

# Decision

## Hydrogen Village Trial Detailed Design Studies Decision

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In December 2021, we received applications from Gas Distribution Network Companies (GDNs) to fund detailed design studies for a hydrogen village trial through the RIIO-GD2 Net Zero Pre-Construction and Small Projects re-opener (‘the NZASP re-opener’). Following stakeholder consultation, we have decided to fund two detailed design studies, and not take forward one study. Our reasons for this decision are set out in this document.

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## 1. Introduction

1.1. The UK government has set out its ambition to support the delivery of a 100% hydrogen village trial by 2025, to understand the feasibility, costs, and convenience of using hydrogen for heat in occupied properties.<sup>1</sup>

1.2. In July 2021, we published a joint letter, with BEIS, setting out how we'll support the delivery of a hydrogen village trial to achieve this.<sup>2</sup> This letter sets out the process to fund ('Stage 2') detailed design studies for a hydrogen village trial, under the Net Zero Pre-construction and Small Project (NZASP) Re-opener. Detailed design studies include stakeholder engagement, procurement and engineering research required in a potential trial location, to enable a future decision on whether to proceed with the build and operation stages of a village trial in 2023. Information on the trial stages are contained in Appendix 1.

1.3. In December 2021, we received three detailed design study applications from Cadent, Northern Gas Networks (NGN) and Scotland Gas Networks (SGN) for funding under our NZASP Re-opener.<sup>3</sup> BEIS provided us with feedback on these applications from their own assessment using expert panels, attended by Ofgem as impartial advisors.

1.4. On 15 March 2022, we published our minded-to decision to approve funding for Cadent and NGN's projects, and not take forward SGN's project.<sup>4</sup> The consultation closed on 12 April 2022 and we received 24 responses.

1.5. This document sets out our decision to maintain our consultation position subject to specific amendments where this is indicated and our responses to stakeholders' feedback. This document also contains the directions to give effect to this decision, in accordance with Special Condition 3.9 and 6.1 of the GDNs' and NGGT's Gas Transporter Licences respectively.

1.6. All figures are in 18/19 real values except where otherwise stated.

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<sup>1</sup> BEIS – UK Hydrogen Strategy. Available at <https://www.gov.uk/government/publications/uk-hydrogen-strategy>

<sup>2</sup> Available at <https://www.ofgem.gov.uk/publications/hydrogen-consumer-trial-open-letter-gdns>

<sup>3</sup> We also received a submission for Wales and West Utilities (WWU), but they withdrew their application later in the process.

<sup>4</sup> <https://www.ofgem.gov.uk/publications/consultation-our-minded-decision-fund-detailed-design-studies-hydrogen-village-trial>

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## 2. Consultation responses and our decisions on our assessment of the projects

### General

2.1. We received 24 responses to the consultation, and have published all of them alongside this decision.

2.2. We have summarised below our consultation position and our final decisions, taking into account the responses we have received. Our decision is to approve the amounts set out in Table 1 for two projects for a total of £9.1m of NZASP funding.

*Table 1 Project summaries and approved NZASP funding (18/19 prices)*

GDN	Area of research	Costs (£)	
Cadent	Areas within Whitby, Ellesmere Port.	Total project value	8,321,228.50
		Private contribution	4,937,652.00
		<b>Approved NZASP funding</b>	<b>3,383,576.50</b>
NGN	Areas within Redcar, Teesside.	Total project value	6,377,157.63
		Private contribution	637,715.76
		<b>Approved NZASP funding</b>	<b>5,739,441.98</b>

2.3. There have been some changes to total project costs (around £200k in total), which has changed the amount of private contributions and approved NZASP funding relative to our consultation. This is due to clarifications provided by NGN on their costs for Stage 2 in response to the consultation and other reasons set out in paragraph 3.5.

## **Our consultation position, summary of stakeholder responses and our final decision**

### **Projects selected for funding**

#### *Consultation position*

2.4. In the consultation, we thought that there was value in funding both Cadent's and NGN's detailed design studies. Both proposals had clear plans and demonstrated a diversity of information that will be captured as they progress, contributing to the evidence base on hydrogen for heating. Both applications provided assurances to us, and BEIS, of their deliverability with clear plans. We considered that both studies represented value for money for consumers and were satisfied with the level of private sector contribution to them. We also highlighted some areas for both GDNs to provide further information on in response to the consultation.

#### *Stakeholders' responses and our final decision*

2.5. We have decided to fund Cadent and NGN's projects under our NZASP Re-opener, maintaining our consultation position. All responses strongly supported this position, although some specific issues were raised which we address below.

2.6. Two industry stakeholders considered that there should be more than one hydrogen village trial funded at later stages, with one suggesting that the size of the village should be increased. Our position is to support the delivery of the UK Government's Hydrogen Strategy which sets out the need for a village by 2025 and a town by 2030.<sup>5</sup>

2.7. A consumer group queried the different level of private sector contributions to the projects. We are satisfied with the level of private contributions provided by GDNs to Stage 2. The level of private contributions satisfies our NZASP governance document<sup>6</sup>, which sets an expectation of 10% of total project costs for substantially innovative projects. We commend the level of private contribution from Cadent beyond this and consider this a strength of their detailed design work. The consumer group queried the level of benefits in kind offered by

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<sup>5</sup> Available at: <https://www.gov.uk/government/publications/uk-hydrogen-strategy>

<sup>6</sup> Available at: <https://www.ofgem.gov.uk/sites/default/files/2022-02/Net%20Zero%20And%20Small%20Projects%20Re-opener%20Guidance%20Version%201.1.pdf>

NGN, due to an error in our consultation where we said benefits in kind would be worth £24k for Stage 2. To confirm, NGN's private sector contribution to their Stage 2 project is 10% of the total cost with no benefits in kind. NGN clarified that it estimates benefits in kind could be around £24m in future stages of the project, if it is successful. We will work closely with BEIS on what funding may look like for future stages of the project, including our expectations for the level of private sector contributions and how we will monitor these.

