SEC
Smart Energy Code

This document is classified as **White** in accordance with the Panel Information Policy. Information can be shared with the public, and any members may publish the information, subject to copyright.

Smart Energy Code

MP179
'DCC Boxed'

Modification Report

Version 0.3

10 November 2021

Corporate member of Plain English Campaign
Committed to clearer communication
592

About this document

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

Contents

1. Summary 3
2. Issue 3
3. Solution 5
4. Impacts 5
5. Costs 6
6. Implementation approach 7
7. Assessment of the proposal 7

Appendix 1: Progression timetable 11

Appendix 2: Glossary 11

This document also has one annex:

- **Annex A** contains the redlined changes to the Smart Energy Code (SEC) required to deliver the Proposed Solution.

Contact

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

Mike Fenn

020 3314 1142

mike.fenn@gemserv.com

1. Summary

This proposal has been raised by Tom Rothery from the Data Communications Company (DCC).

Currently, a User wishing to test its systems or Devices against the DCC Systems must do so through remote or in-situ testing as set out in SEC Section H 'Testing Services' and SEC Appendix J 'Enduring Testing Approach Document' (ETAD). These include a range of associated User-entry and connectivity steps which take time and incur cost.

The DCC has developed an end-to-end testing tool, known as 'DCC Boxed', which replicates the end-to-end DCC system, as an expansion from the existing Great Britain Companion Specification (GBCS) for Industry (GFI) toolset. DCC Boxed was developed to meet the need to enhance the existing GFI tool to provide a holistic testing environment beyond the Home Area Network (HAN).

The DCC has undertaken a cost benefit analysis of making the tool available through an Explicit Charge, which has the potential to recover the development costs and potentially, over time, provide a means for the DCC to reduce its fixed costs to its customers.

The purpose of this modification is to add the necessary wording to the SEC to allow the DCC Boxed product to be provided through an Explicit Charge to those Parties that wish to purchase it. This modification will impact the DCC and will make this service available to other SEC Parties. There are no costs to implement this change and no DCC System impacts. If approved this modification is targeted for the February 2022 SEC Release. This is a Self-Governance Modification.

2. Issue

What are the current arrangements?

Currently, a User wishing to test its systems or Devices against the DCC Systems must do so through remote or in-situ testing as set out in SEC Section H 'Testing Services' and SEC Appendix J 'Enduring Testing Approach Document', with a range of associated User-entry and connectivity steps which take time and incur cost.

DCC Boxed is an end-to-end testing tool developed by the DCC which replicates the end-to-end DCC system. Whilst DCC Boxed can be utilised for internal testing and could be used to support programme testing, several parties (including Suppliers, Device Manufacturers, and other SEC and non-SEC Parties) have requested DCC Boxed be made available as a testing product. The DCC has engaged with stakeholders through industry forums and a survey on the requirements and the regulatory and funding options.

What is the issue?

The DCC currently offer several testing products to its customers, which are set out in SEC Section H and Appendix J. There are currently no explicit provisions within the SEC for the DCC to provide DCC Boxed as a testing product to its customers. Similarly, there is currently no Explicit Charge in SEC Section K 'Charging Methodology' that is specific to the charging for DCC Boxed.

As a result of the costs involved, and due to the nature of the DCC's release schedule, it is often the case that there is limited time available in the regulated User Integration Testing (UIT) environment for the development of new products and services.

The Proposer believes that making DCC Boxed available for early testing will increase the quality of any new products and services because they will have been more rigorously tested over a longer timeframe. The Proposer believes a SEC modification is the correct route to deliver this product as it doesn't meet the scope of existing Elective Communication Services, and to be implemented as a 'value-added service' a product must sit outside of the energy sector[1].

What is the impact this is having?

The DCC has conducted a survey to understand the appetite for DCC Boxed to be made available as a testing product, and received interest from several parties including Suppliers, Device Manufacturers, and other SEC and non-SEC Parties. A summary of these survey responses is available on the DCC's website.

The DCC's survey results provided several examples of issues with time and cost-effectiveness for testing, defect resolution and Device proving under the approaches currently available. These include:

- For organisations without access to test environments provided under the SEC, early development of HAN Connected Auxiliary Load Control Switches (HCALCS) or Standalone Auxiliary Proportional Controllers (SAPCs) is currently unavailable.
- Testing participants without access to Remote Testing Labs (RTLs) are unable to undertake testing outside of scheduled testing hours at DCC test labs.
- For Device manufacturers, Device proving with smaller Supplier Parties is difficult when relying only on GFI and RTLs available under the SEC.

