

Consultation

on the Device Selection
Methodology for Network
Evolution – Communications
Hubs and Networks Single
Band (2.4GHz) Programme

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1. Glossary

The following terms are used extensively in this document;

Term	Definition
Baseline	Meaning that latest version of firmware for a Device
Baseline -1	Meaning the version of firmware for a Device released just before the Baseline
Communications Hub Replacement (CHR)	Meaning the business process by which one SMETS2+ Communications Hub is exchanged for another.
Comms Hub Replacement (CHR) Targeting	Meaning a method applied in the DSM, by which Devices most likely to be involved in a Communications Hub Replacement business process are identified.
Device Selection Candidate List (DSCL)	Meaning the list of Devices produced by the DSM at various stages of the process, which identifies the Devices which can be considered for inclusion in testing.
Estate Coverage	Meaning a metric used to illustrate the extent to which the Devices determined by the DSM to be included in the scope of testing provide coverage of Devices currently installed on the DCC Total System
Install and Commission (I&C)	Meaning the business process by which a Communications Hub is commissioned where the new Communications Hub is not replacing an existing SMETS2+ Communications Hub
Install Coverage	Meaning a metric used to illustrate the extent to which the Devices newly commissioned onto the DCC Total System in the preceding 6 months are covered by those Devices identified by the DSM to be included in the scope of testing
NE CH	Meaning a Communication Hub introduced by the Network Evolution Comms Hubs & Networks Programmes. DCC expects to run separate programmes to introduce a Network Evolution 4G Single Band (2.4GHz) Communications Hub (NE SBCH) and a Network Evolution 4G Dual Band Communications Hub (NE DBCH).

2. Executive Summary

2.1. Context

The Network Evolution (NE) Communications Hubs & Networks (CH&N) Programme is a Data Communications Company (DCC) initiative geared towards defining and delivering the next generation of Communications Hubs & Networks (CH&N) with a longevity of at least 15 years. Maintaining Smart functionality over the longer term will require the introduction of new Communications Hubs (CHs) which use newer 4G networks. A Single Band (2.4GHz) Communication Hub (NE SBCH) and a Dual Band Communications Hub (NE DBCH) together with their associated networks and services will be procured and implemented through two separate programmes, each running to its own schedule.

The framework for testing of both the SBCH and DBCH before deployment into Production is governed under the Smart Energy Code (SEC), via the CH&N SEC Variation Testing Approach Document (SVTAD). The CH&N SVTAD requires the production of more detailed Test Approach Documents (TAD) and Test Coverage Documents (TCD), which set out the approach to PIT and SIT testing and the breadth and depth of testing. Both of these documents are required to be approved by the SEC Panel's Testing Advisory Group (TAG), or any disagreements between DCC and the TAG on the document content referred to the Secretary of State for decision. The TAD will include the methodology that DCC shall use to select Electricity Meters, Gas Meters and PPMIDs to test its solution against in PIT and SIT. TAG have asked DCC to consult on its proposed methodology, prior to presenting it within the TAD to TAG for approval.

This document therefore sets out the methodology that the DCC is recommending for selecting electricity and gas meters and PPMIDs against which the CH&N Programmes, starting with the Single Band CH Programme (delivering 2.4GHz) will be tested, the rationale for it, the effect of it (in terms of percentage of devices in the Production estate that will be covered in PIT and/or SIT testing) and the proposed wording for the methodology that DCC would propose to TAG for inclusion in the TAD (set out in Appendix B).

The consultation closes on 04/02/2022.

2.2. Test Objective

The key objective of CH&N testing, as documented in Clause 2.9 of SEC Appendix AQ - (The SEC Variation Testing Approach Document for the CH&N Arrangements) is to prove the CH&N Solution's compliance with the SEC, most notably in the case of the Communications Hub and its interaction with Devices, to CHTS and GBCS.

2.3. Background

Under the current testing regime that DCC follows, the Test Objective is generally met using a maximum of two Device Models from each Device type to form two Device Model Combinations (or HANs). These Device Models are usually the latest firmware version for the associated Device Model hardware, at the point the DSM is run.

DCC recognises through testing-expert feedback and lessons learnt from previous releases that this testing regime is sub-optimal for the prevention of issues in later Test Phases (User Testing) and even through to production.

DCC are therefore adopting a 'shift-left' principle to ensure that appropriate scope and coverage of testing is conducted within the earliest Test Phase possible, and by expanding the use and number of real Devices used in testing through the Pre-Integration Test (PIT) and Systems Integration Test (SIT) phases of testing.

This increase in the number of real devices used in PIT and SIT will significantly improve the outcomes of testing, however, constraints on the number of Device Models Service Providers can accommodate before incurring a material impact to the timing and cost of the programme means that a limited number of real Device Models can be used in each of PIT and SIT. For the CH&N Single Band Programme the expectation of the maximum number of unique Device Models that can be accommodated in PIT and SIT without significantly impacting the start date, duration and cost is 6 and 3 (per Device Type) respectively. SIT will operate with 4 Device Models per Device Type, but one Device Model from each Device Type will mirror a Device Model used in PIT in order to act as a control set between the two Phases.

The Device Selection Methodology (DSM) has been created as a tool to identify which Device Models offer the greatest benefit for overall programme delivery if used during testing undertaken during the PIT and SIT phases. It identifies the Device Models anticipated to be the most likely to be installed with an NE CH, applying criteria to determine the most beneficial selection of Device Models to reduce risk to the Smart Metering programme, within the cost and time constraints of the CH&N programme. It is not a tool to identify an exhaustive list of Device Models against which DCC must test. This consultation document looks to illustrate the considerations made in determining which Device Models will offer the greatest benefit by their inclusion in testing, whilst recognising that exhaustive coverage of all Device Models on the estate is not a practical goal and does not offer value for money. As such, the DSM takes a risk-based approach to the selection of Device Models, based around a set of key considerations.

2.4. Engagement to Date

The DSM presented in this document is a detailed methodology for selecting devices for use in DCC testing. The key principles of the methodology will be set out in the CH&N Test Approach Document (TAD), which is required to be approved by the SEC Panel's Testing Advisory Group (TAG) (or any disagreements on content referred to the Secretary of State for a decision). Once final, DCC will be required to comply with these principles for CH&N testing. Initial engagement on the development of the DSM was undertaken with the TAG as the body with responsibility for approving the CH&N TAD. Further engagement occurred via a workshop, where attendance was open to stakeholders beyond members of the TAG. Following this workshop, a further session was held with the TAG, where the TAG highlighted a number of key areas which DCC have looked to address. These are as follows;

1. Whether DCC should look to prioritise testing against Device Models installed in a recent, measured period (6 months in the examples presented to date)?

This subject is addressed directly in this consultation.

2. Where DCC targets Device Models against which to test, what level of coverage against the key business processes of Install and Commission (I&C) and Comms Hub Replacement (CHR) should be achieved in testing?

This subject is addressed directly in this consultation.