2.8. We said that we were minded to fund the project costs under the NZASP Re-opener through a charge on all GB gas consumers via National Gas Grid Transmission (NGGT), as opposed to charging network licensee region's customers. This was because the learning from these detailed design studies will benefit all GB gas customers in understanding the potential role hydrogen could play in decarbonising the gas network. There were no objections to this and we think that our position remains appropriate. However, an energy association asked for clarity on whether the costs will be added to both entry and exit charges on a 50:50 basis, or only to exit charges. The re-opener costs will be recovered via NGGT as the Transmission Operator, which is split 50:50 between entry and exit. The directions for Cadent, NGN and NGGT are contained in Appendix 2, 3 and 4 respectively.

2.9. In our consultation, we asked Cadent to confirm whether their detailed design study will explore 'green' hydrogen<sup>7</sup> production methods to use as a backup supply option to their primary 'blue' hydrogen<sup>8</sup> supply. One respondent disagreed with the use of 'grey' hydrogen<sup>9</sup> in the trials and two supported greater focus on green hydrogen. In their response, Cadent clarified that their primary backup supply option is by-product hydrogen already used for combustion, that will be diverted to their project. Whilst we consider this hydrogen to be 'grey' at the source, it is already produced at an industrial site therefore is not expected to contribute to material additional emissions and could be a low carbon option if its previous demand is offset with biomethane. Cadent confirmed they will also explore green hydrogen options in addition to this. We think this is satisfactory at this stage. When considering the final village location and funding, we will look in more detail at the mix of hydrogen

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<sup>7</sup> Green hydrogen is commonly used to refer to hydrogen produced using renewable energy or low carbon power.

<sup>8</sup> Blue hydrogen is commonly used to refer to the process of producing low carbon hydrogen by splitting natural gas into hydrogen and CO<sub>2</sub>, then capturing and storing the CO<sub>2</sub> created.

<sup>9</sup> Grey hydrogen is commonly used to refer to hydrogen produced using fossil fuels such as natural gas.

production sources and whether weight should be placed on plans favouring options that meet BEIS' low carbon hydrogen production standard.<sup>10</sup>

2.10. In our consultation, we asked NGN to demonstrate more clearly the evidence to be captured in Stage 2 against BEIS' Trials Evidence Framework. In their response, NGN have agreed to provide further details on this, which we have decided to accept and make a formal project deliverable as part of receiving funding (see Appendix 3, Table 1).

### **Project not selected for funding**

#### *Consultation position*

2.11. We proposed not to fund SGN's project. We thought that the application lacked detail in key areas of their plan, such as the scope of activities for each stage of the trial and the strategy for stakeholder and consumer engagement. BEIS had similar concerns. This did not provide us with sufficient confidence in delivery of the project.

#### *Decision*

2.12. We have decided to maintain our position not to fund SGN's project. No respondents disagreed with this and we remain of the view that funding two projects represents value for money from consumers. The electricity system operator highlighted the importance of SGN's continuing engagement with the village trial process. We agree, collaboration as well as sharing information and best practice among all the GDNs is vital for the successful delivery of the village trial. We, and BEIS, will continue to engage all GDNs on future stages of the trial and have included several project deliverables as a condition of receiving NZASP funding that will encourage collaboration, including sharing evidence generated from collaborative work and ensuring lessons learnt are disseminated across industry.

2.13. SGN is delivering important work in relation to BEIS' Hydrogen Grid Research and Development Programme, in particular the hydrogen neighbourhood trial.<sup>11</sup> This should remain their immediate focus for contributing towards developing the evidence base on hydrogen for heat. The hydrogen neighbourhood trial will also provide vital learning and best

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<sup>10</sup> Further information available at: <https://www.gov.uk/government/consultations/designing-a-uk-low-carbon-hydrogen-standard>

<sup>11</sup> H100 Fife – SGN Project website. Available at <https://www.sgn.co.uk/H100Fife>



practice to feed into the village trial. SGN also have a key role to play in collaborating with other GDNs to support the village trial.

### 3. Consultation responses and our decisions on the NZASP re-opener directions and project deliverables

#### **NZASP Directions and project deliverables**

3.1. Directions give effect to our NZASP Re-opener funding decisions in accordance with Special Condition 3.9 and Part F of 6.1 of the GDNs' and NGGT's Gas Transporter Licences respectively, which are contained in Appendices 2 to 4. Project deliverables are the plans and evidence that GDNs are committed to delivering as part of receiving funding under the NZASP Re-opener and are contained within the directions. These sit within the direction, meaning deliverables should be met as a condition of receiving funding through the re-opener and funding can be adjusted where Ofgem determines under or non-delivery of a deliverable.

#### *Consultation position*

3.1. We set out the proposed directions for Cadent, NGN and NGGT to govern the NZASP funding, which for Cadent and NGN also included project deliverables.

3.2. We thought the project deliverables proposed by Cadent and NGN were broadly satisfactory, but proposed some additional ones to be included in their plans. We also said that over the consultation period, we would engage with BEIS and GDNs to consider further project deliverables and, in line with the NZASP governance document, agree the wording of these with the GDNs before a decision is made.

