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Letter of Invitation for proposals

Decarbonising heat in buildings and industry is essential to delivering net zero. Heating in buildings accounts for around 23% of national carbon emissions¹, with the vast majority of this fuelled by natural gas. As set out in last year's Energy White Paper, the Government believes that low carbon hydrogen may have the potential to offer a strategic option for decarbonising heat in buildings.

Further work is required to ensure the case for hydrogen heating is properly assessed. This includes developing evidence to understand the feasibility, costs and convenience of transporting 100% hydrogen safely in the grid and using hydrogen in occupied buildings for heating and cooking. The Government's recent Ten Point Plan for a Green Industrial Revolution sets out its ambition to support industry to deliver a 100% hydrogen Neighbourhood Trial, and a Village Trial by 2025. In 2020, Ofgem and Scottish Government provided funding for the Neighbourhood Trial to a consortium led by SGN for the H100 Fife project which will convert around 300 properties to hydrogen². The Village Trial will build on the learnings from H100, extending the scope and learning involved in a range of key areas. For example, the Village Trial will need to trial the conversion of existing gas network infrastructure in the local area, repurposing it for 100% hydrogen. It will also need to include a substantially larger number and wider range of consumers and building types.

Both trials will support the building of the evidence base needed for Government to decide whether to promote hydrogen transported through the existing gas network infrastructure to decarbonise heat and buildings.

BEIS and Ofgem are working together to provide a framework to support the development and delivery of the Village Trial. The purpose of this letter is to invite Gas Distribution Network companies (GDNs) to prepare 'Outline Designs' for the Village Trial. The letter and annexes provide guidance to inform the development of

¹ Internal BEIS analysis for the Heat and Buildings Strategy (2021).

² <https://www.ofgem.gov.uk/publications/amended-project-direction-h100-fife-sgn>

GDN applications, expected in December 2021, for funding to support the subsequent 'Detailed Design' phase. The guidance and annexes below describe the objectives and benefits we are seeking to achieve through supporting such a trial, and the anticipated funding arrangements and processes for the early stages of this work.

The GDNs will need to take responsibility for designing and developing trial project proposals and forming successful partnerships with local authorities, energy companies, organisations and communities which will be essential to enable any project to go ahead. In their Outline Designs, GDNs will need to include clear evidence of their early engagement with stakeholders in the relevant local areas, how they are responding to initial feedback, and their plans for consultation and engagement in developing the proposals.

Government, regulators and industry all have key roles to play in delivering the information and analysis required to enable the Government to make policy decisions on the strategic role of hydrogen. We think that the Village Trial is an exciting opportunity to lead the world in investigating a major potential option for combatting climate change and we look forward to working closely with you as you develop your proposals.

We are copying this letter for information to John Trounson at the Independent Network Association.



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HYDROGEN HEATING VILLAGE TRIAL: OUTLINE AND DETAILED DESIGNS – GUIDANCE FOR GDNs

1. This document provides guidance to GDNs seeking to submit Outline Designs for a village-scale trial of hydrogen heating. BEIS and Ofgem expect to support the development of the Village Trial through a series of stages, with staged decisions on whether to provide funding for further work. These are summarised in Table 1.

Table 1: Village Trial stages

Stages	Description
1. Outline Design	Initial outline designs, feasibility 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 (eg 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.

2. This document sets out the objectives and principles across all stages, and funding arrangements for stages 1 and 2.
 - Annex A sets out the completion requirements expected from Outline Design stage 1 which will need to be met to apply for stage 2 funding.
 - Annex B describes indicative requirements to apply for stage 3 and 4 funding. Funding arrangements for stages 3 – 5 will be set out at a later date.
3. Outline Design submissions at the end of stage 1 will be used as applications for funding to carry out more Detailed Design work in stage 2. The deadline for receiving applications for funding to support stage 2 is 17 December 2021.
4. The final timetable for Detailed Design and subsequent project development stages will be confirmed at a later date and be informed by the plans proposed by the GDNs in their Outline Design applications for stage 2. However, as an indication, our current expectation is that applications for stage 3 will be required by Q2 2023. The trial must be operational no later than mid-2025, however we encourage GDNs to consider all opportunities for commencing trialling earlier than this.

