Smart Energy Code

MP094

'Supporting prepayment customers in no SM WAN scenarios'

Modification Report

Version 0.6

5 September 2022

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About this document

This document is a draft Modification Report. It currently sets out the background, issue, and progression timetable for this modification, along with any relevant discussions, views and conclusions. This document will be updated as this modification progresses.

Contents

This document also has one annex:

- **Annex A** contains the full (non-confidential) responses received to the Request for Information (RFI).

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Page 2 of 15

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1. Summary

This proposal has been raised by Andy Knowles from Utilita.

The Proposer has raised concerns that the minimum functional requirements set out in the second major version of the Smart Metering Equipment Technical Specifications (SMETS) (SMETS2) do not result in a Device that is sufficiently robust to serve smart prepayment customers effectively. Similarly, the Adoption and Enrolment of SMETS1 meters into the Data Communications Company (DCC) leads to the same loss of resilience in relation to SMETS1 meters.

The Proposer seeks a solution to be able to effectively manage SMETS2 prepayment customers in no Smart Metering Wide Area Network (SM WAN), intermittent WAN or DCC outage scenarios equivalent to the commercially developed solution available from the Secure SMETS1 product.

2. Issue

Previous prepayment Modification Proposals

The Proposer predominantly supplies prepayment customers and has provided almost all of these customers with a SMETS1 meter. The Proposer has raised concerns that the minimum functional requirements set out in the SMETS2 do not result in a Device that is sufficiently robust to serve smart prepayment customers effectively. Similarly, the Adoption and Enrolment of SMETS1 meters into the DCC leads to the same loss of resilience in relation to SMETS1 meters.

The Proposer has raised five Modification Proposals in an attempt to support the resolution of this issue, none of which have been able to find an achievable solution. Links to the original proposal forms are provided below, along with their associated submission date:

- SECMP0028 'Prioritising Service Requests' raised in December 2016;

- SECMP0031 'Adding UTRN Functionality to SMETS' raised in February 2017;

- SECMP0032 'Prioritising Prepayment Customers in No WAN Situations' raised in February 2017;

- SECMP0037 'Pairing Local PPMIDs' raised in June 2017; and

- SECMP0038 'Sending Commands via PPMIDs' raised in June 2017.

SECMP00031 sought to expand the capabilities of SMETS2 Unique Transaction Reference Numbers (UTRNs) to allow them to be used for the functions listed above, thus allowing full service of customers in no WAN scenarios. SECMP0032 sought to introduce a requirement on the DCC to prioritise pre-payment customers with no SM WAN. This would be done by reducing the Section F DCC obligation from 90 days to 30 days. SECMP00038 sought to allow for a means other than the SM WAN to deliver Service Requests. This too would allow Suppliers to fully service their customers where SM WAN coverage is poor or non-existent. SECMP0037 is supplementary to SECMP00038 and sought to make pairing of Pre-Payment Meter Interface Devices (PPMIDs) in no WAN scenarios easier.

The Proposer supplements the above Modification Proposals with this Draft Proposal in the hope of achieving a timely solution to the issues identified in these proposals. SECMP0028 is not covered by

this Draft Proposal as the DCC's [SECMP00067 'Service Request Traffic Management'](#) is intended to achieve its aims.

How does SM WAN affect customers?

The SM WAN is the means by which Commands are sent to meters. The Proposer's SMETS1 experience suggests that around 9% of customers will experience very poor or no WAN connectivity. Utilita acknowledge that this is based on its SMETS1 experience and that SMETS2 SM WAN is an entirely separate and independent infrastructure. Whilst poor SM WAN affects all customers, it has the most significant impact on prepayment customers. Prepayment customers engage with their meter far more than credit customers do. Inaccurate data on the meter can cause prepayment customers inconvenience, put them in financial difficulty or in extremes be a safety concern. This is compounded because prepayment customers are more likely to be disabled or otherwise vulnerable[1].

Secure SMETS1 meter functionality in a no WAN situation includes a set of Commands which can be entered into the meter via 20, 40 and 60-digit UTRNs, providing a resilient solution in most no/ intermittent SM WAN scenarios.

However, as SMETS1 adoption and enrolment proceeds this functionality will no longer be available on these meters except for credit top-ups. Commands other than top-ups are also unavailable for SMETS2 meters. Such Commands account for approximately 1% of the Commands sent by the Proposer per year (if smart meters are rolled out to all eight million[2] prepayment customers, then this would be result in an estimated five million Commands). The reduced functionality resulting from the loss of these Commands degrades the customer's experience. It will also give rise to higher Supplier costs in responding to customer issues that would have previously been resolved using these Commands.

