SEC
Smart Energy Code

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MP152

'Consumption on Smart Polyphase Electricity Meters'

Modification Report

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Corporate member of Plain English Campaign
Committed to clearer communication
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About this document

This document is a Modification Report. It currently sets out the background, issue, and progression timetable for this modification. This document will be updated as this modification progresses.

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This document also has one annex:

- **Annex A** contains the non-confidential request for information (RFI) responses.

Contact

If you have any questions on this modification, please contact:

Mike Fenn

020 3314 1142

mike.fenn@gemserv.com

1. Summary

This Proposal was raised by Chris Brown from Haven Power.

Data Communications Company (DCC) Users are currently unable to interrogate polyphase metering equipment to retrieve consumption information from individual phases. This limits the information, understanding and engagement of consumers with their energy consumption.

Being able to read consumption from each phase would mean consumers would benefit from being able to obtain more granular data on their usage behaviours. As a result of being able to obtain individual phase data Suppliers would have the opportunity of offering smart tariffs to consumers if desired.

Following concerns raised during the Refinement Process over the scale and cost of change required to deliver this modification, the Proposer decided to reduce the scope to allowing separate phase data on polyphase electricity meters to be accessed over the Home Area Network (HAN).

2. Issue

What are the current arrangements?

Polyphase meters are electrical meters used for measuring three-phase electricity supply. Polyphase meters are sometimes used in scenarios where each phase is used for a specific purpose e.g. for heating or Electric Vehicle (EV) charging. Separate phase consumption data provides Suppliers the opportunity to offer innovative propositions which allow the customer to be billed at different rates for each phase or purpose.

Currently information provided to Suppliers and to consumers by smart polyphase meters only provides profile consumption data as a combined value across the three phases. Therefore, the tariffs offered to those consumers who have polyphase metering equipment is applied to the cumulative consumption of all three phases combined, rather than individual phase data.

What is the issue?

Some polyphase electricity meters support the measurement of consumption on each phase. However, the Smart Energy Code (SEC) does not currently support functionality that would allow this individual phase data to be retrieved, where it is available. The current arrangements severely limit the opportunity to provide support to consumers around their energy efficiency choices which they could do if their consumption figures were provided at a more granular level.

What is the impact this is having?

This lack of individual phase data limits the ability of Suppliers to innovate and develop products such as smarter tariffs that enable the customer to take greater benefit from smart meters. It also limits the consumers' understanding of their energy usage which could be used to reduce consumption for energy efficiency reasons or to save money by securing a better tariff.

Impact on consumers

Smart metering enables consumers to be more engaged in their energy consumption by informing them of their consumption behaviours, whilst encouraging them to take action to support greater energy efficiency and cost saving. With the increase in EV charging and electrification of heating, polyphase meters will become more prevalent in both non-domestic and domestic properties. In the specific application of supporting EV charging and heating, it is possible for these meters to be used to charge separately for individual appliance consumption and to understand consumption patterns, allowing greater cost and energy efficiency. Therefore, by not having the ability for the consumer to understand the consumption by each individual phase, or to be charged for each phase, the ability for the consumer to be informed, engaged and active in taking energy efficiency measures is limited.

The Proposer also believes the impact of not making this change is that there would be missed opportunities for Suppliers and other Parties to innovate around smart offerings and tariffs.

3. Assessment of the proposal

Observations on the issue

Views of the Change Sub-Committee

The Proposer provided a background to the issue to the Change Sub-Committee (CSC) at the January 2021 meeting. A CSC member questioned if the proposal seeks to measure consumption at both phase and meter level, or just at phase level. The Proposer advised the choice could be offered and can be clarified as the modification progresses.

A CSC member further noted that the data already exists on the meter, and that the Proposal will be seeking an additional data source as opposed to replacing any current sources. A CSC member added that there is ongoing work around half-hourly settlement, which seeks not to have to aggregate data to obtain a meter-level reading. The CSC member advised that this Proposal would not want to perpetuate or worsen the existing issues with data aggregation.

A CSC member acknowledge the intention of the modification is to provide additional data. They further noted there are other modifications currently under the Balancing and Settlement Code (BSC) regarding sub-boundary metering which will be worth looking at to ensure alignment (such as BSC modification P375 ‘Settlement of Secondary BM Units using metering behind the site Boundary Point’).

