



Action for Warm Homes

CONSULTATION RESPONSE

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NEA response to BEIS consultation 'Hydrogen for Heat: Facilitating a grid conversion hydrogen heating trial'

About National Energy Action (NEA)

NEA¹ works across England, Wales and Northern Ireland to ensure that everyone in the United Kingdom can afford to live in a warm, safe home². To achieve this vital mission, NEA provides access to energy and debt advice, delivers training, supports local and national energy efficiency policies and co-ordinates wider services which can help change lives. Our key partners across the UK nations include local and national governments, regulators, industry and the third sector to deliver practical support to improve the quality of life for those in or at risk of fuel poverty. We are working with others to achieve a fair transition to net zero for fuel poor households.

Background to this response

Since the UK legislated in 2019 to end its contribution to global heating by 2050, it has become clear that emissions from domestic households will need to be almost entirely eliminated in the coming decades for this to take place. All scenarios for meeting this challenge require two difficult requirements to be met:

- a) A significant proportion of UK homes will require substantial improvements to the thermal efficiency of their building fabric, and
- b) A significant proportion of UK homes will need to make a switch to zero- or low-carbon heating

The new fuel poverty strategy 'Sustainable Warmth' also sets out a vision to both meet the fuel poverty target for 2030 (to ensure that all fuel poor households reach EPC C), while moving towards net zero for fuel poor households.³ To a large extent, the technologies required to meet these two challenges already exist, and others are in the process of being developed. The use of hydrogen for home heating is one key area which is still under development and could have potential to help households decarbonise their homes. However, without adequate investigation large uncertainties will remain over the use of hydrogen to heat homes. NEA is therefore pleased that the UK Government are facilitating trials to reduce these uncertainties and gain a better understanding of the potential of using hydrogen for home heating.

NEA believes that home heating is a key challenge and strategies to decarbonise domestic heat should be designed in a way that maximises the benefits to fuel poor and vulnerable households. In response to this consultation, our key recommendations are listed below.

Summary of our Recommendations

- a) Any trials with domestic customers must demonstrate the highest safety standards have been applied before, during and after the trials end.
- b) BEIS should consider how, in addition to the necessary focus on consumer protections, the village trial can be used to gather evidence on how to maximise benefits of a hydrogen grid conversion trial for fuel poor and vulnerable households.
- c) BEIS should look at how the trial can be used to gather evidence on the possible total costs of supplying hydrogen to domestic homes, including wholesale, distribution, and conversion costs. This should feed into a broader distributional analysis of the possible impact of large scale hydrogen conversion on energy bills and thus energy affordability, which will likely remain a barrier to fuel poor and vulnerable households accessing affordable warmth in a decarbonised future.
- d) BEIS should work with Ofgem to establish a framework for assessing the extent to which GDN's communications and information about the trial meet the criteria of comprehensive, clear advice tailored to individual circumstances, including the needs of vulnerable consumers, those who do not speak English as a first language, those with limited financial capability, those who are non-users or narrow-users of the internet, and finally those in the private or social rented sector, where engagement with both tenant and landlord will be important.

Our Response

Question 1 - Please list the major activities necessary to set up, run, and conclude a grid conversion trial, to ensure that the premises and the gas distribution network are ready to use hydrogen for heating.

NEA is pleased to note that GDNs will be required to develop and implement a consumer engagement strategy, and that evidence of community consultation and participation will be central to this. We are further pleased to note that in Stage 2 funding applications GDNs will be required to demonstrate a meaningful engagement with local stakeholders that support consumers with additional needs and consumers in vulnerable situations and an assessment of risks and planned approaches in relation to consumers in vulnerable circumstances.⁴ These are essential activities that will be pivotal to ensuring that vulnerable consumers can confidently take part in trial. Although we have some thoughts on how the trial could also benefit fuel poor and vulnerable consumers (see our response to questions 4-7 below), we also believe that there must be an effort to include an appropriate number of vulnerable consumers in the trial so as to gather statistically relevant learnings for that particular set of households. In order to make any future hydrogen transition work for fuel poor and vulnerable consumers, we must have evidence on their experiences, needs, and heating regimes (i.e. how they heat their homes and when), and how these are impacted by a switch to hydrogen. If we do not, we will be less likely to design and undertake a future large scale hydrogen conversion in a way that is most beneficial and least disruptive for these consumers; consumers who are often disadvantaged by the energy market and who must be at the centre of any just transition to Net Zero. As a consequence, it is imperative that steps are taken to proactively include fuel poor and vulnerable consumers in the trial, so that this evidence can be gathered and incorporated into any future conversion.