#### *Decision*

3.3. In terms of the overall directions, we have decided to implement them with some minor typographical changes in response to feedback from the GDNs and minor adjustments to funding amounts, for the reasons set out in paragraph 2.3 of this decision. Changes were made to the project deliverables within the directions, which are explained below. Appendix 2, 3 and 4 in this document contain the final directions.

3.4. We have decided to integrate all the changes to the project deliverables that we proposed in the consultation, as well as some additional ones in response to our engagement with BEIS and GDNs over the consultation period and the consultation responses.

3.5. To aid effective consumer engagement and knowledge dissemination, we proposed an additional project deliverable that both GDNs share details of their research on their websites within a week of our decision and partner with an independent third party to monitor and evaluate their consumer research and engagement plans during Stage 2. There was no disagreement to these additions. Both GDNs suggested that they should partner with the same third party to support their work and that the additional project deliverable to monitor and evaluate their consumer research will cost £25k each, as it was not planned for. We have decided to implement this deliverable with some changes relative to the consultation. We support the use of the same third party (including joint GDN submissions), as it will help ensure a consistent review and comparability of the GDNs' work. We think the additional cost is reasonable given the assurances that the third party will provide and have included this as part of the NZASP re-opener funding. Several stakeholders highlighted the importance of consumer awareness and willingness to trial participation. We think this deliverable will support this and help ensure that the consumer evidence captured is robust and can be built on to inform future stages of the trial. We have added an additional deliverable for GDNs to set out the scope of this work through a Terms of Reference document in due course.

3.6. In response to engagement with GDNs and BEIS, further project deliverables have also been added to ensure we, and BEIS, acquire evidence during Stage 2 that will support the evidence base needed to proceed with future stages of the trials and hydrogen for heat more generally. We have also made changes to project deliverable dates in all areas to better align:

- when evidence is received during stage 2 to help us, BEIS and GDNs understand and assess some of the findings at the same time, and;
- Stage 2 timings with future stages of the trial funding process envisaged in 2023.

3.7. We note suggestions from stakeholders of what could be included in the close-down report, such as recommendations for the supply chain to ensure scalability of hydrogen. We will consider these in our guidance to GDNs in developing close-down reports.

3.8. In response to the consultation, several stakeholders suggested some technical evidence that should be received as part of the project deliverables, including:

- Early engagement with the supply chain (eg appliance manufacturers and installers, suppliers and their appointed Meter Asset Managers (MAMs));
- The safety of hydrogen in buildings (building on learning from previous schemes, such as H21, Hy4Heat);

- Approaches to metering, including the role of the meter, impacts to suppliers and consumers engagement with this.

3.9. As part of inviting companies to submit proposals for Stage 2 detailed design studies, we provided guidance to GDNs to inform their applications including areas of evidence we expected to see by the end of 'Stage 1' (their outline designs).<sup>12</sup> We have developed, with BEIS, similar guidance for GDNs setting out our expectations of the evidence we expect to see at the completion of Stage 2. The evidence will be used to support BEIS' Evidence Trials Framework as well as potential GDN applications for the next stages of the trial. The above areas are captured in this guidance which has been published alongside this decision document, in our open letter to GDNs launching Stage 2.<sup>13</sup>

3.10. Appendix 2 and 3 contain the project deliverables proposed by Cadent and NGN respectively as part of their Stage 2 applications. Additional project deliverables that have been integrated into these plans as a result of Ofgem, BEIS and GDN engagement over the consultation period are underlined. Both Cadent and NGN have agreed in writing to the project deliverables in this decision, in line with paragraph 2.18 of the NZASP Governance document.

### **Next steps**

3.11. We will continue to work closely with BEIS to develop guidance and processes for future stages of the trial and share this information with GDNs. GDNs are also required to have websites for their projects set up and available for stakeholders to view within one week of this decision being published. These will include more detailed information on their detailed design study plans and how stakeholders can further engage with the projects.

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<sup>12</sup> See Annex A of our Joint Letter. Available at: <https://www.ofgem.gov.uk/sites/default/files/2021-07/Hydrogen%20Consumer%20Trial%20-%20Open%20Letter%20to%20GDNs%20%28004%29.pdf>

<sup>13</sup> Available on our website alongside this decision. See Annex A of our 'Open Letter to GDNs – Launch of Stage 2'.

## Appendices

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## Appendix 1 – Village trial stages

<b>Stages</b>	<b>Description</b>
1. Outline Design	Initial outline designs, desktop studies and planning.
2. Detailed Design	Development of detailed plans to enable a go/no-go decision on whether to proceed with the procurement and engineering work required for a particular trial location and design, and investment decisions associated with this.
3. Prepare and Build	By the end of stage 3, project developers will need to demonstrate that they are ready to begin installation in consumer properties and the conversion to hydrogen.
4. Go-live and Operate	Activities will include installation in consumer properties, conversion, system implementation (e.g. settlement/billing), operation of the trial, evidence collection and benefits realisation.
5. Trial exit	Activities will include either planning for the continuation of the project or decommissioning all necessary system engineering work and property installations, and data gathering and evidence analysis.

## Appendix 2 – Direction to Cadent

This appendix sets out our direction for Cadent.

