

UNC Workgroup 0849R Minutes
Commercial Framework Review to Enable Hydrogen Blending
Wednesday 04 October 2023
via Microsoft Teams

Attendees		
Rebecca Hailes (Chair)	(RHa)	Joint Office
Ben Mulcahy (Secretary)	(BM)	Joint Office
Megan Bray (Proposer)	(MB)	National Gas Transmission
Alexis Birchall	(AB)	Northern Gas Networks
Andreas Klinton	(AK)	Shell Energy
Andy Eisenberg	(AE)	Eon Next
Andrew Pearce	(AP)	BP
Andrew Firbank	(AF)	DESNZ
Andy Clasper	(AC)	Cadent
Anna Shrigley	(ASh)	ENI
Anne Jackson	(AJ)	REC Code Manager
Bethan Winter	(BW)	Wales & West Utilities
Chris Wright	(CW)	Exxon Mobil
Dan Hisgett	(DH)	National Gas
David Addison	(DA)	Xoserve (CDSP)
Dave Lander	(DL)	Dave Lander Consulting
Eric Fowler	(EF)	Association of Meter Readers
Emmanouil Mavroudis	(EM)	Ceres Energy Limited
Jeff Chandler	(JCh)	SSE
Joel Martin	(JM)	SGN
Joseph Leggett	(JL)	Interconnector
Julia Komar	(JK)	Energy Networks Association
Lauren Jauss	(LJ)	RWE
Liz Ferry	(LF)	National Gas
Louise Hellyer	(LH)	Totalenergies
Mariachiara Zennaro	(MZ)	Centrica
Mark Cockayne	(MC)	Northern Gas Networks
Niall Coyle	(NC)	Eon Next
Nick King	(NK)	CNG Services
Phoebe Finn	(PF)	Statera Energy
Richard Fairholme	(RF)	Uniper
Richard Hewitt	(RHe)	BBL Interconnector
Richard Pomroy	(RP)	Wales & West Utilities
Rob Gaskell	(RG)	Kellas Midstream
Shiv Singh	(SS)	Cadent
Sikander Mahmood	(SMa)	Cadent
Steve Britton	(SB)	Cornwall Insight
Steve Mulinganie	(SM)	SEFE Energy

Suki Ferris	(SF)	National Gas
Tom Stuart	(TS)	Wales & West Utilities

The Workgroup Report is due to be presented at the UNC Modification Panel by 14 December 2023.

This Workgroup meeting will be considered quorate provided at least two Transporter and two Shipper User representatives are present.

Please note these minutes do not replicate/include detailed content provided within the presentation slides, therefore it is recommended that the published presentation material is reviewed in conjunction with these minutes. Copies of all papers are available at: <https://www.gasgovernance.co.uk/0849/041023>

1. Introduction and Status Review

Rebecca Hailes (RH) welcomed everyone to the meeting.

1.1 Approval of Minutes (02 August 2023)

The minutes of the previous meeting were approved.

1.2 Approval of Late Papers

No late papers were reported.

1.3 Review of Outstanding Actions

Within this Review group, actions reported in the Joint Office minutes are solely updates discussed in the meeting and should be reviewed in conjunction with the Issues and Actions Tracker provided and maintained by National Gas Transmission. A copy of the Tracker discussed in this meeting is available at www.gasgovernance.co.uk/0849/041023.

Due to timing considerations, most of the Actions below were not reviewed and thus have been carried forward.

Action 0701: Action 2 – GCOTER: Guv Dosanjh (GD) to provide link to the report that is looking at gas temperature on the HyDeploy project.

Update: Carried Forward

Action 0703: National Gas Transmission (MB) to seek a view from Ofgem and the Department of Energy (DESNZ) if Deblending and CCGT compatibility is in the scope of this Request.

Update: Carried Forward

Action 801: Reference IEA/CSEP/NExA to UNC Interactions – National Gas Transmission (MB) to consider aspects / interactions with the Offtake Arrangements Document (OAD) and Independent Gas Transporter Arrangements Document (IGTAD).

Update: Carried Forward

Action 802: Reference HyDeploy Report – National Gas Transmission (MB) to double check with the GDNs whether the report is available to publish and/or share with Review Workgroup parties.

Update: Carried Forward

Action 0803: *Reference Interconnectors & European Interconnection Document Issues* – National Gas Transmission (MB) to consider as part of the development of the EU-UK Strategy Paper development.

Update:

Megan Bray (MB) confirmed that National Gas Transmission had a draft of the EU-UK Strategy Paper, with the next phase being to review it and make recommendations. She confirmed an internal workgroup was to meet to review where inter-jurisdictional cooperation was required. It was agreed that there was a link with UNC considerations and that a reference would be maintained in the Issues and Actions Tracker.