3. That the makeup of the DSM should be socialised beyond the TAG to ensure appropriate input is obtained from across industry stakeholders, via a written consultation.

This consultation and the supporting workshop which is to be scheduled in support of this consultation are the direct responses to this action.

2.5. Next Steps

This consultation presents several areas where DCC is keen to understand the views of stakeholders, through a series of consultation questions. These are set out throughout the document and can be found summarised in Section 5.1, Appendix A of this consultation. Respondents are also encouraged to raise any other points that they consider relevant or that should be taken into account.

Respondents are asked to return comments by 04.02.2022

On completion of the consultation period, DCC will review responses and produce a conclusions document, addressing feedback from the consultation. Alongside this, DCC will present an updated version of the CH&N TAD to the TAG for approval, containing the principles of the DSM.

3. Device Selection Methodology – Functional Testing of the CH&N Solution

This Device Selection Methodology considers the selection of Device Models for inclusion in the functional testing of the CH&N Solution based around several criteria. These criteria are designed to output a set of Device Models most likely to fulfil the below;

1. The Device Models most likely to mitigate the risks (as described in Section 3.1) considered to be inherent in testing against Devices as is currently undertaken
2. The Device Models most likely to be utilised in any prevalent business process (as described in Section 3.2.2) in the initial years of the NE CH's use
3. The Device Models most likely to be operated on the DCC Total System (as described in Section 3.2.2) alongside the NE CH in the initial years of the NE CH's use

DCC believes that key to answering the points above is to understand the predominant business process which will be utilised in commissioning NE CHs onto the DCC Total System, as well as the limitations of the current position. This is explored in the following sections of this document.

Functional testing of the CH&N Solution occurs in both the PIT and SIT phases, so the Device Models selected under the methodology described in this section may be used in either phase.

The DCC's work in creating the DSM has led to the conclusion that a selection of Device Models which allows for complete coverage of Device manufacturers operating within the market will offer the most appropriate mitigation of risks inherent in the introduction of the CH&N Solution (Section 3.2.1). As it stands today, this requires the following numbers of devices to be used in testing;

- 7 electricity meters
- 7 gas meters
- 3 PPMIDs

These numbers are achievable within the expectations of delivery timeline and cost constraints described within the Executive Summary, Section 2.3. Any additional capacity available for testing will be utilised to give additional assurance as explored in Section 3.6.

Given the capacity constraint of 6 Device Models, per Device Type in PIT, DCC proposes that the Device Model from the Manufacturer amongst each Device Type, whose devices cumulatively contribute the least to the relevant Coverage metric used for selection will be tested in SIT.

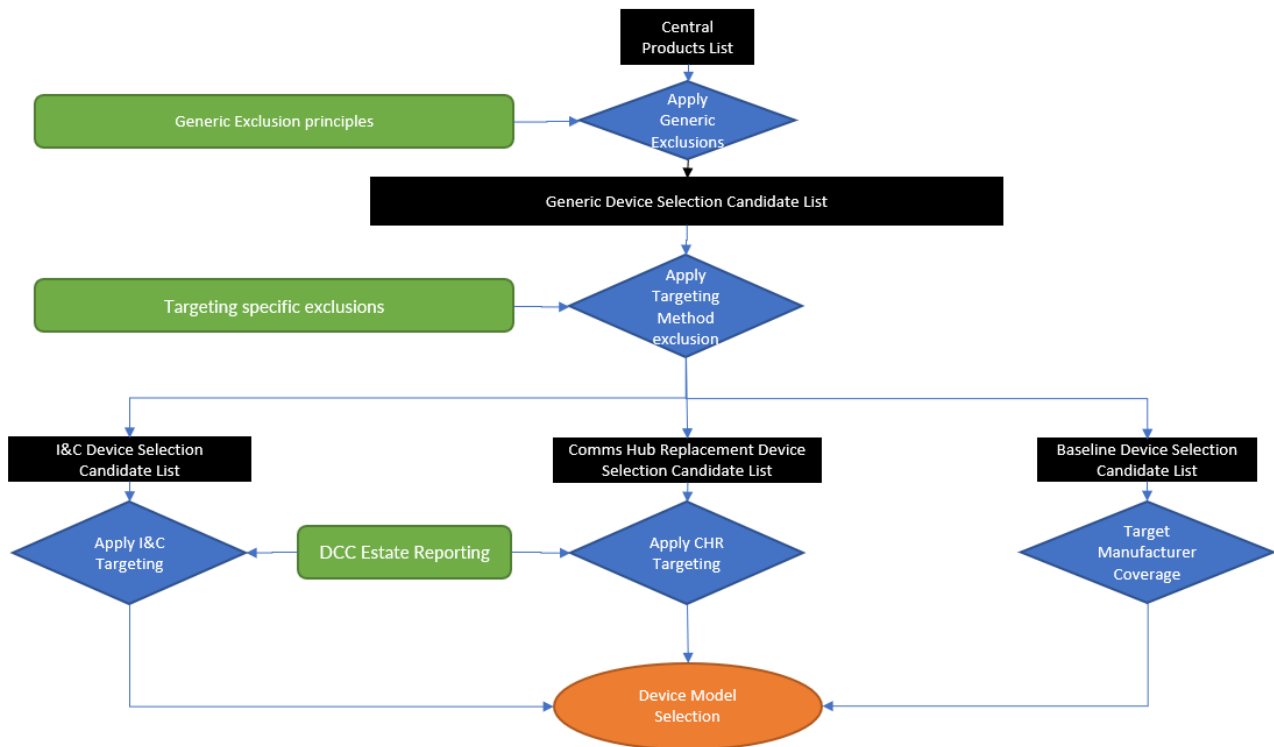
Individual Device Models will be used to form Device Model Combinations, against which testing will be conducted. Device Model Combinations will be created to be as close to production as possible. To this end, they will generally be grouped by manufacturer.

The DSM will be run approximately 14 weeks ahead of the commencement of PIT to allow time for the procurement of devices to take place.

The criteria used to select Device Models for use in functional testing are explored in this section of the consultation document.

The basic flow of the Device Selection Methodology is shown in the figure below and is articulated through this consultation;

Figure 1 - Device Selection Methodology - Basic Flow



3.1. Limitations of the Current Position

The following are considered to be the key limitations of the current position, whereby two Device Models (and in turn manufacturers) are covered in testing. These limitations have historically led to Communication Hub issues being identified beyond the SIT test phase.

Mitigating the risk posed by these limitations is the main aim of this DSM and is explored in detail in the proceeding sections.

1. Manufacturer Coverage is low

The lack of manufacturer coverage within testing is considered to carry considerable risk in terms of the probability of testing issues being found in later Test Phases or raised as Incidents in production. This is attributed to two key reasons;

1. The possibility of different interpretations of technical specifications is greater between different manufacturers than it is between different firmware versions from the same manufacturer.
2. A spread of manufacturers provides a greater probability of variety in items such as ZigBee chipsets, a component of devices considered to pose substantial risk of interoperability and interchangeability issues.

