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Capability to support DSR

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Monitoring of consumption via a Consumer Access Device (CAD) or via DCC



Which Data will be Available?

**No CAD required (Data
retrieved via DCC)**

**Ad hoc or scheduled (at
DCC) requests**

**Highest granularity of
data - 30 minutes**

**Tariff
information**

**Consumption
data (and
Export data)**

**CAD required (Data
not retrieved via
DCC)**

**10 seconds updates
(elec)**

**30 minute updates
(gas)**

Current Price

All of the above PLUS...

**Instantaneous
Active Power
(elec - kW)**

**Prepayment
Information**



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Switching loads via an Auxiliary Load Control Switch (ALCS)



Configure Auxiliary Load Control Switching:

The Smart Metering Equipment Technical Specifications (SMETS) support up to five Auxiliary Load Control Switches (ALCS) – either in the electricity meter or HAN-connected.

Capability in SMETS allows the electricity supplier to:

- Set the calendar on the Electricity Meter that controls ALCS;
- Send ad hoc commands to the ALCS to change state;
- Send ad hoc commands to restore the switch back to calendar switching regime.

Possible uses:

- To replicate functionality of existing metering arrangements (mainly people with basic time-of-use tariffs and 'night storage' electric heaters);
- To offer new tariffs and services for Heat Pumps and Electric Vehicles. Consumer could be offered cheaper rate in return for control of when charging/heating occurs (with over-ride at a penal rate);
- To help supplier stay in balance (settlements); or to provide balancing services to National Grid and potentially participate in the capacity market from 2018.



Switching loads via alternative
comms (could be via CAD box)



Switching loads based on tariff signals - TOU and block pricing

Configure a new tariff - Time-of-Use Tariffs

- Time-of-use tariffs: Meters are capable of maintaining a separate record (on 'registers') of consumption during different time bands
- The price of each period is also held on the meter which allows the meter to calculate the cost of consumption and the meter balance.

Example – evening peak tariff

between 4 and 7pm weekdays;

Count on register 1



at all other times

Count on register 2



Configure a new tariff: Block Tariffs with TOU

- Block Tariffs: In addition to maintaining registers (for Time-of Use), Meters are capable of maintaining additional 'Block Registers' to allow rising or falling block tariffs.

Example (contd.) – during the peak period (4-7pm) peak rate only kicks-in after 5kWhs have been used. No block registers are active during the off-peak period.

between 4 and 7pm weekdays;

if today's peak consumption < 5kWh;

increment Block Register 1



between 4 and 7pm weekdays;

if today's peak consumption > 5kWh

increment Block Register 2



Note: This is for electricity; gas meters also support blocks but works slightly differently



Switching loads based on tariff signals - Load limiting/High-load alerts



Configure Load limiting:

(Electricity only and requires consumer consent): Capability to switch supply off (or increment a counter and send an alert) when an 'instantaneous use' threshold (kW) is crossed. Once supply is disabled immediately rearms such that consumer can re-enable Supply if their kW use has returned below threshold.

Potential uses:

- Supplier could offer a tariff where on certain winter peak days consumer accepts a maximum consumption of 2kW in return for an annual discount on their bill (supply set to 'trip' when $> 2\text{kW}$);
- Supplier could offer a discount if a customer does not exceed a given threshold in any month (where consumption over the threshold triggers an alert to the supplier which cancels the 'bonus' payment for that month but does not disable supply);



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Switching loads based on tariff signals - Twin element meters



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Other points



Additional points

- Maximum demand capability could be used to reward consumers for lower maximum demand (either at all times or during peak times);
- Other routes to load control are available;
- Interplay between gas and electric (e.g. possibility to choose which fuel to use for heating depending on price).