Action Closed.

Action 0804: *Reference Existing Trading Regime and potential gas blending variability* – National Gas Transmission (MB) and CNG Services (NK) to discuss the various gas variability options and how these would potentially impact the current trading regime

Update: Carried Forward

Action 0805: *Reference Hydrogen Blending (Trading)* – National Gas Transmission (MB) to seek a view from National Gas Transmission Control Centre personnel as to whether they believe that the SO would want to know that they are buying H₂.

Update: Carried Forward

Action 0806: *Reference Hydrogen Blending / Commingling Models* – National Gas Transmission (MB) to provide examples of various commingling models and also confirm what NGT requirements might be.

Update: Carried Forward

Review of National Gas Transmission Action Tracking List (please refer to the Issues and Actions Tracker published here: <https://www.gasgovernance.co.uk/0849/041023> for details, with only Review group commentary on the Tracker recorded in these minutes)

MB led a review of the actions detailed on the list.

Action 2 - GCOTER

Review group participants requested that this be split to account for the consequential impact in terms of I&C customers with either a 1 - Flow Computer (in the need to upgrade the Gas Chromatograph or make other changes) or 2 - Convertors - will need to be reviewed to ensure they are fit for purpose, and the view that Shippers would require solutions and sufficient time to address these points with consumers.

Action 3a Existing NExA gas Specifications

MB commented that this action was completed and that the DNs had checked and there are no direct gas specifications in the existing exit agreements, which was reported to be the case for the NTS as well. She referenced previous meeting discussions regarding combined entry/exit agreements, such as Interconnectors or storage and that they do specify Hydrogen figures that will need to be changed, adding that Interconnectors have more bespoke agreements.

Richard Hewitt (RHe) commented that interconnectors supply gas into other European markets which may need the involvement of different parliamentary authorities to discuss if these can be changed.

MB agreed with this point, adding that it did depend upon European strategy on the 1%-2% blend and her commentary was intended to highlight what would need to be considered rather than a statement that it could be changed unilaterally.

Action 4 Safety case/data sheets

MB noted that this was previously agreed to be effectively a comment only and that sufficient time was needed for Offtake to allow a Hydrogen blend, adding that this would remain on the list but did not fit within the scope of the 0849R Review Group.

Action (5a/5b) GT Licence exemption

MB confirmed that Ofgem had been approached on this matter with the subsequent feedback being that the considerations within this entry would require a case-by-case approach with decisions made by Ofgem. On this basis, the Review Group agreed to close this action.

Action 6 European Interconnection Document

MB advised that this action was still in progress, with dependencies on the interconnection methodology piece, adding that until it was resolved it would affect the market consideration in other areas.

RHe noted that the action description mentions the importation of gas and suggested that the issue applied just as equally to the export of gas, mentioning Ireland as an example and how questions could be asked there as to their view of receiving Hydrogen exports and how that, in turn, could affect the total supply of gas to the country.

MD acknowledged this wider EU/GB/Ireland question and committed to expanding the action to include both the import and export of blended Hydrogen.

Action 7a – Managing the H2 blend cap (decrease in H2 availability)

MD noted that because of the decision that the primary role would be for the gas grid to receive H2 as a reserve offtaker, the blend would be variable, ruling out a flat rate blend.

Richard Fairholme (RF) asked about the stability of Hydrogen in the gas and if this was a nuance that National Gas would be dealing with and managing variations or if the assumption was that it would just be variable which the end user would have to deal with. MD responded that the consultation had asked for views on the variability and as such an understanding had yet to be reached. RF agreed that this was his understanding, and as such this action should not be closed and remain considered as 'in progress'.

Action 7b- Managing the H2 blend cap (when limited NG to blend)

MB explained that this action related to considerations as to the scenario in which there was not enough natural gas available to mix to meet the blend requirements and shared that the internal capacity team at National Gas were looking to see what other tools were available in the UNC and that the issue linked into the controlled free market and/or strategic considerations discussed later within this meeting.

Action 8- Clarification on the role of H2 Blending into networks (reserve offtaker or maximised production)

MB highlighted that the reserve offtaker role was outlined in the consultation and included managing volume risk for hydrogen producers and delays in infrastructure and being able to use blending. She asked if the outline provided sufficient understanding.

