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# SECMP0009 Draft Modification Report

## About this document

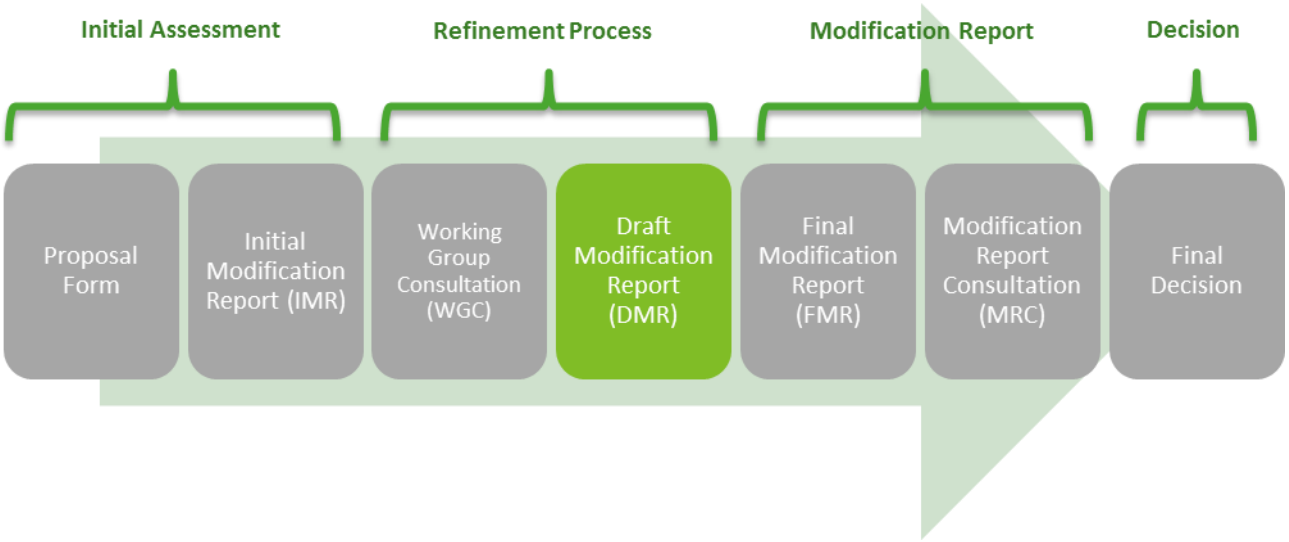
This Draft Modification Report (DMR) provides detailed information on the issue, solution(s), impacts, costs and Working Group (WG) discussions and conclusion on SECMP0009 'Centralised Firmware Library'.

**This report is submitted to the Smart Energy Code (SEC) Panel for consideration to ensure that due process has been followed and determine whether to issue the modification for Modification Report Consultation (MRC).**

As part of this document the Panel will be invited to:

- **AGREE** that SECMP0009 is a Path 2 Modification Proposal;
- **AGREE** that the draft legal text delivers the intention of the modification;
- **AGREE** with the recommended implementation approach; and
- **AGREE** that this modification be submitted to Modification Report Consultation.

## Where are we in the process?



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**Stage 02: Draft Modification Report**

What stage is this document in the process?

| | |
|---|---|
| 01 | Initial Assessment |
| 02 | Refinement Process |
| 03 | Modification Report |
| ▶ 04 | Decision |

# SECMP0009:

# Centralised Firmware Library


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## Summary


This Modification Proposal seeks to establish a Firmware Information Repository, with access provided to all Parties responsible for the management of Smart Metering Equipment Technical Specifications (SMETS) 1 and/or SMETS2 meters.


## Working Group View

✓

- The Working Group unanimously believes that SECMP0009 should be approved.

## Impacts

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- Supplier Parties
- Meter Manufacturers
- Firmware Developers.
- There are no impacts on Data Communications Company (DCC) Central Systems or Party interfacing systems




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## Contents


1. Summary 4
2. What is the issue? 6
3. Proposed Solution 8
4. Impacts 9
5. Costs 11
6. Implementation 12
7. Working Group Discussions 13
8. Working Group's Conclusions 17

Appendix 1: Glossary 19


## About this Document

This document is a Draft Modification Report (DMR). It provides detailed information on the issue, solutions, impacts, costs and Working Group discussions and conclusion on SECMP0009.