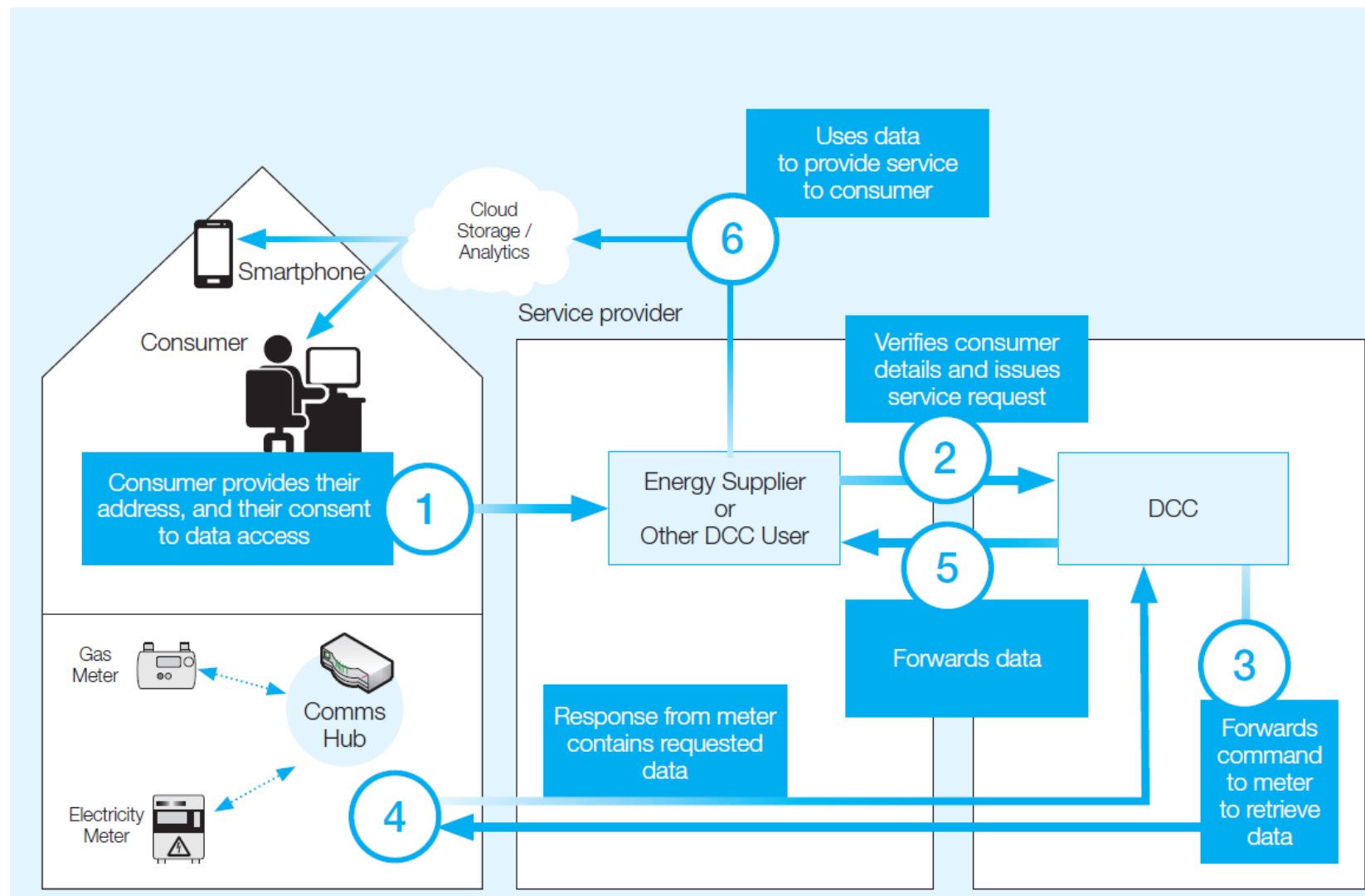


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Additional slides



Remote Access via WAN using DCC



What is a CAD?

Minimum requirement: Any Device with a ZigBee SEP1.2 Interface and access to ZigBee features defined in the 'Great Britain Companion Specification'