RHe commented that the consultation was just regarding the Distribution networks and was not explicitly considering Transmission though the views and comments made might be equally true for Transmission as well. This was equally true for the reserve offtaker role and did not necessarily follow for Transmission, with a potential scenario being that hydrogen blending only takes place in the DN networks and thus NTS is only ever all one gas. This would also fit given the volume considerations, as putting other gases into Transmission would require large volumes and expensive high-pressure provision, which he did not think would be feasible anytime soon. Whilst he noted that this may be a reasonable assumption, he suggested obtaining a clarification from DESNZ to ask why the consultation was about Distribution only.

MB commented that within the consultation DESNZ did advise that they may look at releasing timelines and the plan for assessing Transmission and Distribution considerations, adding that in National Gas's consultation response, they would consider what information they needed to share on the role when they got the policy plan for Distribution. RHe concluded that it was thus very likely to be considered regarding the DNS first and that it was clearly where the priority was, noting that laying over some timelines would be very useful.

Nick King (NK) added that he wished it noted that there was at least one small AD plant connected to the NTS and as such it would be incorrect to assume small volumes being connected to the NTS could not happen or were not viable.

RF acknowledged the point that such outliers no doubt existed and that the question was more the cost of compressing to the pressure for NTS, which was probably prohibitively expensive in most cases. MB committed to adding a separate point on the actions list.

Chris Wright (CW) added that there were conversations about reverse compression already taking place considering Transmission networks connected into the local DN, and thus should this go ahead when there is hydrogen in the local DN network, then hydrogen will be found in the NTS. MB shared that she had already added this as something to watch. *It should be noted that, at the time of the meeting, this DN/NTS reverse compression item relates to the possible use of the UNC Derogation mechanism, rather than a UNC Modification.*

Action 9- Gas Quality changes in existing and new NTS

MB proposed that this needed more clarification ahead of being considered and that an additional, separate piece of work regarding the UNC Modification may be required, adding that this also related back to the free-market vs Strategic considerations discussed later in this meeting

Action 14 - H2 Blend Purchased on OCM

MB commented that it would be the DN Operators or Shippers that would perform the purchasing and noted the related question as to how this would be tracked in Gemini.

RF asked if National Gas or the DNOs would require a licence change to allow them to buy gas other than for balancing or shrinkage reasons.

MB confirmed that such purchases would only be for shrinkage purposes, in keeping with the current processes, sometimes referred to as 'own use' gas. Joel Martin (JM) agreed, noting that the consultation envisages DN purchasing being for shrinkage and that provision already existed in their licenses to do this.

Eric Fowler (EF) shared that he thought it was to address instances of residual balancing for the OCM, where an OCM quantity was taken that could lead to a quality concern, noting that currently, the gas was sufficiently similar. He added that another aspect which needed discussion was recognising that most of what had been considered was through volumetrics which, whilst often the drivers for balancing, did not distinguish the difference in Calorific values (CVs) with subsequent consumer consumption being in kWh. In the case of Hydrogen, more gas would presumably be required and would be more costly, and how that would work in considering an economic and efficient approach he was not sure. It was expected that the OCM would rank them in price order, but with the CV potentially necessitating purchasing three times the volume, it would be important to clarify what was being chased within the residual balancing, be it energy or volumetrics.

2. Review New Issues and Assumptions

MB presented the first part of a presentation prepared by National Gas Transmission for this Review group. The presentation can be reviewed at www.gasgovernance.co.uk/0849/041023 entitled 'UNC 0849R Work Group 4', and as such its content is not replicated here.

MB referred to the Department for Energy Security and Net Zero (DESNZ) consultation on Hydrogen blending into GB gas distribution networks recently published on 15 September 2023 (<https://www.gov.uk/government/consultations/hydrogen-blending-into-gb-gas-distribution-networks>) and the questions that DESNZ had issued within.

MB reviewed the Assumptions and Parameters detailed on **Slide 3 & Slide 4** and explained that the assumptions highlighted had been updated since the last meeting. She clarified that the assumptions and parameters listed were specifically about this 0849R Review Group and highlighted that, whilst it was hard not to be drawn into the discussion of the physical solutions, the Review group's purpose was to focus on the commercial considerations.

MB was asked to clarify the assumption that low levels of blending were to be considered (Circa 5%), with initial blends lower than 20% and volumes that would not be material thus avoiding impacting the physical capabilities of the networks. She confirmed that this was to get blending 'off its feet', with CV Capping being a key consideration.

The Review group's attention was drawn to the highlighted text on **Slide 4**, with MB commenting that it had been rewritten with the intent to capture the project's aspirations better.

RHe suggested that where Hydrogen was supplied as a remnant of a different process, with the gas network being a 'last point of call', then the volume would be simply what was available and any connection where blending occurred would necessitate upstream storage of the hydrogen to ensure parameters were kept. He asked if the assumption was that there would always be such Hydrogen connection facilities.

