Consultation

On the delivery plan for Network Evolution – Communications Hubs and Networks

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1.   Executive Summary

Context

The Network Evolution Programme (NEP) is a Data Communications Company (DCC) initiative geared towards defining and delivering future-proof Communications Hubs & Networks (CH&N) with an efficient supply chain and a targeted longevity of at least 15 years. Maintaining Smart functionality over the longer term will require the introduction of new Communications Hubs (CHs) which use the newer 4G network. DCC has stood-up a CH&N Programme to assess options for and then implement a chosen solution to achieve this.

On 29 January 2021 DCC was Directed by BEIS to produce an implementation plan for CH&N and this document is our consultation on that plan. **The consultation closes on 7 May 2021**.

The plan

DCC has developed a balanced plan which builds on lessons learned and includes better ways of working agreed with industry, whilst also factoring in the lack of certainty, given that procurement activity is currently 'in flight'. We propose two control points for the plan – at an advanced stage of the procurement process and the finalisation of lower level design, where we will review and, if necessary, propose refinements to the plan. Alongside the plan we set out opportunities that may enable quicker delivery and we would value in particular stakeholders' views on their appetite for incorporating these into the plan.

The plan covers two distinct elements, one for Single Band Communications Hubs (SBCH) and one for Dual Band (DBCH). These are being procured with different completion dates. Given the relative maturity of SBCH and DBCH technology, they also have differing testing schedules, with DBCH being delivered over a longer timeframe. DCC is considering the commencement of design activity early, once preferred bidders are identified, and negotiations are sufficiently progressed.

For testing, DCC has responded to testing-expert feedback and we are adopting a 'shift-left' principle; increasing the breadth and depth of testing in Pre-Integration Testing and System Integration Testing, using enough real devices to demonstrate fitness for purpose. This will be supported by robust external assurance and audit of testing.

Users will have two opportunities to test their readiness for new CHs, as part of Device and User System Testing, and during a low-volume deployment of new CHs on the production platform (referred to as Initial Pallet Validation). We are proposing that there are no obligations placed on Users to conduct User Integration Testing, because of this increased breadth and depth or our testing and given that the plan will not introduce changes to the DCC User Interface or Zigbee Interfaces. Our view is that the proposed testing regime will allow us to prove readiness of DCC systems and hardware without a dependency on Users to participate. For the same reason we propose there are no obligation placed on Users to participate in Initial Pallet Validation.

We expect significant participation from customers in both phases because this will provide the opportunity for them to prove they can conduct their business as usual with new CHs operating across a new Wide Area Network (WAN). As part of DCC's proposed approach, where DCC can do so, orders placed from the point of the 'volume supply' milestone will be met via delivery of the new 4G CHs and

the normal SEC rules relating to charging and returns will apply. DCC considers this an additional and significant driver for customer participation in the User Testing and Initial Pallet Validation phases.

Go-Live

DCC proposes two go-live gates for each element of the programme. The first will be to deploy the technical changes to DCC Systems, which will enable the use of new 4G CHs on the production platform. This first go-live will be followed by an opportunity for users to deploy small numbers (limited to less than one pallet per user) of CHs over an 8-week period. Results from this Initial Pallet Validation phase will support the second go-live step, which will be the decision to commence mass manufacture of 4G CHs. We recommend that BEIS acts as the approval body for both gates, through the sign-off of Live Service Criteria. We also propose that the SEC Panel provides a recommendation on readiness to BEIS.

Once the mass-manufacture decision is made, we do not plan to pause 4GCH manufacture and will 'fix-forward' from this point. Our testing approach mitigates risks of this approach, but to further mitigate risk we have requested that prospective Service Providers include the ability to 'flash' CHs after manufacture and will build this capability into the plan.

Transition to new CHs

It will be important for industry that there is an efficient transition to new 4G CHs while maintaining a smooth and continuous rollout. Key considerations affecting this transition include how to avoid the risk of surplus 3G CHs and how to avoid complexity for installers. These decisions require input from across industry and especially from energy suppliers and installers, and DCC proposes to engage with these stakeholders to develop guidelines, objectives and critical milestones in a new CH Transition Roadmap.

External factors and opportunities in the plan

In forming the plan, DCC has assessed the impact of other programmes and deliverables across industry. Those that need to be most closely tracked and managed are the November 2022 and June 2023 SEC Releases, and the Market Wide Half-Hourly Settlement programme, all of which are being delivered alongside the CH&N plan. DCC will monitor each and manage any risks that arise (for example urgent SEC changes which impact the scope of testing).

We have set out the external dependencies and assumptions that underpin the plan. Delays to the certification of new devices pose a risk to the plan, as does the provision of device details from Energy suppliers to inform our testing. Our key assumptions relate to CH design (including that changes only relate to the WAN and that we will not require a 4G mesh variant), and stability of the technical baseline. We also set out external risks and opportunities, inviting comments on these.

As well as external risks and opportunities, there are a number of opportunities within the programme that DCC can factor into the final delivery plans. Some of these are based on assumptions, in other cases the opportunities are structural; based on the duration and/or overlap of programme activity. DCC considers it is important that if taken, these opportunities – some of which do not take full account of lessons learned or previously supported approaches – are supported by stakeholders given the impact it will have on their own plans, and invites views on them.

Responding to Customer feedback and our ask of respondents

DCC's aim in developing this plan is to build one which is supported by customers; with agreed objectives and aligned outcomes. We have changed our test approach based on feedback from industry and want to work with customers and engage openly on the best approach to CH transition. DCC has also sought to minimise impacts on customer systems and processes and sets out later in this document what it sees as the potential change impacts for customers.

We seek to gain industry's input on the programme's planning and delivery approach, and planning opportunities. We are seeking stakeholders' views on specific points as well as the plan generally and are especially interested in feedback that will validate our initial assessment of impacts on DCC customers in the customer journey through the delivery of the plan.

A summary of key milestones in the plans is set out in the table below.

Milestone	SB CH	DB CH
Early design commences with letters of intent signed	15 Aug 2021	15 Oct 2021
Service Providers enter PIT	15 Jan 2022	15 Mar 2022
Test 4G CHs can be ordered for use in UIT	1 Feb 2022	15 Mar 2022
Completion of System Integration Testing (SIT)	1 Nov 2022	15 Jan 2023
Initial Pallets of 4G CHs can be ordered by customers	1 Nov 2022	15 Jan 2023
UIT Window	15 Jan – 15 Mar 2023	1 Apr – 1 Jun 2023
Go-Live Decision to deploy changes to Live systems	15 Apr 2023	1 Jul 2023
Initial Pallet Supply	15 Apr 2023	1 Jul 2023
Initial Pallet Validation Phase	15 May – 15 Jul 2023	1 Aug – 1 Oct 2023
Go-Live: Volume manufacture decision	15 Aug 2023	1 Nov 2023
Volume 4G CH Supply	15 Dec 2023	1 Apr 2024

Selected milestones from the proposed plans (the full set of milestones is included in Appendix B)

2. Introduction and Context

2.1. The Network Evolution Programme

1. The Network Evolution Programme (NEP) is a Data Communications Company (DCC) initiative geared towards defining and delivering the organisation's future operating capability. It comprises four sub-programmes:

   - **Network Evolution Communication Hubs & Networks:** Designing and procuring future-proof Communications Hubs & Networks (CH&N). We require a technology with a targeted longevity of at least 15 years so that the full benefit of CH assets' operational life is realised from the point of installation;

   - **Network Evolution DSP:** Designing and procuring data services which are secure and sustainable, with a reduced operating cost, capable of rapid and cost-effective change in response to market and customer demand. This work will include investigations into how cloud computing and microservices could contribute to a new design for the Data Service Provider (DSP) to de-risk the overall re-tendering activity;

   - **Network Evolution Security & SMKI:** Procure a replacement or extension to the Smart Metering Key Infrastructure (SMKI) security (TSP) service in a cost-effective way; and

   - **Network Evolution Test Automation:** Designing and implementing automated testing of the SEC releases to achieve faster and lower-cost testing.

2.2. The Communications Hubs and Networks Programme

2. The Network Evolution Communication Hubs & Networks programme is geared towards defining and delivering future-proof Communications Hubs & Networks (CH&N) with an efficient supply chain and a targeted longevity of at least 15 years. Maintaining Smart functionality over the longer term will require the introduction of new CHs which use the newer 4G network. DCC has stood-up a CH&N Programme to assess options for and then implement a chosen solution to achieve this.

3. The programme aims to maximise value for money and ensure that DCC continues to meet the needs of its customers in the medium and long term, supported by a flexible commercial model that supports effective change and drives value for money for DCC Users. The CH&N Programme aims to deliver the following outcomes for DCC and its customers:

   - Ongoing secure connectivity, capacity and longevity of devices as cellular technology evolves;

   - Protection of investments already made and promotion of future value for money for customers; and

   - Flexibility to allow future change to support industry evolution.

4. DCC currently delivers Smart Metering services over 2G/3G through two distinct families: SMETS1 and SMETS2. Each family has its own arrangements for Communication Service Providers (CSPs), covering the provision of network services and the devices (Communications Hubs).

5. Maintaining Smart functionality over the longer term will require the introduction of new CHs covering both families, which use the newer 4G network. The CH&N Programme will assess options for and then implement a chosen solution to achieve this. We have followed the Treasury

Green Book[1] guidance to develop an Outline Business Case ahead of the finalisation of a Full Business Case for our approach.

6. DCC's Licence includes a requirement for DCC to submit the Busines Case to the Secretary of State for the Department for Business, Energy and Industrial Strategy (BEIS) for their review ahead of certain procurements covering its core service provision. DCC has finalised its Outline Business Case and has used this to inform its Invitation to Tender for the work required under the programme. Following the evaluation of responses and selection of a preferred bidder, DCC finalise the Full Business Case and submit it to BEIS for confirmation.

2.3. Secretary of State's Direction for the CH&N Plan

7. On 29 January 2021 DCC was Directed in accordance with Condition 13B of the DCC Licence to produce an implementation plan for two[2] elements of the 'Network Evolution Arrangements', including for CH&N. The Direction sets out the following requirements relating to the CH&N Programme.

   i. Each plan must set out the activities which the Licensee (including its current or any future External Service Providers) will need to undertake, and the deliverables which the Licensee (including its current or any future External Service Providers) will need to produce in order to enable the Licensee to deliver the relevant element of the Network Evolution Arrangements

   ii. Each plan must set out descriptions, timelines and interim milestones with associated dates for these activities and deliverables of the Licensee (including its current or any future External Service Providers).

   iii. Each plan must identify the key interactions (including, but not limited to, use of test environments and release into the production environment) with other changes that DCC is progressing in timescales that affect the introduction of the relevant element of the Network Evolution arrangements, which may include (but is not limited to) the interactions with business as usual operations and interactions between the two plans and other elements of the Network Evolution Arrangements.

   iv. Each plan must identify activities, deliverables and events which are deemed as outside the control of the Licensee and its External Service Providers, and upon which the Licensee is dependent in order to deliver the relevant element of the Network Evolution Arrangements in accordance with the dates set out in the plan. Such dependencies may include policy decisions by the Secretary of State and Secretary of State modifications to the Smart Energy Code (and prior BEIS baselining of technical and regulatory documents, including at TBDG), as well as other dependent activities and deliverables of energy suppliers and other industry participants and bodies. The plan must identify the date by which each such dependency will need to be met in order to enable the Licensee to deliver the relevant element of the Network Evolution Arrangements in accordance with the dates set out in the plan.

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[1] The Green Book is guidance issued by HM Treasury on how to appraise policies, programmes and projects, and the use of monitoring and evaluation before, during and after implementation.
[2] The Direction also required an implementation plan Network Evolution Arrangements for ensuring continuity in the provision of data services. The implementation plan for these arrangements will be subject to a separate consultation.

    v.   Without limiting the generality of the above and taking account of lessons learnt by DCC to date, each plan must include details of engagement approaches envisaged, timelines and milestones for:

        a.   timely and effective industry engagement, including with DCC Users, Device manufacturers, consumer representative organisations and other SEC Parties and relevant wider stakeholders

        b.   design, development, testing and build of software and hardware changes to the DCC systems and Communications Hubs, plus any associated User trialling and testing, device interoperability testing and deployment into live operations

        c.   changes to the Smart Energy Code to be made by the Secretary of State, which are required to underpin the relevant element of the Network Evolution Arrangements; and

        d.   the development of the go-live decision-making framework to support the changes going live (including, but not limited to, independent external audit reports and the involvement of SEC Panel and its sub-committees).

    vi.   Each plan must provide for reporting of progress against the plan monthly (and where requested by the Secretary of State, more frequently) to BEIS, and the Implementation Managers Forum (IMF), and any other bodies specified from time to time by the Secretary of State for such purpose.

    vii.   In developing each plan, DCC should take into account that each of these two elements of the Network Evolution Arrangements will require BEIS approval before the go-live milestone in each plan is considered to have been met. BEIS will seek advice from the SEC Panel and its sub-committees in arriving at its approval decisions (as well as decisions on the testing documents and testing exit), and therefore the plan should cater for necessary timely and substantive engagement with the SEC Panel and its sub-committees to enable this. Similarly, the plan should also provide for earlier BEIS approval milestones where required, such as those required under Condition 16.6A of the DCC Licence, with timely and effective (including with reference to the quality of artefacts1 used) engagement with the SEC Panel and its sub-committees to ensure that SEC Party business needs and views are clearly set out and taken into account in the information DCC provides to the Secretary of State pursuant to DCC Licence Condition 16B parts (a) and (b).