No WAN – What are the minimum requirements?

The Proposer seeks a solution to be able to effectively manage SMETS2 prepayment customers in no WAN, intermittent WAN or DCC outage scenarios equivalent to the commercially developed solution available from the Secure SMETS1 product.

This, as a minimum, needs to include the ability to command the prepayment meter to action the following Commands:

- Deduct credit
- Set credit
- Change price
- Revert to default settings and remove data
- Open the Home Area Network (HAN)
- Change of mode
- Add debt
- Deduct debt

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[1] [Ofgem Customer Vulnerability Strategy: Prepayment meters](#)
[2] [Ofgem report on vulnerable consumers in the energy market 2018 – Section 3.11, page 39.](#)

- Set debt
- Set friendly credit times/non-disconnect periods

The Proposer has noted the following use cases for requiring the functionality enabled by the above Commands:

Reacting to emergency incidents

Providing a key tool for the resolution of emergency incidents. For example, these Commands enable the Supplier to manage extreme weather or other significant events by changing non-disconnect periods. As an illustration, during an extreme weather event on 3-4 March 2018 (colloquially known as the 'Beast from the East'), Utilita alone sent 963,118 additional messages to meters to help to ensure that customers stayed on supply. The extreme weather conditions meant that WAN connectivity was poorer than usual. Therefore, over 9% (86,000+ messages) would have been entered as a UTRN or else risk the customer being disconnected during freezing conditions.

Servicing customers in no-WAN scenarios

Enabling Suppliers to offer a full range of services to customers, even when they do not have a WAN connection. These services include discretionary credit for customers in payment difficulty and other such activities which prevent self-disconnection.

Changing top-up prices

Suppliers need to ensure that top-up prices are in line with the prepayment price cap, which is updated by Ofgem every six months in April and October. Without the ability to change prices in a no WAN situation, the customer may be paying more for their energy than they should be; and there is an additional cost for the supplier in reconciling how much money should have been paid and refunding the difference.

Adding debt to a meter

Such as when a customer requires a new Device, such as a new In-Home Display (IHD). If the debt is not added promptly, a customer may face a one-off bill or commence paying for their Device at a time when they face higher energy bills (e.g. during winter).

Joining new Devices to the HAN

Enabling a new IHD/PPMID to be joined to the HAN in the absence of the WAN. In the absence of this functionality, customers will not be able to use their IHD/PPMID until the WAN is restored, which may disadvantage less physically able customers who use the PPMID to top-up.

Refunding customers

Enabling the Supplier to refund a customer if there is a change of tenancy and reset any debt and credit balances for the new customer. Without this, customers will face delays reclaiming their money, which could be critical for customers in financial difficulties.

Reducing the reliance on site visits

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Reducing the number of site visits that Suppliers would otherwise be required to conduct. For example, the free top-ups described in the 'Beast from the East' example above would have required a site visit to over 10,000 customers. Site visits usually require the customer to be at their property, resulting in a potential loss of work or leisure time and an overall worse customer experience.
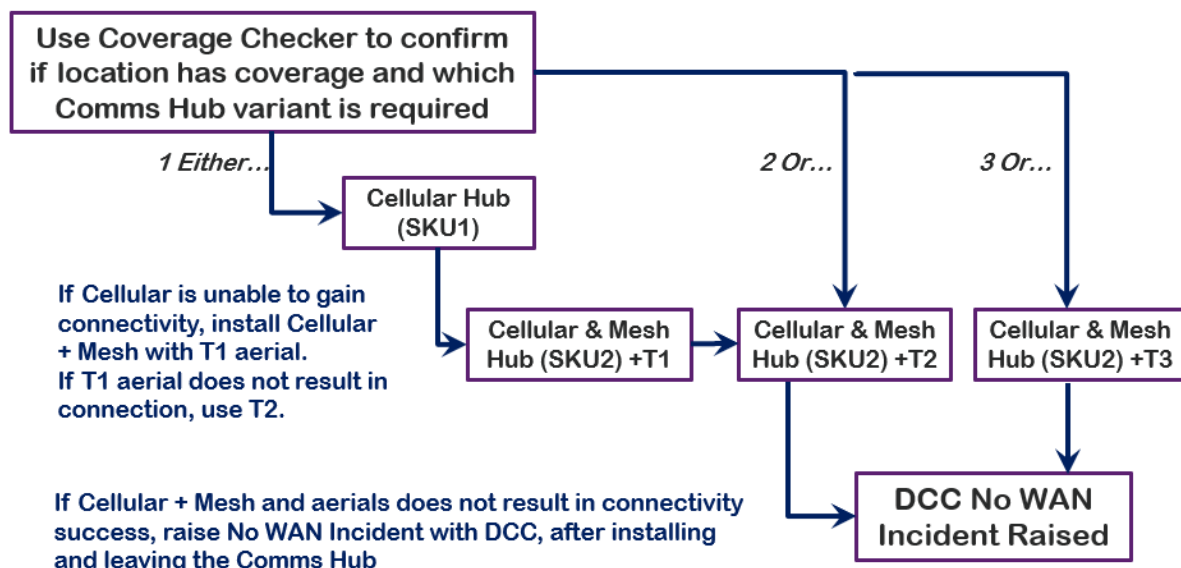
Reducing resolution timescales