Overall Objectives and Purpose

5. The Village Trial is intended to provide a range of evidence which will support Government to assess the feasibility, costs and benefits of a possible transition to hydrogen for heat, enabling a policy decision on whether or not gas networks will

be converted, at scale, for use of hydrogen in occupied buildings. The Village Trial will also have key demonstration benefits to the wider public and decision makers.

7. The Village Trial is expected to build on the lessons learned and evidence obtained from the Neighbourhood Trial, [H100](#), led by SGN. It will provide new evidence due to its larger scale, a more diverse and representative population of gas consumers, and because it will adapt and use existing gas network infrastructure to transport hydrogen.
6. We have not specified the number of properties needed for the trial. However, our expectation is that between 1,000 and 2,000 meter points may be appropriate to generate evidence of rollout methods and conversion processes, and to produce representative findings from a diverse range of participants and building types. However, we are open to proposals for smaller or larger numbers of properties if GDNs can demonstrate this is a robust and cost-effective sample size. It is also anticipated that the trial should be operational for a minimum of 12 months.
7. Trials in local communities on this scale will be complex projects and the precise range of benefits available may depend to some extent on the specific characteristics of the local area and consumer base. We therefore recognise that the overall value of project proposals will need to be assessed in the round and that different projects may deliver different benefits and be stronger in certain areas relative to others.
8. However, to achieve the overall objectives of the Village Trial, it must produce evidence and learnings in the following areas:
 - the extent to which the existing gas network across Great Britain can be repurposed for and operated with 100% hydrogen³;
 - the extent and practicability of any additional network design and installation requirements, and corresponding maintenance and repair regimes;
 - representative findings on the experiences, attitudes and behaviours of a diverse range of trial participants and building types during the conversion process, and of using hydrogen for heating and cooking when the trial is operational;
 - consumer acceptability of hydrogen and ways to improve consumer experience, including minimising disruption and inconvenience;
 - costs and practical requirements involved in preparatory activities, conversion and rollout methods and processes, in relation to a diverse and widely representative range of end users⁴ and property types, including the costs and practicability of any safety mitigations in a real-world setting;
 - how different seasons and weather might impact the conversion process, operation of a hydrogen network, and impact a range of applications using hydrogen for cooking and heating buildings.

³ NI is not part of the GB-wide gas grid, which is shared by England, Wales and mainland Scotland. NI gas distribution operates under a separate legal framework with different energy market considerations and is out of scope for this programme of work.

⁴ While the Village Trial should primarily focus on trialling conversion of gas networks supplying occupied buildings with hydrogen, there may be benefits of integrating or coordinating it with projects funded by other sources that demonstrate use of hydrogen to decarbonise transport or industrial end-uses.

General eligibility principles

9. To qualify for support, all projects will need:
 - a plan for a grid-conversion hydrogen heating trial within England, Scotland or Wales;
 - a licensed GDN to lead the project, taking overall responsibility for its planning and delivery and for achievement of the overall outcomes;
 - a consumer strategy to ensure that all occupiers in the trial locality will be treated fairly. Because the existing gas network in the chosen trial area will be converted to transport hydrogen, all consumers in the chosen village will be switched off from natural gas, but this does not mean that they should be forced to use hydrogen for heat. The consumer strategy should set out how the GDN will ensure the fair treatment of all consumers, including those who do not want to switch to hydrogen, including by offering suitable alternatives for heating and cooking during the period of the trial.
10. To enhance value for money, we expect the GDNs to work together to avoid unnecessary duplication of work across separate projects, and collaborate where possible on areas of common interest, such as on risk assessments. This should help to minimise costs, manage overall delivery risks, and facilitate a diverse and robust evidence base.
11. We expect part of the trial to be funded through private sector investment. GDNs should consider what funding contributions they and /or their project partners can make as part of their applications for funding.