8.   Accordingly, DCC has developed an Implementation Plan that meets the requirements of this Direction for the CH&N Programme, and this document forms our consultation the SEC Panel and all SEC Parties on the implementation plan in accordance with the requirements of Condition 13B.3 of the DCC Licence.

9.   This document is structured as follows:

- **Section 3** of this document sets out the Plan activities and Deliverables, including descriptions, timelines and interim milestones and dates. It also sets out our proposals for managing contingency as part of the plan.

- **Section 4** considers the delivery of the Plan against DCC's other deliverables over the plan lifetime, as well as in the context of broader industry change.

- **Section 5** considers the dependencies which must be met in order to deliver and the dates by which they can be met.

- **Section 6** sets out the risks associated with the Plan, including dependencies identified in Section 5, and how DCC will mitigate and manage these. We also set out opportunities that can be realised.

- **Section 7** focuses on DCC's customers and their involvement in the plan, including the stakeholder engagement we have incorporated into the plan, as well as DCC's perspective on the key milestones and phases that will impact them over the lifetime of the programme.

2.4. Timetable for consulting on and submitting the Plan

10. BEIS have requested that the Plan is submitted to them by no later than 4 June 2021. In order to maximise stakeholder engagement, we will be developing the plan to the following timeline.

Date	Activity
06 April 2021	Consultation Opens
26 April 2021	DCC Engagement Session
07 May 2021	Consultation Closes
4 June 2021	End of Consultation analysis, Conclusion document issued and submission of Plan to BEIS

3. Plan Activities and Deliverables

3.1. Delivery Approach

11. The business case for CH&N makes clear the benefits of prompt transition to 4GCHs. Following the initial proposals for delivery set out in the Outline Business Case, we have built a greater understanding of the challenges and opportunities for delivery, through continued commercial engagement and discussions with industry testing experts (including via the SEC Panel's Testing Advisory Group (TAG).

12. We have devised a plan which we are presenting for consultation which we believe strikes a balance between these challenges and opportunities. The plan builds on our experience of delivery to date, and customer feedback in response to that delivery. We consider the plan incorporates better ways of working and lessons learned, that will make it more likely it can be delivered as proposed. But, with the benefits of prompt delivery in mind, we have also identified opportunities that may enable quicker delivery and have set these out for comment in this document along with an indication of time that could be saved.

13. Some of these changes are structural – for example the overlapping of Business Acceptance Testing with User Integration Testing (UIT), or the staggered approval of Pre-Integration Testing based on testing activities within this phase – but these will require industry support, because of their involvement (either through participating in UIT and/or their role in assurance via the TAG). Other opportunities could be realised through our approach to testing, whereby we undertake significantly broader and deeper testing in PIT, which could in turn allow fewer cycles of testing activities in SIT. This 'shift-left' of testing might also allow opportunities for shorter windows for supported UIT testing and initial CH trails in production.

14. Stakeholder feedback on their support for exploiting these opportunities is particularly welcome and we have structured our assessment of dependencies, assumptions, risks and opportunities accordingly in Section 6 of this document.

15. The plan also factors in some of the uncertainty that exists at this stage of delivery in any plan (i.e. ahead of the completion of commercial negotiations), and reflects the fact that the plan may need to be refined once commercial negotiations with bidders have concluded, and again once we have finalised lower level designs. We have built two control points into the plan – following the completion of commercial negotiations and the finalisation of lower level design, where we will review and, if necessary, propose refinements to the plan.

3.2. Commercial Activity

3.2.1. Activity to date

16. DCC has, in collaboration with BEIS and stakeholders, been assessing the business case for changing our Communications Hub and Network capability, and we have been using this engagement to steer development of our plan. With support and valuable feedback from our customers, our Economic analysis has reached the Outline Business Case stage, which we have used to inform our Invitations to Tender to prospective suppliers to deliver the requirements in the CH&N Programme.

17. Invitations to Tender have been issued for 2 distinct Lots which will comprise two distinct elements of programme delivery. These are:

- **Lot 1** – covers an aggregated solution to provide a Single Band 4G CH Service including devices, a WAN and supporting services.

- **Lot 2** – covers a disaggregated solution to provide a service for Dual Band 4G CHs, including sub-lots for CH device provision, WAN provision and supporting services.

18. Invitations to Tender for both Lots were issued in December 2020 and bids were received on 26 February 2021. The procurement process is, at the time of publication, ongoing

3.2.2. Completion of procurement activity and Contract Award

19. DCC has now begun the process of evaluation responses, and we expect to conclude initial negotiations in July 2021 for Lot 1 and October 2021 for Lot 2. Timelines for commercial activity are different due to the additional commercial complexity of the disaggregated DBCH procurement, and a need to move as quickly as possible to provide a Single Band Communications Hub (SBCH) solution which will support the Smart Metering Business Case.

20. In order to provide the best value for our customers we will take the necessary time to assess contracts awarded for the programme and ensure delivery in accordance with DCC's Licence Objectives. We expect to complete the commercial negotiations and be ready to award the contracts by 5 November 2021 for Lot 1 and 18 January 2022 for Lot 2.

21. Once ready to award the contracts, DCC will submit two separate, final Full Business Cases to BEIS (one for Lot 1 and one for Lot 2) for review, in accordance with the requirements in Condition 16.6A of the DCC Licence. We must receive confirmation from the Secretary of State that they do not object to the procurement going ahead before we can complete the commercial process. Each Lot, and therefore each Business Case, is independent of the other and there are no consequential impacts between then.

22. Recognising the benefits of delivering the plan quickly, we propose to sign Letters of Intent with the preferred bidders so that we can start some design activity ahead of final contract award. We consider the likelihood of changes to design being identified after this point to be small, and therefore the risk of commencing design work ahead of the signing of contracts to be correspondingly low. Given this precedes the approval of the Full Business Case, DCC will share its activities and rationale with stakeholders including Ofgem. Provided that commercial conditions allow, and our assumptions hold, we plan for these letters to be signed in August 2021 for Lot 1 and October 2021 for Lot 2. At the point that Letters of Intent are signed we will be able to finalise our assessment of other commercial change that may be needed with existing Service Providers – although we expect this to be small and limited to the changed needed to the DSP to support the new 4G WAN.

Different plan timetables for Lots 1 (Single Band) and 2 (Dual Band)

23. Undertaking the procurement through 2 separate Lots and assessing Tenders at different times, means that DCC will award the contracts for Lot 1 before Lot 2. This approach means that planned activity for Lot 1 can commence sooner than for Lot 2 and consequently the delivery plans for each, whilst following the same testing, go-live and transitional steps are not aligned.

24. We have presented 2 plans for respondents to comment on as part of this consultation. Steps in the plans are the same and we describe these, and associated dependencies, assumptions and risks together as part of the overall programme delivery. It should be noted that the 4G DBCH delivery plan runs over a longer timetable that the 4G SBCH plan. This is because Dual band technology itself is more complicated than Single Band and we will undertake more testing (over both 2.4GHz and 868MHz Zigbee bands) in PIT for the DBCH.

Single Band 4G CH delivery

Commercial Activity › Testing Phases › Initial Pallet Validation › Transition Roadmap

Dual Band 4G CH delivery

Commercial Activity › Testing Phases › Initial Pallet Validation › Transition Roadmap

3.3. Design and Build

25. We propose to commence design and build activity ahead of contract award and following mobilisation, from the point that Letters of Intent are issued, with the aim of completing the lower level design in December 2021. This will lead up to a control point readiness check ahead of PIT. A critical constituent of this activity will include the development of hardware. We are assuming as part of the plan that changes to the Communications Hub hardware will only relate to the WAN (and not the Home Area Network (HAN)), and that hardware changes will be at a second and final iteration for the start of PIT. To further de-risk delivery, we have instructed vendors that the WAN modules used in the CH must be pre-approved by the Communications Services Provider (CSP) and be proven in the marketplace already.

26. DCC will build on lessons learned in the development, testing and provision of Communications Hubs and we have included in the plan hardware testing including for the Intimate Communications Hub Interface as well as Radio Frequency Noise Testing. We plan to undertake this testing during PIT, as soon as the Hardware is ready, so all issues are fixed before SIT entry. DCC will consult with industry on noise limits through amendments to the Intimate Communications Hubs Interface Specification (ICHIS) and have included a milestone in the plan for when this will conclude.

27. Building confidence in the performance of new hardware will enable DCC to ensure Communications Hubs are available for testing purposes (both remotely or in DCCs labs). We plan to take orders for these CH from the following dates:

- **For SBCH** - on 1 February 2022 ahead of delivery in June 2022.

- **For DBCH** – on 15 March 2022 ahead of delivery in August 2022.

28. DCC will work with Certification bodies concurrently with system testing described below. The plan assumes that we will gain Zigbee Certification in August 2022 and CPA Certification in January 2023. We have asked vendors to build into their bids that there will be no Zigbee chip or design changes.

29. The solutions procured as part of the delivery of the plan will need to interface with the existing DCC Systems. Systems Integration will be undertaken by a separate body, but components

required within each of the lots described above will need to be integrated with one another. The activities for both aggregated and disaggregated integrations are very similar to what DCC's current CSPs have and continue to do for their CSP solutions. The integration activities will commence during the Design phase of the delivery plan, ensuring that functional designs and interfaces are aligned across components and bidders. They will continue through Build and Test phases, which we will describe in the Testing Approach Documentation (See section 3.4.2)

30. To provide high quality assurance of the design, DCC's Cross Functional Design Authority (CFDA) will oversee Design Assurance. The driver for cross functional governance is the reduction of siloed working practices and the improvement in common understanding of change for DCC and its Service Providers. This approach aims to de-risk programme delivery, ensuring the required business outcomes are delivered on time, in budget, right first time and are fit for purpose.

31. The CFDA will provide governance over design change for the programme, to ensure that across all stakeholders there is a holistic understanding of the scope of change, its impact across DCC enterprise and that deliverables are correct, of quality, fit for purpose and meet the required customer and business outcomes. The CFDA will include representation from TABASC, and its governance role will ensure the effective transition of component integration from vendors to DCC, and we consider the involvement of the CFDA will be particularly valuable for DB delivery, given the expected larger number of vendors.

3.4. Testing

3.4.1. Test Strategy for CH&N – 'shift left'

32. Testing forms the core of the CH&N Plan, and it is vital that the testing undertaken is of a high standard. The Communications Hubs that will be provided for installation will have an operational life expectancy of at least 15 years, and ensuring they are fit for purpose and meet the needs of energy suppliers and installers will be an important outcome.

33. DCC has been through several important testing cycles in different delivery programmes and we seek constantly to learn from our experiences, building on our successes and making changes where improvements have been identified. The nature of the CH&N programme, and the benefits gained from prompt delivery, must be balanced against the need for thorough testing that meets stakeholders' needs. To strike this balance we are adopting the 'shift-left' principle – moving more testing to the left of the delivery plan – whereby we increase the breadth and depth of testing, especially in PIT, using an adequate number of real devices to demonstrate fitness for purpose. We consider that this approach must be supported by robust external assurance of testing in PIT and SIT, and we set out our proposals in section 3.4.2 below.

34. It is our view that this approach can negate the need seen in other DCC releases to rely on User Testing to prove readiness of DCC Systems and hardware, and that User Testing instead can focus solely on supporting user readiness. We therefore propose two windows for User-led testing, in UIT – conducted in a test environment – and an Initial Pallet Validation stage – using real devices in the production environment – to support user readiness.

35. As part of DCC's proposed delivery approach, where DCC can do so, orders placed from the point of the 'volume supply' milestone will be met via delivery of the new 4G CHs and our current assumption is that the normal SEC Party initiated rules relating to charging and returns will apply. We therefore expect significant participation from customers in both the User Testing window

(which DCC is confident it can accommodate through remote testing or through the use of DCC test labs) and IPV phase because this will provide the opportunity for them to satisfy themselves that they can conduct their business as usual with new CHs operating across a new WAN.

36. DCC will build any evidence that emerges from participation in these test phases into its key decision-making gates – deploying change to the production environment and starting mass manufacture – but is not proposing that participation in UIT or Initial Pallet Validation should be mandatory. Whilst highly unlikely, this would mean that DCC could move through these gates without any User testing having taken place in UIT or in production.

Question 1	Do you support DCC's shift-left strategy for testing, including that there are no obligations on DCC Users to undertake testing? If not, please explain why.