The Smart Energy Code Administrator and Secretariat (SECAS), on behalf of the Proposer, provided a further update on the issue and business context to the CSC at the February 2021 meeting. SECAS noted that while the modification still requires discussion with the Technical Architecture and Business Architecture Sub-Committee (TABASC), further discussion with the Proposer had outlined that this change is a Device-oriented opportunity, where some Devices may be able to produce individual phase data. The benefit of this change is that it paves a way for greater granularity of usage information, whilst allowing organisations to show people and consumers opportunities to cut down usage and enable efficiency. SECAS added that the Proposer anticipates that the opportunity and benefit of this modification will increase with the larger uptake of polyphase meters in the domestic space. The Proposer believes the real benefit would not only be for one business but for many

businesses and ultimately consumers, which benefits the wider industry as a whole. CSC members noted that the question around wider benefits should be addressed during the Refinement Process.

SECAS advised that discussion around the opportunity the modification presents will be discussed at the TABASC. This was discussed at the March 2021 TABASC meeting, where the TABASC members had no comments on the issue raised.

At the CSC meeting on 28 September 2021, the members agreed that this modification was ready to proceed to the Refinement Process. One member highlighted that a rigorous cost-benefit analysis would be key to building support for any proposed solution, and SECAS agreed this would be central to discussions when working to develop the solution.

Views of the Requirements Workshop

The Draft Proposal was discussed at the Requirements Workshop. One attendee asked how many of these meters were currently in the field. The Proposer stated that this information was not available but suggested that as more consumers take on EVs and Smart heating arrangements such as Heat Pump cooling and heating, the demand for a polyphase meter is likely to increase. Another attendee believed there are currently 3.4 million polyphase meters in the field. One attendee added that there needs to be a clear business case, as they believed that the current proposal is a 'nice to have'. It was also felt that for this to go ahead, the consumer would need to see the consumption data across all phases on the In-Home Display (IHD).

Request for information responses

An RFI was issued to gauge industry views on the need for this modification, and to assist in developing the business case. Eight Parties responded to the RFI: three Large Suppliers, three Small Suppliers, one Network Party, and one Other SEC Party. Collated responses can be found in Annex A.

Respondents indicated that there is a significant and increasing demand for Smart Metering Equipment Technical Specifications (SMETS) 2+ polyphase meters and were unanimous in seeing a benefit in having the ability to read separate consumption data on each phase of those meters.

All but one of the respondents believed that developing this modification further would be beneficial to industry, and that it would be beneficial for the solution to include the ability for Suppliers to set price tariffs per phase. There was a majority consensus among respondents that this modification would also provide benefits to them as a business, although they were unable to quantify this at this stage.

Of the four respondents that commented on the relevance of BSC modification P375, three believed that DP152 would have the added benefit of providing a disaggregated data view to consumers and Suppliers, rather than just the Balancing Service Provider (BSP).

There were mixed opinions on whether existing prepayment functionality should be replicated in the solution. One respondent expressed the belief that prepayment customers should not be "left behind" by Smart metering innovations, but two other respondents queried the demand for polyphase metering among prepayment consumers.

One respondent noted that as part of the solution, all information provided per phase must be available on the HAN for IHDs, Prepayment Interface Devices (PPMIDs) and Customer Access Devices (CADs) to utilise, including the capability to have per-phase Time of Use (ToU) pricing.

One Small Supplier asked that the solution includes the capability to charge different tariffs per phase. It highlighted the work being done by the Department for Business, Energy & Industrial Strategy (BEIS) to drive energy efficiency using Smart metering in the non-domestic market, specifically through the Non-Domestic Smart Energy Management Innovation Competition (NDSEMIC).

A Large Supplier expressed the view that at present the potential costs of this modification far outweigh any tangible benefits to Suppliers, due to the likely requirement of firmware changes on polyphase meters, Communications Hubs, and IHDs. The respondent noted that whilst providing increased disaggregation for consumers is a positive development, many consumers with an EV will be able to access the costs of charging via existing charging point and vehicle apps outside of the DCC smart infrastructure.