To:

**Cadent Gas Ltd ('Cadent' or 'the Licensee')**

### **Direction under Part C of Special Condition 3.9. (Net Zero Pre-construction Work and Small Net Zero Projects Re-opener (NZPt))**

#### *General*

1. Cadent is the holder of a licence granted or treated as granted under section 7 of the Gas Act ('the Act').
2. On 14 December 2021, Cadent submitted a Net Zero Pre-Construction Work and Small Net Zero Projects Re-opener application in respect of a detailed design study to support the development and delivery of a hydrogen village trial ('the Project'). On 15 March 2022 we consulted on our assessment and minded-to decision for this Project<sup>14</sup>. Having considered the consultation responses, on 6 May 2022, we published our decision and approved £3,383,576.50 (18/19 values) in funding for the Project.
3. This direction is issued pursuant to Part C of Special Condition 3.9. (Net Zero Pre-construction Work and Small Net Zero Projects Re-opener (NZPt)). It sets out the approved funding, the adjustment to the value of NGGT's NZPS<sub>t</sub> term and the Regulatory Years to which that adjustment relates, as well as the conditions to be met by Cadent in relation to the Project. It is issued alongside a direction to NGGT, setting out the necessary amendment to the value of the NZPS<sub>t</sub> term in Appendix 2 of Special Condition 6.1 Part F of NGGT's licence.
4. In accordance with Part C of Special Condition 3.9, the Gas and Electricity Markets Authority ("the Authority") published on its website the text of the proposed direction and stated that representations must be made on or before 11<sup>th</sup> April 2022.
5. We received 24 responses overall to our consultation, of which 15 provided views on the proposed directions. We have placed all non-confidential responses on our website. Having considered those responses, we have decided to proceed with making this direction.

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<sup>14</sup> Available at: <https://www.ofgem.gov.uk/publications/consultation-our-minded-decision-fund-detailed-design-studies-hydrogen-village-trial>

6. We summarised our consultation minded-to decisions and our final decisions, taking into account the responses we have received from stakeholders in the decision document published alongside this direction.<sup>15</sup>

Approved funding for the Project

7. The approved amount is £8,321,228.50, in 18/19 values. Further details on the funding value are set out in this decision published on 6 May 2022.
8. Of the approved amount, Cadent will contribute £4,937,652 in cash and benefits in kind. The remaining £3,383,576.50, will be recovered by NGGT, through NTS Transportation Owner Charges<sup>16</sup>, and transferred to Cadent. Annex 1 sets out the amounts to be recovered in each Regulatory Year and attributed to the Licensee.
9. The timing of the revenue transfer between NGGT and the Cadent must occur in accordance with Special Condition 6.1.13 of NGGT's Licence. Cadent is responsible for notifying NGGT of the bank account details to which transfers must be made, using the template provided in Annex 3 to this direction.

Project Funding Conditions

10. The Licensee must abide by the following conditions in undertaking the Project. It must:
- (i) undertake the Project in accordance with the description set out in Section 7 of their Re-opener application;
  - (ii) complete all the project deliverables set out in Annex 2 of this Direction; and
  - (iii) share the learnings from the Project.

Notifications and close-down report

11. Cadent must inform the Authority promptly in writing of any material event or circumstance likely to affect its ability to deliver the Project as set out in its submission.
12. At the end of the Project, Cadent must submit a close-down report to the Authority setting out how it has completed the project deliverables set out in Annex 2 below.
13. If the Licensee fails to comply with a condition imposed by this Direction, the Authority will make use of this report in considering whether any funding should be returned to customers, pursuant to Special Condition 3.19.12 of Cadent's licence.

*NOW THEREFORE,*

14. The Authority, pursuant to the provisions of Special Condition 3.9 and the NZASP Re-opener Governance Document, issues this Direction to Cadent.
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<sup>15</sup> See Chapter 3 of this decision document.

<sup>16</sup> As defined in Special Condition 1.1.15 of National Grid Gas' Gas Transporter Licence



15. This Direction constitutes notice of reasons for the Authority’s decision pursuant to section 38A (Reasons for decisions) of the Gas Act 1986.



**Jourdan Edwards – Interim Deputy Director, Onshore Networks**

Duly authorised on behalf of the Gas and Electricity Markets Authority

6 May 2022

**Annex 1: Funding value**

This annex sets out the amendments to be made to NGGT’s licence. The figures below are expressed in 18/19 values.

**Special Condition 6.1 Part F Appendix 2**

Payments to Distribution Networks for Net Zero Pre-construction Work and Small Net Zero Projects (£)

<b>Distribution Network/Regulatory Year</b>	<b>2021/22</b>	<b>2022/23</b>	<b>2023/24</b>	<b>2024/25</b>	<b>2025/26</b>	<b>Total</b>
Cadent	0.00	3,383,576.50	0.00	0.00	0.00	3,383,576.50

**Annex 2: Project Deliverables**

This annex sets out the requirements that Cadent will be held to account for delivering through this project. Should Cadent be unable to meet these deadlines, they must notify Ofgem of this at least two weeks beforehand, setting out the reasons for the delay and a revised submission date.