3.4.2. Testing Governance

37. A key lesson learned from our experience to date is the value of independent stakeholder assurance of our testing and we propose to make fuller use of this for the CH&N programme and aim to maximise the use of the SEC Panel's Testing Advisory Group (TAG) in the governance of testing. We have already held an initial workshop for TAG in January 2021 to outline the principles for testing and have supplied the version of our Testing Approach Document (TAD) for review for discussion at the February 2021 TAG meeting. We propose to continue this engagement throughout the programme. TAG have indicated that Testing Design and Expert Group (TDEG) should be the industry body to collaborate with DCC on defining the scope and coverage of testing for each test phase with the phase TAD which can then be submitted to TAG for agreement.

38. DCC will develop and consult on an SEC Variation Testing Approach Document (SVTAD) which sets out the overarching approach to and governance framework for testing, in accordance with the requirements in Section X11 of the SEC. We have already started our plans for testing and have developed a testing approach which has been used by bidders to develop their cost proposals. We propose that that the SVTAD will set out the high-level framework for testing and be supplemented with a more detailed testing document covering the scope, depth and breadth of testing.

39. DCC will, as with previous programmes, procure independent auditing of our testing in SIT, and this will feed into testing and go-live governance decisions.

3.4.3. Pre-Integration Testing (PIT) and early testing

40. We propose that the first testing activity undertaken in the plan will be to test any necessary DSP changes to manage new 4G WANs on top of those provided today. The nature and extent of these changes cannot be finalised at this stage as it is in part dependent on the ongoing procurement activity. Any DSP develop and test activity required for SBCH and, separately, DBCH will be necessary ahead of the first Component Integration Testing (CIT) that will take place in PIT. DCC has already developed some high-level design documentation for this activity (which was

needed to support the tender process), and this has been agreed and shared with the SEC Panel's technical expert group, TABASC.

41.   Until the procurement process is more advanced, and the final solutions for both Lots known, it is not possible to precisely set out the scope and duration of this DSP activity, but we see merit in conducting is as soon as possible given that it sits on the critical path for the programme. It is probable that this activity will need to start ahead of the Secretary of State confirming they do not object to the procurement of Relevant Service Capability.

42.   The PIT phase itself will confirm the successful implementation of functional and non-functional requirements of the NE CH&N Solution across a combination of new Service Providers' own Pre-Integration Test environment(s) as well as the DCC Early Integration Test environment. Sub-phases will include:

- **Unit Testing** – which is conducted at the component level of the solution, verifying each component in isolation. Unit Testing will isolate a unit of code, such as a function or procedure and check that unit of code is functioning correctly against its functional specification;

- **Link Testing** – which is conducted to validate interaction between components. Link testing is performed to take individual units of code that have undertaken Unit Test, and test that these combined units function together;

- **System Testing** – this is the first time that a complete system within a Service Provider is tested, meaning that all components are in place and Unit and Link Testing has been completed on them; and

- **Component Integration Testing** – where the new Service Providers' systems will complete testing against a real version of the DSP before entering to the regulated environments of SIT & UIT.

43.   Non-DSP PIT will start in January 2022 for the SBCH plan and in March 2022 for the DBCH plan. As part of the 'shift left' principles DCC will be assuring these Service Provider activities to ensure scope, coverage and successful completion and traceability back through to the requirements. We anticipate that in accordance with PIT generally, unit, link and system tests will take place in Service Providers' PIT Environments.

44.   As part of implementing the lessons learnt where at all possible the testing will be completed utilising real devices via Component Integration Testing (CIT) and will take place on an EIT environment. For SBCH development this activity will be completed by the successful bidder. For DBCH the Component Integrator activity and function will be conducted by a third-party organisation. DCC will agree with TAG the how many and which device combinations it will use in PIT, ensuring it represents a significantly large population of smart metering installations modelled on the Production estate (we will consider both the as-is estate and how we expect it to be at the point of mass manufacture) and with industry guidance. Additional combinations, where applicable and agreed with TAG, will also be considered for use within SIT. DCC plans to use test-scripts and scenarios that reflect those that Users will exercise in UIT and the production environment. We will require meter configuration details from energy suppliers ahead of PIT so we can test against devices that reflect their set-up in the production environment and will ask energy suppliers to provide these details.

45.   CIT comprises two elements. The first looks to test scope and coverage that may traditionally have been considered part of the System Test scope, covering test techniques such as Boundary Equivalence. The second strand will look to perform a level of early integration testing of CH&N

Solution Systems, validating the interfaces and interactions between the various actors in the overall NE CH&N Solution.

46. Additionally, as part of our lessons learned activity, we have listened to stakeholder feedback from testing experts regarding their involvement in all testing phases and intend to invite TAG or their nominated representatives to contribute to our assurance of testing in PIT, including witnessing tests. We are developing the extent of our testing – its breadth and depth – and will include this in the SVTAD and its supporting documents, along with the exit arrangements for PIT, and will propose that TAG decides on test completion for PIT.

47. During the PIT phase DCC intends to undertake Technical Readiness Testing (TRT) which will provide validation that the systems and overall service will be deployed and provisioned as an integrated service.

3.4.4. System Integration Testing

48. The DCC CH&N plan sets out that SIT will commence in June 2022 for Single Band and August 2022 for Dual Band and will run for 4 ½ months for each. Our intent is that the SIT phase includes:

- **Pre-SIT** – this activity will undertake the scope and coverage of testing due for execution in the Solution Testing Stage of SIT in an EIT environment.

- **Solution Testing** – which will validate interactions between systems forming part of the End-to-End Smart Metering System in the SIT environment.

- **Technical Readiness Testing for User Integration Testing** – this will happen during SIT and will provide assurance that the services can be deployed and provisioned as integrated services in the UIT environment and that operational policy and procedures have been developed to support the go-live operations.

49. As with PIT, DCC proposed to make use of TAG to assure the testing undertaken in SIT, with a similar governance process and timetable for decision making to that proposed for PIT.

Additional Testing and checkpoints

50. The plan includes additional testing beyond SIT, as part of the programme.

- **Pre-UIT testing** will be carried in UIT environment to de-risk the Device and User System Testing (DUST) to be carried out by Users.

- **Operational Performance Testing (OPT)** comprises non-functional and performance related testing as part of preparation towards operational readiness. This includes Resilience Testing, Business Continuity testing and System Capacity Testing. Non-functional testing will include performance engineering, volume testing, network worthiness testing. OPT will be undertaken throughout testing and is not a distinct phase.

- **Business Acceptance Testing** that will be carried out in the UIT environment to test the service management processes.

3.4.5. User Integration Testing Window

51. DCC will provide User Integration Testing services in respect of the new 4G service (Device and User System Testing) at its Manchester Test Labs where there will be sufficient space available for devices. DCC's Testing Approach is to complete all of the testing required to demonstrate readiness for live through earlier testing phases. Accordingly DCC proposes that there will be a window during which customers have the opportunity to validate their own readiness for new 4GCHs and service in UIT prior to DCC moving to the Initial Pallet Validation phase.

52. We do not propose there are any user-entry tests which must be passed by DCC Users, nor mandatory testing required in order for the UIT window to complete. The changes being delivered by the programme relate primarily to the Communications Hubs and their operation with the WAN, as opposed to GBCS changes and communications between the Communications Hub and the meter. DCC will be testing CHs to validate that it works as expected with other devices throughout PIT and SIT. The UIT window will therefore be a set window of opportunity for customers, running from 15 January 2023 to 15 March 2023 for SBCH testing and 1 April 2023 to 1 June 2023 for DBCH testing. The ability for Users to test in UIT will continue beyond this point, but importantly once this window has expired, DCC will move to the Initial Pallet Validation phase, subject to the criteria supporting commencement of that phase having been met (Live Services Criteria) and BEIS approval.

53. DCC will not be amending or adding new testing services as part of the programme. We will maintain the testing services as set out in the SEC (In Section H14 and the Enduring Testing Approach Document) which will continue to cover testing in this and other Network Evolution Programmes.

Question 2	Do you support DCC's testing approach for the CH&N programme. Are there steps missing or unnecessary activities? Please provide a rationale for your position

3.5. Readiness for Live

3.5.1. Initial Pallet Validation and Production Deployment

54. Following the defined UIT window, there will be an initial go-live governance process for both SB and DB plans. This will include validation and assurance of all testing undertaken, including any testing results from any participants of UIT, as well as confirmation of DCC's Operational Acceptance of change to the production platform. It will also include results of third-party, independent audits of DCC's testing.   This will take the form of **initial live services submissions to BEIS**, following approval of which there will be Communications Hub Certified Products Lists (CPL) entries, Device Manager update, DSP WAN gateway changes and WAN deployment into the production systems. DCC will develop these submissions – one each for SBCHs and DBCHs – during UIT with the expectation that we receive a decision from BEIS on 15 April 2023 for SB and 15 June 2023 for DB. We will request that the SEC Panel is asked to make a recommendation on readiness for this gate alongside DCC's submission to BEIS.

55. After this first go-live gate there will be a period of **Initial Pallet Validation (IPV)**. This is a newly introduced concept as part of this plan, as a lesson from Release 2 DBCH, which will see limited

CHs made available for installation pilots by energy suppliers on the production environment. The purpose of Initial Pallet Validation will be to allow customers to conduct their own live pilots of the new 4G CHs in readiness for mass manufacture. The entry gate for IPV will be a successfully validated programme deployment to live systems dependent upon the approval of the go-live submission described above. We propose that IPV window will commence in May 2023 and conclude in July 2023 for the SB plan and run from August 2023 to October 2023 for the Dual Band plan.

56. DCC will engage with customers to request their participation in IPV. Volumes of CHs provided will be limited as we expect to produce a small number of initial pallets of each type of 4G CH (Single or Dual Band). The quantity of devices ordered will be informed by customer confirmed CH requests at the relevant programme milestone, 'Initial Pallet CH Orders'. Customers will be engaged in advance through multiple forums including SMIP Governance (the Smart Metering Delivery Group (SMDG) and Implementation Managers' Forum (IMF) and the SEC Panel's Operations Group. DCC's Testing Services team will run regular engagement sessions with customers during IPV, implementing a lesson learned from Release 2 SB and DB CH transition, to manage reported issues during this phase. DCC will triage any operational challenges through its BAU Incident Management processes. We expect that all Larger Supplier Parties will take part in IPV and we would welcome views from respondents on this approach, and their likelihood to participate.

3.5.2.   Volume manufacture

57. The exit point for IPV will come after a defined window subject to DCC having demonstrated that it has met a set of criteria (Live Services Criteria and have passed Operational Acceptance thresholds. We propose this takes the form of two, **final live-services submissions to BEIS** (one each for SB and DB). Passing this governance step will enable the manufacture of CHs at volume, ready for supply for customers and will represent the point when new CH orders placed will be met with 4G CHs where coverage exists to support them. We have planned these go-live dates for 15 April 2023 and 1 July 2023 respectively.

58. These gates will be informed by DCC readiness and is a critical point in the programme that will inform whether to start CH production at volume. At these points we also expect a level of industry readiness, in terms of operational processes in place to manage new stock.

59. DCC's view is that this should be a one-way decision gate, and that following approval DCC would not seek to revert back to early CH manufacture or stop new 4GCH manufacture. DCC would seek to 'fix forward' from this point. We consider that our overall approach to testing mitigates risk associated with this approach and describe this further in Section 7. We are investigating whether we can further mitigate risk, and we have requested that prospective Service Providers include in their bids the capability to 'flash' CHs after manufacture in the unlikely event firmware changes later on in the manufacturing process. We have built the plan on the assumption that this will not be included but will review cost-effectiveness during the commercial process.

60. It is DCC's view that the fix-forward principle should apply up to and beyond the installation of new CHs. As long as CHs provided to energy suppliers are capable of being installed and able to receive over-the-air Firmware upgrades, standard CH obligations and charges in the SEC should apply.

61. As with previous significant go-live milestones delivered as part of the Smart Metering Implementation Programme, we expect that BEIS will require robust and assured evidence to inform its decision. We therefore propose that the SEC Panel is asked to make a recommendation on readiness for mass manufacture alongside DCC's submission to BEIS. DCC will work with BEIS, the Panel and stakeholders generally to develop the final set of criteria that it will provide on DCC's readiness. We would expect this to include the following evidence:

- Testing results with a threshold of no High Severity (P1 or P2) Production Incidents attributed to 4G CHs (and lower Severity issues below agreed thresholds);
- Where undertaken, results provided from customers' participation in IPV, including DCC Early Life Service (ELS) report success against pre agreed criteria against device performance, Install and Commission Times, and Prepay Vend Times; and
- Supply Chain readiness;

Question 3	Do you support DCC's proposals for go-live using two milestones in readiness for Initial Pallet Validation and Mass Manufacture? Please provide a rationale for your response.

Question 4	Do you support DCC's proposals for non-mandated IPV, including that there are no obligations on DCC Users to undertake this activity? If not, please explain why.