In no WAN situations, the time taken to resolve issues relating to customer accounts is greatly reduced when UTRN functionality is available – i.e. customers do not have to wait for WAN to be re-established to update their meter.

What are the current arrangements?

DCC obligations in no WAN Incidents

The DCC provide the below advice for installers when installing smart meters. If the appropriate cellular and mesh hubs are unable to gain connectivity success, the installer should raise a No WAN incident with the DCC.

*Processes from Appendix I CH Installation and Maintenance Support Materials

The obligations set out in Smart Energy Code (SEC) Sections F7.18-F7.22 'Smart Metering System Requirements' place timescales and resolution targets on the DCC for resolution of SM WAN coverage incidents during initial installs. The obligations are that the DCC must, within 90 days:

> *provide a response to the installing Supplier Party that either (i) confirms that the SM WAN is now available in the relevant area such that Communications Hubs installed at premises in*

that area can be expected to be able to connect to the SM WAN; or (ii) provides reasons why the SM WAN is not so available.

The obligation goes on to say the DCC must be able to confirm SM WAN availability in at least 99% of cases raised. In the absence of the additional Commands set out above, which provide additional functionality in no WAN situations, the timescales under these Sections of the SEC are highly problematic.

What is the issue?

The Proposer believes that the 90-day obligation in SEC Section F (F17.8) for the DCC to resolve the lack of SM WAN in the given area is too long. This could leave a customer without full prepayment functionality for 90 days. Where the SM WAN issue was relating to a prepayment customer, the Proposer sought to shorten the 90-day obligation to 30 days – the details are set out in SECMP0032. However, the DCC advised it would incur an estimated cost of £1bn to implement the solution proposed in SECMP0032.

The Proposer also believes that there is neither clarity as to how the DCC is going to deliver against this obligation, nor what the scenario is where the DCC cannot resolve the SM WAN within 90 days. If the DCC is unable to remotely resolve the SM WAN coverage in an area, the next step may require an engineer to be sent to the site by the Supplier to resolve the problem. However, given that the market has a prepayment price cap in operation limiting Suppliers' income, sending an engineer to site is not economically viable.

If a suitable solution can be implemented giving prepayment customers the functionality to manage their accounts during a period of no WAN, SECMP0031, SECMP0032, SECMP0037 and SECMP0038 will become redundant.

What is the impact this is having?

Impacts on prepayment customers

The Proposer believes that no WAN scenarios greatly diminish Suppliers' ability to service prepayment customers, placing prepayment customers at a disadvantage compared to credit customers. Furthermore, the customers impacted by this lack of functionality are more likely to be vulnerable, as noted above.

Impacts on the Proposer

The loss of functionality during no WAN incidents will significantly reduce the mechanisms available to call centre operatives to manage customer accounts. Given that intermittent SM WAN results in more customer contact with the Proposer and other Suppliers, this will result in longer calls, more complaints, and less customer engagement. Furthermore, the Proposer and other Suppliers will incur the additional cost of relying on engineer visits in situations that are currently resolved through a UTRN.

Feedback – Impacts on a Large Supplier

During the Development Stage a Large Supplier advised that it typically saw around 0.75% HAN/WAN connectivity issues in SMETS1. In these cases, it would carry out a site visit and exchange the meters to non-smart meter in order to secure supply to the customers.

It added that with SMETS2 credit installs it saw 3% suffer HAN/WAN issues. However, it noted this is due to a known issue that has since been fixed in new Communications Hub firmware versions. Therefore, it would expect enduring issues to reduce back to at least as good as the 0.75% it experiences in SMETS1.