Table 1: Cadent's final project deliverables

Reference	Project Deliverable	Indicative Deadline	Evidence
1	Project websites and independent third party TOR	1. 13/05/22 2. 31/05/2022	1. <u>Publicly share details of their research sites and detailed design study plans on project websites and any other engagement channels</u> 2. <u>Submission of a Terms of Reference for an independent third party to support the project, including the expected scope of work to be monitored and evaluated (which may be joint with NGN).</u>
2	Detailed designs and specifications for infrastructure requirements	31/03/2023	1. Network solutions defined 2. Engineering packages completed for hydrogen supply resilience and network infrastructure requirements 3. Procurement plan provided for Stages 3-5
3	Safety case and safety documentation development	31/03/23	1. Full Project Quantitative Risk Assessment (QRA) Report 2. Safety case framework developed 3. Site-specific design safety documentation developed (i.e. HAZID, HAZOP, Hazardous Area Classification etc).
4	Stakeholder engagement and communications	1. 25/10/22 2. 30/06/22 3. 30/06/22 4. 30/06/22 5. 30/06/22	1. Refined and researched consumer propositions leading to high uptake 2. Stakeholder engagement plan for Stage 2 produced 3. Stakeholder database 4. Implementation of successful marketing and communications plans 5. <u>Submission of a plan for an independent third party to support the project and monitor consumer research and engagement over Stage 2 (which may be joint with NGN).</u>
5	Regulatory and commercial arrangements in place to be implemented	31/03/23	1. Documented proposal on the UNC modifications required to support trial 2. Documented proposed on technical billing modifications undertaken 3. Development of Commercial Assurance Framework 4. Development of a Commercial Change Framework for hydrogen
6	Comms and Engagement Plans	1. 30/06/22 2. 30/09/22	1. <u>Detailed comms and stakeholder (including consumers) engagement plan for Stage 2</u> 2. <u>Outcome of early comms and engagement with all stakeholders (including consumers)</u>
7	Project Costs	1. 30/09/22	1. <u>Updated best estimate of indicative project costs and any changes from estimates supplied in Stage 1, including in:</u> <ul style="list-style-type: none"> <li>• <u>Total spend in each stage</u></li> </ul>

		<p><u>2. 30/09/22</u></p> <p><u>3. 15/12/22</u></p>	<ul style="list-style-type: none"> <li>• <u>Profile of spend by financial year</u></li> <li>• <u>Any optionality under consideration (e.g. consumer offers, exit scenarios)</u></li> <li>• <u>Materiality of private sector contributions</u></li> </ul> <p><u>2. Assessment of any additional funding requirements for activities necessary in advance of starting Stage 3 (e.g. long lead items)</u></p> <p><u>3. Evidence of application for funding to relevant funds if applicable (NZHF, IDHRS)</u></p>
<u>8</u>	<u>Consumer Offer</u>	<p><u>1. 30/09/22</u></p> <p><u>2. 30/09/22</u></p> <p><u>15/01/23</u></p>	<p><u>1. Detail of provisional consumer offer including alternative offers</u></p> <p><u>2. Provisional strategy for maintaining consumer protections for all (including engagement, approaches to vulnerable consumers or those who opt for alternative offers).</u></p> <p><u>3. Consumer draft agreements with indicative sign-up figures</u></p>
<u>9</u>	<u>End-Users Surveys</u>	<p><u>1. 30/09/22</u></p> <p><u>2. 31/03/23</u></p>	<p><u>1. Report on initial site surveys including demographics</u></p> <p><u>2. Full surveys of all properties in the trial locality, including inventory of appliances (currently in use + required during the trial)</u></p>
<u>10</u>	<u>Supply Chain Analysis</u>	<u>30/09/22</u>	<u>Assessment of appliance, workforce, equipment and material availability and reliability including gap analysis and RAG table</u>
<u>11</u>	<u>Conversion Plan</u>	<u>30/09/22</u>	<u>Initial sectorisation plan, modelling report, and conversion schedule</u>
<u>12</u>	<u>Hydrogen Production Design</u>	<p><u>1. 30/09/22</u></p> <p><u>2. 15/12/22</u></p>	<p><u>1. Feasibility analysis of options for hydrogen production</u></p> <p><u>2. Update on final design concept for hydrogen production and review of options outcomes of stress test assessing resilience, mitigation plans, and associated GHG emissions estimates</u></p>
<u>13</u>	<u>Miscellaneous Cadent</u>	<u>30/09/22</u>	<u>Mitigation plan against delivery risks associated with the 6km pipeline</u>
<u>14</u>	<u>Regulatory Plan</u>	<p><u>1. 15/12/22</u></p> <p><u>2. 15/12/22</u></p>	<p><u>1. Analysis of regulatory framework and issues with regards to specificities of the trial location, with a plan for resolving any potential issues (e.g. planning, derogations, permissions, etc) (expanding on collaborative annex work)</u></p> <p><u>2. Outline of options for potential billing methodologies including analysis of potential risks and issues</u></p>
<u>15</u>	<u>End use appliance procurement strategy developed</u>	<p><u>1. 19/09/22</u></p> <p><u>2. 15/12/22</u></p> <p><u>3. 31/03/23</u></p> <p><u>4. 31/03/23</u></p>	<p><u>1. Sample surveys of domestic properties and full survey non-domestic properties completed</u></p> <p><u>2. Consumer solutions produced and heating technology preferences understood.</u></p> <p><u>3. Bill of Materials for hydrogen and electrification approaches</u></p> <p><u>4. Appliance procurement and contracting strategies</u></p>