This document has two attachments:

- Attachment A contains the legal text that will deliver the intention of SECMP0009; and
- Attachment B contains the collated responses received to the Working Group Consultation.

The SEC Panel will consider this report to ensure that due process has been followed and determine whether to issue the modification for Modification Report Consultation (MRC).



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# 1. Summary

## What is the issue?

As the population of Smart Meters grows, Suppliers have found that they are responsible for maintaining assets supplied by Manufacturers with which they do not have commercial agreements. If a Supplier is the gaining Supplier in a Change of Supplier scenario it may become responsible for assets provided by Manufacturers that it has not previously worked with, and so may not have a commercial agreement in place with them. However, it still has the responsibility of maintaining the asset, including ensuring the latest version of firmware is in use. At the moment, there is no easy way for Suppliers to find out if a version of firmware is the latest version and who to contact if it is not.

## What is the solution?

The proposed solution is to establish a Firmware Information Repository containing "non-commercial" data regarding firmware provided to maintain compliance with industry specifications. This repository would sit alongside the Central Products List (CPL) and be updated in tandem. The information will be supplied by the meter Manufacturers, allowing gaining Suppliers to understand if an asset is using the most recent version of firmware and how to acquire the latest firmware release from Manufacturers.

## Impacts

### Party

| | | | |
|---|---|---|---|
| Large Supplier Parties | X | Small Supplier Parties | X |
| Electricity Network Parties | | Gas Network Parties | |
| Other SEC Parties | X | | |

### System

| | | | |
|---|---|---|---|
| DCC Systems | | Party interfacing systems | |
| Smart Metering Systems | | Communication Hubs | |
| Other systems | | | |


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## Implementation Costs

The total estimated implementation cost to deliver SECMP0009 is approximately £3,000. This total cost consists of:

- **£3,000** in SEC Administration effort.

## Implementation Date

The Working Group is recommending an implementation date of:

- **1st November 2018**, if a decision to approve is made by 18th October 2018; or
- **28th February 2019**, if a decision to approve is received after 18th October 2018 but on or before 14th February 2019.

## Working Group's views

The Working Group believes **unanimously** that SECMP0009 better facilitates the SEC Objectives. It therefore believes that this Modification Proposal should be **approved**.


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## 2. What is the issue?

### Ensuring firmware is up-to-date

Smart Metering Devices include Smart Meters, In Home Displays (IHD), Pre-Payment Interface Devices (PPMID) and HAN Connected Auxiliary Load Control Switches (HCALS). All these Devices contain software, which is specifically designed for the operational tasks of each Device. Since this software is bound to the Device hardware it is commonly referred to as firmware. The firmware for all Smart Metering Devices installed in the field will need to be updated from time to time due to changes in the technical specifications and the correction of issues. The firmware for Smart Meters (gas and electricity) is at the heart of this SEC modification proposal; it is anticipated that PPMIDs, IHDs and HCALCS will also require firmware updates (the inclusion of IHDs depends on SECMP0007 'Firmware updates to IHDS and PPMIDs').

As Smart Metering is rolled out, there has been increasing pressure on Suppliers to adhere to the SEC requirement in Section G- Security to ensure that the Devices they are responsible for are operating with the latest versions of firmware. This is to fully utilise the Smart Meters' ability to both convey and receive relevant information.

Suppliers have encountered issues with ensuring that firmware is still up to date for all Devices, particularly if there has been a change of Supplier or Customer. In order to be able to fulfil their obligations, Suppliers need to be able to have access to the latest firmware images. This would need to be the case even if they do not normally purchase Devices from a particular Manufacturer.

In a Change of Supplier scenario, the gaining Supplier may acquire responsibility for Devices for which it has no commercial agreement in place with that Manufacturer. Without such an agreement, it may be difficult for that Supplier to be able to gain the necessary firmware needed for their Device from the Manufacturer. In some cases, they may not even know which Manufacturer they need to contact. There is currently no provision for any form of centralised access point for information regarding firmware for these Suppliers to access.

A number of papers were drafted by SECAS, each developing the concept of a Centralised Firmware Library (CFL), prior to this Modification Proposal being raised. These papers are referenced below:

- *SECP_17_1302_04*: This paper laid out an original suggestion for SECAS to develop the CFL proposal.
- *SECP_23_1408_04*: This paper provided an assessment of the practicality of providing a CFL, taking into account legal, regulatory, technological, economic, security and other factors.
- *SECP_27_1112_07*: This paper set out some of the architectural considerations for the CFL.