Aside from the two steps noted above and our detailed responses to questions 4-7 below, NEA believes the following will be necessary to setting up, running, and concluding a grid conversion trial in a way that works for fuel poor and vulnerable consumers.

Understanding fuel poverty and vulnerabilities in the local area. NEA considers that it will be necessary for the GDNs to undertake desk-based (and potentially primary) research to understand the ‘map’ of fuel poverty and vulnerability in the chosen conversion area(s), in addition to work to understand the population and coverage of the trial area.⁵ This is necessary because such an exercise will likely uncover clusters or pockets of particular kinds of vulnerability within a chosen area, or Lower Super Output Areas (LSOAs) with higher than average levels of fuel poverty, that will need to be accounted for in their engagement strategy. In our Connecting Homes for Health⁶ project with Northern Gas Networks, NEA undertook an analysis of this kind using fuel poverty statistics, deprivation statistics (Index of Multiple Deprivation), and statistics on cold-related ill health from the Quality Outcomes Framework and Public Health Outcomes Framework. This analysis revealed parts of the North East of England that had clusters of high fuel poverty, deprivation, and cold-related ill health, and which were therefore suitable for engagement as part of the project. Undertaking a similar exercise on potential conversion areas will be essential to helping GDNs and their project partners understand where in the potential conversion areas will be likely to have higher levels of fuel poor and vulnerable consumers, which in turn will help determine the best methods of engagement in those areas.

The development of meaningful relationships with local stakeholders that support fuel poor and vulnerable consumers. As noted above, NEA agrees that this will be essential to undertaking a grid conversion trial in a way that works for fuel poor and vulnerable consumers. However, we would add that it will be important for GDNs to structure their engagement with local stakeholders in a way that responds to any identified needs present in the local area (e.g. such as any clusters of vulnerabilities identified through the ‘mapping’ exercise discussed above). For example, this might include engaging with local community groups or charities that support families and young children if the proposed area has a higher-than-average proportion of households with children under 5, or engaging with local disability charities if the proposed area has a higher than average proportion of households with disabilities. This should not be prescriptive, but based on a fine grained understanding of the social geography, demographics, and fuel poverty/vulnerability ‘map’ of the local area. We consider this essential because these partners will likely be important for establishing trusted relationships in communities and thus encouraging opt-ins among communities in a way that is most beneficial and least disruptive for vulnerable consumers.

The highest safety standards must be demonstrated and applied before, during, and after the trial. NEA recognises that converting an existing network area to transport hydrogen presents large safety challenges. We expect that, as in previous and ongoing preparations for hydrogen trials, a detailed safety case will be considered and approved by the Health and Safety Executive before any build phase can begin.⁷ This is worth underlining because previous research into the possible use of hydrogen for home heating has highlighted safety as one of the main concerns consumers will have. Nationally representative survey research by Newcastle University into public perceptions of blended hydrogen found that 44% of respondents would be worried about the possibilities of gas leaks, explosions, and fires, and the level of initial concerns that their respondents had was significantly associated with their overall support for using hydrogen in the home.⁸ A separate research project by the same authors highlighted that some of the specific properties of hydrogen (e.g. flammability, ignition energy and temperature, flame speed, detonation level, and speed of diffusion in the event of leak) were perceived by consumers as posing an additional safety risk in the home, especially by families with young children.⁹ Similarly, research by Leeds Beckett University noted that some, but not all, of their research participants asked questions about safety, including informed questions about (e.g.) the risk implications of hydrogen being more flammable than methane.¹⁰ Beyond the UK, research about the use of hydrogen for domestic heat in Australia found safety was the most important determining factor shaping participants’ willingness to live in a hydrogen home.¹¹

The question asked by one focus group participant in this research is indicative of the kinds of questions some consumers will have about the village trial:

“And obviously, hydrogen’s quite dangerous. Is it like, as dangerous as other – like, as having gas at the moment? Or is it going to be like, more dangerous because it’s more flammable and the higher percentage we get up, is it going to get more dangerous?”¹²