16	Safety	<u>15/12/22</u>	Initial version of detailed plan of the evidence the network intends to submit to HSE before the Trial, based on the HSE 'Safety considerations for a hydrogen trial' document and the 'Guidance on the development of safety evidence for a hydrogen conversion trial' (to be shared by HSE in due course), including content of the case for safety, timeline for delivery of each element of the case for safety and supporting evidence to HSE
17	Evidence Plan	<u>1. 30/09/22</u> <u>2. 31/03/2023</u>	1. Initial monitoring and evaluation plan for the trial for the evidence generated and type of evaluation methods, including timescales, resourcing considerations, and how lessons learnt will be disseminated with Ofgem, BEIS, and other GDNs 2. Full evidence plan in relation to the latest version of the BEIS' Trials Evidence Framework.
18	Regulatory and commercial arrangements in place to be implemented	31/03/23	1. Documented proposal on the UNC modifications required to support trial 2. Documented proposed on technical billing modifications undertaken 3. Development of Commercial Assurance Framework 4. Development of a Commercial Change Framework for hydrogen
19	Delivery model and commercial strategy established	31/03/23	1. Delivery model 2. Project team for Stage 3 defined and evidence of supplier support
20	Spending profile and implementation timetable for live trial	31/03/23	1. Robust spending profile over full lifetime of project 2. Detailed implementation timetable for delivery of live trial 3. Land procurement
21	Procedures, standards, and workforce training	1. 31/03/23 2. 24/02/23	1. Workforce training programmes 2. Local operating procedures
22	Project management and technical oversight	31/03/23	1. Project management 2. Work-pack co-ordination and technical support 3. Maintenance of project risk register 4. Final project report preparation
23	Stage 2 Complete	<u>1. 31/03/23</u> <u>2. 31/05/23</u>	1. <u>Submission of a report by the independent third party that evaluates the success of consumer research and engagement methodologies, including the robustness of evidence generated as a result of these (which may be joint with NGN).</u> 2. <u>Stage 2 close-down report</u>

**ANNEX 3: TEMPLATE OF BANK ACCOUNT DETAILS TO BE PROVIDED TO NGGT****\*REDACTED\***

## Appendix 3 – Direction to NGN

This appendix sets out our direction for NGN.

To:

**Northern Gas Networks plc ('NGN' or 'the Licensee')**

### **Direction under Part C of Special Condition 3.9. (Net Zero Pre-construction Work and Small Net Zero Projects Re-opener (NZPt))**

#### General

1. NGN is the holder of a licence granted or treated as granted under section 7 of the Gas Act ('the Act').
2. On 14 December 2021, NGN submitted a Net Zero Pre-construction Work and Small Net Zero Projects Re-opener application in respect of a detailed design study to support the development and delivery of a hydrogen village trial ('the Project'). On 15 March 2022 we consulted on our assessment and minded-to decision for this Project<sup>17</sup>. Having considered the consultation responses, on 6 May 2022, we published our decision and approved £5,739,441.98 (18/19 values) in funding for the Project.
3. This direction is issued pursuant to Part C of Special Condition 3.9. (Net Zero Pre-construction Work and Small Net Zero Projects Re-opener (NZPt)). It sets out the approved funding, the adjustment to the value of NGGT's NZPS<sub>t</sub> term and the Regulatory Years to which that adjustment relates, as well as the conditions to be met by NGN in relation to the Project. It is issued alongside a direction to NGGT, setting out the necessary amendment to the value of the NZPS<sub>t</sub> term in Appendix 2 of Special Condition 6.1 Part F of NGGT's licence.
4. In accordance with Part C of Special Condition 3.9., the Gas and Electricity Markets Authority ("the Authority") published on its website the text of the proposed direction and stated that representations must be made on or before 11 April 2022.
5. We received 24 responses overall to our consultation, of which 15 provided views on the proposed directions. We and have placed all non-confidential responses on our website. Having considered those responses, we have decided to proceed with making this direction.

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<sup>17</sup> Available at: <https://www.ofgem.gov.uk/publications/consultation-our-minded-decision-fund-detailed-design-studies-hydrogen-village-trial>

6. We summarised our consultation minded-to decisions and our final decisions, taking into account the responses we have received from stakeholders in the decision document published alongside this direction.<sup>18</sup>

#### Approved funding for the Project

7. The approved amount is £6,377,157.63, in 18/19 values. Further details on the funding value are set out in our decision published on 6 May 2022.
8. Of the approved amount, NGN will contribute £637,715.76 in cash and benefits in kind. The remaining £5,739,441.98, will be recovered by NGGT, through NTS Transportation Owner Charges<sup>19</sup>, and transferred to NGN. Annex 1 sets out the amounts to be recovered in each Regulatory Year and attributed to the Licensee.
9. The timing of the revenue transfer between NGGT and the NGN must occur in accordance with Special Condition 6.1.13 of NGGT's Licence. NGN is responsible for notifying NGGT of the bank account details to which transfers must be made, using the template provided in Annex 3 to this direction.

#### Project Funding Conditions

10. The Licensee must abide by the following conditions in undertaking the Project. It must:
  - (i) undertake the Project in accordance with the description set out in Section 7 of their Re-opener application;
  - (ii) complete all the project deliverables set out in Annex 2 of this Direction; and
  - (iii) share the learnings from the Project.

#### Notifications and close-down report

11. NGN must inform the Authority promptly in writing of any material event or circumstance likely to affect its ability to deliver the Project as set out in its submission.
12. At the end of the Project, NGN must submit a close-down report to the Authority setting out how it has completed the project deliverables set out in Annex 2 below.
13. If the Licensee fails to comply with a condition imposed by this Direction, the Authority will make use of this report in considering whether any funding should be returned to customers, pursuant to Special Condition 3.19.12 of NGN's licence.

#### *NOW THEREFORE,*

14. The Authority, pursuant to the provisions of Special Condition 3.9 and the NZASP Re-opener Governance Document, issues this Direction to NGN.

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<sup>18</sup> See Chapter 3 of this decision document.

<sup>19</sup> As defined in Special Condition 1.1.15 of National Grid Gas' Gas Transporter Licence

15. This Direction constitutes notice of reasons for the Authority’s decision pursuant to section 38A (Reasons for decisions) of the Gas Act 1986.