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In addition, Energy UK drafted a paper to the Panel in March 2014 outlining Supplier's requirements in relation to firmware management: this included the original CFL proposal.

## What is the issue?

The Proposer raised SECMP0009 seeking to establish a CFL. The library was intended to be a repository of "non-commercially released" firmware images for all Device Models which were required to be included on the CPL. The term "non-commercially released" firmware images related to those firmware images that are released to fix bugs and defects associated with a Device Model, rather than firmware images that are developed on a commercial basis between an Energy Supplier and Device Manufacturer in order to deliver enhanced functionality and/or features that go beyond the minimum SMETS1 and/or SMETS2 specifications.

However, through Working Group discussions, Manufacturers raised legitimate concerns around sharing information other than that recorded in the CPL, particularly around commercial, Intellectual Property Rights (IPR) and security issues with providing firmware images to a CFL available to all Suppliers.


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# 3. Proposed Solution

## Solution

To address concerns raised during the assessment of SECMP0009 surrounding IPR and security, the initial solution of a CFL was amended. SECMP0009 is therefore proposing to establish a minimal information set that will allow a gaining Supplier to easily identify the most recent firmware release for a given asset and which Manufacturer to contact regarding acquiring any updated versions required.

A Firmware Information Repository will be collated. It will be a human readable Excel spreadsheet that contains the following data items:

- The reference CPL Entry Number;
- Contact details for the relevant Manufacturer; and
- A free text field for any notes about the release that the Manufacturer wants recorded against the entry. The level of detail provided is at the discretion of the Manufacturer.

The Firmware Information Repository will be published, cross referenced and updated on the SECAS website and updated alongside the CPL so will be publicly accessible. Whenever a new entry is added to the CPL, a corresponding entry will be added to the Firmware Information Repository, and the mechanism for this information being provided to SECAS will be the same as for the CPL. When a Party is submitting Device details for addition to the CPL, they will supply the details listed above for the same Device at the same time.

This solution will only apply to entries added to the CPL on or after the SECMP0009 implementation date. There will be no entries retrospectively added into the Firmware Information Repository for CPL entries added prior to this date.

## Draft legal text

The proposed legal text changes to SEC Sections A and F are provided in Attachment A.


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# 4. Impacts

The following section sets out the impacts associated with the implementation of SECMP0009.

## SEC Party Impacts

| | | | |
|---|---|---|---|
| Large Supplier Parties | X | Small Supplier Parties | X |
| Electricity Network Parties | | Gas Network Parties | |
| Other SEC Parties | X | | |

Large and Small Supplier Parties will not be impacted in implementing SECMP0009, but will be positively impacted by its implementation as they will have a central database from which to obtain information about firmware releases, updates and Manufacturer contact details.

Manufacturers will be impacted by SECMP0009 as they will have to provide contact details in relation to each new firmware image, as well as provide information about the firmware regarding critical fixes related to security or service impacting functionality for reference in the repository. The expectation is that the contents of the optional free text field will be a reduced version of the Manufacturer's full release notes.

## Central System impacts

| | | | |
|---|---|---|---|
| DCC Systems | | Party interfacing systems | |
| Smart Metering Systems | | Communication Hubs | |
| Other systems | | | |

There are no system impacts anticipated.

## Testing

There are no testing impacts anticipated.

## SEC and Subsidiary Document impacts

This modification will require changes to SEC Sections A 'Definitions and Interpretations' and Section F 'Smart Metering System Requirements'.


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## Impacts on other industry codes

There are no other code impacts anticipated.

## Greenhouse Gas Emission impacts

There are no Greenhouse Gas Emission impacts anticipated.


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# 5. Costs

## Estimated Implementation costs

The total estimated implementation cost to delivery SECMP0009 is approximately £**3,000**

## SEC costs

The estimated SEC implementation cost is detailed in the table below:

| SECAS implementation costs | | |
|---|---|---|
| **Implementation Activity** | **Effort (man days)** | **Cost** |
| Creation of the Firmware Information Repository and publication on the SEC website.<br>Development of internal process documentation.<br>Ongoing Support Activity.<br>Application of approved changes to the SEC.<br>Publication of a new version of the SEC on the SEC Website and issuing this to SEC Parties.<br>Review and update any impacted SEC guidance materials. | Five | £3,000[1] |

[1] SEC man day effort based on a blended rate of £600 per day.