JM responded that this was potentially correct in that there will need to be a control of flow rate into the Transporters networks to ensure the GS(M)R 20% H2 cap is not exceeded as well as to control the Hydrogen flow rate to ensure CV capping did not occur. This may need upstream storage on the hydrogen control network, as well as the requirement to manage the amount of Natural gas available on the network.

RHe asked if this needed to be reflected in the commercial arrangements and asked if it was to be located in the connection contract or the UNC. JM commented that it could sit within the network entry agreement to mitigate against capping and ensure GS(M)R compliance.

Dave Lander (DL) provided a technical commentary on storage citing a feasibility study provided for the GDNs in which he provided a view on storage. He added that a key consideration was where the hydrogen was injected, noting the case for NTS offtakes included better control line pack to manage demand and hydrogen supply. He shared that it was not certain that storage would be required, and suggested that the report he referenced be made available to all, asking if the DNs would coordinate the provision. Sikander Mahmood (SMa) provided a link to the report within the meeting which is replicated here: -

www.energynetworks.org/publications/hydrogen-blending-infrastructure-project-functional-specification

Steve Mulinganie (SM) commented that it was not necessary to dictate how parties complied and rather it would be best to set the requirements that the parties could then consider.

Mariachiara Zennaro (MZ) asked, in considering GS(M)R and the possibility of exemptions, if an allowance was being made for minimum levels of safety for industrial users or Transporters. MB noted that this was something that may have been missed and would need to be considered, adding that it had been stated that GS(M)R would change following an HSE safety review but that DESNZ had suggested that exemptions made be in GS(M)R but had not, to date, provided details as to how this would look, noting that it could possibly be on a case by case basis or that there may be blending prior to the GS(M)R change.

Jeff Chandler (JCn) acknowledged the Hydrogen blending report mentioned and suggested that Hydrogen was already a challenging consideration with mandating storage only increasing costs. MB agreed that the matter did link to the technical delivery model, noting that if someone wanted to connect on the lower stream networks it was more likely to be restrained and that discussions of the technical solutions may help in this issue.

DL commented that injecting at 20% very low into the pressure tier would mean no one upstream could inject and that the lower party would need to reduce if demand proved low. SMa advised that the evidence submitted to the HSE would encompass the whole system to enable any changes to safety management regulations, noting that DESNZ had stated that if the evidence stacks up there was the option to allow speedier connections to the network.

CW commented that it should not be possible to allow use within the UK to interrupt flows to the continent on the interconnectors with trade needing to be maintained. MB agreed that it was necessary to ensure cross-border trading could still flow and committed to adding this consideration as an additional parameter.

MB noted that the connections and capacity methodology was an important piece of work as it looked at the technical delivery models being based on either a free market or strategic delivery model, with the approach taken being a major factor in how the networks would need to be managed and which would therefore lead into the resultant UNC changes.

3. DN Charging Review

Not discussed in this meeting.

4. Gas Pressure / Temperature

DL presented 'Errors in volume conversion when NG-H2 blends are conveyed', from **Slide 7** to **Slide 16** in the presentation provided by National Gas Transmission as linked under Item 2 above.

This item discussed the need for volume conversion and was taken, DL explained, from work in Hydeploy, which will be available from the IGEM database.

In discussing High-Pressure connections DL noted an investment in a new Gas Computer with possibly a hydrogen sensor would correctly calculate the composition and other than upgrading their analysis system nothing else was required. When he was asked about costs, he advised

the newer more sophisticated devices would cost between £30k and £50k, with retrofitted systems being a lot less, He added that there was a lot of interest from device providers in what they perceived as a growth market and as such it was a rapidly changing area, with demonstration systems using sensor-based systems for natural gases/Hydrogen blends, adding that these could make solutions cheaper.

DL stated that intermediate pressure sites that did not perhaps warrant a Gas Computer could use electronic conversion devices assuming a fixed composition, warning that suboptimal settings for natural gas consumption at the supply may have far more of an effect than the introduction of hydrogen, giving the example of having St Fergus gas balancing details entered and actually using Bacton gas. He stated the area was a complicated situation and that the guidance in IGEM/GM/5 needed updating.

SM noted past trends where a lot of gas converters were stripped out of larger sites and set the agenda that somewhat undid the approach of installing converters and asked if this created a greater exposure to the potential errors discussed.

DL acknowledged the commentary and advised that it was worth noting that there were no electronic volume devices that would currently accept a hydrogen signal, so if this was required today it would be necessary to buy a flow computer as a replacement, which cost more but with the current activity in the service devices industry the range of potential solutions and costs was very likely to evolve.