3.6. Device Transition

62. DCC considers there is an industry imperative to transition to the new 4G CHs efficiently and in good time while maintaining a smooth and continuous rollout. The plans for transition should ensure that both of these aims are met. Successfully achieving this will best support the Smart Metering Benefits Case and Energy Consumers. There are a number of key considerations affecting this transition, including:

- How to ensure the roll-out is not slowed or impeded by the transition to new CHs;
- How to avoid the risk of surplus 3G CHs;
- How to ensure the transition avoids complexity and is as seamless as possible for installers;
- Whether to require end-dates for the supply and installation of current CH models,
- Whether (and if so how) parties should be obligated to support this process.

63. Alongside these there will be milestones which will impact CH installation and management. These include:

- The volume manufacturing decision (described in section 3.5.2 above);
- The volume supply of 4G CHs only;
- A first point at which 4G CHs can be ordered; and

- A point from which only 4G CHs can be installed.

64. These decisions require input from across industry and especially energy suppliers and installers and DCC proposes to engage with these and other key stakeholders, to develop guidelines, objectives and critical milestones which would form a new **CH Transition Roadmap**. The CH Transition Roadmap would provide key stakeholders clarity on how the industry would collectively manage the transition.

65. The CH Transition Roadmap will be an important document as it offers opportunities to increase the overall benefits of the programme (e.g. through a faster transition, with quicker ramp down of 2G assets), but which would introduce corresponding risks that will need to be managed.

The CH Transition Roadmap – initial view

66. We expect the following key activities to be included in the roadmap:

START: Current forecasting and ordering – Customers forecast and order 3G CHs to meet rollout objectives

- **Early Engagement.** DCC engages with key stakeholders to establish guidelines, objectives and critical milestones which form transition roadmap

- **4G Product Developed.** 4G CH product developed and passes all agreed PIT and SIT criteria.

- **Test CH Engagement.** During product development DCC engages with customers to confirm Test CH volume required by testing participants (.

- **Stock and Installation Engagement.** Based on agreed criteria and objectives, DCC engages with DCC Customers to manage 3G stock levels in relation to installation rates, and on installation practices (e.g. any new training). Primary objective to ensure required stock available for industry; maximising 4G CH installs numbers whilst maintaining rollout pace.

- **Product development complete, test units delivered.** Product passes DCC testing and is approved for customer testing in UIT.

- **Initial Pallet Validation (IPV) Engagement.** Programme engages with DCC Customers to confirm CH volumes required for IPV activity

- **IPV manufacture.** DCC instructs manufacture of agreed initial pallet volume.

- **Customers commence UIT testing.** DCC Customers test 4G CHs, with their chosen smart metering devices and own processes. DCC triage all defects detected and issue required resolutions. Close collaboration with DCC Customers and Device Manufacturers.

- **UIT Window Elapsed, IPV live service submission.** Once criteria met DCC make their first live service submission to BEIS.

- **Mass Manufacture Engagement.** DCC engages with DCC Customers to forecast CH volumes required for Mass Manufacture

- **IPV installations commence.** Installations with delivered IPV CHs begin. DCC monitor the operational metrics for the CHs, engage closely with customers to triage any issues discovered and develop required resolutions.

- **IPV Complete, second live service submission and mass manufacture.** Once pre-agreed acceptance criteria for IPV met DCC make final live service submission to BEIS. Upon approval DCC instructs mass manufacture and begin delivering based on industry forecasts and orders.

- **Final Industry 3G Engagement.** Mass Manufacture of 4G CHs signifies the end of final engagement with industry before 3G mass manufacturing lines end. Final stock allows DCC Customers to manage remaining commitments or objectives (e.g. for testing), but 3G supply after the mass manufacturing milestone would be limited to criteria to be defined.

END: Future forecasting and ordering – Customers forecast and order 4G CHs to meet rollout objectives

67. As well as setting out these transitional steps, guidelines for CH installation will also need to be considered for different scenarios for existing CHs which have failed or need to be replaced. We expect the CH Transition Roadmap will also set out:

- How failed devices will be replaced, with an expected date from when only 4G CH replacements can be made;

- How end-of-life replacements will be managed; and

- How SMETS1 CHs and Meters will be managed at end-of-life and if they are managed differently.

68. Guidelines over SMETS1 CH and meter replacement will need to be driven by commercial factors for each cohort of meters supported under the SMETS1 Service.

69. We also propose to set out how arrangements for 3G Device testing can be managed, considering for example how many Instrumented Test CH will be required by customers, and whether there is a point after which these should no longer be available.

Question 5	Do you consider DCC's assessment of the issues for transition to 4G CHs to be complete? Please provide a rationale for your response.
Question 6	Do you support DCC's approach for managing industry's transition to 4G CHs? Are there steps in the roadmap that are unnecessary or others that have not been included?

3.7. Security Testing and Assurance

70. A Security Test and Assurance Programme will ensure that appropriate and sufficient testing has taken place to demonstrate that the CH&N solution and associated integrations have been designed, developed and implemented securely, with the intent of building confidence in the security of the solution as DCC moves towards go-live.

71. The programme will cover security testing across the development and implementation life cycle and operate across those environments that support test coverage. Activities for test phases will include:

- Code review and Unit / Module testing. These are development activities and so conducted within the development environment;

- PIT System testing; conducted in the system test environment;

- SIT – Infrastructure and Boundary Penetration testing activities;

- UIT - Application, Infrastructure and Boundary Penetration testing activities;

- Misuse Testing, Base Operating System Testing, Application, Infrastructure and Boundary Penetration Testing activities are performed in the Target implementation environment (Prod/UIT); and

- Penetration testing, which will be conducted during development, testing and prior to live operation, and augmented with an independent audit.

72.   All penetration testing will be carried out by a CHECK accredited provider who will provide a plan for scoping, delivery and reporting to be included within the main programme plan. CIO assurance of CH&N will be required at each of the key Design, Build and Test phases to ensure appropriate assurance of the solution.

73.   The SEC Panel's Security Sub-committee and the SMKI Policy Management Authority will be regularly updated throughout the life of the project, and will be asked to consider the scope of the CIO assurance activities and any deliverables that are produced, as well as any other key DCC security relevant documents.

74.   DCC will submit all new CHs for CPA certification by the National Cyber-Security Centre and have included submission dates in the delivery pans.

3.8. Regulatory Change

75.   At a fundamental level, the CH&N Programme introduces change the CHs and the WAN provided by DCC. In and of itself, this would not lead to significant regulatory change in the SEC, but there are a range of changes required to regulation to support the programme overall, and these will need to be included in the plan. These include:

- Transitional testing arrangements, as set out in the SVTAD;

- Possible amendments to support the IPV activity;

- Possible amendments to support delivery of the CH Transition Roadmap;

- Any amended requirements relating to CH ordering, forecasting and maintenance;

- Possible changes to Service and Incident Management arrangements to reflect contracts with 4G Service Providers; and

- Lower level operational and process changes to ensure alignment between service provider contracts and the SEC, including changes to reflect updates to the SM WAN Coverage Database.

76.   The programme offers opportunities to make improvements in service to DCC Users, and we are engaging with stakeholders to identify these. These include improvements to Power Outage and Power Restore Alert processing times.

77.   As with previous programmes implemented by DCC through Direction from Government, we expect that BEIS will use its Secretary of State powers to direct changes to the SEC, and DCC will manage consultations on these changes in the same way we have done for the SMETS1 Programme.

78.	As part of our change delivery process, DCC assesses and plans for regulatory change throughout programme lifecycles. We expect to have a good understanding of the scope of regulatory change at the point of contract award and have added a milestone to the programme plan as a point by which this scope will be confirmed. We will use this scope to inform our more detailed regulatory delivery plans for the programme.

3.9. Lessons learned

79.	DCC has delivered several large change programmes for Government, and on behalf of the energy sector. We seek always to apply lessons learned from this experience into our work moving forward. We have included in this section how we are factoring these into our plan for CH&N delivery.

Testing execution

- All DCC testing should be executed against real devices. Testing with emulators should not be the first option when setting out stall and agreeing contracts with suppliers. Emulators have proven **not** to be reflective enough of real-world conditions

- All suppliers in the Communications Hubs delivery chain must utilise real devices in their test phases

- A good mix of devices and chipsets from different manufacturers should be incorporated in all test phases. This will help identify design conflicts or ambiguities in the implementation of chipset interoperability.

- Test assets from industry should be confirmed in the defined test approach documentation before commitment of programme delivery plans to avoid quality issues and delays. It is not possible to test every combination and a representative sample of Communications Hubs to meter combinations should be assessed from production installations.

- More comprehensive PIT using test-scripts and scenarios that reflect those that Users will exercise in UIT and the production environment.

- Performance and stress testing of the Communications Hubs is very important to confirm network unresponsiveness due to deafness issues. This should be seen as different to soak testing and should be completed by the Communications Hub Manufacturer prior to PIT entry. DCC must also revalidate this activity throughout its testing in the integrated environment, SIT.

- Instrumented Test CHs (ITCHs) should be made available as soon as possible and their provision should feature in the plan.

Testing Governance

- To ensure stakeholders have assessed, understand and support our approach to the whole testing process, we will seek TAG's involvement in PIT and all subsequent testing stages.

- We will also involve TAG in the development of our test approach documentation.

- Testing Governance requires time and in previous programmes it has been necessary to ask TAG and others to operate to compressed timetables. We will include sufficient windows for testing governance in this plan.

Plan management

- Where delays occur, the programme delivery plan will need to consider the impact of ongoing maintenance and specification updates that may now need integrating with the delivery plan as this may add further risk and delay. It may be suitable to stall ongoing feature change until stability is achieved in the programme delivery.

Firmware management

- Turnaround time of fix firmware was time-consuming and challenging in the Release 2.0 Single Band and Dual Band Communications Hub supply chain. This was further compounded as fixes had to come from lower layers of the supplier chain than the Communications Hub provider. DCC should work with future Vendors for an improved agility in the provision of fix releases.

Interoperability

- In order to mitigate unknown interoperability issues in production, CH validation should take place against as many real available meters as possible and early in testing.
- Customers must be engaged early and taken on the journey, rather than engaging just before UIT opens. This is to ensure a streamlined entry into user testing through early adoption and adaptations of customer test assets/environments. Additionally, this provides an early feedback mechanism from customers to DCC.

Question 7	We would welcome comments on DCC's lessons learned. Are there any we have not listed, or lessons in the list which should be discounted?

3.10. Contingency

80. The prompt delivery of this plan supports the Smart Metering Benefits Case and something that DCC considers is in all parties' interests. As described in the section 3.1 on our approach to delivery, we have developed a balanced delivery plan with control points and opportunities (presented for comment in Section 6). If this balanced plan is approved, we will not build specific windows of contingency into this plan and would instead **request that BEIS holds an allocation of 2 months contingency that we could apply for if needed through the Joint Industry Plan change control**.

81.   If we adopt all the opportunities presented alongside this plan (in Section 6.2) we would request an allocation of 6 months contingency. We propose that any contingency allocation starts from the point at which Letters of Intent are signed when we will have preferred bidders and more detail of their design and delivery plans.

Question 8	Do you support DCC's approach to managing contingency for CH&N delivery? Please explain why.

4.   Plan interactions with other DCC and industry change

82.   The delivery of the CH&N Programme will take place during a period of significant change in the energy sector. In this section we assess the key changes in which DCC is involved and set out how we propose to manage contention across this portfolio of change.

4.1.   Smart Energy Code Releases

83.   The SEC releases that will take place during the life of the programme are already timetabled. Whilst the content of each is not finalised, we can anticipate probable change and use this to develop our approach to manage contention. It will be important that testing requirements for DCC Users are understood for SEC releases and that impacts on the testing in the CH&N plan (and vice versa) are understood.

84.   DCC will be baselining its CHs on version 3.2 of GBCS and where GBCS change is introduced during the lifetime of the programme DCC will need to factor this uplift into its testing.

4.1.1.   February 2022

85.   It is highly likely that the February 2022 Release will be a document only SEC release, and DCC is not planning for any system changes, associated testing, or go-live governance for system readiness.

4.1.2.   June 2022

86.   We expect the testing for the June 2022 SEC Release will have been completed by end of May 2022. The CH&N Programme is planned to start testing in DCC's SIT B environment in June 2022, and therefore we do not anticipate any contention between the June 2022 release and CH&N testing

4.1.3.   November 2022

87.   The November 2022 SEC Release and the CH&N programme will be testing in the SIT B environment together. In order to de-risk integration testing, the CH&N programme is introducing its EIT environment and conducting CIT and Pre-SIT testing before deploying changes into the SIT B environment. The CH&N programme is also starting testing in the SIT B environment before the commencement of November 2022 release. Our assumption is that the functionally of the two releases can co-exist as there would be no functional cross over between them, and we have factored this into our plan. If there was functional crossover, this could result in a delay for 4G SBCH SIT for a few weeks.

88.   DCC will carefully monitor scope of the November 2022 release as it takes shape and add, remove and/or manage risks as they arise. We have assumed for the purposes of the plan that there will be no GBCS changes introduced as part of this release which might require regression testing.