Mitigation of this risk is considered essential for the DSM to achieve its goal of mitigating risk inherent in the introduction of a new Communications Hub.

2. The potential for low coverage of both Install and Estate Coverage metrics is higher than desired.

Given that there are several active manufacturers in the market, the use of a small subset of devices from these manufacturers will exclude a significant proportion of the market, even when the most

prevalent manufacturers are used. This can be particularly prevalent if the “Baseline” version is selected as part of the current position, which is generally the case. This is believed to be due to the time taken for the latest version of firmware for a device to make its way to the front of supply chains for installation, which has the impact of Baseline appearing as a small contributor to the Coverage Metrics.

3.2. Factors Considered for Device Selection

3.2.1. Mitigating Key Risks

DCC considers that the initial selection of Device Models by the DSM should target the lack of Manufacturer Coverage within current testing, given that this is considered to offer the greatest mitigation of risk, as described in Section 3.1.

3.2.2. Supporting Business Process

DCC also considers the business processes which will support the installation of NE Communications Hubs (NE CH) onto the estate, and the stage at which that business process is expected to be utilised at volume.

There are two business processes that will support this;

1. Install and Commission (I&C)
2. Communications Hub Replacement (CHR)

In determining the prevalent business process, the data in Table 2.1 below shows that there is still significant volume of non-smart meters on the estate against which SMETS2 meters will be installed. These installations will be I&Cs, as will the replacement of existing SMETS1 devices, which are subject to the same 2G/3G sunsetting risk as existing SMETS2 devices. As such, the assumption is that I&C is the predominant business process in terms of the number of NE CH installations expected to be installed in the initial years post NE CHs being available for Initial Pallet Validation / mass manufacture. This is based on the need for Suppliers to complete the Smart Meter rollout.

It is further assumed that volume replacement of existing SMETS2 Communications Hubs is anticipated from circa 2028 (with 2G/3G sunsetting confirmed for 2033), meaning that the SMETS2 Devices are not expected to be replaced in the imminent future. For this reason, DCC assumes that older firmware on the Estate today will not be utilised against the NE CH as Suppliers will have upgraded Devices by the time they are utilised against an NE CH via the CHR process.

Question 1

Do you support DCC's view that volume replacement of existing SMETS2 Communications Hubs in response to the sunsetting of 2G is not expected to commence at volume until after the initial SMIP rollout is completed?

Question 2

Do you support the DCC's view that older Device Models on the Estate (Device Models installed previously that are no longer actively installed), will not interact with the NE CH at any volume due to these Device Models being upgraded between NE CH Go Live and the CHR process commencing at volume?

Table 3.1 - Business Process view of NE CH installation to Domestic Metering Estate

Installation Type	Device Type	Volume	Source	Percentage	Business Process (to install NE CH)
Non-Smart	Electricity	~15,000,000	Smart meters in Great Britain, quarterly update June 2021 - GOV.UK (www.gov.uk) Number of non-smart electric meters installed in Domestic Premises	~51.72%	Install & Commission
	Gas	~13,500,000		~56.25%	
SMETS1	Electricity	~8,500,000	Remaining number of installations when Traditional Meters and SMETS2 meter volumes are removed from the Total number of Domestic Meters (28,494,182), as taken from the report shown below.	~29.31%	Install & Commission
	Gas	~6,500,000		~27.08%	
SMETS2	Electricity	~5,500,00	Count of SMETS2 Devices on the DCC estate as of 15.09.2021 with a status of "Commissioned"	~18.97%	Comms Hub Replacement
	Gas	~4,000,000		~16.67%	

3.2.3. Coverage Metrics

Finally, DCC has identified two coverage metrics used to illustrate coverage against the two business processes described above by a Device Models inclusion in testing.

1. Install Coverage – measures the percentage of Device Models installed in the 6-month measured period which are determined to be candidates for inclusion in testing
2. Estate Coverage – measures the percentage of Device Models currently installed on the production estate which are determined to be candidates for inclusion in testing

These Coverage Metrics are used both to illustrate the Coverage achieved for the Device Models selected for inclusion in testing, as well as to drive inclusion when targeting a particular metric, under limited circumstances.

DCC considers that although these Coverage Metrics provide a useful view on testing's coverage of the current estate and recent installed base, the Supplier communities upgrading of existing Devices and use of newer firmware for installation activity means that the metrics representative of the estate today do not necessarily reflect that at the point of NE CH Go Live.

3.3. Creating the Device Selection Candidate Lists

This section of the consultation document sets out the data inputs and targeting methods used to create the various Device Selection Candidate Lists against which the selection criteria described in sections 3.4, 3.5 and 3.6 of this consultation are applied in order to determine the final list of Device Models to be used in testing.

3.3.1. Data Sources

3.3.1.1. Central Products List

The Central Products list is used to identify the list of all possible Device Models to be assessed as candidates for inclusion in testing.

3.3.1.2. DCC Estate Reporting

Reporting is taken from the DCC estate to provide the following information;

1. Volume of Device Models commissioned in a 6-month period. This report identifies the firmware that was present on the device at the point of commissioning.
2. Volume of commissioned Device Models on the production estate for each unique Device Model. This report identifies the firmware version of a device at the point the report is ran.

This data is utilised when Device Model selection is based on coverage metrics (through I&C and CHR Targeting) but does not influence the selection for non-coverage-based selection methods such as Baseline selection. This data is also used to produce the Coverage Metrics described in Section 3.2.2, which are shown against all selection methods.

3.3.1.3. DCC Derived Information

There are two categories of information derived by DCC which contribute to the decision to exclude a Device Model from the DSCL as below;

1. Home Area Network (HAN) operating bands – Device Models are identified as 2.4GHz, Sub GHz only or Dual Band
2. Device Specific Exclusions – this category excludes Device Models for reasons specific to the Device (or Device Model) and is covered in detail in Section 3.3.2.

3.3.2. Exclusion Criteria – Device Specific Exclusions (Applicable to all Targeting Methods)

A number of exclusion criteria apply to all targeting methods and are described below. These criteria will be applied to the CPL to create a Generic Device Selection Candidate List, against which further specific exclusions can be applied;

3.3.2.1. Sub-GHz Device

Device Models are excluded on the basis that the NE SBCH only supports a 2.4GHz HAN

3.3.2.2. Dual Band Device

Device Models are excluded on the basis that the Sub-GHz element of these devices cannot be utilised against the NE SBCH and so the likelihood of these devices being installed against the NE SBCH is limited.

3.3.2.3. Commercial Support for Testing Services

Device Models are excluded on the basis that DCC have been unable to agree commercial cover for support of testing services through the DCC Test Phases. This cover needs to include provision for;

- i. Procurement of devices to support testing against PIT, EIT and SIT environments
- ii. Second line triage of issues where first line triage identifies the issue to be with a device other than the NE CH.