This evidence not only reinforces the view that safety will be paramount, but that allaying the concerns of residents about the possible safety risks of hydrogen will be central to securing opt-ins. Any trials with domestic customers must therefore demonstrate the highest safety standards have been applied before, during and after the trials end, with close oversight from Ofgem and the Health and Safety Executive. This must be conveyed in clear, inclusive communications to ensure that all consumers in the trial area are well informed about possible risks (see our response to questions 4-7 below for more on this). We do note and appreciate that in purely technical terms the risks of using hydrogen will likely be broadly similar to the risks associated with natural gas use, and that there are even advantages of hydrogen, such as the elimination of carbon monoxide risk. However, consumers may not see it this way, especially vulnerable consumers, and taking steps to demonstrate and communicate the safety case will therefore be critical to the operation and success of the trial.

Question 2 Do you agree with our view that changing existing legislation would help to ensure that GDNs can deliver grid conversion trials?

and

Question 3 Please list any other amendments to existing legislation which you consider would be necessary to ensure that GDNs could effectively set up, run, and conclude a grid conversion trial

Our suggested amendments to existing legislation are discussed individually in our responses to questions 4-7.

Question 4 - Which aspects of a grid conversion trial could lead to consumers being treated unfairly or not being protected?

and

Question 5 - Which of the consumer protections listed on p.14 are necessary to ensure that energy consumers are protected in a grid conversion trial? Please explain why they are necessary.

and

Question 6 - Are there any other consumer protections not set out on p.14 which would be necessary to implement? If so, please explain why they are necessary.

and

Question 7 - How should each of the consumer protections you have listed in response to questions 5 and 6 be implemented

NEA agrees that there are ways that consumers could be treated unfairly or not be protected during a grid conversion trial, and we concur that all of the protections on p. 14 of the consultation are important to ensuring this does not happen. We group our responses to questions 4, 5, 6, and 7 together here by theme.

Specific additional protections are implemented for vulnerable consumers and those experiencing fuel poverty

NEA believes that one of the key priorities for this trial should be to explore how any large scale conversion to hydrogen in the future can improve the health and lives of fuel poor

households. This will require moving a step beyond a necessary focus on consumer protection to explore possible mechanisms through which fuel poor and vulnerable households can be identified and offered additional support across the full life cycle of the trial. The aim of doing this should not wholly be to identify and support fuel poor households in the 'village' itself (although of course this is important), but to begin the devising of a delivery model that places fuel poverty and vulnerability at its core, and which can be further refined in a future 'town' trial at the end of the decade. Long-term, this will ensure that if larger scale conversions to hydrogen take place in the 2030s on an area by area basis, **no household that is converted to hydrogen is left in fuel poverty once their switch is complete.**

This could be implemented in the following way. We note from Annex One of the consultation that while the village trial should focus on trialling the conversion of gas networks to transport hydrogen, there may be benefits of blending the trial with other projects funded by separate sources. These sources could include the Network Innovation Allowance (NIA) or the Use It Or Lose It (UIOLO) allowance. Such an approach could fund and enable a 'trial within a trial', whereby additional services are provided to consumers identified as fuel poor or vulnerable to enhance their experience and maximise the benefit they accrue from the trial. Such an approach could provide ringfenced funding for upgrading the energy efficiency of fuel poor homes as part of the trial and include provision for detailed advice and support (e.g. income maximisation services, tariff switching support, Warm Home Discount, etc.) in parallel to or before the conversion of a household to hydrogen. This is not an entirely new concept – NEA is involved in a project with Cadent which trains and enables gas engineers to refer households they identify as vulnerable to a bespoke service which can provide appliance repairs and replacements and energy advice to the household.¹³ If the lead GDN follows the approach taken at the HyDeploy trial at Keele University, and employs one or several specialist resident liaison officers to engage with consumers, these officers will also be ideally placed to identify and refer households into a bespoke service.¹⁴

Alternatively and at minimum, BEIS should ensure that in their stakeholder engagement processes, the GDNs include provision for identifying and referring fuel poor and vulnerable households to allied services or project partners that can provide this kind of support. This should include the establishment of a mechanism for referring households to any energy efficiency programmes administered by the relevant local authority or housing association (e.g. ECO4, future iterations of the SHDF, etc.), and a mechanism for referring households to local or national energy advice and support services. As noted above, gas engineers should be equipped and enabled to refer households they identify as vulnerable through this mechanism, as should any resident liaison officers that come into contact with households through community events, doorknocking, and other forms of engagement.