4.1.4.   February 2023

89.   As with February 2022 it is highly likely that the February 2023 Release will be a document only SEC release, and DCC is not planning for any system changes, associated testing, or go-live governance for system readiness.

4.1.5. June 2023

90. Whilst the scope of change for June 2023 is unknown, DCC will monitor approved SEC modifications scheduled for this release and add, remove and/or manage risks as they arise. As with the November 2022 release, we have assumed for the purposes of the plan that there will be no GBCS changes introduced as part of this release which might require regression testing. There is a risk that the June 23 SEC Release could be entering SIT testing during 4G DBCH SIT. Our assumption is that functionally they can co-exist as there would be no functional cross over. If there was functional crossover, this could result in a need to delay the June 23 SEC Release for a few weeks. If this risk arises we will engage early with the SEC Panel to ensure it is clearly understood and will seek their views on the most appropriate course of action to ensure both changes are delivered in a way that best meets SEC Parties' needs.

91. Based on our current plans, the June 2023 Sec Release and the 4G DBCH plan could be entering DCC's UIT B environment on the same day and completing Pre-UTS Device and User System Testing in parallel. It will be necessary for testing participants to consider this impact against their test plans and resources. We also expect the go-live dates for both the June 2023 release and the deployment of new code to support DBCHs to be very close. Possibly within a week of each other. It is DCC's view that this does not allow a sufficient period of stability between deployments to manage early life activities and will therefore engage with the SEC Panel to consider the most appropriate way to manage this conflict.

4.2. Faster Switching Programme

92. DCC plays an integral part in Ofgem's Faster Switching Programme, to design, build and test a central service that will deliver faster and more reliable switching and will go-live in the summer of 2022. Switching testing will be complete ahead of any User testing for the CH&N plan. In the event that Switching Testing timelines are extended, there is a buffer of Pre-Integration Activity for CH&N that can happen concurrently with any remaining Switching Testing. As such we consider the risks of contention between the programmes to be low.

93. To further minimise risks, as we move towards live service provision for Switching, DCC has initiated a 'transition to live service' programme which ensures the readiness of all functions across DCC to support in-life switching and the Retail Energy Code (REC), from Q1 2022 to 2025 and beyond. This includes a REC/SEC coordination project which will assess all new REC obligations against DCC's obligations in the SEC, to ensure that any contention is identified, and a management plan is in place to remove or mitigate risks. The project will assess all extant and planned change to the SEC, and we will factor in any SEC changes that are required as part of CH&N delivery to ensure there are no impacts on the Switching Programme and vice versa.

4.3. Market-Wide Half-Hourly Settlement

94. As well as the Faster Switching Programme Ofgem is currently overseeing a transition to market-wide half-hourly settlement (MHHS) for all energy consumers. This programme will require significant change across industry and will impact DCC. The Ofgem decision on implementation of MHHS is anticipated in Spring 2021, at which point DCC will have increased clarity on its expected obligations and requirements. Currently we estimate the following milestones for the programme:

- Design & Build Feb 2022 – Apr 2023.

- Systems Integration Testing Feb 2023 – Apr 2023.

- User Interface Testing May 2023 – Jul 2023.

- System Go-live Aug 2023.

95. System integration planning has started for MHHS, however it is at an early stage and a final assessment on the processes and activities that comprise it has not yet been completed. This will become clearer following release of the Ofgem decision to implement MHHS and subsequent impact assessments undertaken by impacted Service Providers. This is scheduled for May-July 2021. UIT resources for MHHS will likely focus on the new 'Meter Data Retrieval' users, which is separate to existing Supplier roles and will only have access to a very limited set of Service Requests.

96. It is anticipated that large volumes of half-hourly data will not be required until the migration of Energy Suppliers to the new MHHS processes from mid-2025 onwards.

4.4. Transition of SMETS1 activities into Business-As-Usual

97. The SMETS1 Programme **is completing its transition to Business as Usual for SMETS1 Services. and we expect to conclude this activity by the end of 2021.** In addition to uplifts to our Final Operating Capability, work will continue in relation to Device Model Combination Testing and Migration Device and User System Testing.

98. DCC is planning a range of activity that will enable the transition to BAU operations for SMETS1 Services. These include concluding our approach to the migration of devices with Trilliant as the SMSO, and projects to introduce service enhancements and maximise migrations.

4.5. ECoS

99. DCC has commenced a programme of work to replace the existing Transitional Change of Supplier (TCoS) arrangements with a more robust set of enduring arrangements – the Enduring Change of Supplier (ECoS) arrangements. This work is underpinned by a plan that was approved by BEIS on 30 March 2020, under Condition 13A of the DCC Licence.

100. The ECoS programme will define and implement the enduring arrangements for the changing of security credentials on SMETS devices. Enabling energy customers to change supplier securely and easily is one of the fundamental purposes of the smart metering rollout and is underpinned by DCC's change of supplier process.

101. The ECoS Programme is due for completion in April 2023. It is split into 3 distinct phases:

- Procurement Phase: January 2020 – May 2021

- Design, Build and Test: February 2021 – June 2022

- TCoS – ECoS Migration: July 2022 – April 2023.

There will then be a managed transition of the live service into operations from May 2023.

102. Testing for ECoS is scheduled to complete ahead of testing for the CH&N Programme, and we do not expect there to be any contention for testing resource and environment space between ECoS and CH&N.

4.6. The broader Network Evolution Programme

103. DCC's Network Evolution Programme extends beyond the CH&N programme, and DCC will need to ensure each sub-programme is managed efficiently and without contention as part of DCC's overall portfolio.

4.6.1. Trusted Service Provider Programme

104. DCC is currently in the process of ensuring continued provision of Trusted Service Provider (TSP) services for the Public Key Infrastructure (PKI) that underpins the smart metering security model. TSP service continuity it critical and DCC is currently procuring the service beyond its contracted expiry in April 2022. We expect minimal impact on users of the TSP service with only minor changes to the supporting technology. User Integration Testing is planned from November 2021 to January 2022.

105. Based on this plan we expect no contention between the TSP and CH&N element of the broader Network Evolution Programme.

4.6.2. Test Automation Framework

106. DCC is currently implementing changes to its approach to testing to enable greater automation. The Test Automation Framework (TAF) is a platform agnostic tool which has the ability to be used 24/7 across multiple environments executing tests concurrently in multiple meter sets, whilst capturing device information and logs using robotics.

107. Use of this tool will result in enhanced testing throughput, increased scope and coverage and reduction in cost of testing DCC Motorway related changes. We expect to have a Strategic Business Case for the framework in May 2021, which will propose a direction for future service provision, with an Outline Business Case complete in 2022.

108. Testing in the CH&N Programme is based on as-is testing and does not factor in any impacts of the Testing Automation Framework. We would expect that the implementation of the framework would only provide opportunities for this CH&N programme, and no risks.

4.6.3. Data Service Provision

109. DCC's Network Evolution DSP Programme forms the core of the overall Network Evolution Programme and will deliver the enduring data services provision beyond the current contractual arrangements with DCC's incumbent DSP. Currently contracts have the ability to be extended beyond expiry for a further 3 years, and DCC is currently working with the DSP to consider whether or not to make use of this. Our assumption for the purposes of this plan is that these contracts will be extended, and we have included this in the plan.

110. The NE DSP programme focuses on the enduring services beyond this extension period and will be subject to a separate plan directed under Licence Condition LC13B, and DCC will be consulting on this in the coming weeks. We will set out the proposed NE DSP programme activities that will be taking place during the delivery of the CH&N programme in this plan and consider risks and opportunities as part of this NE DSP consultation.

4.7. Summary

111. There is a great deal of industry change being undertaken over the duration of the CH&N plan and it is important that all dependencies and contentions are identified and managed. This role is performed by DCC's Portfolio management function. Our analysis indicates that there is overlap between other activities and the CH&N Programme, and we consider this an unavoidable reality in the context of a sector undergoing significant change as part of government driven activity towards Net Zero ambitions for 2050.

112. DCC will use its experience of multiple programme delivery to coordinate this portfolio and ensure solutions are in place to manage the concurrent activity that we anticipate now, and any overlap that arises from changes to this or other programme timelines. We will also ensure we engage extensively with stakeholders to update on delivery within DCC's control and take views on how to manage any external change which may impact the programme delivery. DCC shares its portfolio view of testing environments with TAG on a monthly basis and will continue to do so, incorporating testing planned as part of this programme.

113. The areas of concurrent activity in the plan we are actively managing are as follows:

- November 2022 SEC Release Testing;
- June 2023 SEC Release Testing and go-live; and
- MHHS testing in H1 2023

114. Those which pose most risk are:

- Urgent SEC change/late changes to SEC Release scope; and
- Unavoidable planned scope of November 2022 and/or June 2023 which impacts CH&N testing.

Question 9	**Do you agree with our assessment of external change which could impact or be impacted by CH&N delivery? Is there change that we have not considered?**

5. Dependencies and assumptions

115. In this section we set out the external dependencies and assumptions – i.e. those over which DCC does not have direct control – that underpin the plan. The tables below capture these.

5.1. Dependencies

Ref	Title	Who	Date/Duration	Description
D1	**DEPENDENCY** - Secretary of State confirms no objection to CH&N procurement	Secretary of State (BEIS)	Within 4 weeks of DCC submission (in line with plan) and ahead of Contract Award.	DCC's Licence requires that DCC submits its proposals for CH&N procurement to the Secretary of State and the procurement can only proceed where they do not object. We will do this through the submission of the CH&N Business Cases to BEIS ahead of contract award.
D2	**DEPENDENCY** – Zigbee certification in Nov 2022 (SB) and Dec 2022 (DB)	Zigbee Alliance	Within 4 weeks of completion of SIT.	We require Zigbee certification for Communications Hubs to be provided by the Zigbee Alliance ahead of CPA certification.
D3	**DEPENDENCY** – CPA Certification in Nov 2022 (SB) and Dec 2022 (DB)	National Cyber Security Centre	Within 4 weeks in advance of UIT start.	We require CPA certification from NCSC to be able to make Communications Hubs available for use in the production environment.
D4	**DEPENDENCY** – Meter configuration details provided to support testing	Energy Suppliers	4 weeks ahead of PIT exit.	We are dependent on receiving live-like configuration details from customers on their devices to enable us to test as planned in PIT, SIT and UIT
D5	**DEPENDENCY** – Meter Manufacturer support for meter testing	Meter Manufacturers	During testing.	In order to test with real devices in PIT and SIT we require support from meter manufacturers so any technical testing issues we encounter that stop or delay testing are minimised.

5.2. Assumptions

Ref	Title	Description
A1	**ASSUMPTION** – Design commences prior to final contract award	Our current procurement approach aims to sign letters of intent with preferred bidders ahead of final contract award, to enable lower level design work to commence, provided that the commercial position in the procurement activity is sufficiently acceptable.
A2	**ASSUMPTION** - WAN only Hardware changes to CH	That hardware changes to the CH only relate to the WAN, and not the HAN, and that hardware will be at a second iteration (Beta) ahead of PIT start.
A3	**ASSUMPTION** – WAN modules on CH are proven	We will only select a CH which has a WAN module which is approved by the CSP and proven in the marketplace.
A4	**ASSUMPTION** – Testing Governance provides certainty within allotted window	The involvement of TAG and/or their representatives in Testing Completion Decision adds additional contributors to testing decision points. We assume that the governance windows allow for a clear decision to be made with no impasse.
A5	**ASSUMPTION** - Use of ECoS Certificates on CH&N CHs	The plan assumes that the delivery of the ECoS programme will conclude as planned and that all SB and DB 4G CHs will use new ECoS certificates and not have to rely on TCoS certificates.
A6	**ASSUMPTION** – no user testing required for the programme.	We will not require DCC Users to undertake obligated testing during User Integration Testing or ahead of 4G CHs being made available.
A7	**ASSUMPTION** – no significant GBCS or CHTS changes	The plan assumes that there are no newly identified, significant changes to GBCS or the CHTS during the delivery of the plan. DCC will baseline its technical design of the CH on GBCS version 3.2
A8	**ASSUMPTION** – There will not be a 4G mesh variant	We expect that 4G coverage will provide for installations that currently require a 2G mesh variant and have not planned for a mesh variant in either of the Lots under the programme.
A9	**ASSUMPTION** – Post manufacture flashing available	We have requested vendors to include the capability for post manufacture firmware flashing in their bids and that this will be available as part of the toolset to manage risk around volume manufacture.

Question 10	**Do you agree with our assumptions for CH&N delivery? Are there any which have not been included but should have been?**
Question 11	**Do you agree with our assessment of dependencies for CH&N delivery? Are there any which have not been included but should have been?**

6. Risks and Opportunities

116. In this section we set out the risks and opportunities which could impact or be impacted by the plan. We have presented this in two sections. The first considers external risks and external opportunities. The second focusses specifically on the opportunities to deliver our plans more quickly, as well as the inherent threats to programme delivery where the programme exercises significant control. Views from respondents on both of these will be integral to DCC's finalisation of the CH&N plans.