3.3.2.4. GBCS Version Applicability

Device Models are excluded on the basis that they are an unsupported GBCS Version per SEC Schedule 11 – TS Applicability Tables

3.3.2.5. Common Manufacturer Image Hash

Device Models are excluded on the basis that they share a Manufacturer Image Hash (implying an identical firmware version) with a different Device Model on a different hardware version, from the same manufacturer, or a single Device Model with identical Manufacturer Image Hashes has an entry on the CPL for two different GBCS Versions (in which case the later GBCS Version is retained).

Though not reflected in the Install Coverage or Estate Coverage figures presented in Section 3.6 of this consultation, acceptance of the logic that excludes a Device Model based on common Manufacturer Image Hash would imply that those Device Models excluded on this basis should count as covered in terms of testing.

This would almost certainly have a major impact on the coverage statistics, particularly for Estate Coverage where major contributors to volume such as Manufacturers that have changed hardware platforms whilst retaining the same firmware have Device Models currently showing as excluded based on Common Manufacturer Image Hash, which would actually be “covered” by their newer hardware equivalents sharing a Common Manufacturer Image Hash.

The example below shows the impact across these Device Models (limited to the example above);

Table 3.2 - Impact of considering common Manufacturer Image Hashes as covered by testing

Device Model	FW Version (sharing a Hash)	Install Coverage	Estate Coverage	Current Status
Example 1	Example 1	0.00%	0.56%	Excluded
Example 2		0.07%	2.01%	Included
Example 1	Example 2	0.00%	1.61%	Excluded
Example 2		16.79%	9.21%	Included
Example 1	Example 3	0.00%	0.09%	Excluded
Example 2		0.10%	1.24%	Included
Example 3	Example 4	0.00%	0.01%	Excluded
Example 4		2.78%	2.94%	Included
Example 3	Example 5	0.00%	1.40%	Excluded
Example 4		4.01%	3.75%	Included
Example 3	Example 6	0.00%	7.90%	Excluded
Example 4		33.59%	10.35%	Included
Example 3	Example 7	0.00%	0.19%	Excluded
Example 4		5.01%	1.93%	Included

	Included Total	62.35%	31.43%	
	Excluded Total	<u>0.00%</u>	<u>11.76%</u>	

As can be seen in the table above representing two manufacturers, the inclusion of firmware currently determined to be excluded that shares a common manufacturer image hash with an “included” Device Model would increase the Estate Coverage by 11.76%.

3.3.2.6. End of Life Hardware

Devices are excluded on the basis that the hardware associated with a Device Model has become end of life and can no longer be provisioned for testing. In many instances, older Device Models have been replaced with newer hardware which shares an identical firmware version. In these instances, the newer hardware will be a candidate for testing and the older Device Model is covered within testing by virtue of testing the identical firmware image on the newer hardware, as described in the section above.

3.3.3. Baseline Targeting Methodology

The initial selection methodology used to determine Device Models which can be considered candidates for testing is to identify any Device Models at Baseline firmware for devices remaining as candidates on the Generic Device Selection Candidate List. The Baseline Device Models identified through this method are referred to as the Baseline Device Selection Candidate List.

3.3.4. I&C Targeting Methodology – Exclusion Criteria

The Generic Device Selection Candidate List is then used to support exclusions, specific to the targeting of a business process. In this section, exclusions supporting the targeting of Device Models prevalent in the I&C Business Process are described. Devices remaining post these exclusions being applied are considered to be the I&C Targeting Device Selection Candidate List;

3.3.4.1. Older than Baseline-1 and not currently being installed (within last quarter)

The logic behind excluding these Device Models is that they have not been installed in the preceding quarter and there are a minimum of two firmware versions (Baseline & Baseline -1) which are newer than the excluded Device Model.

3.3.4.2. Baseline Version at GBCS 1.1 not installed in previous quarter

The logic behind excluding these Device Models is that they are an aged GBCS Version and have not been installed within the previous quarter (and in most instances within the previous 6 months).

3.3.4.3. Not installed in 6-month period and none on estate - CPL entry more than 6 months old

The logic behind excluding these Device Models is that they have not been installed on the estate within the preceding 6 months and there are no instances of the Device Model currently installed on the estate (and so no device has been OTA'd to this version)

3.3.4.4. Exclude – not installed in 6-month period but some on estate

The logic behind excluding these Device Models is that they have not been installed on the estate within the preceding 6 months. There are instances of the Device Model currently on the estate, but these have either been installed more than 6 months ago or have been OTA'd to the current version from another.

3.3.4.5. CHR Targeting Methodology – Exclusion Criteria

The Generic Device Selection Candidate List is then used to support exclusions, specific to the targeting of a business process. In this section, exclusions supporting the targeting of Device Models prevalent in

the CHR Business Process are described. Devices remaining post these exclusions being applied are considered to be the CHR Targeting Device Selection Candidate List;

3.3.4.6. Prevalence on the estate

Device Models are excluded on the basis that they do not feature in the top 80% of commissioned devices on the estate for a particular Device Type.

3.3.5. Consultation Questions

Question 3

Do you support the various exclusion criteria utilised in producing the Device Selection Candidate Lists?

Question 4

Do you support counting Device Models excluded on the basis of “Common Manufacturer Image Hash” as covered for the purposes of testing?

3.4. Establishing Manufacturer Coverage

The first area targeted by the DSM for including Device Models in testing is Manufacturer Coverage, as this is deemed to resolve the most critical limitation, and largest risk factor of the current position, that being the greater likelihood of different interpretations and implementations of technical specifications between Manufacturers, as opposed to between firmware versions from the same Manufacturer.

Question 5

Do you support DCC’s view that Manufacturer Coverage offers the greatest mitigation to the risk of issues being found in later Phases of the CH&N Programme and so should be the initial target area for including Device Models in testing?

3.5. Use of Baseline Targeting Methodology to achieve Manufacturer Coverage

In looking to establish Manufacturer Coverage, DCC proposes that each currently active Manufacturer with a Device Model on the Baseline Device Selection Candidate List shall provide a single Device Model hardware variant, per Device Type for inclusion in the scope of testing.

DCC considers that in the case of Manufacturer Coverage, targeting should not be based on achieving an amount of coverage against either the Install or Estate coverage metrics but should instead look to achieve Manufacturer Coverage against the Device Models most likely to interact with NE CHs during their initial deployment. DCC considers the likelihood of Baseline firmware having made its way to the front of an installing Supplier’s supply chain during the duration of testing and Initial Pallet Validation a highly likely scenario and as such considers Baseline firmware a strong candidate for testing.

DCC further considers the potential that a Manufacturer may highlight a situation whereby a firmware version currently on its development roadmap (sufficiently advanced that it is available in UIT), but not yet on the production CPL may be considered the Device Model most likely to be installed against an NE

CH. In these instances, the DSM would permit these Device Models to act as the Baseline for the impacted manufacturer. This would be agreed under the governance of the CH&N Test Coverage Document, which is mandated to contain the final list of Device Models against which testing shall be conducted.