Participants in the trial area are not expected to pay more to use hydrogen than they would for natural gas.

Consumers in the trial area are not expected to pay for the installation and maintenance of hydrogen-capable appliances, or an alternative heating solution (and faulty or inoperative appliances and equipment are promptly repaired or replaced at no cost to the consumer).

No consumers in the trial area are financially disadvantaged as a result of a grid conversion trial taking place.

Consumers are treated fairly when the trial concludes and are transitioned back to using natural gas.

NEA agrees that consumers should not be financially disadvantaged in any way as a result of a grid conversion trial taking place, and considers this a vital step to ensuring the trial is fair and does not exclude low income or fuel poor consumers. Research by Leeds Beckett University has demonstrated that consumers would be concerned about the dual costs of

energy bill increases and appliance replacements if they were converted to hydrogen, and this research also highlighted that consumers in the 'able to pay' bracket were concerned about the detrimental impact of increased costs on fuel poor, vulnerable, and older consumers.¹⁵ Furthermore, research undertaken by Newcastle University found that any increased cost would be a significant barrier to consumers' willingness to take part in a blended hydrogen trial. This research found that 41.2% of a nationally representative sample valued hydrogen but were not willing or able to pay more for it, and that 43.7% of respondents agreed with the statement *I fear that hydrogen would be too expensive*, compared to 13.3% that disagreed.¹⁶ Internationally, a small amount of academic research has also shown that there is a very limited willingness to pay more for different hydrogen technologies (e.g. hydrogen buses) among national publics.¹⁷ Taken together, the weight of this evidence suggests that if a hydrogen grid conversion trial has any cost to the consumer, the proportion of consumers opting into the trial may be detrimentally affected, perhaps fatally. Given the importance NEA attaches to ensuring vulnerable consumers are included in the trial to optimise the wider benefit of any large scale hydrogen rollout in the future (see above), this is particularly vital for low-income and financially vulnerable consumers, who would be more likely to be dissuaded from taking part in a trial if there were any cost implications.

Accordingly, NEA would like to see a commitment to the following:

- That participants in the trial area *do not* (as opposed to 'are not expected to') pay more to use hydrogen than they would for natural gas, or for the installation of hydrogen appliances or an alternative solution. As noted elsewhere in our response to the consultation, this will be pivotal to ensuring fuel poor and vulnerable consumers can be included in the trial, and this commitment must be set out and communicated clearly in the preparation phase of the trial. NEA would expect that billing methodologies and arrangements build on the methodologies used in hydrogen blending trials and H100 Fife to ensure that any cost differential between hydrogen and natural gas will be covered by the project.¹⁸ NEA expects that by the build phase of the trial, hydrogen ready boilers are installed that can be back converted to natural gas, removing the need to re-replace hydrogen boilers with natural gas boilers if the hydrogen network does not continue post-trial. Consumers should be able to keep these boilers beyond the life cycle of the trial irrespective of whether they remain on hydrogen or are returned to using natural gas at its end, providing they are safe and can be maintained effectively without disproportionate cost (e.g. servicing cost).
- If consumers are transitioned back to natural gas at the conclusion of the trial, all hydrogen-only appliances are replaced free of charge to the consumer (e.g. cooking appliances).
- Any consumers that take up the offer of the hydrogen conversion or the alternative heating solution do not pay any ancillary costs that might be associated with that solution, such as an upgraded connection to the electricity network for a heat pump, the capping of their gas supply, or any remedial/redecorative costs (e.g. plastering, wallpaper). This latter point on remedial costs is especially important if pipework and other similar parts of the household infrastructure may require replacing to facilitate the switch for some homes, as noted in a paper on hydrogen heating published by Citizen's Advice.¹⁹ In all of these situations, we expect the GDN will coordinate with the relevant industry actors and contractors (e.g. DNOs, installers of alternative heating solutions) to ensure that this does not happen.
- Ofgem should have oversight over all of the above commitments, and should be able to take enforcement action if they are breached.