Stage 1: Outline Design

12. Outline Designs should be prepared in line with BEIS and Ofgem's purpose and overall objectives in seeking to support the design, development and delivery of village-scale hydrogen heating trials.
13. GDNs can begin Outline Design stage 1 work now and prepare applications for stage 2 funding. We anticipate that most of the work will be funded through the RIIO-2 Net Zero and Re-opener Development Allowance⁵. Elements of the work that are unique and novel could also be taken forward under the Network Innovation Allowance (NIA)⁶. The use of both allowances is subject to the requirements set out in the licence and governance documents directed by Ofgem. These mechanisms are both use-it-or-lose-it allowances and are designed to quickly support net zero project development, small scale innovation projects and early-stage R&D. Under both mechanisms, we expect GDNs to share knowledge created during the Outline Design stage 1 widely.
14. During stage 1, we would like GDNs to develop initial Outline Designs so that the case for funding for stage 2 can be considered. GDNs may produce Outline Design proposals for different potential trial locations, in which case we expect GDNs to

⁵ The [NZARD Use-it-or-lose-it allowance \(UIOLI\) Guidance document](#) sets out the detailed arrangements for this allowance. Network Licensees are required to comply with this governance document in accordance with Special Condition 3.5 in the Gas Transporter Licence.

⁶ The [Network Innovation Allowance \(NIA\) Governance document](#) sets out the regulation, governance and administration for this allowance. Network Licensees are required to comply with this governance document in accordance with Special Condition 5.2 of the Gas Transporter Licence.

ensure these proposals are diverse in terms of risk profile and / or with respect to the evidence the different trial locations would produce.

15. Regular engagement between GDNs, BEIS and Ofgem during stage 1 will be established to help ensure that:

- stage 1 work is progressing to plan and to highlight any key learnings or future challenges;
- potential applications for stage 2 funding are shaped in a way to deliver value for money and to best meet the overall objectives of the Village Trial set out here and in the Trials Evidence Framework v3 June 2021⁷;
- any regulatory and legislative structures can be put in place to enable the trial;
- the funding mechanism(s), and associated processes, for future trial stages are clear.

Stage 2: Detailed Design

16. Stage 2 will investigate the feasibility for the Village Trial in detail and result in the development of detailed plans for potential implementation. More than one project may be supported with funding for stage 2 if the benefits of doing so are evident.

Funding

17. We anticipate that funding for stage 2 will primarily be provided by Ofgem under the RIIO-2 Net Zero Pre-construction Work and Small Net Zero Projects Re-opener (NZASP).⁸ Ofgem will, during stage 1, seek to confirm the appropriate RIIO-2 mechanism and trigger the re-opener in advance of accepting stage 2 funding applications in December 2021.

18. RIIO-2 could fund elements of detailed design work beyond the gas network where these are ancillary, and where there are clear network benefits to be obtained from the work. It is not expected that RIIO funding will be used for significant design feasibility work associated with hydrogen production. Moreover, we anticipate the requirements for capital expenditure for the procurement of new physical assets will be determined in assessments of applications for stage 3 funding. If GDNs' project planning indicates specific expenditure commitments of this type may be required in advance of this point, or that spending is required beyond the scope of RIIO-2, GDNs should identify these requirements and discuss with BEIS and Ofgem as early as practicable, to enable consideration of options and timing issues.

Decision Making

19. The applications for stage 2 funding must include the information outlined in Annex A. Once applications are submitted, BEIS and Ofgem will review project proposals and may propose amendments as appropriate to enhance the overall value for money the projects expect to achieve.

⁷ The Trials Evidence Framework v3 June 2021 was shared with the GDNs on Wednesday, 7 July 2021.

⁸ The [NZASP Governance Document](#) sets out the arrangements for gas transmission and gas distribution network companies to use this re-opener. Network Licensees are required to comply with this governance document in accordance with Special Condition 3.9 of the Gas Transporter Licence.

20. The organisation responsible for administering the relevant funding mechanisms will take the relevant funding decision(s). Conditions may also be attached to the funding which will be discussed with project developers and relevant stakeholders.