3. Assessment of the proposal

Observations on the issue

Views of the DCC

The DCC believes this proposal re-iterates the same issues that were raised under the previous modifications noted above, with the Proposer still in need of a solution.

The DCC notes that more SMETS2 installs have taken place since the previous modifications were raised. This increase may provide more background information on what the problems now look like. The DCC's initial thoughts are that there isn't anything that suggests the situation has changed or worsened.

Views of a Large Supplier

Scale of the issue

Noting its experiences with SMETS1 and SMETS2 pilot installs, a Supplier Party advised that they do not support this proposal. They agreed that they do experience issues with HAN/WAN connectivity, with both prepayment and credit customers. However, these were in 0.75% of SMETS1 installations and 3% of SMETS2 installations.

Resolving HAN/WAN issues

The Supplier advised that where it does raise HAN/WAN issues, the DCC normally respond within 48 hours and in around two out of three cases, the Communications Service Providers (CSPs) are able to resolve the issue remotely. In the other cases, it would schedule a site visit to re-boot the Communications Hub. If this failed, it would replace the Communications Hub.

The Supplier added that the 90-day DCC obligation is only supposed to be required in relatively extreme cases, which it is yet to experience despite installing around 600,000 SMETS meters.

Prepayment commands

The Supplier advised that industry would need to develop a 'local command' delivery mechanism in order to support the full list of Commands listed in Section 2 above. Where WAN could not be established, this would allow the installer to leave the Communications Hub installed on site and commission the HAN. Then, once the WAN is established, a second site visit wouldn't be required to

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commission the HAN. However, there is currently no capability in place to support this. The Supplier also acknowledged that customers having to enter a 20-digit UTRN to the PPMID isn't an ideal process to have to follow on a regular basis.

Views of Panel Sub-Committees

SMKI PMA views

The Smart Metering Key Infrastructure (SMKI) Policy Management Authority (PMA) noted that this proposal could have implications on the SMKI, depending on how Commands will be signed, encrypted and decrypted.

A member questioned if one solution to the problem could cover the requirements for both SMETS1 and SMETS2. It advised the likely need for two different solutions due to the differing technical architecture and prepayment processes (for example, UTRN generation).

TABASC views

The Technical Architecture and Business Architecture Sub-Committee (TABASC) suggested that the issue be considered as affecting all meters and not just those in prepayment mode, noting that the problems are more acute for prepayment consumers.

Views of the Change Sub-Committee

Discussions on the issue

The Change Sub-Committee (CSC) agreed there is an issue, and that smart prepayment does not always work in some scenarios. However, it noted the need to understand the scale of the issue, as the Proposer, being predominantly a prepayment Supplier, is likely to be more impacted than other Parties. It recognised the need for a cost-effective solution to the issue and suggested early engagement with the TABASC should a technical solution be needed.

The CSC reviewed the Department for Business, Energy and Industrial Strategy's (BEIS's) initial policy intent on smart prepayment. It noted that the original technical specifications for the Smart Metering Implementation Programme (SMIP) never assumed there would ever be full WAN coverage. Therefore, it believed it should be clarified what Suppliers should be doing now in these no WAN scenarios. The CSC also noted that the previous modifications raised on this topic assumed a technical solution is needed and queried if there could be non-technical solutions to the issue.

The 'install and leave' scenario was noted as having significance to the issue set out in the Draft Proposal. This is where a site is listed as having WAN coverage, but the installation fails as the engineer cannot gain a connection with the WAN. Therefore, the engineer is unable to commission the HAN. A CSC Member advised that in this scenario, the DCC does not have to resolve the lack of coverage, even if it advised that the site should have full WAN coverage but it does not.

Request for Information

The CSC agreed an RFI would be useful to seek wider input from other Parties on the issue. The responses received are summarised further below and can be found in Annex A.

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When reviewing the responses, one member recognised the RFI comments but stressed the importance of progressing this proposal as there is a risk of losing consumer confidence if it is not considered. The member noted the impact this issue has on consumers, such as not being able to top-up pre-payment meters with no-WAN. They added that their organisation does not supply pre-payment customers, but it still experiences WAN issues.

The Consumer Representative agreed and believed that more could be done to assess the scale of the issue.

Another member agreed there is a clearly defined issue but reiterated the need to explore cost effective ways within the Working Group to resolve issues raised against the WAN.