As described in Section 3.2.2, DCC also believes that CHR not commencing at volume until ~2028 will mean that older Device Models on the estate are highly unlikely to interact with an NE CH, given that they will not be used through the I&C process (where newer Device Models are being installed) and will have been upgraded by the time CHR occurs at any significant volume. DCC considers that this further supports the use of Baseline Device Models in achieving Manufacturer Coverage.

Question 6

Do you support DCC's view that Device Models included based on Manufacturer Coverage should be tested on the Baseline firmware for the device and that Baseline may be considered to be a version currently only available via the Test CPL where industry (via the TAGs approval of the CH&N Test Coverage Document) approve this?

Alternative options that have been considered for Device Model selection are presented in Appendix C of this consultation.

3.6. Additional Capacity Device Selection Methodology

The logic up to and including Manufacturer Coverage looks to address the key areas of risk driving issues to be found in user testing or production, considered to be;

- differences in manufacturer coding practices,
- interpretation of technical specifications and
- variety in key components such as ZigBee

These issues present the greatest risk to interoperability and interchangeability between the NE CH and Devices. This is addressed by targeting Manufacturer Coverage.

It is DCC's view that Manufacturer Coverage, with Device Models selected at Baseline firmware is the point at which DCC can fulfil their Test Objective whilst mitigating risk to an appropriate level. This is based on the view that Device Models at Baseline are the most likely to be installed against an NE CH and that measuring Estate Coverage based on today's estate provides an artificial view of the Device Models which will likely be subject to the CHR process at the point in the future where existing SMETS2 Communications Hubs are replaced at volume. As such, DCC consider that Manufacturer Coverage at Baseline provides an appropriate coverage of Device Models for testing.

In this section, options to include further Device Models and the value of doing so are explored. Given that Manufacturer Coverage using Device Models operating at Baseline firmware is considered to mitigate the key risks, these additional Device Models are considered by DCC to be a value add. The addition of any Device Models beyond those required for Manufacturer Coverage needs to be shown to offer a significant benefit against one or both of Install Coverage or Estate Coverage, given that each additional Device Model within scope adds cost and time risk to the programme. This must be balanced against the risk which the additional Device Models are mitigating, which DCC considers to be a reduced coverage of the current estate as a result of selecting Baseline Device Models for each manufacturer (though DCC considers this a low risk for the reasons set out earlier in this consultation).

DCC's expectation in discussions with potential Service Providers is that due to constraints of lab capacity and time there is an upper limit of 9 Device Models of each Device Type that can be tested before encountering significant impact to the programme timeline.

This section of the consultation document will explore the addition of Device Models up to the upper limit of the Service Providers, should that prove possible, using targeting methods as described below;

1. I&C Targeting – will select Device Models from the I&C Targeting Device Selection Candidate List, based on their contribution to Install Coverage in the 6-month period preceding the running of the DSM
2. CHR Targeting - will select Device Models from the CHR Targeting Device Selection Candidate List, based on their contribution to Estate Coverage

The following Sections illustrate the additional coverage achieved by adding Device Models from either of the I&C Targeting Device Selection Candidate List or the CHR Targeting Device Selection Candidate Lists to those already selected in achieving Manufacturer Coverage.

3.6.1. Electricity Meter Coverage

The table below builds on the Manufacturer Coverage option by adding two further Device Models, up to the envisaged limit of 9. The table illustrates the coverage achieved by including additional Device Models based on either the I&C or CHR Targeting methods.

Table 3.3 - Electricity Meter - Expanded Coverage – I&C Targeting – Install Coverage driven

Manufacturer Coverage Based On	Baseline			
	I&C Targeting – Install Coverage		CHR Targeting – Estate Coverage	
Addition	Install Coverage	Estate Coverage	Install Coverage	Estate Coverage
Manufacturer 8	7.11%	3.10%	7.11%	3.10%
Manufacturer 4	0.10%	1.24%	16.88%	10.45%
Manufacturer 12	0.30%	0.66%	0.30%	0.66%
Manufacturer 6	0.01%	0.20%	0.01%	0.20%
Manufacturer 7	0.02%	0.02%	0.02%	0.02%
Manufacturer 3	57.24%	16.95%	38.60%	12.28%
Manufacturer 9	0.00%	0.00%	0.00%	0.00%
Total	<u>64.78%</u>	<u>22.17%</u>	<u>62.93%</u>	<u>26.71%</u>
Increase from Manufacturer Coverage Option	<u>52.23%</u>	<u>15.02%</u>	<u>50.38%</u>	<u>19.56%</u>

3.6.1.1. Comparison between addition options

A comparison between the two methods of selecting additional Device Models beyond those included by Manufacturer Coverage shows very little difference in either Install or Estate Coverage achieved, regardless of the Targeting method used to drive the additional Device Models.

Table 3.4 - Electricity Meter - I&C vs CHR Targeting Comparison for Device Models beyond Manufacturer Coverage

Addition Method	Install Coverage	Estate Coverage
Install Coverage contributor from I&C Targeting method	64.78%	22.17%
Estate Coverage contributor from CHR Targeting method	62.93%	26.71%

3.6.2. Gas Meter Coverage

The table below builds on the Manufacturer Coverage option by adding two further Device Models, up to the limit of 9. The table illustrates the coverage achieved by including additional Device Models based on either the I&C or CHR Targeting methods.

Table 3.5 - Gas Meter - Expanded Coverage – I&C Targeting – Install Coverage driven

Manufacturer Coverage Based On	Baseline			
	I&C Targeting – Install Coverage		CHR Targeting – Estate Coverage	
Addition	Install Coverage	Estate Coverage	Install Coverage	Estate Coverage
Coverage Metric				
Manufacturer 4	13.10%	9.75%	13.10%	9.75%
Manufacturer 12	0%	0%	0%	0%
Manufacturer 6	0.16%	0.32%	0.16%	0.32%
Manufacturer 3	73.23%	31.46%	76.07%	64.70%
Manufacturer 9	0%	0%	0%	0%
Manufacturer 10	1.33%	1.99%	1.33%	1.99%
Manufacturer 2	5.19%	0.78%	0%	0%
Total	93.01%	44.30%	90.66%	76.76%
Increase from Manufacturer Coverage Option	18.23%	9.25%	15.88%	41.71%

3.6.2.1. Comparison between addition options

A comparison between the two methods of selecting additional Device Models beyond those included by Manufacturer Coverage shows very little difference in Install Coverage, however Estate Coverage is shown to benefit considerably when additional Device Models are selected using the CHR Targeting method.

Table 3.6 - Gas Meter - I&C vs CHR Targeting Comparison for Device Models beyond Manufacturer Coverage

Addition Method	Install Coverage	Estate Coverage
Install Coverage contributor from I&C Targeting	93.01%	44.30%
Estate Coverage contributor from CHR Targeting	90.66%	76.76%

3.6.3. PPMID Coverage

The table below builds on the Manufacturer Coverage option by adding further Device Models, up to the limit of 9. The table illustrates the coverage achieved by including additional Device Models based on either the I&C or CHR Targeting methods.

