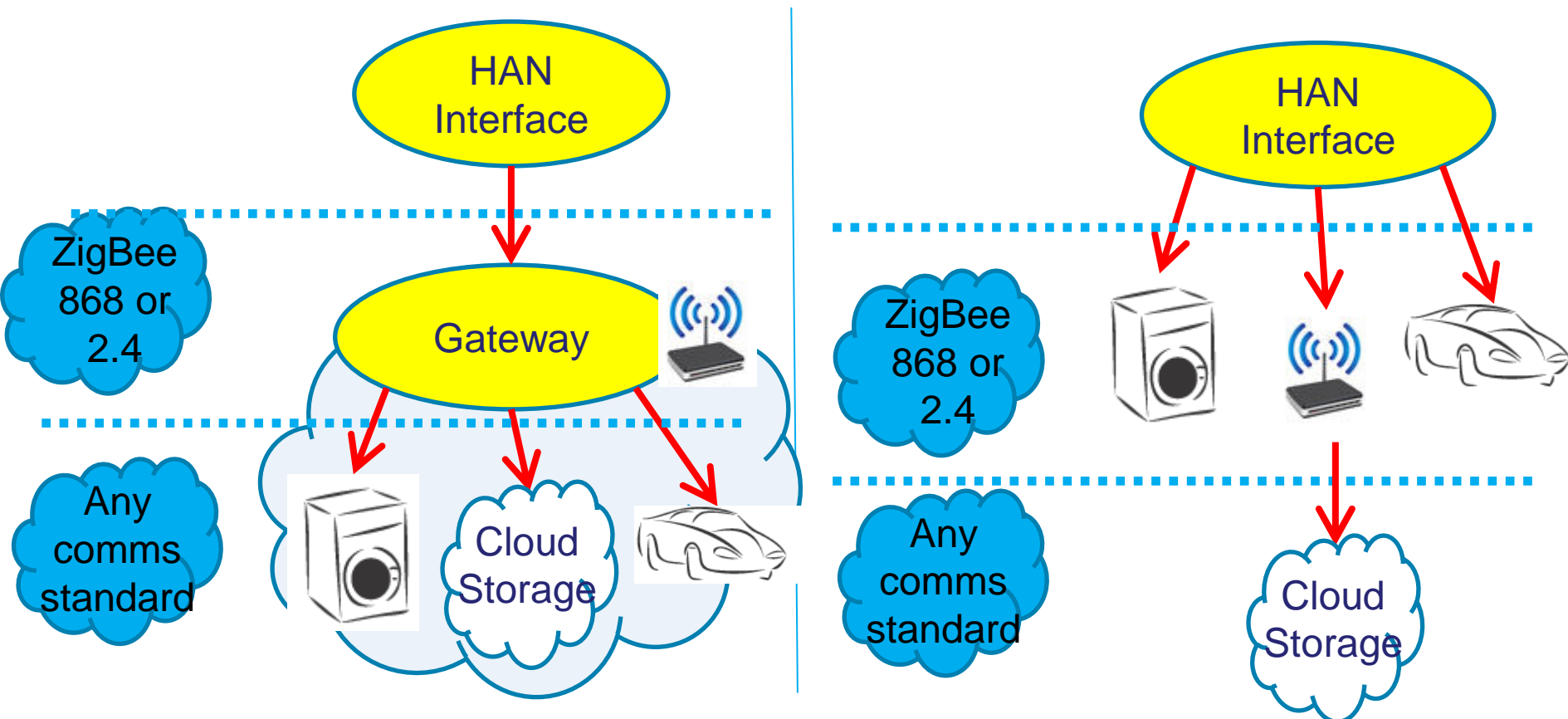


CAD Architecture: DSR achieved through pricing and consumption signals to devices





Devices can access data via the SMHAN directly or via a “Gateway” CAD





Timescales and next steps

- Base-lined version of SMETS2 is available now on request;
- Base-lined version of the GB Companion specification for communications standards will be available in the Summer .
- Expectation that SMETS2 meters will be available to support testing in 2015;
- DCC go-live planned for Autumn 2015;
- Consultation on consumer access to data and data services due in coming months;
- For more information please contact tim.bailey@decc.gsi.gov.uk or peter.morgan@decc.gsi.gov.uk .