**Jourdan Edwards – Interim Deputy Director, Onshore Networks**

Duly authorised on behalf of the Gas and Electricity Markets Authority

6 May 2022

**Annex 1: Funding value**

This annex sets out the amendments to be made to NGGT’s licence. The figures below are expressed in 18/19 values.

**Special Condition 6.1 Part F Appendix 2**

Payments to Distribution Networks for Net Zero Pre-construction Work and Small Net Zero Projects (£)

<b>Distribution Network/Regulatory Year</b>	<b>2021/22</b>	<b>2022/23</b>	<b>2023/24</b>	<b>2024/25</b>	<b>2025/26</b>	<b>Total</b>
NGN	0.00	5,739,441.98	0.00	0.00	0.00	5,739,441.98

**Annex 2: Project Deliverables**

This annex sets out the requirements that NGN will be held to account for delivering through this project. Should NGN be unable to meet these deadlines, they must notify Ofgem of this at least two weeks beforehand, setting out the reasons for the delay and a revised submission date.

Table 1: NGN's final project deliverables

Reference	Project Deliverable	Indicative Deadline	Evidence
<u>1</u>	<u>Project websites and independent third party TOR</u>	<u>1. 13/05/22</u> <u>2. 31/05/2022</u>	<u>1. Publicly share details of their research sites and detailed design study plans on project websites and any other engagement channels.</u> <u>2. Submission of a Terms of Reference for an independent third party to support the project, including the expected scope of work to be monitored and evaluated (which may be joint with Cadent).</u>
2	Comms Plan	1) 31/05/22 2) 30/06/22	1. Completion and issue of the Communications Plan 2. Submission of a plan for an independent third party to support the project and monitor consumer research and engagement over Stage 2 (which may be joint with Cadent).
<u>3</u>	<u>Evidence mapping</u>	<u>30/06/22</u>	<u>Outline mapping of evidence collection (Stages 2 to 5) against the latest version of BEIS' Trials Evidence Framework.</u>
4	Comms and Engagement Plans	1) 30/06/22 2) 30/09/22	1. Detailed comms and stakeholder (including consumers) engagement plan for Stage 2 2. Outcome of early comms and engagement with all stakeholders (including consumers)
<u>5</u>	<u>Project Costs</u>	1) 30/06/22  2) 30/06/22  3) 15/12/22	1. Updated best estimate of indicative project costs and any changes from estimates supplied in Stage 1, including in: <ul style="list-style-type: none"> <li>• Total spend in each stage</li> <li>• Profile of spend by financial year</li> <li>• Any optionality under consideration (e.g. consumer offers, exit scenarios)</li> <li>• Materiality of private sector contributions</li> </ul> 2. Assessment of any additional funding requirements for activities necessary in advance of starting Stage 3 (e.g. long lead items) 3. Evidence of application for funding to relevant funds if applicable (NZHF, IDHRS)
6	Preliminary Site Investigations	30/6/22	Report on the initial site surveys and outline of further reporting requirements of more detailed surveys (if any)
7	Evidence Plan	1) 30/09/22  2) 31/03/2023	1. Initial monitoring and evaluation plan for the trial for the evidence generated and type of evaluation methods, including timescales, resourcing considerations, and how lessons learnt will be disseminated with Ofgem, BEIS, and other GDNs 2. Full evidence plan in relation to the latest version of the BEIS' Trials Evidence Framework.
8	Consumer Offer	1) 30/09/22 2) 30/09/22	1. Detail of provisional consumer offer including alternative offers 2. Provisional strategy for maintaining consumer protections for all (including engagement, approaches to



		<u>3) 15/01/23</u>	vulnerable consumers or those who opt for alternative offers). <u>3. Consumer draft agreements with indicative sign-up figures</u>
<u>9</u>	<u>End-Users Surveys</u>	<u>1) 30/09/22</u> <u>2) 15/01/23</u>	<u>1. Report on initial site surveys including demographics</u> <u>2. Full surveys of all properties in the trial locality, including inventory of appliances (currently in use + required during the trial)</u>
<u>10</u>	<u>Supply Chain Analysis</u>	<u>30/09/22</u>	<u>Assessment of appliance, workforce, equipment and material availability and reliability including gap analysis and RAG table</u>
<u>11</u>	<u>Conversion Plan</u>	<u>30/09/22</u>	<u>Initial sectorisation plan, modelling report, and conversion schedule</u>
<u>12</u>	<u>Hydrogen Production Design</u>	<u>1) 30/09/22</u> <u>2) 15/12/22</u>	<u>1. Feasibility analysis of options for hydrogen production</u> <u>2. Update on final design concept for hydrogen production and review of options outcomes of stress test assessing resilience, mitigation plans, and associated GHG emissions estimates</u>
<u>13</u>	<u>Property Surveys Complete</u>	<u>31/12/22</u>	<u>Survey database updated with majority of required data</u>
<u>14</u>	<u>Outline Case for Safety</u>	<u>31/3/23</u>	<u>Draft Case for Safety</u>
<u>15</u>	<u>Training Plan</u>	<u>31/3/23</u>	<u>The outline training plan complete to allow the detail to be developed</u>
<u>16</u>	<u>Regulatory Plan</u>	<u>1) 15/12/22</u> <u>2) 15/12/22</u>	<u>1. Analysis of regulatory framework and issues with regards to specificities of the trial location, with a plan for resolving any potential issues (e.g. planning, derogations, permissions, etc) (expanding on collaborative annex work)</u> <u>2. Outline of options for potential billing methodologies including analysis of potential risks and issues</u>
<u>17</u>	<u>Safety</u>	<u>15/12/22</u>	<u>Initial version of detailed plan of the evidence the network intends to submit to HSE before the Trial, based on the HSE ‘Safety considerations for a hydrogen trial’ document and the ‘Guidance on the development of safety evidence for a hydrogen conversion trial’ (to be shared by HSE in due course), including content of the case for safety, timeline for delivery of each element of the case for safety and supporting evidence to HSE</u>
<u>18</u>	<u>Network detailed design complete</u>	<u>31/12/22</u>	<u>Initial pipeline design complete, including reinforcement schemes</u>
<u>19</u>	<u>QRA and modelling completion</u>	<u>31/12/22</u>	<u>QRA report issued incorporating Commercial consumers</u>
<u>20</u>	<u>Stage 2 Report &amp; Results</u>	<u>31/3/23</u>	<u>All technical reports complete and issued</u>