Table 3.7 - PPMID - Expanded Coverage – I&C Targeting - Install Coverage driven

Manufacturer Coverage Based on	Baseline			
	I&C Targeting – Install Coverage		CHR Targeting – Estate Coverage	
Addition	Install Coverage	Estate Coverage	Install Coverage	Estate Coverage
Manufacturer 11	58.02%	13.15%	27.26%	39.93%
Manufacturer 1	17.71%	15.12%	18.19%	25.63%
Manufacturer 5	13.37%	2.02%	N/A – no Device included	N/A – no Device included
Total	<u>89.10%</u>	<u>30.29%</u>	<u>45.45%</u>	<u>65.56%</u>
Increase from Manufacturer Coverage Option	<u>62.44%</u>	<u>24.12%</u>	<u>18.79%</u>	<u>59.39%</u>

3.6.3.1. Comparison between addition options

In the case of PPMID, there is a strong difference in Install and Estate Coverage driven by which Targeting Method is employed.

This is believed to be driven by a lack of OTA capability to the PPMID estate, which lends itself to a far higher level of distribution between firmware versions for devices, as they have never been OTA'd to a later version. This is expected to change over time as the ability to OTA a PPMID is introduced. Depending on the uptake of the capability to perform OTA upgrades of PPMIDs, it could be expected that these devices will exhibit similar Coverage statistics to other Device Types in the future, though it is recognised this is dependent on the appetite to upgrade the devices, as well as the success rate which can be achieved, given a significant proportion of these devices may be powered down.

Table 3.8 - PPMID - I&C vs CHR Targeting Comparison for Device Models beyond Manufacturer Coverage

Addition Method	Install Coverage	Estate Coverage
Install Coverage contributor from I&C Targeting	89.10%	30.29%
Estate Coverage contributor from CHR Targeting	45.45%	65.56%

3.7. Conclusions

DCC considers that the aim of the DSM, to mitigate the risk of issues being found during User Testing or production, whilst meeting the overall Test Objective is achieved at the point of Manufacturer Coverage being achieved. This is based on the mitigation of what DCC considers to be the key risk, around the potential for different interpretation and implementation of technical specifications by different Manufacturers.

3.7.1. Conclusion 1 – Adopt Manufacturer Coverage

The priority criteria in selection of Devices is to ensure Manufacturer Coverage is achieved within the Device Models selected for testing, a target which as it stands today would require coverage of the following numbers of manufacturers;

- o 7 manufacturers for electricity meters

This is based on the inclusion of Single Element electricity meters only, meaning that Twin Element and Polyphase meters are not included in scope. This is on the basis that the interaction with the CH&N Solution is the same for these devices as it is for a Single Element electricity meter, but the volume of Twin Element and Polyphase meters in comparison is negligible. Twin Element and Polyphase meters are made by the same manufacturer group, which further supports the decision to exclude them, given the high risk of manufacturer coverage is mitigated by including Single Element electricity meters from the same manufacturers.

- o 7 manufacturers for gas meters

Sub-GHz only and Dual Band gas meters are excluded from selection on the basis that they either can't be (in the case of Sub-GHz only) or are unlikely to be (in the case of Dual Band) installed against an NE SBCH given that the NE SBCH is 2.4GHz only.

- o 3 manufacturers for PPMIDs

Sub-GHz only and Dual Band PPMIDs are excluded from selection on the basis that they either can't be (in the case of Sub-GHz only) or are unlikely to be (in the case of Dual Band) installed against an NE SBCH given that the NE SBCH is 2.4GHz only.

3.7.2. Conclusion 2 - Utilise Baseline firmware versions for those Device Models included under Manufacturer Coverage

DCC proposes that the Baseline firmware version is selected for each Device Model included on the basis of manufacturer coverage. Although Baseline is not always the highest contributor to installs over the preceding 6-month period, DCC considers that the likelihood of Baseline having made its way to the front of a supply chain during the duration of testing and Initial Pallet Validation makes it a strong candidate for testing. This selection also supports the testing of the I&C business process as the prevalent business process.

DCC further considers the potential that a Manufacturer may highlight a situation whereby a firmware version currently on its development roadmap, but not yet on the production CPL may be considered the Device Model most likely to be installed against an NE CH. In these instances, the DSM would permit these Device Models to act as the Baseline for the impacted manufacturer. This would be agreed under the governance of the CH&N Test Coverage Document, which is mandated to contain the final list of Device Models against which testing shall be conducted.

3.7.3. Conclusion 3 – Reserve any remaining capacity for Device Models available beyond Manufacturer Coverage

DCC proposes that the DSM does not finalise a decision on the Device Models included beyond those required for Manufacturer Coverage, but instead presents information as has been done in Section 3.6 of this consultation to highlight the increased coverage against both I&C and CHR targeting methods for additional Device Models. An example of the potential impact to Coverage is shown in Section 3.8 below.

DCC intends to make a recommendation to the TAG on the use of any Device Models beyond those required for Manufacturer Coverage, based on the data produced when the DSM is ran. This may be to reserve the capacity to address any unforeseen issues arising with existing Device Models, or may be to simply select Device Models offering an increase to one of the Coverage Metrics.

3.8. Summarised view of DCC Recommendation

The below view of the coverage metrics applicable to DCC's recommended Device Models for inclusion in testing is based on the following criteria, which form the basis of the DSMs selection criteria;

1. Manufacturer Coverage is achieved using Baseline firmware – this would be a set criterion of the DSM under DCC's proposal
2. Further Device Models are added to target the greatest benefit to either Install or Estate Coverage. This would be presented to TAG as illustrated in the table below, with DCC's recommendation (if looking to increase Coverage Metrics) based on the current figures illustrated by an underline;

Selection Type	Coverage Metric	ESME	GSME	PPMID
Manufacturer Coverage Only	Install Coverage	12.55%	18.23%	26.66%
	Estate Coverage	7.15%	9.25%	6.17%
I&C Targeting Addition	Install Coverage	<u>64.78%</u>	93.01%	89.10%
	Estate Coverage	<u>22.17%</u>	44.30%	30.29%
CHR Targeting Addition	Install Coverage	62.93%	<u>90.66%</u>	<u>45.45%</u>
	Estate Coverage	26.71%	<u>76.76%</u>	<u>65.56%</u>

As can be seen in the above table, it is possible to recommend a different targeting method for each Device Type, in order to ensure the most appropriate benefit to coverage metrics for that Device Type.

3.9. Consultation Questions

Questions in this section of the document relate to the concepts introduced in Section 3 of this consultation document.