RHa asked if the required update to IGEM/GM/5 was already underway, to which DL replied that it was not. Dave Addison (DA) advised that the document had only just been republished by IGEM, and that the issue mentioned had not been picked up in the recent review. He suggested that someone should reach out to IGEM on this matter.

RHe commented regarding a likely timeframe for IGEM changes, that a somewhat similar process took between four and five years to complete from initial thought to final recommendations.

Anne Jackson (AJ) asked if climate change had impacted the regulations as a whole with ambient temperatures going up in general. DL responded that temperature was the largest contributor to errors, with the question being at what point should the correction factor be reconsidered. He explained that it came down to how temperatures are thought likely to change in the next decades. He noted that he could reread his report for Ofgem as to what the existing errors are now and then apply some form of factor based on rising temperatures (giving as an example a figure of 0.5C) and come back to the Review Group, adding that he did not know which way the errors would go, with a rise in temperature average potentially meaning excessively high temperatures in summer and low temperatures in winter with the various parts of the country affected differently.

EF noted that the gas spends most of the time in pipes in the ground so temperature changes would have a very attenuated effect, adding that when the temperature, and thus the gas, was at its coldest, and when consumption was at its highest, consumers would prove to get more energy than otherwise. He also shared that the next meeting of IGEM GMC was in November.

DL completed the presentation with the Summary shown on **slide 16** stating that no change was suggested for domestic, small commercial or low-pressure installations, which he stated was also probably suggested for large commercial installations.

In the case of large, high-pressure installations an upgrade of gas chromatograph was required to account for hydrogen in the blend.

Finally, for intermediate pressure installations, DL said that these were less straightforward and that the guidance in IGEM/GM/5 for volume conversion devices needed updating. Caveats were made that this was in response to volume conversion considerations only and that the blends will have lower calorific value, resulting in higher volume flow rates with evidence of a small impact on meter accuracy collated from research done for Hydeploy.

5. Connections and Capacity Methodology Review (Part 1)

MB provided some initial background, explaining that the DNs have held a couple of meetings to discuss the question posed about using a free-market vs strategic approach, and with the DESNZ consultation publication had reviewed the benefits of both and wanted to talk these through with the industry to obtain views and decide the next steps.

Richard Pomroy (RP) presented this section of the National Gas Transmission slide deck referenced in items 2 and 4 above, starting from **slide 17**.

In discussing **Slide 19** RP noted that DL had spoken earlier about the Calorific Value challenge and highlighted the bar graph on the right of this slide that compares the CV of differing gases and blends, moving from the highest at 39 MJ/m³ for Natural Gas through to Hydrogen being the lowest shown at 12 MJ/m³ on the right.

RP reviewed the two example arrangements for hydrogen shown on **Slide 20** and **Slide 21** asking if parties injecting hydrogen should be protected, noting that if injection is permitted lower downstream and a later new site is connected higher upstream and commences injecting, the likely result would be that the downstream site would become saturated and unable to inject due to 20% blend capping. As such, if there are no protections for sites lower down the system, they will always be at risk of becoming redundant by newer sites coming in higher upstream.

In **Slide 22** RP discussed the potential scenario of protecting connections, noting that doing so and preventing any higher connections would result in significant sterilisation of upstream capacity, adding that the higher upstream injections that would be prevented would be more efficient as more hydrogen could be injected due to the higher volumes there. The sterilisation of such connections, RP commented, would thus be creating inefficiencies.

In **Slide 23** RP talked through what the DNs perceived as the benefits and Risks of Free market vs Strategic blending connections, postulating that the Free-Market approach may mean that parties may decide to only inject higher up the system, in effect creating the same solution as the strategic without the need to build the strategic framework.

Moving on to **Slide 24** RP provided a link to the DESNZ consultation, noting responses were due on 27 October, and noting that DESNZ were not minded to pursue a strategic approach and were disposed towards the free market alternative. He highlighted that the DNs can only control connections on their own networks and have no influence on the amount of blending that comes in from the NTS or indirectly through interconnectors.

RHa asked if it was known why DESNZ was minded not to pursue the strategic approach. MB replied that she thought it may be that producers were not located close to strategic locations and was not sure if it was also to align with the Gas Act, which requires that provided it is economically viable to connect, parties should be able to, thus a need to provide some leeway in offering a connection was needed. RP added that the Gas Act section 9b talks about developing an economic and efficient system for conveying gas to customers and allowing connections consistent with that. He viewed it as not being very clear and that it was probably best to consider it silent in this regard as it was written when all gas came from the North Sea and other types of entry were not considered.