Views of the UK Metering Forum

Representatives of the United Kingdom Metering Forum (UKMF) approached SECAS to express concerns over the planned implementation of MP152. The UKMF cited materials published by the Association of Meter Operators (AMO) which outline the technical issues faced when configuring polyphase meters to separate their phase data, specifically with regards to failures in accurate recording of cumulative consumption where import and export phases exist on the same meter. It is the UKMF's view that any solution which MP152 seeks to implement will exacerbate these issues and lead to reductions in interoperability of Devices.

Views of the TABASC

This modification was presented to the TABASC on 4 November 2021. The TABASC queried the use cases for MP152, citing concerns over proposals to use each phase for different purposes, where Distribution Connection and Use of System Agreement (DCUSA) requirements exist to balance load across all phases. SECAS acknowledged that the rules around how loads will need to be balanced across multiple phases needs consideration.

Conversely, a TABASC member noted that a combined view would be welcome as the industry would benefit if more metering equipment was three phase, particularly for high load requirements such as EV charging.

The TABASC noted that the current level of clarity in the modification would not be enough to accommodate the tripling volume of data that would occur if a Device was required to send three sets of consumption data. The TABASC suggested that further investigation is needed to determine whether the requirement is for a polyphase meter to provide the same information as three separate single-phase meters. A TABASC member questioned whether there should be two modes of operation, one as a polyphase meter providing combined readings as in the current functionality, and one as a polyphase meter effectively able to supply data as if it was three single phase meters.

Discussion with Proposer

Following concerns raised by industry Parties, the UKMF and the TABASC, SECAS discussed the large-scale technical implications of this modification with the Proposer. It was agreed that due to the scale and cost of change required, and the subsequent likely difficulties in obtaining support for this modification to be implemented, the scope should be reduced.

The business requirements for the solution were therefore reduced to one requirement, which was to make the necessary changes in the Zigbee specifications to allow separate phase data on polyphase electricity meters to be accessed over the HAN.

Appendix 1: Progression timetable

On 28 September 2021 the CSC approved the conversion of DP152 from a Draft Proposal to a Modification Proposal. SECAS will work with the Proposer and the DCC to develop the business requirements. SECAS's view is that this modification may have significant overlap with DP184 'Increase Smart Capability of SMETS2 Twin Element ESME to support Solar and Storage use cases'. During the Refinement Process both modifications will be discussed with the relevant Sub-Committees in parallel to ensure the implications of each on the other are fully understood, that the solutions do not contradict or duplicate each other, and identify any synergies between them.

Timetable	
Event/Action	**Date**
Draft Proposal raised	29 Jan 2021
Presented to CSC for initial comment	26 Jan 2021
Presented to CSC for further comment	23 Feb 2021
Problem statement discussed with TABASC	4 Mar 2021
Request for information issued	16 Aug – 3 Sep 2021
CSC converts Draft Proposal to Modification Proposal	28 Sep 2021
Business requirements developed with Proposer and DCC	Oct 2021
Modification discussed at Operations Group	2 Nov 2021
Modification discussed at Working Group	3 Nov 2021
Modification discussed with TABASC	4 Nov 2021
Modification discussed with SSC	24 Nov 2021
Modification discussed at Working Group	5 Jan 2022
Preliminary Impact Assessment requested	10 Jan 2022
Update provided to CSC	15 Feb 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**
AMO	Association of Meter Operators
BEIS	Department for Business, Energy & Industrial Strategy
BSC	Balancing and Settlement Code
BSP	Balancing Service Provider
CAD	Customer Access Device
CH	Communications Hub
CSC	Change Sub-Committee
DCC	Data Communications Company
DCUSA	Distribution Connection and Use of System Agreement
EV	Electric Vehicles
HAN	Home Area Network
IHD	In-Home Display
NDSEMIC	Non-Domestic Smart Energy Management Innovation Competition
PPMID	Prepayment Interface Device
RFI	Request for Information
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SMETS	Smart Metering Equipment Technical Specifications
TABASC	Technical Architecture and Business Architecture Sub-Committee
ToU	Time of Use
UKMF	United Kingdom Metering Forum