Without more accessible and robust testing of new products and Devices in a realistic simulation of a live environment, design issues will continue to go unidentified prior to implementation, resulting in lower performance and higher costs to resolve across all industry Parties.

It is also the DCC's view that doing nothing would inhibit its ability to comply at all times with the DCC Licence Conditions, primarily its first General Objective, which is outlined in the Smart Meter Communication Licence. This requires that the DCC carries on the Mandatory Business in the manner that is most likely to ensure the development, operation, and maintenance of an efficient, economical, co-ordinated, and secure system for the provision of Mandatory Business Services under the SEC[2]. This also relates to SEC Objective (a)[3]. This is because the use of DCC Boxed as a saleable tool for SEC Parties and Testing Participants should enable the DCC to reduce its overall fixed cost charges to SEC Parties.

Impact on consumers

Limitations in access to an end-to-end testing environment for some Users can lead to new products going live without a full understanding of how they will interact in a live environment. Many issues that

[1] Value Added Services are defined in the DCC's Licence as services that 'are not related solely to the Supply of Energy (or its use) under the Principal Energy Legislation'
[2] Smart Meter Communication Licence Condition 5.9
[3] Facilitate the efficient provision, installation, operation and interoperability of smart metering systems at energy consumers' premises within Great Britain.

arise once a product is live will negatively impact consumer experience, as they may result in reduced Device operability, increased Round Trip Times (RTTs) of System messages relating to key customer business processes, and increased cost of service if Device repair or replacement is required.

3. Solution

The DCC Boxed tool has been developed for internal use by the DCC. The DCC recognised the product may have potential uses for their customers' testing and development processes, and so conducted public surveys to gauge interest. The responses received expressed an appetite for the DCC Boxed product to be made available for purchase through an Explicit Charge model.

This modification seeks to make the necessary changes to the SEC to provide a commercial vehicle for DCC Boxed to be provided through an Explicit Charge to those Parties that wish to purchase it. This is a text-only change and will not impact DCC Systems. This is expected to be a Self-Governance modification.

The changes to the SEC required to deliver the proposed solution can be found in Annex A.

4. Impacts

This section summarises the impacts that would arise from the implementation of this modification.

SEC Parties

SEC Party Categories impacted			
	Large Suppliers		Small Suppliers
	Electricity Network Operators		Gas Network Operators
	Other SEC Parties	✓	DCC

The impact on the DCC will be the obligation to provide the DCC Boxed product and subsequent servicing requirements to Parties that wish to purchase it, and to update their financial reporting accordingly.

While there will be no direct impact on Parties other than the DCC from the implementation of MP179, any Party that wishes to purchase DCC Boxed will be subject to the relevant charges.

DCC System

There is no impact from this modification on the DCC Systems.

SEC and subsidiary documents

The following parts of the SEC will be impacted:

- SEC Section A 'Definitions and Interpretation'
- SEC Section H 'DCC Services'
- SEC Section K 'Charging Methodology'
- SEC Schedule 7 'Specimen Enabling Services Agreement'
- SEC Appendix J 'Enduring Testing Approach Document'

The changes to the SEC required to deliver the proposed solution can be found in Annex A.

Consumers

The Proposer believes that Consumers will be positively impacted by the implementation of this modification, as the improvement in testing will lead to the availability of more robust products and services.

Other industry Codes

There is no impact from this modification on other industry Codes.

Greenhouse gas emissions

There is no impact from this modification on greenhouse gas emissions.

5. Costs

DCC costs

There are no DCC costs to implement this modification.

SECAS costs

The estimated Smart Energy Code Administrator and Secretariat (SECAS) implementation cost to implement this as a stand-alone modification is one day of effort, amounting to approximately £600. This cost will be reassessed when combining this modification in a scheduled SEC Release. The activities needed to be undertaken for this are:

- Updating the SEC and releasing the new version to the industry.

SEC Party costs

There are no SEC Party costs to implement this modification.

6. Implementation approach

Recommended implementation approach

SECAS is recommending an implementation date of:

- **24 February 2022** (February 2022 SEC Release) if a decision to approve is received on or before 9 February 2022; or
- **30 June 2022** (June 2022 SEC Release) if a decision to approve is received after 9 February 2022 but on or before 15 June 2022.