21. Considerations relevant to assessing the overall value for money may include (but will not be limited to):

- costs to consumers and / or taxpayers (including the funding contributions GDN shareholders and third-party partners are proposing to make);
- the range and quality of relevant evidence and other benefits which the proposal could deliver;
- delivery risks in relation to achievement of the objectives of the project and the latest date required for the start of operations for the trial, including the strength of the plan and risk management strategies;
- evidence of appropriate engagement with local stakeholders in developing the outline design, and plans for future engagement;
- the offer for trial participants/local communities;
- and environmental impacts of the trial project.

ANNEX A: OUTLINE DESIGN - REQUIREMENTS FOR STAGE 2 FUNDING APPLICATIONS

At the end of stage 1, project developers should submit evidence which includes the following information (unless exceptions or amendments have been made by prior agreement with BEIS and Ofgem). Subject to Ofgem triggering the NZASP re-opener, Ofgem will assess the outline design submissions as applications for the NZASP re-opener and this evidence must be compliant with the NZASP governance⁹ directed by Ofgem.

- i. Trial project summary, including:
 - the population and geographical coverage of the potential trial location;
 - the number and range of gas consumers in the trial area, and coverage of consumers and building types within the trial;
 - the broad strategy for hydrogen supply, new infrastructure and network conversion.
- ii. Plan, timetable and scope of work for subsequent stages, including:
 - a full plan for the Detailed Design stage;
 - a high-level plan and schedule for all other stages of the trial as set out in Annex B, identifying the scope of work, deliverables and milestones for each stage.
- iii. Outline evidence/benefits plan, including:
 - a description of the different types of evidence expected to be generated by the proposed trial, with reference to the Trials Evidence Framework being developed by BEIS;
 - an assessment of the quality and comprehensiveness of evidence the trial project would provide against each evidence type, including an assessment of the nature of any substantial evidence gaps expected to remain after the completion of the trial (eg materially different building types);
 - an explanation of how the scope and design of the trial will enable these benefits;
 - when the benefits would be realised, eg identifying benefits at each subsequent stage of design, preparation and operation.
- iv. Cost estimates, for the full lifetime and the full costs of the trial project, including:
 - the expected costs and profile of expenditure over the full lifetime of the project broken down by appropriate expenditure items/headings, identifying material estimating risks, uncertainties and ranges;
 - funding contributions that the GDN and project partners expect to provide; and
 - firm cost estimates and a statement of the GDN's funding requirements for the Detailed Design stage.
- v. Organisation of responsibilities and liabilities, including:
 - a description of the proposed organisational, funding and legal arrangements with project delivery partners, and suppliers, describing their respective responsibilities and liabilities, including for procurement,

⁹ [NZASP Governance Document](#)

ownership and delivery of assets and services and associated liabilities.

- vi. Safety Case Development Strategy, including a description of:
 - the planned technical approach to modelling/quantifying/assessing risks and mitigations;
 - the scope of activities which the GDN plans to include in its assessment of risks;
 - the main potential hazards which the GDN anticipates its risk assessment will need to encompass;
 - the GDN's approach to building on existing safety projects and working with others to build our collective understanding of hydrogen safety;
 - the GDN's plan for delivering the necessary risk assessment work including securing the necessary technical expertise and resources; and
 - set out the GDN's plans to meet the requirements of the relevant health and safety regulatory framework.

- vii. Regulatory plan, including:
 - a summary of regulatory frameworks potentially impacting on the design, feasibility or timeline of the project (eg. GDN licence conditions, planning regulations, environmental requirements);
 - an outline timetable of regulatory compliance activities and milestones anticipated by the GDN;
 - a description of any regulatory barriers in relation to which the GDN is planning to seek some form of exemption/derogation/easement/special permission etc.

- viii. A statement of the options identified for meeting requirements for hydrogen supply and resilience, including:
 - identification of reliable and resilient hydrogen supply solution(s) for the proposed trial site. This should also include an assessment of the viability and cost of using a low carbon hydrogen supply; and
 - evidence of support from any third parties who would be partners on the project and responsible for delivering hydrogen production.