Question 1	Do you support DCC's view that volume replacement of existing SMETS2 Communications Hubs in response to the sunsetting of 2G is not expected to commence at volume until after the initial SMIP rollout is completed?
Question 2	Do you support the DCC's view that older Device Models on the Estate (Device Models installed previously that are no longer actively installed), will not interact with the NE CH at any volume due to these Device Models being upgraded between NE CH Go Live and the CHR process commencing at volume?
Question 3	Do you support the various exclusion criteria utilised in producing the Device Selection Candidate Lists?
Question 4	Do you support counting Device Models excluded on the basis of "Common Manufacturer Image Hash" as covered for the purposes of testing?
Question 5	Do you support DCC's view that Manufacturer Coverage offers the greatest mitigation to the risk of issues being found in later Phases of the CH&N Programme and so should be the initial target area for including Device Models in testing?
Question 6	Do you support DCC's view that Device Models included based on Manufacturer Coverage should be tested on the Baseline firmware for the device and that Baseline may be considered to be a version currently only available via the Test CPL where industry (via the TAGs approval of the CH&N Test Coverage Document) approve this?

4. Device Models for Regression Testing of the DCC Total System

Regression Testing of the DCC Total System drives two requirements for devices to be utilised, one for the testing of SMETS1 and a second for the testing of existing SMETS2 installations. Functional testing of the actual installations is not considered necessary to prove the changes introduced by the CH&N Solution, which introduces a new interface from the DSP to the CH&N Solution. Regression testing is required to prove that Service Requests from DCC Users targeting an existing installation (SMETS1 or SMETS2) are appropriately routed to the existing CSP interface by the DSP. Beyond this point, CH&N introduces no changes to the DCC Total System.

4.1. SMETS1

The recommendation for SMETS1 regression testing is a single Device Model Combination from each S1SP. This will ensure coverage of all SMETS1 interfaces between the DSP and SMETS1 Device Models.

4.2. SMETS2

The recommendation for SMETS2 regression testing is described in 2 parts;

1. Testing shall be conducted using any Device Model included within the scope of functional testing.
2. The Baseline version of the current 2.4GHz, Single Band Communications Hub from each CSP region shall be utilised to perform testing. To this purpose, CSP Central and South (CSP C&S) shall be considered as a single CSP (given they share a single interface). Only one of the two CSP C&S Communications Hub manufacturers is required for this testing.

4.3. Consultation Questions

Question 7

Do you support the DCC's view that regression testing of the existing elements of the DCC Total System, in relation to the changes introduced by the CH&N Solution (as it relates to Device Selection) is limited to the proving of interfaces to the CSP and SMETS1 S1SPs?

Question 8

Do you support the proposed Device Selection criteria for regression testing against SMETS1 and SMETS2?

5. How to respond

Please provide responses by 17:00 on 4 February 2022 to DCC at: consultations@smartdcc.co.uk

DCC will review consultation responses and consider the most appropriate next steps to confirm arrangements.

Consultation responses may be published on our website www.smartdcc.co.uk. Please state clearly in writing whether you want all or any part, of your consultation response to be treated as confidential. It would be helpful if you could explain to us why you regard the information you have provided as

confidential. Please note that responses in their entirety (including any text marked confidential) may be made available to the Department of Business, Energy and Industrial Strategy (BEIS) and the Gas and Electricity Markets Authority (the Authority). Information provided to BEIS or the Authority, including personal information, may be subject to publication or disclosure in accordance with the access to information legislation (primarily the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004). If BEIS or the Authority receive a request for disclosure of the information we/they will take full account of your explanation (to the extent provided to them), but we/they cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded by us as a confidentiality request.

6. Appendix

6.1. Appendix A - List of Consultation Questions

Question 1	Do you support the DCC's view that volume replacement of existing SMETS2 Communications Hubs in response to the sunsetting of 2G is not expected to commence at volume until after the initial SMIP rollout is completed?
Question 2	Do you support the DCC's view that older Device Models on the Estate (Device Models installed previously that are no longer actively installed), will not interact with the NE CH at any volume due to these Device Models being upgraded between NE CH Go Live and the CHR process commencing at volume?
Question 3	Do you support the various exclusion criteria utilised in producing the Device Selection Candidate Lists?
Question 4	Do you support counting Device Models excluded on the basis of "Common Manufacturer Image Hash" as covered for the purposes of testing?
Question 5	Do you support DCC's view that Manufacturer Coverage offers the greatest mitigation to the risk of issues being found in later Phases of the CH&N Programme and so should be the initial target area for including Device Models in testing?
Question 6	Do you support DCC's view that Device Models included based on Manufacturer Coverage should be tested on the Baseline firmware for the device and that Baseline may be considered to be a version currently only available via the Test CPL where industry (via the TAGs approval of the CH&N Test Coverage Document) approve this?
Question 7	Do you support the DCC's view that regression testing of the existing elements of the DCC Total System, in relation to the changes introduced by the CH&N Solution (as it relates to Device Selection) is limited to the proving of interfaces to the CSP and SMETS1 S1SPs?
Question 8	Do you support the proposed Device Selection criteria for regression testing against SMETS1 and SMETS2?

6.2. Appendix B - Proposed Wording for Inclusion in CH&N TAD

Device Selection Methodology

The Device Selection Methodology is used to identify electricity and gas meter Device Models as well as PPMID Device Models for inclusion in testing of the CH&N Solution. Device Models will be utilised across all areas of testing as described below;

- i. Functional testing of the Single Band, 2.4GHz Network Evolution Communication Hub's (NECH SB) interaction with Devices on the HAN through PIT and SIT
- ii. Functional testing of the NE CH Solution interfaces through PIT and SIT, against a subset of Devices
- iii. Regression testing of the existing SMETS2 CSP and SMETS1 S1SP supporting interfaces

The final list of Device Models selected for inclusion in testing will be included in the CH&N TCD.

Functional Testing

Devices included in the Functional testing of the CH&N Solution will be based around the below;

- i. A single Device Model at Baseline firmware, per Device Type from each active Manufacturer
- ii. Additional Device Models, up to the limit of 9 Device Models, per Device Type to provide increased coverage of recent installations (Install Coverage) or Device Models currently installed (Estate Coverage) as agreed with TAG.
 - a. Additional Device Models will be presented from both the I&C Targeting Device Selection Candidate List (which looks to target Device Models installed in the preceding 6-month period) or the CHR Targeting Device Selection Candidate List (which looks to target Device Models which may undergo a Comms Hub replacement, based on their prevalence in the estate), with supporting metrics to illustrate the coverage of both installs and estate provided by each Device Model.

Regression Testing

Devices included in the regression testing of the Modified DCC Total System, as amended to accommodate the CH&N Solution shall be as below;

- i. A single Device Model Combination from each S1SP
- ii. A single Device Model, from each Device Type selected from those Device Models used for functional testing of the CH&N Solution
- iii. A single SMETS2 Communications Hub (Single Band) at Baseline firmware from each current CSP (counting Central and South as a single CSP).

6.3. Appendix C – Alternative Options for Manufacturer Coverage where Baseline is not used

6.3.1. Alternative Options if Baseline is not Used

If responses to this consultation do not support DCC’s proposed position of selecting Baseline Device Models to achieve Manufacturer Coverage, alternative options would need to be explored. DCC proposes that these options would need to target one or both of Install or Estate Coverage metrics in order to select a Device Model from each Manufacturer. As such, the following sections present a view of I&C targeting & CHR targeting for consideration.