SM asked how the industry might mitigate the sterilisation risk that would have a beneficial impact on the free market model, as if it proved that there were lots of customers producing hydrogen on their own sites and wanting to inject it back into the system it was obstructive to have the risk of capacity investment being trumped, and the business model destroyed, by another party higher up the system, and queried if the sterilisation was localised or total.

RP acknowledged that this would mean fixing the risk of being trumped on the system, adding that the Wales & West network was pretty much root and branch, but that was not the case for all, and traces back to the NTS offtake, thus if a party were to inject in Wales North, then it would sterilise all of that network leg.

MB added that there are tools for the system to address such as gas swaps to manage and

some offtakes which need network modelling anyway which could be seen to lean away from the strategic approach as the networks are already performing network modelling. EF commented that this all fed into considerations about the future system network manager and the need to optimise investment and confidence, with sterilisation leading to a suboptimal outcome.

MZ asked if the same risk would be true of injection and blending into Transmission, stating that she presumed there was a lower risk of capping. MB advised that there were different tools to influence the offtakes in Transmission, though it was still possible to have operations that may want to inject which may introduce the higher connection issue and who has the right to flow.

Suki Ferris (SF) asked if it was the case that the unifying aim had to be to maximise blending as a whole, and indicated the key element in DESNZ consultation was that the networks will need to have a management system to manage the blend, which would also be an important tool to maximise blend. She questioned why the industry was not starting the progress to get DESNZ to move regulations to move beyond capping at 20%.

SMa explained that the future billing methodology project (FBM) had demonstrated that 5% blend was within the existing regimes so could be progressed quickly, with a lot of the work showing that the costs to allowing higher blending are higher so the cost-benefit analysis needed to make the case, adding that as more blending comes into the networks, they will get closer to the 20% figure.

JM agreed, adding that the thermal energy CV capping mechanism was not going to go away as it is in place to protect consumers from an energy value that is less than what they are paying for. The constraint, he added, though uncertain if that was the correct term, was the central system billing systems inability to facilitate different charging mechanisms, and it was these considerations that were preventing higher blends. JM also spoke about more cooperation between Transporters around different blends coming into the networks and in particular to the UNC, adding that the industry needed to look at the coordination between NTS and the DNs to understand what was coming into the NTS and its impacts downstream.

Emmanouil Mavroudis (EM) asked if there had been similar scenarios around the sterilisation issue within DNO networks they could share the experience of. JM confirmed that DNs did get some interactivity between Biomethane entry points where they are close to each other and these were managed on a 'first come, first served' basis but added that these volumes were very low whereas with Hydrogen blending the industry was looking to get as much into the system as possible, and so trying to protect asset investment would mean the rules between connection points would need to be looked at, especially as DNs do not have the concept of entry capacity in the UNC in the same way as the NTS did. RP added that the approach to Hydrogen was different, adding that licence Standard Special Condition (SSpC) D12 has 'no undue discrimination' gas quality constraint as well as physical constraints.

CW asked if the obligation to offer connection to producers is restricted in any way by who is connected downstream, and in particular who may have sensitivity to this, suggesting parties such as feed producers. RP responded that the licence does not refer to gas quality issues, and as long as DNs provide gas that is legally compliant there are no other obligations on them. He shared that there had been conversations around blending but they had not really received an answer from DESNZ about the networks.

RHa asked if MB could comment on the need for deblending, noting that there did seem to be some restricted downstream customers that could not take gas otherwise. MB responded that they were considering Hydrogen acceptability analysis and discussions with end users as to what they could take with deblending, adding that once it was understood who might be impacted and in what way it would be possible to understand what was needed. SF added that work was underway to consider how to enable deblending, with FutureGrid looking to run a deblending demo, and agreed that the current focus was to understand what is required before taking the next steps.

CW considered it likely that some consumers will need to get deblending equipment and asked

if they would be expected to fund this or if there was an alternate approach to funding under consideration. MB advised that DESNZ had asked for feedback from end-users on the issue.

Andy Eisenberg (AE) asked that, if DESNZ were not minded to consider the strategic approach, if there were any concerns about existing hydrogen producers. RP confirmed that his understanding was that if a current producer was a long way from what would be considered a strategically pertinent location, they could be left high and dry. AE then asked if there was a way that those existing producers could be considered in some way in any sort of strategy that was developed. RP noted that as a decision had not yet been made all options were possible. In response, AE suggested that it would be good to understand if it was a problem that could be solved or if was unavoidable.

SF commented that for a strategic connection location that may be advisable as the best location to blend, it did not have to be the case to dictate that the location be used, and instead pricing incentives could be used to indicate where it was best to locate.