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# 6. Implementation

## Recommended implementation date

The Working Group is recommending an implementation date for SECMP0009 of:

- **1st November 2018**, if a decision to approve is made by 18th October 2018; or
- **28th February 2019**, if a decision to approve is received after 18th October 2018 but before 14th February 2019.

SECAS will require a minimum of 10 Working Days to implement the changes required for this modification. No other participants are expected to need to be involved in the implementation of the proposed solution. The November 2018 SEC Release is the earliest release that this modification can be targeted for.


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# 7. Working Group Discussions

## Issues with a Centralised Firmware Library

The Proposer initially sought to establish a Centralised Firmware Library where interested SEC Parties would be able to access all firmware release notes and images, which they could distribute to installed Devices as required. The CFL would capture SMETS2, Electricity Smart Meters (ESME) and Gas Smart Meters (GSME) firmware images as a minimum, with the aim being to facilitate transparency and efficiency through a common exchange for obtaining firmware.

During early Working Group discussions, a number of issues were identified in regard to the creation and operation of the CFL.

### Manufacturers as SEC Parties

During meetings, Working Group members confirmed that Manufacturers and Meter Asset Providers (MAPs) may not be SEC Parties and therefore cannot be bound by the SEC. This meant that there were conflicts regarding what they could be mandated to do by SECMP0009. In particular, Manufacturers could not be bound to place any firmware images into any developed library, and any other solution posed would require full voluntary backing of Manufacturers as they couldn't be compelled to participate. In addition, the Working Group discussed the role of the SEC in this modification, considering it had no powers to compel any action. It was agreed that the SEC had definite responsibility and a role regarding meter maintenance for the Consumer. However, the liability provisions within the SEC that would mitigate for circumstances such as unauthorised or incorrect firmware use or equipment damage would not extend to Manufacturers or MAPs who were not SEC Parties.

### DCC Involvement

Discussion was undertaken as to the level of DCC involvement with this modification. For example, if DCC was to facilitate firmware for Devices, it would need to tackle the issue of digital signatures for access firmware images, and the need for a different hash for each Supplier accessing the same image to maintain a secure process. Also, one of the business requirements excluded other Devices outside of SMETS2 ESME and GSME, but the Working Group believed that the CFL should be utilised for firmware images for all SMETS Devices. DCC requested clarification that this scope did not include Communications Hubs (CH) and it was confirmed that was not required as it would be expected that, as the sole provider of CHs, DCC would have a mechanism in place with the CH Manufacturers to manage provision of firmware images. Ultimately, it was decided that the CFL solution would not include DCC.


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## CFL Access

Access for read, update, maintain and download permissions within the CFL was discussed. It was agreed that due to necessary constraints on who could see commercially sensitive material, only Responsible Supplier's and Manufacturers would have access to the CFL. Creation and uploading of updates would be limited further to only Manufacturers. It was suggested that access control should be applied as part of the solution to restrict access of images to only the Responsible Supplier.

ISO27001 demands adequate controls are in place for data security, which lead to an agreement in principle that the CFL Provider would provide a 'gate' for checking and/or verification, but the integrity of the process would rely on all involved to undertake appropriate checks. It was agreed that publication of the CFL on a website was probably too risky a method of image storage and access.

## CFL Hosting

There were deliberations around who would be permitted to upload images onto the CFL. Meter Asset Providers (MAPs) indicated that they were looking to support firmware process management rather than the provision of images. DCC would require an interface with non-CH Manufacturers for the provision of images. Also, DCC checks images as part of Service Request processing so this could create a significant vulnerability. DCC was discounted as an option on this basis.

SECAS considered uploading images as part of the CPL. This addition would have required an interface with Device Manufacturers and Suppliers (as a Responsible Supplier) and potentially MAPs, as part of CPL management.

However, Manufacturers would need authentication of identity, and it was felt that such mechanisms would be complex to manage.

Suppliers already had relationships with MAPs and would be able to verify firmware images as part of their responsibility for Smart Metering equipment maintenance. However, they would still have to obtain the firmware image from a Manufacturer prior to submission into the CFL.