6.1. External Risks and opportunities

6.1.1. External Risks

117. There are a number of risks associated with the delivery of the programme according to the plan. The table below sets these out along with their impact, and DCC's management of them.

| Ref	Description	Impact	Mgt Strategy
R1	**Dependencies are delayed;** There are a number of external dependencies in the plan where DCC does not have contractual levers to drive activity in accordance with the plan.	Any delay in meeting these dependencies will have an impact on the plan and subsequent milestones with will delay delivery	DCC will engage with all external parties we are dependent on to ensure that dependencies are understood, quality criteria are set and met by DCC, and that risks to dates are identified early.
R2	The conclusion of the commercial process and finalisation of hardware identifies that **new Chipsets from 4G WAN and Zigbee are required** for new CHs	New chipsets will not be proven which could mean increased testing is needed and/or more time is required to resolve testing issues.	DCC has requested that bidders build into their bids that there will be no Zigbee chip or design changes and that the 4G WAN chip selected is proven in market with UK operators. If new Zigbee Chip is used it should be proven in market, DCC will assess design status at the control points in the plan propose revisions if needed.
R3	**Lack of customer testing in UIT and IPV** fails to identify issues outside of DCC's testing scope. This may impact individual customer's transition plans.	Whilst DCC will test against a broad set of meters and a scope that is agreed with industry through TAG, it will not be exhaustive. Issues may be identified by individual users which could impact their transition to new devices.	The CH&N Programme will work with customers during UIT and IPV to ensure as broad a set of devices are tested as possible.
R4	**Urgent SEC MOD releases** or unplanned additional change are required to be implemented at short notice (especially for changes to Communications Hubs)	Additional scope will likely impact that planned delivery timelines possibly requiring previously completed steps to be executed again. This could prove the timeline to completion unachievable.	DCC to review the forward schedule of change plan in the portfolio and impact assess accordingly.

R5	**Contentions with other programmes** outside of DCC's direct control may impact CH&N delivery	Resource and environment contention could be caused by changes to scope or timings of externally governed programmes (e.g. MHHS or SEC releases) which could impact the project timeline and/or costs.	DCC to impact assess scope and delivery plans of other programmes within and outside its portfolio on an ongoing basis
R6	**Additional test governance** steps could introduce delays if disagreements/disputes are not concluded in a timely manner	Planned project timeline could prove undeliverable.	DCC will continue to work with TAG to develop and agree the scope / coverage of testing upfront to reduce the risk of misalignment.
R7	**Design, Build & Test timelines are based on** previous programme lessons and **commercial activity to date. They are not based on finalised contracts**	The conclusion of commercial activity could identify the need for changes to the delivery timetable for the plan.	DCC will evaluate this risk continuously as the commercial process concludes, managing any change through agreed governance routes.
R8	**Test Devices Released too late from Device Manufacturers**	This will delay the Testing undertaken in PIT and SIT as planned, and will impact associated timelines	The CH&N Programme will work with energy suppliers and contract with Device Manufacturers to ensure delivery within the required timescales
R9	**June 23 go-live**	The go-live date for both the June 2023 release and the deployment of new code to support DBCHs could be close. This may not allow a sufficient period of stability between deployments to manage early life activities.	DCC will engage with the SEC Panel to consider the most appropriate way to manage this possible conflict
R10	**Test phase duration does not meet the requirements for the depth and breadth of testing agreed with testing governance.**	The plan includes test phases with durations set ahead of stakeholder approval of our detailed test plans (including depth and breadth). If there is a requirement for additional testing this may impact test phase duration.	Early engagement with TAG, to define the key parameters that will drive the time-lines.

6.1.2. External Opportunities

Ref	Description	Impact	Mgt Strategy
EO1	Improve known issues in line with Programme scope	Operating Processes (e.g Service Desk; Incident, Problem, and Release Management) within the scope of the programme will be procured on the basis of alignment with existing processes and SLAs in the SEC; but there may be scope use the procurement to resolve know issues.	DCC will perform Business Acceptance Test with new vendors to ensure alignment with existing processes and if opportunities are identified these will be shared with customers during programme delivery.
EO2	Test Automation Framework	Testing for the CH&N plan is assumed against an as-is testing framework. DCC's Test Automation Framework may provide opportunities for shortened test cycles and phases.	DCC will assess Testing Automation Framework programme delivery plan and monitor whether there is scope to utilise the automation provision in the programme.
EO3	POA improvements	DCC will not be seeking to improve Power Outage and Power Restore Alert message times as part of the programme, but there may be opportunities to drive improvements in this area through programme procurement.	DCC will ensure its DNO Transformation Programme and the CH&N Programme share insight and that opportunities are presented to stakeholders for consideration.

Question 12	Do you agree with our assessment of risks for CH&N delivery? Are there any which are not included but should have been?
Question 13	Do you agree with our assessment of opportunities for CH&N delivery? Are there any which are not included but should have been?

6.2. Programme opportunities and threats
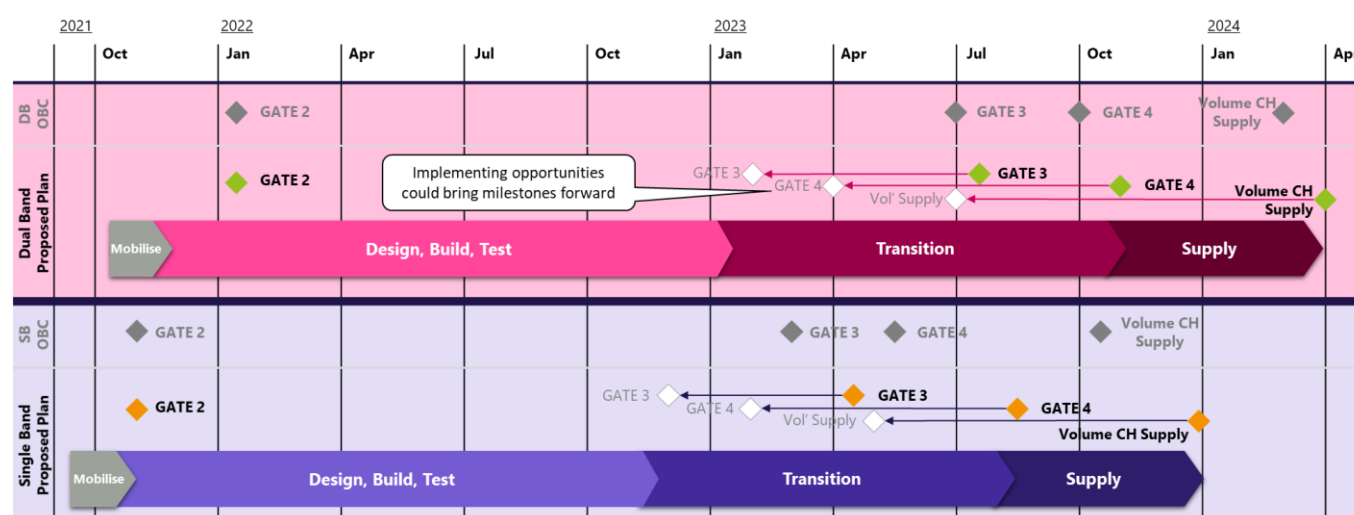
118. The table below sets out the opportunities that DCC could incorporate into the delivery plan which could allow it to be delivered more quickly, including and <u>indicative</u> amount of time that could be saved. In some cases, the opportunities are based on assumptions which may or may not arise, in other cases the opportunities are structural, and based on the duration and/or overlap of programme activity.

Ref	Opportunity and description
O1	**PIT governance can be managed by sub-phase (Unit/Link/System/ Interface) with customer review in parallel during later PIT section tests execution – 2 WEEKS**
	The updated PIT approach for the CH&N programme will require vendors to prove the quality delivery of requirements through Unit, Link, System, and Interface testing in PIT. Each vendor will need to progress through PIT to demonstrate evidence of successful completion against their approved PIT test plans. The opportunity here is to pass individual or smaller groups of vendors through PIT governance as they are ready, as opposed to waiting for vendors to present all at the same time for review. This would benefit the review process by staging the relative effort required but risks that test sections may require retesting from any issues identified in later stages.
O2	**SIT can plan for fewer testing cycles (2 cycles and 1 End-of-Cycle (EoC) vs. 3 cycles and 2 EoC) due to the changes made in PIT which will identify and fix errors earlier – 6 WEEKS**
	As a result of the increased focus in the PIT, there could be a relative improvement in the length of the SIT phase. DCC has planned realistically, so we are not over reliant on instant PIT improvements with a limited 3 test cycles with 2 EoC runs in SIT. However, this could be reduced to 2 cycles and 1 EoC. The SIT phase would be at risk of extension should this be unrealistic. DCC's preference if for a cautious planning approach at this stage, however, if the PIT benefits are better than estimated then SIT could be expedited.
O3	**Pre-UIT test readiness for UIT can assume only a CH and no impact whatsoever to business process – 2 WEEKS**
	Once the detailed designs have completed, we will know the full scope and impact of the CH&N changes on the smart metering systems. This could prove as simple a case as a new CH being introduced with no business process changes and were this to be the case, we shorten our Pre-UIT readiness. However, at this early stage we note that there is design work required to the DSP WAN gateway, Device Management, and Logistics updates must remain in consideration. These would need to be run through Pre-UIT checks ahead of BAT and Customer DUST phases.
O4	**DCC BAT can be run in parallel to customers' DUST testing in UIT window since there is no change to business process of CH feature – 4 WEEKS**
	As with the opportunity for shortened Pre-UIT, if we conclude that the impact to the smart metering systems is not material, customers could agree that Business Acceptance Testing (BAT) undertaken by DCC could be executed in parallel to customers' DUST testing phase in UIT. The risk of this approach is that issues are discovered in UIT that require fixes prior to the BAT activity being able to complete, and this may require DCC to extend or re-do part of BAT and this could in turn delay go-live.

O5	**Production Pilots can start as soon as live deployment completes without any settle period / checks for early life support from production deployment – 4 WEEKS**
	After production deployments the DCC operations team invoke a period of caution where the smart metering production systems are monitored against adverse impact of change. This period is called Early Life Support (ELS). Normally this is planned as 2 weeks when deploying change to the existing core systems. Currently the CH&N plans allow for 4 weeks since a new core WAN is being introduced and the competitive ITT could introduce new vendors to production systems. This time can be reduced or completely removed as a precursor to the IPV phase starting. Customers risk installing or swapping out 4G CHs should the production deployment be identified later as faulty.
O6	**Live services criteria creation for a volume manufacturing decision could start in parallel to IPV – 2 WEEKS**
	All governance periods in the plan are scheduled for 4 weeks, which we consider prudent based on evidence of delivery to date. This includes for Live Services Criteria. There is opportunity in the IPV phase to start governance of the volume manufacturing decision ahead of the IPV window closing. This will expedite the decision making for Volume Manufacturing.
O7	**Volume manufacturing lead times could be planned as 3 months depending on the capability of the winning vendor – 8 WEEKS**
	The plan can assume that a winning vendor will expedite initial CH volume supply in the early months. Should this not prove possible customers shall still receive existing 2/3G CHs until supply of 4G CHs is possible. This opportunity will be dependent on the outcome of the commercial process.

Question 14	**DCC would welcome respondents' views on the opportunities described above and whether or not DCC should incorporate these into the plan.**

119. For completeness, we also set out the inherent threats to the plans which may cause them to be delayed if they arise, along with indicative timings, recognising that these could vary between SB and DB delivery given the differing technical complexity of the two solutions.

Ref	Threat and description
T1	**Design of hardware integration of 4G modem is longer than planned and prevents PIT starting on time – 4 WEEKS**
	As we complete the low-level designs and associated hardware applications, we may discover unknown issues to integrate the 4G modem. This would extend the time to final hardware signoff and delay the execution of the PIT phase.
T2	**PIT may keep finding defects. Not allowing enough time for PIT or pushing through to SIT without enough testing or fault resolution will increase errors found in SIT – 4-8 WEEKS**
	The changes in the test approach deliberately make it harder for vendors to exit the PIT phase since there are more tasks to complete to meet quality criteria. Many of these defects would have been previously found in SIT

phases, causing them to extend greatly. The aim is to identify these in PIT and reduce costs of SIT. However, the PIT phase may require an extended duration to ensure all issues identified are resolved ahead of impacting/starting the SIT phase.