7. Assessment of the proposal

Observations on the issue

Views of the Change Sub-Committee

The SECAS presented a summary of this modification to the Change Sub-Committee (CSC) on 31 August 2021 for initial comment. A CSC member noted the importance of understanding the cost/benefit case, and it was agreed that further development was required to define and understand the issue. When this modification was initially raised, the issue was defined by the need for the improvement of available testing services; however, it has since been redefined as the need to provide a commercial vehicle for the delivery of an existing testing and development tool. Following this clarification, the CSC agreed that this modification should proceed to the Refinement Process in order to develop the solution.

Views of the SMKI PMA

A Smart Metering Key Infrastructure (SMKI) Policy Management Authority (PMA) member questioned whether the testing tool has an interface with the SMKI, and if so, how this is configured internally. The SMKI PMA considered that investigation would be required to determine if the DCC Boxed tool could be used to ‘reverse engineer’ sensitive data concerning SMKI configuration. The Proposer has since confirmed that DCC Boxed offers no more insight than the SMKI documentation already in the public domain and that no sensitive material is shared between DCC Boxed and the SMKI.

Views of the SSC

SECAS noted to the Security Sub-Committee (SSC) that no sensitive material is shared between DCC Boxed and DCC Systems or any of the interfaces which are emulated by tool.

The SSC queried why this is not being provided as an elective service. SECAS advised that DCC Boxed doesn't meet the scope of existing Elective Communication Services, so a SEC modification would still be required to allow this service to be offered to DCC customers.

The SSC queried how the tool would be security assured. SECAS advised that an independent security assessment had already been completed and no substantive issues were found. The DCC have summarised the findings of the independent security assessment report below and provided responses to the specific questions raised by the SSC.

> 'The penetration test showed that both outsider and insider threats had low to negligible inherent risk levels, and low residual risks. The independent test was in two parts: a code review and a build review.
>
> The code review included a check on third-party dependencies. The reviewed application was developed with care taken to ensure that security was accounted for, and security best practices were followed. The overall potential for abuse of the application code was found to be low. During the review, dependencies for the application code were verified to ensure that no required dependencies contained known security vulnerabilities. It was identified that some elements of the application depended on versions of third-party libraries that contained known vulnerabilities.
>
> For the build review, one medium risk vulnerability was discovered which concerned the webserver configuration which supported the DCC application on the Device. The Device did not present any other vulnerabilities that could be leveraged by an unauthenticated network attacker. The overall risk rating was amended accordingly.
>
> The penetration test report was clear in that this product has very low security risk. The DCC will also be exploring the hosting of a page for DCC Boxed users to gain security awareness regarding DCC Boxed components, as per its internal security recommendation.'

The SSC asked whether DCC Boxed connects to the internet or uses a separate operating system. The DCC has advised that an internet connection is required only to download new updates.

The SSC queried whether the emulator Universal Serial Bus (USB) sticks would be encrypted and how. The DCC has confirmed that the Device emulator code is contained within the mini-PC or Next Unit of Computing (NUC) and not on the USB stick. The USB sticks simply provide a method of integrating Zigbee into the computer's gateways and bridge Devices. There is no personal or sensitive data on the USB sticks, and from a security standpoint there is no necessity for encryption.

The SSC also asked what protections are in place on the mini-PC to prevent other USBs being used to interrogate Devices. The DCC has advised that the operating system is a compiled piece of code and has no user access. The DCC Boxed equipment acts as a server for hosting the DCC Boxed application only and cannot be used for any other activity. As the code is purely an emulator built from publicly available information, attackers would be unable to gain access to or information about the DCC Total Systems. The architecture of the DCC Boxed component ensures the Zigbee USB sticks are solely used for that purpose only on the preconfigured Device.

The SSC queried what controls are built in for protection in the event of physical theft of the mini-PC. The DCC advised that as the DCC Boxed component does not store any real or live data there are no significant risks to integrity or confidentiality. The DCC can stop the mini-PC from updating once being reported stolen, however the security risk is very low.

Views of the TAG

The Testing Advisory Group (TAG) considered that the issue had not been clearly defined, as it had not been made clear exactly what uses the tool is intended to have. Following a discussion with the Proposer and the TAG chair, the Modification Report summary has been amended to address this.

The TAG asked whether emulators would have to be updated ahead of Communication Service Provider (CSP) and Data Service Provider (DSP) uplifts, and how this would be aligned with governance. The DCC has confirmed it can update the tool and users can configure the tool to test against current and upcoming releases. If DCC Boxed is configured to current releases it cannot be used as an early testing tool for upcoming releases; users will be referred to a website for configuration patches and updates, and it will be down to the user to check for and download the updates. The DCC proposes to set out its approach to updates in the DCC Boxed Policy.

The DCC confirmed that the projected cost of DCC Boxed covers annual uplifts of the product, which may be undertaken more regularly than once yearly.