- ix. A statement of infrastructure requirements, including:
 - a description of any new infrastructure construction or existing infrastructure adaptation required to deliver the project;
 - an outline strategy and timeline for the design, procurement, construction and/or adaptation of infrastructure required.

- x. Public engagement evidence:
 - evidence of positive engagement with local partners, local representative authorities and/or consumer groups, including stakeholders that support consumers with additional needs and consumers in vulnerable situations, and a summary of feedback received.

- xi. Public engagement strategy, including:
 - the plan for extending engagement and consultation with communities, local authorities, and representative organisations in the Detailed Design stage. This should include the objectives and success criteria for each stage of the strategy/plan, as well as planned methods of communication/engagement.

- xii. Proposals for a consumer strategy, ensuring fair treatment for all gas consumers in the trial locality, including:
 - a strategy for establishing all consumers' requirements;
 - the consumer "offer", including proposed options for consumers/businesses who do not wish to or cannot participate, and how these could be funded;
 - an assessment of risks and planned approaches in relation to consumers in vulnerable situations;
 - outline billing solutions: the approach to billing arrangements for the duration of the trial.

- xiii. Supply chain strategy, including:
 - an assessment of the required range and volume of appliances, ancillary devices (eg meters), and any other necessary installations;
 - evidence of support from third parties who would be partners on the project to supply these elements; and
 - analysis of any further new technology/product development work required, and associated risks.

- xiv. Workforce capability, skills and training plan:
 - identification of the workforce and training requirements needed to successfully deliver the proposed trial, and a plan to show how these needs would be met (eg recruitment, certifications, competency assessments).

- xv. Exit plan:
 - outline plans for two possible scenarios:
 1. the continuation of the project;
 2. ending the project within 1-3 years of trial commencement and the reinstatement of natural gas supplies.
 - This should include the necessary infrastructure works, an outline strategy for treatment/status of consumer appliances and installations, and associated costs.

- xvi. Risk Register:
 - the project risk register with associated mitigation measures to manage risk.

ANNEX B: INDICATIVE REQUIREMENTS FOR FUNDING APPLICATIONS FOR FUTURE TRIAL STAGES

Future Trial Stages		Indicative Outline Completion Requirements
Stage 2	Detailed Design	<p>Work in this stage will develop funding applications for stage 3: Build & Prepare. These applications will 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. To that end, completion requirements will include a full evidence/benefits plan, a robust spending profile and a detailed implementation timetable for delivery of a live trial (including identification of further stage gates and a detailed exit or continuation plan).</p> <p>Applications will need to evidence a readiness to begin the building and preparation work required in stage 3, with network solutions defined, partnerships with third parties agreed, commercial contracts and regulatory approvals ready to be finalised, and workforce training programmes provided for. At this stage, applications will need to summarise the conclusions of the safety and risk assessment work so far and the key risk reduction measures to be deployed in the trial. They should also outline the full scope of site-specific safety documentation to be developed, as agreed with the Health and Safety Executive.</p> <p>Applications should also demonstrate how the outcomes of all public and consumer engagement, including a survey of individual consumers and visits to premises/properties, have been taken into account and used to inform all aspects of the trial which will impact home owners, residents and other occupiers within the trial region. Consumer solutions and corresponding agreements should be ready to be put in place, including a detailed billing strategy (that covers also balancing and settlement).</p>
Stage 3	Build & Prepare	<p>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. Evidence of this will include:</p> <ul style="list-style-type: none"> • Completed procurement processes and the necessary assets and supply chains in place • Consumer agreements in place • Operational readiness gateways passed • System construction • System commissioning ready for/ahead of go-live
Stage 4	Go-live/ Operate	<p>Activities in the go-live stage will include installation in consumer properties, conversion, system implementation (eg settlement/billing), operation of the trial, evidence collection and benefits realisation.</p>
Stage 5	Exit	<p>Stage 5 will include data gathering and evidence analysis and either preparing for the continuation of the project or decommissioning all necessary system engineering work and property installations.</p>