T3	**PIT governance is longer than estimated due to the increased regulatory reviews and approvals with customers – 4 WEEKS**
	During PIT we will seek the views and involvement of TAG and TDEG throughout its execution and final governance. The CH&N programmes is the first to operate in this way and there will be a step level of detail introduced here for white box tests vs. SIT end to end black box tests. The governance process may require additional time to complete detailed review.
T4	**PIT approach changes do not remove as many later issues found in SIT as hoped and increased time is required for defect fix and retesting – 4-8 WEEKS**
	As part of our lessons learned, we will apply an improved PIT approach with the aim of resolving more errors in PIT, thus reducing issues that are leaked through to the SIT phase. It is not likely that this approach can be an instant fix to all issues and some continued lessons will need to be learned and applied to future revisions. This approach aims to mitigate but may not entirely remove the risk that defects impact the execution of SIT. This does mean that there may still be additional time required in the SIT phase, impacting the exit completion and start of Customer testing phases.
T5	**Issues found in BAT delay the start of Customer UIT (DUST) testing – 2 WEEKS**
	Unknown system impacts on business processes may present themselves late in the BAT phase. This will impact the opening / start of testing for Customers in UIT, DUST.
T6	**Testing Participants identify high severity issues in UIT – 4-8 WEEKS**
	Due to the vast number of CH to Device configurations that are possible, it is not economic or efficient for DCC to exhaustively test all combinations, before users' involvement. Whilst PIT will select a suitable sample that is representative of production, it will still remain possible that an issue may remain with another combinations.
	We have seen previous issues that have been raised due to the varying order and sequence of the Service Requests sent by customers across the 'motorway' to the DSP. There would remain the chance that this type of issue continues from customers' changes even in the situation where we are not changing or adding any Service Requests and that plan introduces changes to the WAN interface only.
	Either of these points would require investigations and possibly a fix from DCC or Meter Manufacturers. There remains the risk of delay to UIT due to additional fixes and re-testing.
T7	**No Zigbee or Specification change assumption is false, and/or unknown urgent maintenance issues are required to be included in CH scope – potentially significant delay**
	The CH&N programme assumes there is no Zigbee change. Similarly, DCC is not presuming to integrate unknown maintenance issues as scope change late in SIT.
	Zigbee change has been a high risk to previous delivery programmes, including Release 2, which experienced delays due to adopting maintenance change late in the test phases which delayed transition to UIT testing for customers due to additional issues for resolution.
	If either of these cases are proven wrong, then there will need to be a full impact assessment to the programme and delivery schedule. Consideration must be given to delaying the 4G CH rollout through the additional re-testing and potential fixes required vs. supplying 4G CHs earlier without the suggested change.

T8	**CH supplier cannot honour reduced lead times for supply – 4-8 WEEKS**

We can plan for an expediated lead time to volume supply of 4G CHs from the LSC approval for volume manufacturing. The fastest supply experienced to date is c. 3 months and we could apply this as an optimistic assumption that is included in the plan, but this would need to be balanced by a slower reduction and cessation of 2G/3G CH provision. We can only identify vendor capability for 4G CH provision through the completion of the commercial process and would need to consider this threat with customers through the implementation of the CH Transition Roadmap.

7. Customer Journey and engagement

7.1. Overview

Delivery of the CH&N Plan will not meet its intended outcomes without DCC customers' support. Whilst we consider the plan to be necessary – with a do-nothing option leading to unnecessary industry costs and lost benefits – it needs to be built around DCC's customers' own plans and obligations, in particular around finishing the smart meter roll-out.

In this section we set out the sequential key points in the delivery of the plan which will impact or require action from customers. We also describe the engagement we will undertake during the delivery of the plan, and the role of industry in go-live decision-making points.

7.2. Customer Journey and key milestones

Activity	Description	Date
Consultation on the SVTAD	DCC will consult on its testing proposals to deliver the plan – we require customer feedback and insight to allow us to shape it.	Q2 2022
Development of the CH Transition Roadmap	Some CH transition milestones are certain (e.g. a start date for 4G CH orders) but customer shaping of the detail will provide the least impactful transition	Q2 2021 to end 2021
Ordering of Test CHs from DCC	Testing new CHs against customers' systems and devices will support DCC User readiness for 4G CH deployment	4G SB: Q1 2022 4G DB: Q2 2022
Provision of Test CHs	It is from this point that test Communications Hubs will be made available to customers for use in DUST.	4GSB Q3 2022 4GDB Q3 2022
Initial orders for IPV	Programme engages with DCC Customers to confirm CH volumes required for Initial Pallet Validation activity	Q4 2022
Stock and installation engagement	DCC engages with DCC Customers to manage 3G stock levels in relation to installation rates. Primary objective to ensure required stock available for industry but does not exceed agreed upper limits	4G SB: Q3 2022 4G DB: Q1 2023
Participation in UIT	Customers encouraged to participate in UIT,	4G SB: Q1 2023 4G DB: Q2 2023
Mass manufacture engagement	DCC engages with DCC Customers to confirm CH volumes required for Mass Manufacture	4G SB: Q4 2022 – Q3 2023 4G DB: Q1 2023 – Q4 2023

IPV Go-Live	Customer feedback through the SEC Panel will support BEIS to make the go-live decision for IPV	4G SB: Q2 2023 4G DB: Q3 2023
IPV	Customers will be invited to install initial 4G CHs in the production environment ahead of mass manufacture.	4G SB: Q2 2023 4G DB: Q3-Q4 2023
IPV ELS and feedback	Customer engagement with DCC on IPV will ensure DCC has a clear view on its outcomes	4G SB: Q2 2023 4G DB: Q3-Q4 2023
IPV completion and mass manufacture go-live	Customer feedback through the SEC Panel will support BEIS to make the go-live decision for mass-manufacture	4G SB: Q3 2023 4G DB: Q4 2023
Final 3G CH engagement	Customer engagement before 3G manufacturing lines terminated. Focus on enabling customers to manage remaining commitments or objectives; orders would be limited to criteria set out in the CH Transition Roadmap.	4G SB: Q4 2022 – Q3 2023 4G DB: Q1 2023 – Q4 2023
End of 3G CH installs	Customers would only be allowed to install 4G CHs from this point onwards	To be confirmed in the CH Transition Plan

7.3. Device Interoperability

120. With the introduction of new CHs, a new WAN and changes to the DSP to support these, it will be important that sufficient interoperability testing is carried out in order to meet programme outcomes and ensure a smooth transition between CHs and WAN. This should be proportionate given the lack of Zigbee and GBCS changes assumed in the plan.

121. DCC has embedded interoperability testing between the new CHs and other Devices in the plan and is building on lessons learned to enable testing between as many meter and CH combinations as is feasible. It is proposed that the exact number and type of combinations will be agreed with TAG.

122. DCC is seeking to pursue a plan which gives confidence in a mass manufacturing date and which will avoid a situation where customers seek to return production Communications Hubs due to issues with firmware which have not been identified during the various test phases. The improved approach to PIT and SIT should help to reduce this risk substantially.

123. DCC is proposing that there is no obligation for customers to carry out testing during the UIT window. This is based on a rationale that DCC will agree with TAG a scope of testing for PIT and SIT which has sufficient coverage of both CH device interoperability and business scenario testing that would make an obligation for customer testing of DCC's solution in UIT unnecessary. The alternative to this is that an obligation is placed on industry to ensure customers complete a defined scope of testing in UIT within a specified period of time. DCC is seeking views on the relative merits of these approaches as part of this consultation.

124. In any case, DCC are still encouraging customers to make full use of the UIT window as it will not be possible for DCC to cover all device/firmware/business scenario combinations either in PIT/SIT or via an obligation on customers in UIT. This means that there is a risk that some combinations may not function as expected. Customers can use UIT to mitigate this risk and validate that their specific combinations work correctly. Once the UIT window closes and any high severity defects resulting from UIT testing have been resolved, DCC expects the firmware exiting UIT to be the version used for mass manufacture.

125. Whilst DCC are pursuing the potential to flash firmware onto Communications Hubs later in the manufacture/logistics process – which would allow for more flexibility to fix the production firmware later in the plan, the assumption for this document is that such a facility will not exist. This means that, as long as Communications Hubs can be commissioned and take an over the air firmware upgrade, defects discovered in customer testing after the UIT window has closed will have to be fixed in firmware updates post go-live rather than seeing Communications Hubs returned.

126. The purpose of the IPV pilot is to validate that installation and commissioning of Communications Hubs works as expected in the live environment and that logistics processes operate successfully. DCC is proposing a similar approach to IPV activities as with customer testing in UIT in that participation is not mandated. Issues found during and after the IPV window closes will be fixed after the mass manufacturing go-live, as long as Communications Hubs can be commissioned and take an over the air firmware upgrade.

7.4. Engagement during plan delivery

127. Understanding and reflecting user business needs in the CH&N programme is a key part of DCC's approach. During the programme so far, DCC has engaged with a variety of governance fora (SMDG IMF etc.), as well as SEC Panel and its Sub-Committees.

- DCC has made available to stakeholders and customers key artifacts like the Cost Benefit Analysis, High Level End to End Solution Designs, and detailed Business Requirements. As DCC progresses through the ITT process, it is anticipated that there will be regular engagement with customers to ensure that the programme remains in line with the planning assumptions which have been shared with the committees and fora, in particular on costs and delivery timeline.

- DCC anticipates providing SEC Sub-committees with the final outputs of the ITT in September 2021, with the SEC Panel receiving final advice from the sub-committees in October 2021.

- Engagement on aspects of the programme which are running have already begun. DCC has started work with TABASC on the 4G WAN Gateway and will continue to engage with them as this aspect of the programme matures, before its completion in Q1 2022. DCC has started sharing the Test Approach with TAG and will continue to engage as we enter PIT testing in Q1 2022 and SIT testing in Q3 2022.

- DCC is keen to ensure that customers and stakeholders continue to be engaged and provide welcome challenges and feedback on DCC's approach and to ensure that the solution continues to meet recognised user business needs after the ITT is complete. DCC anticipates engaging with TABASC as the architecture around the solution is being designed in early 2022. DCC will also provide regular updates to the Security Sub-committee (SSC) and SMKI PMA as the security risk assessments are made at each stage.

- DCC anticipates providing regular updates to the Ops Group as the programme is delivered to inform them on progress and anticipates engaging in detail on DCC's implementation approach and go-live in 2022 and 2023. DCC expects to continue to engage with the SEC Panel as the programme proceeds, to provide regular updates and escalate issues as and when is necessary.

- Outside of formal governance structures, DCC will engage with affected parties, including DCC Users and other stakeholders such as meter manufacturers and, where necessary, those installing meters. As with other Directed programmes, DCC will report on progress to SMIP Governance groups including the Smart Metering Delivery Group (SMDG) and Implementation Managers' Forum (IMF).

128. The table below sets out DCC's planned engagement with stakeholder governance bodies during the delivery of the plan.

Activity	Description	Date
LC13B Conclusions and ITT Update	DCC to report to the Sub-Committees and Panel on the outcomes of the LC13B consultation and advise of any changes to information previously provided to the Committees as well as providing an update on the ITT and whether the programme remains in line with costs and timeframe as previously shared with SEC Committees	June 2021
ITT Update	DCC will provide SEC-Subcommittees with an update on the conclusions and outcomes of the ITT process, including details on the successful bidder and the rationale behind the contract award.	August and September 2021
ITT Outcomes	DCC have included a number of optional requirements in the ITT and will return to OPSG and TABASC to discuss further	August 2021
Optional Elements	DCC have included a number of optional requirements in the ITT and will return to OPSG and TABASC to discuss further	August and September 2021
Design Options	DCC will work up Design Options with the successful bidder and will work with TABASC on these options	Early 2022
4G WAN Gateway	DCC will discuss proposals around the WAN Gateway	Autumn 2021 – Q1 2022
Test Approach	DCC will work with TAG on the Communications Hubs Testing intentions	Q2 2021
PIT Testing	Feedback on progress on Testing to TAG	Q1 2022
SIT Testing	Feedback on progress on Testing to TAG	Q3 2022
Go-live and Operational Updates	DCC to engage regularly with the Ops Group on operational readiness and transitional arrangements to support the role of the SEC Panel in Go-Live decision making	Q1 2023

| Question 15	Do you agree with DCC's assessment of the key customer steps required to support delivery of the plan? Are there any that are not required or any that have not been included? Please provide a rationale for your response.
Question 16	Do you support DCC's proposals for engagement with stakeholders during the delivery of the plan? Please tell us why.

8. Next Steps

129. This consultation closes at **16:00 on 7 May 2021**. Please email your response to consultations@smartdcc.co.uk.

130. DCC reserves the right not to publish, or to delay publication of, referenced material or documents and/or respondent feedback for confidentiality, commercial, compliance and/or legal reasons.

131. Subject to paragraph 130:

    a. 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 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.

    b. 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), who are subject to public law duties and obligations as regards such information and its publication, entirely separate to DCC.