The TAG asked what steps are in place to triage any issues encountered by DCC Boxed users. The DCC has a clearly defined path of customer support, starting with the product user guide, progressing to the DCC Service centre and internal staff support, through to specialist assistance to help understand issues and resolve any potential problems.

Views of the TABASC

The Technical Architecture and Business Architecture Sub-Committee (TABASC) had similar concerns to the TAG regarding the issue not being clearly defined.

The TABASC asked how many years' use the intended Explicit Charge covers when the tool is bought. The DCC has confirmed that the Explicit Charge covers user support for the lifecycle of the product, although the product is designed to be self-serving. The cost includes a twelve-month warranty, and the current pricing model has five years of GBCS changes costed in.

The DCC advised the tool is intended to increase the uptake of smart metering systems by Suppliers by supporting early testing and reducing the volume and severity of testing issues.

The TABASC also asked for more detail around uplifting of functionality and availability of Communications Hubs, including whether the tool would provide access to early versions of firmware. The DCC has responded that the DCC Boxed policy document, which is owned by the DCC and referred to in the legal text changes proposed for SEC Appendix J 'Enduring Testing Approach Document', will provide the plans for future updates and their frequency. The DCC has confirmed that DCC Boxed is not shipped with physical Communications Hubs and will not provide any details around availability or plans for future upgrades of any Communications Hub firmware. However, when early versions of Communications Hub firmware are released by CSPs ahead of any Release, they can be tested using DCC Boxed.

Views of the Working Group

SECAS presented a summary of the modification and the proposed solution to the Working Group on 3 November 2021. During the discussion the opinion was expressed that the Device emulators used by the DCC should behave the same as emulators which are already in the market, rather than simply being compliant with the relevant technical specifications. The DCC noted this point, although SECAS advised that it cannot enforce compliance with 'unwritten' industry consensus. There were no

concerns raised over the planned approach, and the Working Group agreed MP179 was ready to be issued for Refinement Consultation.

Views against the consumer areas

Improved safety and reliability

This modification is expected to have a positive impact on safety and reliability; more robust testing of new products and services will lead to more issues being identified prior to going live.

Lower bills than would otherwise be the case

This modification is expected to have a positive impact on consumer bills, as fewer issues in product design will lead to a lower cost to service.

Reduced environmental damage

This modification is expected to have a positive impact on the environment, as it will enable greater innovation in the design and delivery of new ‘green’ products and services.

Improved quality of service

This modification is expected to have a positive impact on quality of service, as it will lead to fewer faults being encountered after new products and services have entered the market.

Benefits for society as a whole

This modification is expected to have a positive impact on society as a whole, as it will enable greater innovation in the design and delivery of new products and services.

Appendix 1: Progression timetable

This Draft Proposal has been discussed with all relevant Sub-Committees to capture initial views on the problem statement. On 26 October 2021 the CSC approved the conversion from a Draft Proposal to a Modification Proposal.

Timetable	
Event/Action	**Date**
Draft Proposal raised	23 Aug 2021
Presented to CSC for initial comment	31 Aug 2021
Modification discussed with Sub-Committees	Sep 2021 – Oct 2021
CSC converts Draft Proposal to Modification Proposal	26 Oct 2021
Discussion with Working Group	3 Nov 2021
Refinement Consultation	10 – 26 Nov 2021
Discussion with Working Group	1 Dec 2021
Modification Report approved by CSC	22 Dec 2021
Modification Report Consultation	27 Dec 2021 – 14 Jan 2022
Change Board Vote	26 Jan 2022
Authority Decision (anticipated date)	9 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**
CSC	Change Sub-Committee
CSP	Communication Service Provider
DCC	Data Communications Company
DSP	Data Service Provider
ETAD	Enduring Testing Approach Document
GBCS	Great Britain Companion Specification
GFI	GBCS for Industry
HAN	Home Area Network
HCALCS	HAN Connected Auxiliary Load Control Switch
NUC	Next Unit of Computing
RTL	Remote Testing Lab
RTT	Round Trip Time
SAPC	Standalone Auxiliary Proportional Controller
SEC	Smart Energy Code

Glossary	
Acronym	**Full term**
SECAS	Smart Energy Code Administrator and Secretariat
SMKI PMA	Smart Metering Key Infrastructure Policy Management Authority
SSC	Security Sub-Committee
TABASC	Technical Architecture and Business Architecture Sub-Committee
TAG	Testing Advisory Group
UIT	User Integration Testing
USB	Universal Serial Bus