Where coverage figures are provided in the following sections of this document against a Manufacturer, these are anonymised views of the Coverage Metrics against real Manufacturers.

6.3.1. Electricity Meter Coverage

The table below illustrates the coverage achieved through including a single Device Model from each of the 7 currently active electricity meter manufacturers, where Device Models are selected from either the I&C Targeting Device Selection Candidate list based on Install Coverage or the CHR Targeting Device Selection Candidate List based on Estate Coverage.

Given DCC’s assumption around the predominance of the I&C business process, the highest install contributor from the I&C Targeting DSCL would form DCC’s second choice for achieving Manufacturer Coverage.

Table 6.1 - Electricity Meter - Manufacturer Coverage – I&C Targeting – Install Coverage driven

Targeting Method	I&C Targeting		CHR Targeting	
	Highest Install Contributor		Highest Estate Contributor	
Coverage Metric	Install Coverage	Estate Coverage	Install Coverage	Estate Coverage
Manufacturer 8	7.11%	3.10%	7.11%	3.10%
Manufacturer 4	16.79%	9.21%	16.79%	9.21%
Manufacturer 12	1.07%	0.43%	0.00%	2.09%
Manufacturer 6	1.68%	1.05%	1.68%	1.05%
Manufacturer 7	1.40%	0.12%	0.03%	0.62%
Manufacturer 3	33.59%	10.35%	33.59%	10.35%
Manufacturer 9	1.00%	0.72%	1.00%	0.72%
Total	62.64%	24.98%	60.20%	27.14%

6.3.1. Comparison between I&C Targeting & CHR Targeting

The tables above provide a view of the coverage metrics applicable to achieving Manufacturer Coverage through both the I&C Targeting and CHR Targeting methods. The total coverage achieved is compared in the table below;

Table 6.2 - Comparison between I&C Targeting and CHR Targeting for ESMEs

Addition Method	Install Coverage	Estate Coverage
I&C Targeting – Highest Install Contributor	62.64%	24.98%
CHR Targeting – Estate Coverage Contributor	60.20%	27.14%

It is clear from the coverage metrics presented above, that when coverage of a particular metric, being either Install Coverage or Estate Coverage is used as the driver for selecting Devices to ensure Manufacturer Coverage, there is very little difference between the coverage achieved by the two methods.

Given the insignificance of any difference between the coverage metrics of the two Targeting Methods and the working assumption that I&C is the predominant business process, DCC proposes that I&C Targeting is utilised in the selection of Devices to achieve Manufacturer Coverage.

6.3.1. Gas Meter Coverage

The table below illustrates the coverage achieved through including a single Device from each of the 7, currently active gas meter manufacturers, where Devices are selected from either the I&C Targeting Device Selection Candidate list based on Install Coverage or the CHR Targeting Device Selection Candidate List based on Estate Coverage. Given DCC’s assumption around the predominance of the I&C business process, the highest install contributor from the I&C Targeting DSCL would form DCC’s second choice for achieving Manufacturer Coverage.

Table 6.3 - Gas Meter - Manufacturer Coverage – I&C Targeting – Install Coverage driven

Manufacturer	I&C Targeting Highest Install Contributor		CHR Targeting Highest Estate Contributor	
	Install Coverage	Estate Coverage	Install Coverage	Estate Coverage
Manufacturer 4	13.04%	8.47%	13.04%	8.47%
Manufacturer 12	0.65%	3.22%	0.65%	3.22%
Manufacturer 6	0.16%	0.32%	0.16%	0.32%
Manufacturer 3	73.23%	31.46%	2.84%	33.24%

Manufacturer 9	0.65%	0.79%	0.65%	0.79%
Manufacturer 10	1.33%	1.99%	1.33%	1.99%
Manufacturer 2	5.19%	0.78%	5.19%	0.78%
Total	94.25%	47.03%	23.86%	48.81%

6.3.1. Comparison between I&C Targeting & CHR Targeting

The tables above provide a view of the coverage metrics applicable to achieving Manufacturer Coverage through both the I&C Targeting and CHR Targeting methods. The total coverage is compared in the table below;

Table 6.4 - Comparison between I&C Targeting and CHR Targeting for GSMEs

Addition Method	Install Coverage	Estate Coverage
I&C Targeting – Highest Install Contributor	94.25%	47.03%
CHR Targeting – Estate Coverage Contributor	23.86%	48.81%

It is clear from the coverage metrics presented above, that the I&C Targeting method provides a much greater coverage of the recent install base (Install Coverage) and a comparable coverage of the current production estate (Estate Coverage).

Given the coverage metrics presented and the working assumption that I&C is the predominant business process, DCC proposes that I&C Targeting is utilised in the selection of Devices to achieve Manufacturer Coverage.

6.3.1. PPMID Coverage

The table below illustrates the coverage achieved through including a single Device from each of the 3, currently active PPMID manufacturers, where Devices are selected from either the I&C Targeting Device Selection Candidate list based on Install Coverage or the CHR Targeting Device Selection Candidate List based on Estate Coverage. Given DCC's assumption around the predominance of the I&C business process, the highest install contributor from the I&C Targeting DSCL would form DCC's second choice for achieving Manufacturer Coverage.

Table 6.5 - PPMID Manufacturer Coverage – I&C Targeting – Install Coverage driven

Manufacturer	I&C Targeting Highest Install Contributor		CHR Targeting Highest Estate Contributor	
	Install Coverage	Estate Coverage	Install Coverage	Estate Coverage
Manufacturer 11	26.60%	5.50%	0.65%	15.77%

Manufacturer 1	16.31%	4.46%	1.34%	10.00%
Manufacturer 5	13.37%	2.02%	13.37%	2.02%
Total	56.28%	11.98%	15.36%	27.79%

6.3.1. Comparison between I&C Targeting & CHR Targeting

The tables above provided a view of the coverage metrics applicable to achieving Manufacturer Coverage through both the I&C Targeting and CHR Targeting methods. The total coverage is compared in the table below;

Table 6.6 - Comparison between I&C Targeting and CHR Targeting - PPMID

Addition Method	Install Coverage	Estate Coverage
I&C Targeting – Highest Install Contributor	56.28%	11.98%
CHR Targeting – Estate Coverage Contributor	15.36%	27.79%

In the case of PPMID, there is a more notable difference in Install and Estate Coverage driven by which Targeting Method is employed.

This is believed to be driven by a lack of OTA capability to the PPMID estate, which lends itself to a far higher level of distribution between firmware versions for devices, as they have never been OTA'd to a later version.

Given the coverage metrics presented show a greater detriment to Install Coverage when CHR Targeting is utilised than they do to Estate Coverage when I&C Targeting is used, and the working assumption that I&C is the predominant business process, DCC proposes that I&C Targeting is utilised in the selection of Device Models to achieve Manufacturer Coverage.