Finally, NEA would like to see the trial used as an opportunity to understand more about the costs and benefits of supplying hydrogen to domestic homes. There is currently considerable uncertainty as to the possible future cost of transitioning domestic homes to hydrogen heating, both in terms of the costs necessary to convert the gas network and how consumer energy bills will be affected. In its section on home heating, a recent report by Cadent²⁰ has noted that *“whilst no-one knows what hydrogen will cost when it is deployed, it is reasonable to believe that it will be more expensive than fossil gas today.”* The report²¹ later states that, although the installation of a hydrogen boiler is expected to cost roughly the same as the installation of a natural gas boiler, *“the cost of the hydrogen fuel itself is expected to be higher and, like renewable electricity, will require subsidy to protect the customer as production scales enabling prices to fall.”* Going further back, a report by Northern Gas Networks, Cadent, and Equinor²² made an early estimate that using hydrogen for home heating could add 7% to consumer gas bills. However, it is equally possible that as processes of hydrogen production and distribution are scaled and refined, these predicted costs will reduce. These matters are not trivial, because if there are any additional costs of using hydrogen, regardless of when it is deployed, they will feed through into increased (or deepened) levels of fuel poverty.

As a result of this uncertainty, BEIS should seek to understand, in a capacity independent from the gas networks, how the trial can be used to gather evidence on the possible total costs of supplying hydrogen to domestic homes, including wholesale, distribution, and conversion costs. This should feed into a broader distributional analysis of the possible impact of large scale hydrogen conversion on energy bills and thus fuel poverty, precisely because the cost of energy will likely remain a barrier to fuel poor and vulnerable households accessing affordable warmth in a decarbonised future. In other words, if a decision is to be made on the future of the gas network in 2026, this evidence will be important to ensuring any such decision does not impact the affordability of energy and, ideally, improves it.

Additional protections and support are provided to consumers during the build phase of the grid conversion trial, particularly relating to the length of time consumers may be disconnected from the gas grid

NEA agrees with this proposition. Research²³ on consumer acceptability of hydrogen and heat pumps undertaken for the Committee on Climate Change (CCC) in 2018 found that *“the main barrier to acceptability of hydrogen heating was the one to two weeks that households would have to be disconnected from the gas supply during installation.”* Research by Leeds Beckett University also suggested that participants in their study assumed the length of the disconnection would be hours rather than days.²⁴ The time households will be disconnected from the gas grid during conversion is therefore a key issue that requires additional consumer protection. From NEA’s point of view, there are several additional risks of being disconnected from supply for vulnerable consumers that will also be necessary to address.

Specifically, it is especially important that households featuring occupants with cold-related health conditions, households with children, and other vulnerable households who rely on natural gas for heating and cooking can heat their homes and adequately prepare meals during the period of disconnection from the gas grid. We agree that for the purposes of the village trial, this proposition should apply to all customers who are converted to hydrogen. We think that this could be achieved through amending the existing legislation in The Gas (Standards of Performance) Regulations 2005, Part II, Section 9, which set out GDN’s responsibilities to priority customers who are disconnected from supply, or using this legislation as a starting point for a part of new primary legislation.²⁵ Specifically, this legislation could include:

- A specification that alternative heating and cooking facilities are provided directly to the premises a specified period of time in advance of planned disconnection, rather than from a place reasonably conveniently situated to the customer’s premises (3 c i). This will make it simpler for vulnerable consumers to obtain alternative heating and

cooking facilities in advance of their supply being disconnected and raise any queries they have about their use or operation with the GDN's engagement team well before supply is actually switched off. This will also maintain a touchpoint between the GDN's engagement team and the household.