## IPR and Security Issues

Manufacturers raised further concerns around sharing information, other than that recorded in the CPL, particularly around their IPR to the firmware images and security issues with providing firmware images to a centralised firmware library available to all Suppliers. It was established that the storage of all Release Notes in one place would also have posed a significant risk by potentially revealing which versions of firmware have security issues and would require additional security controls. Manufacturers felt that there were current routes


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for energy Suppliers to seek firmware access by requesting it via the MAP for the meter. Furthermore, Manufacturers contracts with the MAPs would dictate what firmware upgrades were available to whom. These also dictated whether firmware upgrades would be included in maintenance obligations or as chargeable extras, so they would not be made available unrestrictedly.

There was a suggestion that Release Notes should be downloadable, so that Suppliers would be able to understand what the latest firmware for each Device should be and why a version was released. For example, this would help a Supplier identify if they needed to upgrade a version of firmware due to security issues, or whether the upgrade was less critical in nature. However, Manufacturers were against releasing too much information in case this posed security risks (e.g. by revealing which versions of firmware contain security issues).

It was also suggested that Release Notes needed to be secured to ensure sensitive information is protected. During the solution development discussion, the Working Group noted that the CPL doesn't have any password protection or require login credentials.

Members also noted that there would be security concerns regarding how Manufacturers will verify who they are speaking to when they are contacted by a Supplier. It was also considered that Suppliers may need secure login details to every Manufacturer's website, which Manufacturers may only provide to Suppliers they have contracts with. However, it was decided that this was outside the scope of SECMP0009.

## Development of a firmware information repository

Following the feedback on the concept of a full CPL, the Working Group explored the development of a simpler Firmware Information Repository, to contain a basic set of information that Manufacturers could provide to support Suppliers in identifying the latest version of firmware.

The Working Group believed that the details in the repository should be linked back to the CPL by using the corresponding CPL reference number. As part of this, it was believed that the Firmware Information Repository would be updated in parallel with updates to the CPL; each time there is a new entry in the CPL, a corresponding entry would need to be added to the repository.

It was considered that the most critical piece of information needed was contact details for the relevant Manufacturer, so that a gaining Supplier would know who to contact if they took on an unfamiliar Device.

The Firmware Information Repository will also contain a free-text field which can be used by the Manufacturer to provide high level firmware Release information. The level of detail entered in this field would be at the discretion of the Device Manufacturer. SECAS contacted Manufacturers to find out the level of information they would be willing to provide


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for Release Notes. Manufacturers provided neutral responses but were open to this approach as long as the full Release Notes were not mandated.

Working Group members noted that this approach could form the starting point for a repository that could grow over time. Members felt it was important to begin by embedding a simple solution now and evolve it over time as additional information is identified.

One respondent to the Working Group Consultation (WGC) felt that this solution would be worthwhile to implement, but they would want to see a post-implementation review, with a view to disregarding the spreadsheet if it was found to provide no value, as otherwise Parties would be paying for its maintenance when it provided no industry benefit. However, the estimated costs for this modification are limited to approximately £3,000, attributable to SECAS time and effort, and ongoing maintenance will be done alongside CPL updates, incurring negligible additional effort to the existing process so it was not felt this would be an issue.

Another respondent wanted insight into how information for the Repository would be gained so that SECAS would be able to complete the spreadsheet. As Manufacturers make CPL Submissions, the information would be gained in the same way for the Repository data being collected as part of the CPL submission, with a very small extra effort. Furthermore, this solution will only apply to entries added to the CPL on or after SECMP0009 is implemented; entries added to the CPL prior to this time will not be retrospectively added to the Firmware Information Repository as, in many cases, the relevant information would be difficult to obtain due to the time that has passed.

## Hosting and format of the repository

The Working Group considered who would host the Firmware Information Repository. SECAS was considered the most appropriate option as it currently maintains the CPL and there would be some overlap between the data held in the CPL and the data to be included as part of the Repository.

Other potential hosts considered were under Smart Meter Device Assurance (SMDA) scheme and with DCC. SMDA was decided against as it is a voluntary scheme and therefore, unlike the CPL, it cannot be guaranteed that all Manufacturer information will be captured. DCC was decided against as the meter firmware images are outside the scope of the DCC (other than obligations to validate the firmware image before being deployed).

The Working Group also considered what format the Firmware Information Repository would take. Given the simple nature of the solution, members believed a standard Excel Workbook would be appropriate, and for this to be published on the SEC Website alongside the CPL. It was also concluded that, as with the CPL this spreadsheet should be publicly available.