RHa asked why locational requirements were shown as a risk for the strategic approach on **Slide 23**, as they seemed to be a key aspect such an approach would consider. RP confirmed JM's earlier commentary in that the DNs did not have the concept of entry capacity, it was just the NTS that used it, and DNs did not have methods available to send pricing signals, with the current approach being a binary 'you can connect or not'.

SF remarked that in terms of risk, there was a case that the next work package for the Review group to think about was how to modify the existing tools to enable maximising blending opportunities, in context with the associated risks. RHa commented that considering the DN feedback to date considerable changes would need to be introduced to achieve this and RP noted that the electricity DNs had taken a very long time to make changes to some of their charging methodologies.

JM observed, in response to the earlier question as to how to address optimally locating blending provision, the strategic approach offered additional advantages alongside addressing network sterilisation. He noted that the strategic locations were likely to be upstream on the DN networks and close to NTS connections, as these presented the optimum opportunities in both terms of volume and capacity, whereas the further downstream sites are located the more likely constraints like pressure and blending capacity come into play, adding that it might be that parties have to lay longer pipes to maximise their flow rates into the network.

RHa observed that this would raise the question as to who would pay for the longer pipe, which JM acknowledged, adding that this was possibly a question for the DNs charging methodologies which would need to be signed off by Ofgem.

SM put forward that the course of the discussion implied that the industry was unable to be agile in its approach and was subsequently defaulting to the strategic approach. He observed that doing so was likely to produce a simplistic muddled model and instead proposed that there had to be a better hybrid approach that allowed innovation and the benefits recognised from the free-market approach to still be obtainable, suggesting that otherwise in opting for the 'big' strategic model the industry would be locking itself out of a lot of innovative opportunities and potential investors. He recognised that it would be challenging and hard work, but added he felt that committing to the strategic model now might prove something to regret later, and noted he was in effect agreeing with the DESNZ-minded position.

RHe commented on the discussed pricing signals for preferable locations and the statement that the NTS had entry capacity mechanisms where the DNs did not, stating that NTS charging uses a 'postage stamp' model in that it is a single price arrangement, adding a caveat that auctions can introduce some variety in costs, and as such, if the industry was looking to move away from this it would necessitate moving away from the EU Tariff Code agreed in 2020.

RF agreed that the answer was probably a hybrid of the approaches, noting that National Gas Transmission had done some work to improve transparency, but suggested that being told as a customer where you can connect might be useful but if it was 25 miles away it probably was not.

He added that innovation was required to ascertain where it was best to connect for all parties and not just the networks, and to this end, more information was required on connections and it needed to be available with more transparency around costs, time, and areas of congestion. He advised that currently unless parties actively ask the networks, there is no information available to consider.

In response to commentary about the capacity regime and price signals, RF stated that such mechanisms only worked where there was competition. He suggested that there are options out there and it was not necessary to replicate what happens at the transmission level.

Bethan Winter (BW) stated that she was interested in the conversations about the hybrid model, adding that the industry needed an informed approach and noting that there was no information on how many connections were wanted, and drawing the Review Group's attention to question 8 on the DESNZ consultation as it asked how many connections are required. She enquired if parties would share any information provided on this with the networks, including Transmission, as it would be helpful, adding that Wales & West had some information but it was currently insufficient.

RHa asked if such information would be commercially sensitive, to which BW responded that it may be and was the reason why she had asked the question of the Review Group. RHa acknowledged this and noted that parties sharing with DESNZ may allow such information to flow to the industry but recognised this was not guaranteed.

Anna Shrigley (ASh) commented that in the current regime there was also a short haul tariff that allowed entry and exit that are close to each other to benefit from a geo-discount, and thus there was already a price incentive which could be used for hydrogen blending in the future, with perhaps the easiest hydrogen implementation being a point-to-point regime using this short-haul tariff. RHa asked if this was the Conditional NTS Capacity Charge Discount (CNCCD), which Dan Hisgett (DH) confirmed, mentioning in doing so that there was potential to look at discounts for LNG and storage and to potentially add something for Hydrogen, stating that there was a range of options.

NK asked if he was missing something as one of the fundamental points of code was that trading takes part at the National Balancing Point (NBP) and is in kWh, which he wanted to check was still the case, and that blending Hydrogen at 20% would not be treated differently. JM responded that his view was that Hydrogen energy would indeed be traded at the NBP as there was no alternative. MB stated that this would be added to the recorded assumptions and that this had been discussed at the last meeting.