132. If you have any questions in relation to this consultation, please contact DCC via consultations@smartdcc.co.uk.

9. List of Consultation Questions

1	Do you support DCC's shift-left strategy for testing, including that there are no obligations on DCC Users to undertake testing? If not, please explain why.
2	Do you support DCC's testing approach for the CH&N programme. Are there steps missing or unnecessary activities? Please provide a rationale for your position.
3	Do you support DCC's proposals for go-live using two milestones in readiness for Initial Pallet Validation and Mass Manufacture? Please provide a rationale for your response.
4	Do you support DCC's proposals for non-mandated IPV, including that there are no obligations on DCC Users to undertake this activity? If not, please explain why.
5	Do you consider DCC's assessment of the issues for transition to 4G CHs to be complete? Please provide a rationale for your response.
6	Do you support DCC's approach for managing industry's transition to 4G CHs? Are there steps in the roadmap that are unnecessary or others that have not been included?
7	We would welcome comments on DCC's lessons learned. Are there any we have not listed, or lessons in the list which should be discounted?
8	Do you support DCC's approach to managing contingency for CH&N delivery? Please explain why.
9	Do you agree with our assessment of external change which could impact or be impacted by CH&N delivery? Is there change that we have not considered?
10	Do you agree with our assumptions for CH&N delivery? Are there any which have not been included but should have been?
11	Do you agree with our assessment of dependencies for CH&N delivery? Are there any which have not been included but should have been?
12	Do you agree with our assessment of risks for CH&N delivery? Are there any which are not included but should have been?
13	Do you agree with our assessment of opportunities for CH&N delivery? Are there any which are not included but should have been?
14	DCC would welcome respondents' views on the opportunities described above and whether or not DCC should incorporate these into the plan.
15	Do you agree with DCC's assessment of the key customer steps required to support delivery of the plan? Are there any that are not required or any that have not been included? Please provide a rationale for your response.
16	Do you support DCC's proposals for engagement with stakeholders during the delivery of the plan? Please tell us why.

Appendix A – Plans on a Page

Indicative Single Band CH schedule
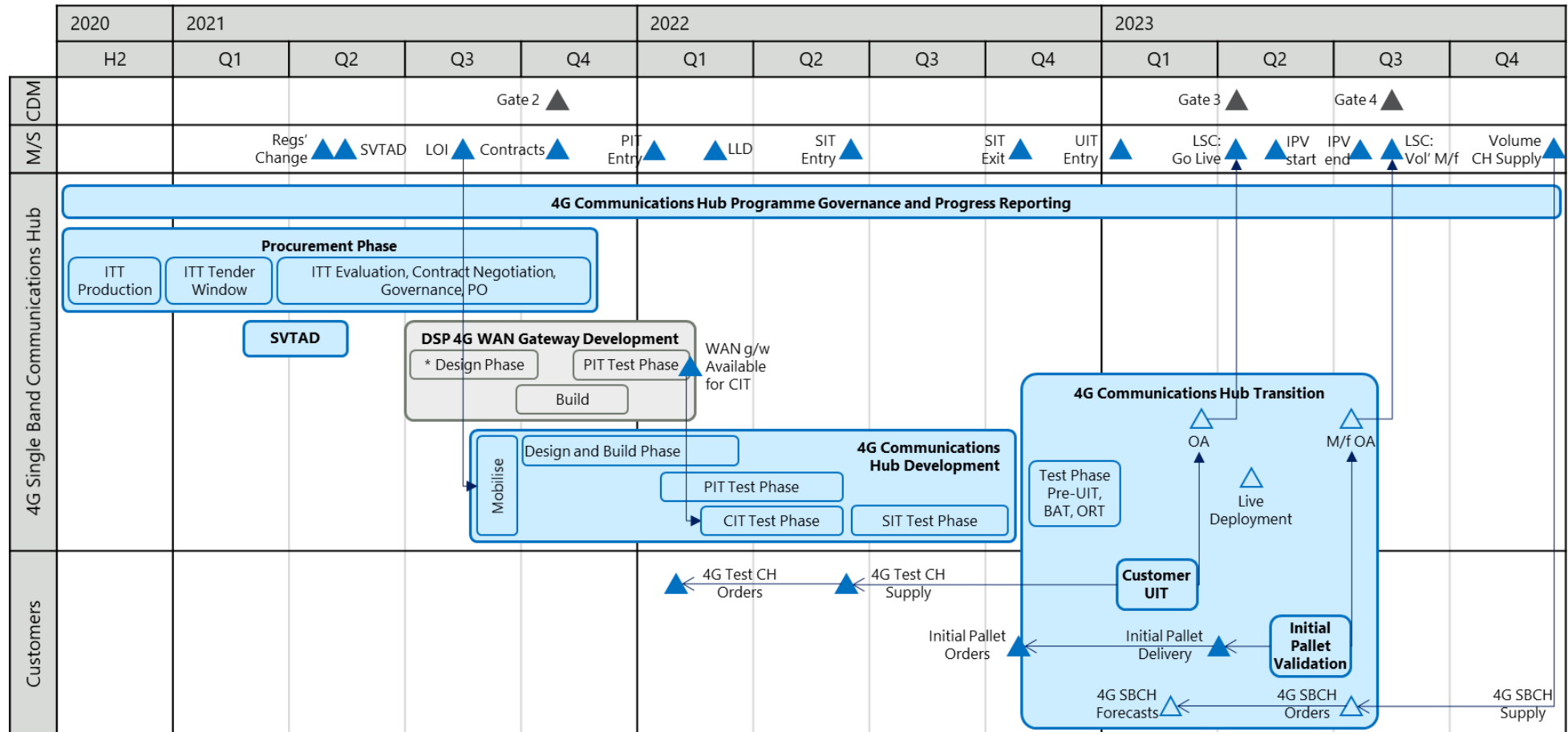
Indicative Dual Band CH schedule
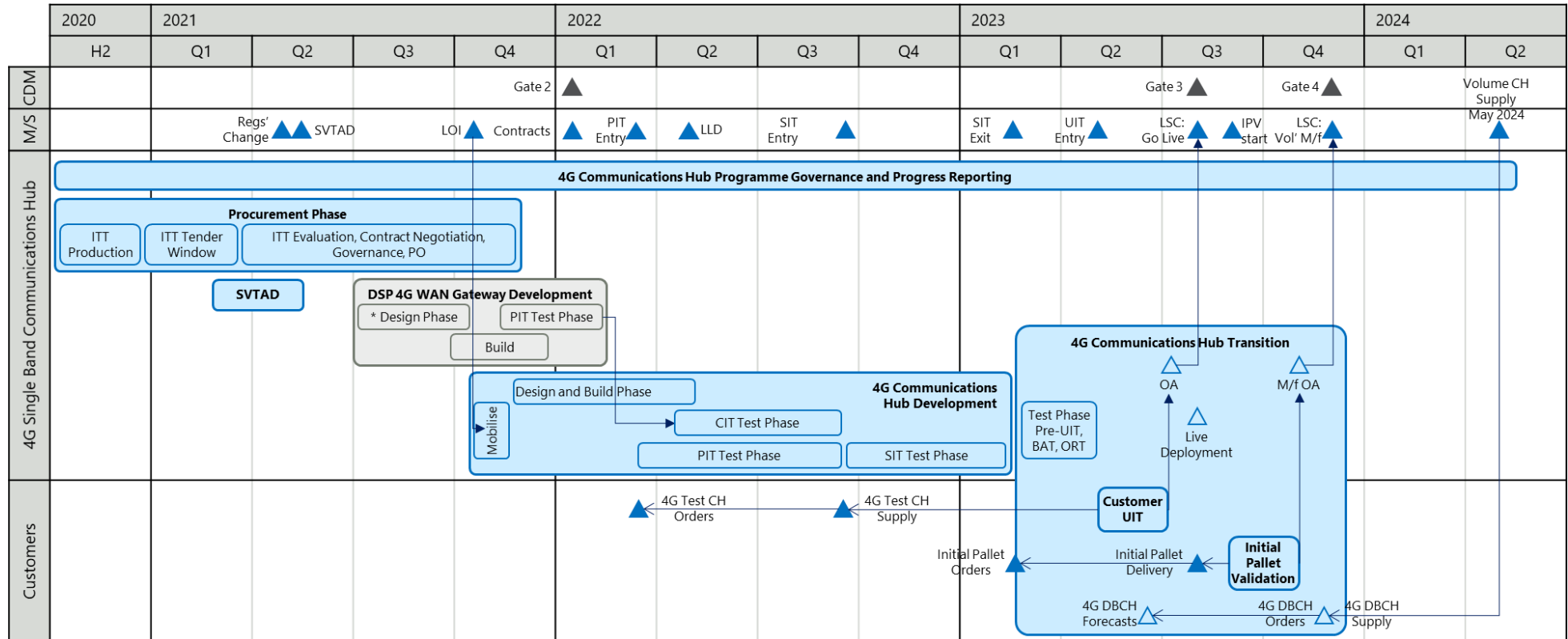
Appendix B – Licence Condition 13B Milestone Table

#	Milestone	SB CH Est. Date	DB CH Est. Date	Description
1	SVTAD submission	15 Jun 2021		DCC submission of the CH&N SVTAD to BEIS (further to SEC Party and SEC Panel consultation) setting out testing framework for CH&N testing (SB and DB)
2	Lower level testing document submission	30 Sep 21	31 Oct 21	DCC submission of lower level testing documentation (TAD(s)) to TAG for approval.
3	LOI	15 Aug 2021	15 Oct 2021	Letters of Intent issued to successful vendors to enable advance designs to commence ahead of final negotiations completing and contract signatures
4	DSP LLD	15 Aug 2021		Low level designs for DSP change approved by DCC's CFDA (Cross Functional Design Authority)
5	Final Business Case submission	27 Sep 2021	22 Oct 2021	DCC will submit its full business cases to BEIS covering for their review and confirmation that they do not object to DCC's procurement.
6	Confirmation of scope of regulatory change	8 Nov 2021	3 Dec 2021	DCC will set out to industry the scope of regulatory changes needed for the CH&N programme along with plans for its delivery.
7	Contracts Signed	29 Nov 2021	24 Dec 2021	DCC will sign contracts with CH&N Service Providers, subject to the Secretary of State confirming no objection on the basis of the Full Business Cases.
-	*Control Point 1*	29 Nov 2021	24 Dec 2021	

#	Milestone	SB CH Est. Date	DB CH Est. Date	Description
8	DSP WAN gateway testing complete	1 Jan 2022		DCC will have completed any testing of the DSP WAN Gateway ahead of CIT.
9	LLD Complete	1 Mar 2022	1 May 2022	Completion of all vendor low level designs approved with DCC CFDA for CH, DM, WAN and Logistics changes
-	*Control Point 2*	1 Mar 2022	1 May 2022	
10	PIT Start	15 Jan 2022	15 Mar 2022	Start of PIT phase for CH, DM, WAN and Logistics change, subject to earlier TAG approval of the corresponding TAD(s).
11	OPT Start	15 Jan 2022	15 Mar 2022	Start of DCC's Operational Performance Testing, comprising non-functional and business acceptance tests.
12	Test 4GCH Orders	1 Feb 2022	15 Mar 2022	Test CHs ordered by Testing Participants. (Test CHs will include logging capability and capable of use with or without the WAN)
13	RF Noise limits confirmed	15 Jun 2022	15 Aug 2022	DCC confirmation of RF noise limits for devices to be installed with 4G CHs, following consultation
14	PIT Complete	15 Jun 2022	15 Aug 2022	TAG approval of Completion of PIT phase for CH, DM, WAN and Logistics change
15	SIT Start	15 Jun 2022	15 Aug 2022	Start of the SIT after successfully meeting entry gate criteria
16	Test 4GCH Supply	15 Jun 2022	15 Aug 2022	Test CHs ordered are supplied to Testing Participants
17	SIT Complete	1 Nov 2022	15 Jan 2023	TAG approval of Completion of the SIT phase
18	OPT End	1 Nov 2022	15 Jan 2023	Completion of all non-functional and performance related testing as part of preparation towards operational readiness

#	Milestone	SB CH Est. Date	DB CH Est. Date	Description
19	Initial Pallet Orders	1 Nov 2022	15 Jan 2023	CHs required for IPV are available for ordering by Suppliers
20	CPA Certification received	1 Nov 2022	1 Jan 2023	Safety certification of device for production installations in consumers' homes
21	UIT Window Start (Customers)	15 Jan 2023	1 Apr 2023	Start of the UIT Window based on agreed set of entry criteria
22	UIT Window Complete (Customers)	15 Mar 2023	1 Jun 2023	End of the UIT window based on an agreed set of exit criteria
23	LSC: Go-live Submission	24 Mar 2023	9 Jun 2023	Live Services Criteria submission to BEIS for consideration to start IPV and deploy changes to Live Systems
24	LSC: Go-live Decision	15 Apr 2023	1 Jul 2023	Response from BEIS for approval to deploy changes to Live systems
25	Initial Pallet Supply	15 Apr 2023	1 Jul 2023	CHs ordered for IPV phase are delivered to customers
26	Initial Pallet Validation Start	15 May 2023	1 Aug 2023	Start of the Initial Pallet Verification pilot window in production
27	Initial Pallet Validation Complete	15 Jul 2023	1 Oct 2023	Completion of the Initial Pallet Verification pilot window in production
28	LSC: Volume M/f submission	25 Jul 2023	9 Oct 2023	Live Services Criteria submission to BEIS and SEC Panel for consideration for DCC's Volume Manufacturing Decision
29	LSC: Volume M/f decision	15 Aug 2023	1 Nov 2023	Decision from BEIS to approve Volume Manufacturing, following receipt of SEC Panel advice
30	Volume 4G CH Supply	15 Dec 2023	1 Apr 2024	Start of Volume Supply of 4G Communications Hubs