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# 8. Working Group's Conclusions

The Working Group's **unanimous** view is that SECMP0009 better facilitates General SEC Objectives (a), (c), (d) and (f) and should be **approved**.

## Benefits and drawbacks of SECMP0009

The Proposer and the Working Group have identified the following benefits and drawbacks related to SECMP0009:

### Benefits

- Implementation costs will be limited to SECAS time and effort in implementing and maintaining the Firmware Information Repository. Ongoing costs will be mitigated through the process being performed in parallel with updates to the CPL.
- Manufacturers would be able to get information out to a large number of Suppliers at the same time using the free text field in the repository. This allows Suppliers to plan their smart meter roll outs effectively and ensure customers have optimal Device functionality.
- There would be security and performance benefits, by better enabling Suppliers to have access to the right firmware and knowing who to contact if they do not.

### Drawbacks

No drawbacks were identified during Working Group meetings in regard to the solution that has been put forward for SECMP0009.

## Views against the General SEC Objectives

### Objective (a)[2]

The **majority** of the Working Group believes the modification better facilitates objective (a), to facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems at Energy Consumers' premises within Great Britain because it would allow all Suppliers to have access to firmware versions, resulting in increased equality between market participants, alleviating a potential barrier to entry for new Suppliers and improving potential response times to critical firmware updates (i.e. those addressing a potential security vulnerability).

There will also be more efficient operation of Devices through wider access to firmware which may alleviate bugs or improve functionality.

[2] Facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems at Energy Consumers' premises within Great Britain.


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The remaining members believed SECMP0009 was neutral against Objective (a).

## Objective (c)[3]

A **minority** of the Working Group believes the modification facilitates objective (c), to facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems at Energy Consumers' premises within Great Britain because there will be more efficient operation of Devices through wider access to firmware which may alleviate bugs or improve functionality.

The remaining members believed SECMP0009 was neutral against Objective (c).

## Objective (d)[4]

A **minority** of the Working Group believes the modification better facilitates objective (d), to facilitate Energy Consumers' management of their use of electricity and gas through the provision to them of appropriate information by means of Smart Metering Systems as Suppliers now have access to all firmware versions. There will be in increased equality between market participants, alleviating a potential barrier to entry for new Suppliers and improving potential response times to critical firmware.

The remaining members believed SECMP0009 was neutral against Objective (d).

## Objective (f)[5]

A **minority** of the Working Group believes the modification better facilitates objective (f), to ensure the protection of Data and the security of Data and Systems in the operation of this Code because protection would be made easier by readily available firmware information as Responsible Suppliers' ability to respond to identified vulnerabilities is enhanced. This also helps achieve a secure supply of energy. Notification of recommended updates also helps achieve security of the network.

The remaining members believed SECMP0009 was neutral against Objective (f).

For the avoidance of doubt, the Working Group believes SECMP0009 is neutral against the remaining objectives.

[3] Facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems at Energy Consumers' premises within Great Britain.
[4] Facilitate Energy Consumers' management of their use of electricity and gas through the provision to them of appropriate information by means of Smart Metering Systems.
[5] Ensure the protection of Data and the security of Data and Systems in the operation of this Code.


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# 9. Recommendations

The Panel is invited to:

- **AGREE** that SECMP0009 is a Path 2 Modification Proposal;
- **AGREE** that the draft legal text delivers the intention of the modification;
- **AGREE** with the recommended implementation approach; and
- **AGREE** that this modification be submitted to Modification Report Consultation.


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# Appendix 1: Glossary

The table below provides definitions of the terms used in this document.

| Term | Acronym |
|---|---|
| CFL | Centralised Firmware Library |
| CH | Communication Hub |
| CPL | Central Product List |
| CoE | Community of Experts |
| DCC | Data Communications Company |
| DMR | Draft Modification Report |
| ESME | Electricity Smart Metering Equipment |
| GSME | Gas Smart Metering Equipment |
| HCALCS | Home Area Network Connected Auxiliary Load Control Switches |
| IHD | In Home Display |
| IPR | Intellectual Property Rights |
| MAPs | Meter Asset Providers |
| MRC | Modification Report Consultation |
| PPMID | Pre-Payment Meter Interface Devices |
| SMETS | Smart Metering Equipment Technical Specifications |
| SEC | Smart Energy Code |
| SECAS | Smart Energy Code Administrator and Secretariat |
| SMDA | Smart Meter Device Assurance |


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