Conclusions

In conclusion, the CSC agreed the issue defined in this proposal is clear and recommended to the Panel this proposal should become a Modification Proposal and proceed to the Refinement Process.

Request for Information responses

On 3 April 2020 SECAS issued an RFI to Parties which closed on 5 May 2020. The aim of the RFI was to seek Parties' experience with WAN coverage and how it affects their SMETS2 installations.

The CSC had suggested broadening the scope of the modification and the RFI with a focus on WAN coverage, rather than on SMETS2 pre-payment where volumes are relatively low. SECAS worded the RFI to cover issues with WAN as a whole and how it can impact the installation of Devices.

Six Parties responded to the RFI, each with varying responses. There were not any common themes, but the key points have been summarised below. The full non-confidential responses received can be found in Annex A.

WAN coverage

Two Parties advised that they found a lack of WAN with 2% to 3% of attempted installations. One added that for successful installations, subsequent WAN issues are not a significant issue. However, this contrasted with a Small Supplier's view that 12% of its Electricity Smart Meter and 36% of its Gas Smart Meter installations experienced a lack of WAN.

A Large Supplier advised it experiences a loss of communications to its prepayment meters at a rate of around 8%. However, these are not always due to no WAN and can be caused by HAN failures. It added that it does not currently schedule a prepayment meter installation where the DCC's coverage checker says there is no WAN in the given area.

The DCC noted that it resolves 97.59% of WAN issues.

Reporting of WAN resolution timescales

The DCC advised that 86% of PPMID WAN issues are resolved within the Service Level Agreement (SLA), noting that these are Category 3 incidents which have a 72 Hour SLA. However, the other five respondents could not provide such statistics for WAN resolution timescales.

MP094 Modification Report

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Page 10 of 15

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One Large Supplier advised that it only raises incidents with WAN where there is an issue after a successful installation, which is in only around 0.07% of cases. The DCC response is normally within 48 hours. It added that when it raises a WAN incident, in 90% of recent cases a site visit is required.

Other factors to note

Respondents pointed to other factors causing loss of communications with meters, other than no/intermittent WAN scenarios:

- Loss of connectivity due to an Over-The-Air (OTA) firmware update; and

- Failures on the HAN e.g. a Communications Hub firmware defect causing meters to drop off the HAN CSP region.

One respondent noted that some WAN issues lie with the Supplier and not the DCC.

Other comments

The Other SEC Party respondent advised that, as an installer, it would be useful to receive information on its assets and WAN resolution directly. This would improve speed of response, provide a better service to end consumers and connect more Devices to the DCC Smart infrastructure.

A Large Supplier believed the RFI was repeating the work already held at customer forums, adding that the DCC already reports upon its performance measures and WAN connectivity. It noted that discussions around the issue highlighted in this Draft Proposal have already been held at length, with the DCC and Parties. These focused on how to mitigate and manage no-WAN scenarios. Overall, the respondent felt the Draft Proposal to be unclear in the issue it was trying resolve.

A Large Supplier acknowledged that the Proposer is disproportionately impacted due to the impact WAN has on prepayment customers, and any solution needs to be cost effective. It stressed that, if a solution is found, that it addresses actual WAN connectivity rather than create workarounds. It went onto to explain its practices and processes for managing lack of communications with prepayment meters, which can be found in the collated responses document (Annex A).

Views of the PPMF

The RFI responses were presented to the PPMF where no additional comments were raised.

Support for Change

Working Group

The Working Group requested clarification from the Proposer whether the issue relates to intermittent WAN or no WAN scenarios. The Proposer commented that intermittent WAN still results in no WAN and so it is the intent to provide a solution that addresses no WAN scenarios, whether this is for a given timeframe, or when there is permanently no WAN. Another scenario was identified where there is no WAN yet but there will be in future.

The Working Group discussed how the issue affects the Consumer. Members acknowledged that the demographic of prepayment customers put them at a higher risk in the case of no WAN. However, a

member commented that in the case of no WAN, all customers are vulnerable and so the issue should be view holistically.

Questions were raised as to why Smart Metering Equipment (SME) is being installed in areas where there is no WAN. This is due to legacy meters being replaced. It was noted that the DCC is obliged to provide WAN to 99.5% of the country and so some areas will permanently have no WAN. One Working Group member asked why AMI meters could not be installed. Another member pointed out that this would be in breach of the Supply Licence and would not count towards SMETS2 rollout obligations.