Laptop dongles



Energy displays

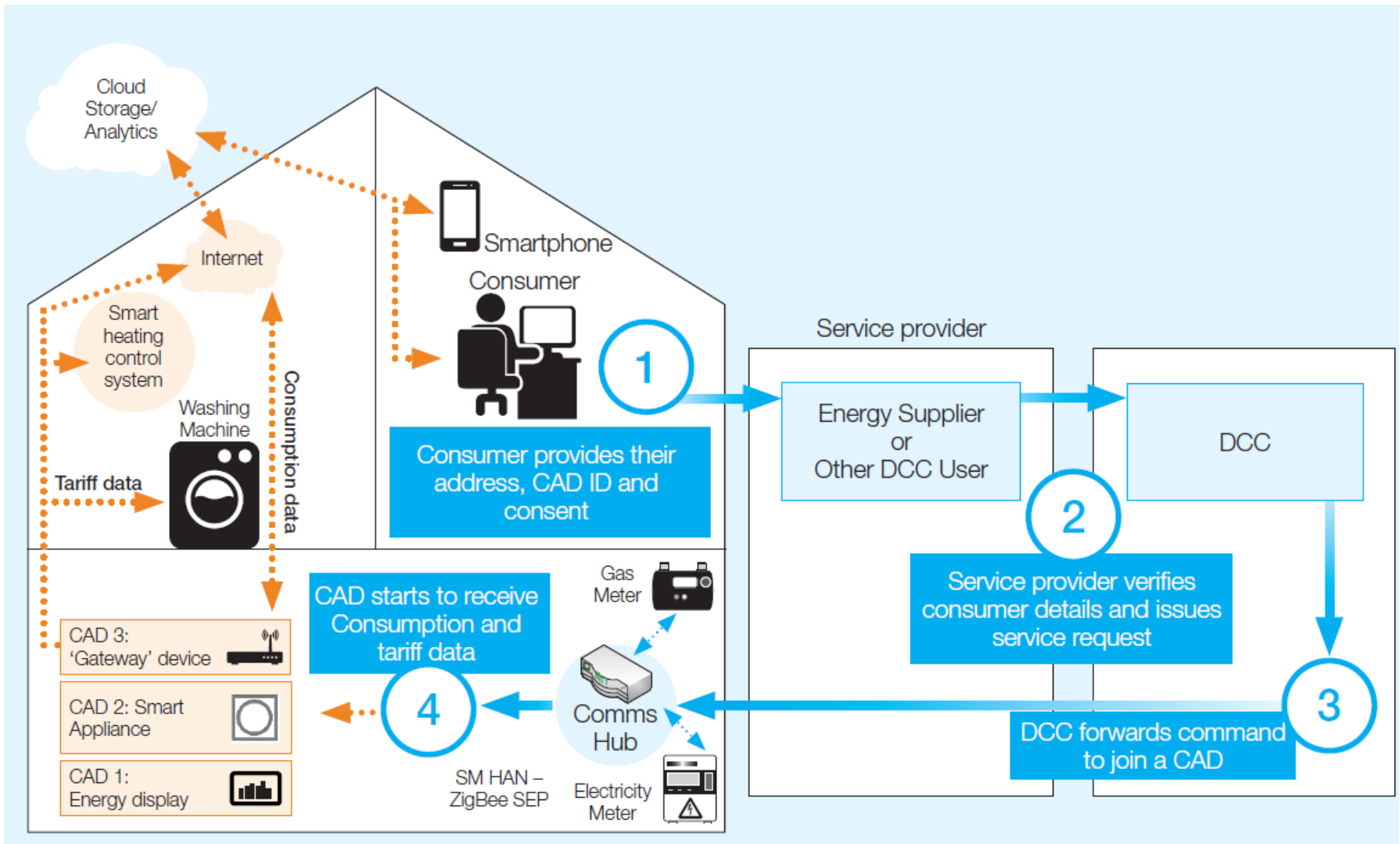


**Smart Energy
Hubs/gateways**



Smart Appliances

Local Access via HAN using a CAD





Requirements on DCC 'Other Users'

**Must buy a
DCC
Gateway
Connection**

**Must update
IT systems
to be able to
talk to DCC**

**Must meet
applicable
Security
requirements**

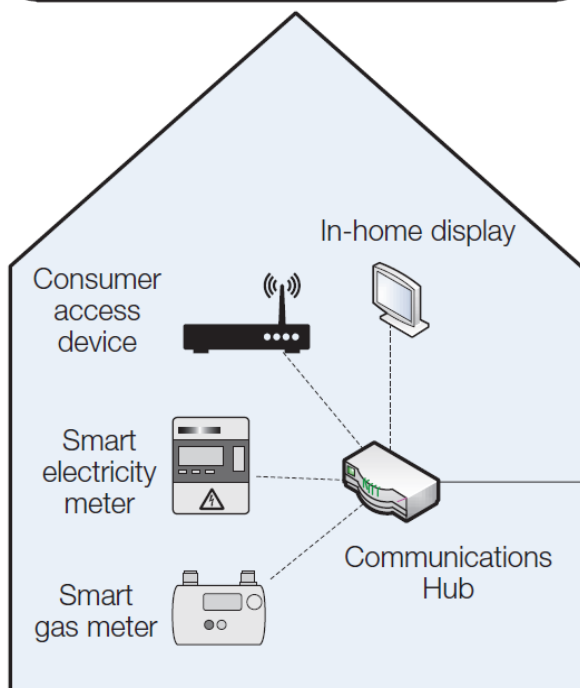
**Must
complete User
Entry Process
Testing**

**Must have a
process for
consumer
consent and
verification**

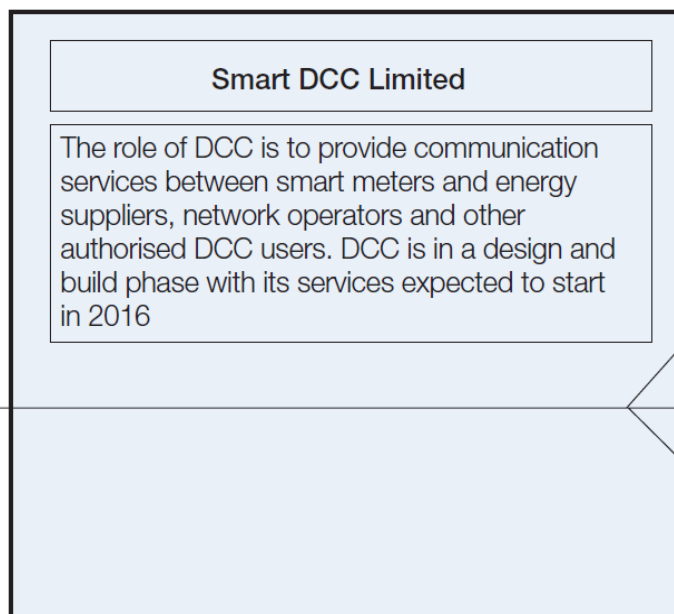
**Must have
appropriate
Privacy
arrangements**

Overview of End-to-end system

Energy consumers



Data and Communications Company (DCC)



DCC Service Users