NK noted that there had been a lot of discussion about exit capacity and the challenges around it and wanted to check that there were exit mechanisms such as the 4B economic test which aimed to address the interactivity of connections to networks. RP asked if the implication was that the industry could develop something similar for entry, as 4B was more specifically about reinforcement, with the economic test dealing with funding reinforcements for exit capacity, He added that he could see an indirect link, but noted that it did not deal with entry at all and its involvement with capacity was indirect.

NK commented that he was thinking more in regard to the underlying party who did not have any capacity and those that did as a form of grandfather rights as this was a way of dealing with something similar to what had been discussed in this meeting, such as party who is first comer who did not have the disadvantage of dealing with parties looking to connect later. He added that he was not making a case but suggesting that there were parallels.

MB then looked to close off the discussion and sought to agree on what had been reviewed so far in that it was agreed that it might not necessarily be the case of a free market or strategic connections strategy but maybe a hybrid approach of free market approach but with a capacity allocation tool more strategic in nature, adding that the group might need to look at understanding what that meant in later discussions.

RP stated that it was important for parties who disagree with DESNZ's stated minded to position

communicated in the consultation to respond, as otherwise the decision would be taken out of the industry’s hands. MZ challenged the suggestion that participants in the Review Group did not agree with DESNZ, stating that there was agreement with a free-market approach but through a suggested a more pragmatic hybrid answer, supporting innovation whilst also ensuring the greatest efficiencies.

RF commented that there were market sensitivity questions and thus the DNs might need to speak to parties looking to undertake projects, suggesting it was almost an ‘open season’ to let networks know what is needed and adding that wider communications were required on the issue as the Review Group was fairly limited.

MB added that from an 0849R focus on UNC changes, the Review Group will need to understand this free market/strategic hybrid but to do so it would be necessary to understand the technical solution first.

6. Next Steps

Workgroup 6 will take a view to making final considerations and complete the Workgroup Report.

7. Any Other Business

No other business was raised.

8. Diary Planning

Further details of planned meetings are available at: www.gasgovernance.co.uk/events-calendar/month

Time / Date	Paper Publication Deadline	Venue	Workgroup Programme
10:00 22 November 2023 (TBC)	17:00 14 November September 2023	Microsoft Teams	Workgroup 6 <ul style="list-style-type: none"> Final Considerations Pre-Modification Review Workgroup Report Completion

0849R Action Table (as of 02 August 2023)

Action Ref	Meeting Date	Minute Ref	Action	Reporting Month	Owner	Status Update
0701	18/07/23	1.3	Action 2 – GCOTER: Guv Dosanjh (GD) to provide link to the report that is looking at gas temperature on the HyDeploy project.	Sept 2023	Guv Dosanjh (GD)	Carried Forward
0703	18/07/23	3.0	National Gas Transmission (MB) to seek a view from Ofgem and the Department of Energy (DESNZ) if Deblending and CCGT compatibility is in the scope of this Request.	Sept 2023	National Gas Transmission (MB)	Carried Forward

0801	02/08/23	1.3	<i>Reference IEA/CSEP/NExA to UNC Interactions</i> – National Gas Transmission (MB) to consider aspects / interactions with the Offtake Arrangements Document (OAD) and Independent Gas Transporter Arrangements Document (IGTAD).	Sept 2023	National Gas Transmission (MB)	Carried Forward
0802	02/08/23	2.	<i>Reference HyDeploy Report</i> – National Gas Transmission (MB) to double check with the GDNs whether the report is available to publish and/or share with Review Workgroup parties.	Sept 2023	National Gas Transmission (MB)	Carried Forward
0803	02/08/23	2.	<i>Reference Interconnectors & European Interconnection Document Issues</i> – National Gas Transmission (MB) to consider as part of the development of the EU-UK Strategy Paper development.	Sept 2023	National Gas Transmission (MB)	Closed
0804	02/08/23	3.	<i>Reference Existing Trading Regime and potential gas blending variability</i> – National Gas Transmission (MB) and CNG Services (NK) to discuss the various gas variability options and how these would potentially impact the current trading regime	Sept 2023	National Gas Transmission (MB) & CNG Services (NK)	Pending
0805	02/08/23	3.	<i>Reference Hydrogen Blending (Trading)</i> – National Gas Transmission (MB) to seek a view from National Gas Transmission Control Centre personnel as to whether they believe that the SO would want to know that they are buying H ₂ .	Sept 2023	National Gas Transmission (MB)	Pending
0806	02/08/23	3.	<i>Reference Hydrogen Blending / Commingling Models</i> – National Gas Transmission (MB) to provide examples of various commingling models and also confirm what NGT requirements might be.	Sept 2023	National Gas Transmission (MB)	Pending