A Working Group member stated that sometimes meters cannot communicate because of firmware issues and other times a meshing Communications Hub or gateway node would be needed. In a no WAN situation the Supplier may need to wait until another Supplier is installing a Communications Hub. The DCC stated that in areas of low connectivity in the South and Central Regions they identify when installations are taking place and ensure a meshing Communications Hub is installed. The DCC further advised only installing a SMETS2 PPM in areas of medium and high connectivity.

The DCC stated that if there was any connectivity when trying to install SMETS2 equipment which then dropped out it should be raised as an 'intermittent WAN' incident.

The Proposer stated that during SMETS1 adoption and enrolment all additional SMETS1 functionality has been turned off to achieve a minimum viable product. This means that PPM functionality has been lost.

Working Group members agreed with the business requirements as they provide sufficient framework to develop the solution. The Proposer highlighted that they would be happy if the solution benefits all types of Consumers, not only those using prepayment. The Proposer stipulated that a solution that delivers better WAN is not acceptable, the solution must address where there is no WAN available.

DCC Elective Services

The Proposer has engaged with the DCC's Elective Services team to explore potential solutions. During the Working Group, a member of the DCC confirmed that two discussions had taken place with the Proposer to potentially resolve the issues identified. The DCC Elective Services reported that they found there was a lack of appetite from other SEC Parties regarding prepayment issues. Comments were received that due to the way Elective Communication Services function (through critical commands), it may be ineffective as the WAN would not be available to deliver the commands. SECAS will engage with the DCC to explore this further.

Views of the Security Sub-Committee

SECAS presented the Modification to the Security Sub-Committee to discuss the use of UTRNs in order to action Commands as well as previous modifications raised to support pre-payment customers in no SM WAN scenarios. The aim of these discussions was to help steer the direction of the solution.

The SSC advised that any command that changes a price or is supply-affecting would be considered to be high-risk that needs the application of the security controls in the end to end security architecture noting that there may be more viable solutions for non-critical commands.

Regarding SECMP0038, the SSC advised that the use of a wi-fi solution would entail replicating the end-to-end security architecture in a 'no WAN' solution, therefore the SSC is unable to change its

earlier advice on the proposed solution, and could not support the proposed solution on security grounds.

The SSC Chair advised that a risk assessment for SECMP0037 was commissioned from an external company and it was found that implementing the proposed solution to remove the 60 minute timeout from the Communications Hub on start-up would increase the residual risk above the risk appetite of 'medium'. Therefore, the SSC could not support the removal of the 60-minute timeout to enable paring the PPMID with a HAN, without requiring a reliable WAN connection or engineer intervention.

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Appendix 1: Progression timetable

The Panel will consider this proposal on 19 June. Following this SECAS will work the Proposer to develop business requirements, considering those already identified by previous modifications.

Once the business requirements are agreed, SECAS will hold a Working Group meeting to identify a strawman solution to address no-WAN scenarios. The Panel Sub-Committees will be engaged in developing the strawman solution.

Timetable	
Action	**Date**
Draft Proposal raised	12 Nov 2019
Presented to CSC for initial comment	26 Nov 2019
Update given to the CSC	28 Jan 2020
Request for Information	3 Apr 2020 – 5 May 2020
Presented to CSC for final comment and recommendations	26 May 2020
Panel converts Draft Proposal to Modification Proposal	19 Jun 2020
Business requirements developed with Proposer and DCC	22 Jun 2020 – 6 Jul 2020
WAN workshop held with the DCC, Working Group and appropriate Sub-Committees	Jul 2020
Update Panel	14 Aug 2020
Request for Information	March 2021
Business Requirements Workshop	16 May 2022

Appendix 2: Glossary

This table lists all the acronyms used in this document and the full term they are an abbreviation for.

Glossary	
Acronym	**Full term**
BEIS	Department of Business, Energy and Industrial Strategy
CSC	Change Sub-Committee
CSP	Communications Services Provider
DCC	Data Communications Company
HAN	Home Area Network
IHD	In-Home Display
OTA	Over The Air
PPMID	Prepayment Meter Interface Device
RFI	Request for Information
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SLA	Service Level Agreement
SME	Smart Metering Equipment
SMETS	Smart Metering Equipment Technical Specifications
SMIP	Smart Metering Implementation Programme
SM WAN	Smart Meter Wide Area Network
SMKI PMA	Smart Metering Key Infrastructure Policy Management Authority
TABASC	Technical Architecture and Business Architecture Sub-Committee
UTRN	Unique Transaction Reference Number
WAN	Wide Area Network

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