21	Stage 2 Complete	1) 31/03/23  2) 31/05/23	1. <u>Submission of a report by the independent third party that evaluates the success of consumer research and engagement methodologies, including the robustness of evidence generated as a result of these (which may be joint with Cadent).</u> 2. Stage 2 close-down report
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**ANNEX 3: TEMPLATE OF BANK ACCOUNT DETAILS TO BE PROVIDED TO NGGT**

**\*REDACTED\***

## Appendix 4 – Direction to NGGT

This appendix sets out our direction for NGGT.

To:

**National Grid Gas Transmission plc ('NGGT' or 'the Licensee')**

### **Direction under Part F (Adjustment for the Distribution Networks' Net Zero Pre-construction Work and Small Net Zero Projects Re-opener (NZPSt) of Special Condition 6.1. (Transportation owner pass-through items (PTt))**

#### General

1. NGGT is the holder of a licence granted or treated as granted under section 7 of the Gas Act ('the Act').
2. In December 2021, Cadent, NGN and SGN submitted NZASP Re-opener applications for detailed design studies to support the development and delivery of a hydrogen village trial ('the Projects'). On 15 March 2022 we consulted on our assessment and minded-to decision for these Projects. Having considered the consultation responses, on 6 May 2022, we published our decision, where we approved £14,698,386.1 in total funding for 2 of the Projects. Further details on the funding value are set out in this decision document.
3. This direction is issued pursuant to Part F (Adjustment for the Distribution Networks' Net Zero Pre-construction Work and Small Net Zero Projects Re-opener (NZPSt). It sets out the adjustments to the value of NZPSt. In particular, it provides for the payments to be made by the Licensee to Cadent and NGN for the detailed design studies mentioned in paragraph 2 above, as a result of the applications made under Special Condition 3.9 of the licence of Cadent and NGN. It is issued alongside directions to Cadent and NGN setting out the conditions to be met by them in relation to the Projects.
4. The Gas and Electricity Markets Authority ("the Authority") published on its website the text of the proposed direction and stated that representations must be made on or before 11 April 2022.
5. We received 24 responses overall to our consultation, of which 15 provided views on the proposed directions. Having considered those responses, we have decided to proceed with making this direction.
6. We summarised our consultation minded-to decisions and our final decisions, taking into account the responses we have received from stakeholders in this decision document published alongside this direction.<sup>20</sup>

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<sup>20</sup> See Chapter 3 of this decision document.

Payments to Cadent and NGN under the Net Zero Pre-construction Work and Small Net Zero Projects

7. Of the approved total amount of £14,698,386.1 for the detailed design studies, Cadent and NGN will contribute £5,575,367.76 in cash and benefits in kind. The remaining £9,123,018.48 in 18-19 values, will be recovered by NGGT, through NTS Transportation Owner Charges<sup>21</sup>, and transferred to Cadent and NGN. Annex 1 sets out the amounts to be recovered in each Regulatory Year.
8. The timing of the revenue transfer between NGGT and the Cadent and NGN must occur in accordance with Special Condition 6.1.13 of NGGT's Licence. Cadent and NGN are responsible for notifying NGGT of the bank account details to which transfers must be made.

*NOW THEREFORE,*

9. The Authority, pursuant to the provisions of Special Condition 6.1, issues this Direction to NGGT. Furthermore, the Authority directs that Appendix 2 of Special Condition 6.1 Part F is amended as set out in Annex 1.
10. This Direction constitutes notice of reasons for the Authority's decision pursuant to section 38A (Reasons for decisions) of the Gas Act 1986.



**Jourdan Edwards – Interim Deputy Director, Onshore Networks**

Duly authorised on behalf of the Gas and Electricity Markets Authority

6 May 2022

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<sup>21</sup> As defined in Special Condition 1.1.15 of National Grid Gas' Gas Transporter Licence

### Annex 1: Funding value

This annex sets out the amendments to be made to NGGT’s licence. The figures below are expressed in 18/19 values.

### Special Condition 6.1 Part F Appendix 2

Payments to Distribution Networks for Net Zero Pre-construction Work and Small Net Zero Projects (£)

<b>Distribution Network/Regulatory Year</b>	<b>2021/22</b>	<b>2022/23</b>	<b>2023/24</b>	<b>2024/25</b>	<b>2025/26</b>	<b>Total</b>
Cadent	0.00	3,383,576.50	0.00	0.00	0.00	3,383,576.50
NGN	0.00	5,739,441.98	0.00	0.00	0.00	5,739,441.98