- An expansion of the appliances specified in 4a of Section 9 to include a wider range of heating, cooking, and hygiene facilities (e.g. an electric shower), dependent on the need of the household. The narrow range of facilities specified in the legislation as it currently reads is insufficient for one to two weeks off supply, and specifying a wider range of facilities within updated or new legislation will therefore enable consumer choice over the appliances they will need to use for the time they are off supply.
- BEIS should consider whether an amendment is required to provide vulnerable households with financial support if they are likely to be financially disadvantaged by using alternative heating and cooking facilities for a period of up to two weeks. For example, if a household is provided with portable heaters during a period of disconnection, it is possible they will pay more per unit of energy to achieve a satisfactory heating regime²⁶ than they would using natural gas central heating, which may result in them harmfully rationing the heat that they use to stay within their household budget. This is dependent on a multitude of factors, such as the relative price of gas and electricity in 2025 and the precise length of time they will be off supply, but at minimum BEIS should expect the GDNs to set out how they will ensure fuel poor and vulnerable consumers who are disconnected from supply can stay warm at home in a way that does not create financial disadvantage or hardship.
- A requirement should be introduced in amended or new legislation whereby the lead GDN is obligated to contact all consumers at specified points in their disconnection period (e.g. one day after disconnection, seven days after disconnection) to ensure that temporary cooking and heating facilities are working correctly and meeting the cooking/heating needs of the household. It would be unacceptable if any household was left cold at home because their supply has been disconnected and they cannot use, or experience unforeseen problems with, the facilities that they have been provided.

There is a means of 'consumer redress' if customers are unhappy about the way that aspects of a grid conversion trial are being conducted, potentially linking to existing Alternative Dispute Resolution provisions or even including the development of a bespoke dispute resolution mechanism.

NEA agrees with this, and has no view at present as to whether this could be based on existing provisions or a bespoke mechanism. In keeping with our responses below on communication and information, we would add only that such a mechanism must be easy for consumers to understand and activate, and communicated clearly in advance of the build phase through a range of different mediums.

The principles of the quality of service in the Gas (Standards of Performance) Regulations 2005 will be adhered to.

There is some form of independent oversight or scrutiny of the lead GDN's conduct during a grid conversion trial (e.g. through Ofgem).

NEA agrees with both of these propositions, and believes that Ofgem would be the most suitable body to perform an oversight role.

We would add that there should be independent research and evaluation activities conducted before, during, and after the trial to understand consumer experiences of the process, including the experiences of vulnerable energy consumers. Collecting feedback on the consumer experience of the trial process should in other words be undertaken

independent of the lead GDN running the trial. This is essential to ensuring robust, reliable feedback is obtained from trial participants which can feed into the potential development of the hydrogen ‘town’ trial and any future large scale hydrogen conversion. Research and evaluation activities should include appropriate quantitative and qualitative research with trial participants. Research and evaluation could be commissioned directly by BEIS, or, due to the likely need of any evaluation to work closely with the lead GDN and any local partners involved in liaising with households in the village site, be included within GDN applications as a distinct work package.

There is comprehensive and accessible information and guidance on how a grid conversion trial will affect consumers in the trial area, and options for participation, to enable them to make informed decisions.

The ‘alternative offer’ to consumers who do not wish to take part in a grid conversion trial should include clear language and information.

Customer information packs will be made available for those who participate, including details of billing arrangements, length of trial and relevant contact information.

We agree with these propositions. Previous research on public perceptions of hydrogen has demonstrated that knowledge and awareness of hydrogen among the UK population is consistently low. For example, research²⁷ undertaken for the CCC in 2018 found that just over half (51%) of survey respondents had never heard of hydrogen fuel boilers, and in survey research²⁸ undertaken by Newcastle University, 64.4% of respondents answered only one or none of three knowledge questions on hydrogen correctly, suggesting that a majority of respondents “felt that they did not know enough about hydrogen to give an opinion on whether or not it should be accepted as a fuel for UK homes.” International research also suggests that segments of the population more likely to know about the potential of hydrogen as a heating technology tend to be those working in the trade (e.g. heating engineers) and those with backgrounds in STEM subjects.²⁹ NEA therefore agrees that clear and accessible information must be central to the development of consumer engagement strategies, and note that this is particularly important for consumers with specific communication needs and preferences.

For example, recent estimates suggest that at least 5% of the UK population remain digitally excluded, despite large increases in digital literacy caused by the shift to home working in the pandemic.³⁰ Research³¹ has suggested that digital exclusion intersects with a range of other groups that may be considered vulnerable, such as:

- Socio-economic group DE, and others who are structurally disadvantaged in society (e.g. low income, unemployed, low levels of educational attainment)
- People who are of an older age (over 65 but especially over 75)
- People who live in rural areas
- People with a disability
- People living in particular housing tenures (e.g. social rented housing)
- Those with particular household compositions (e.g. single parent female households, ethnic minorities, within-family carers)

Digitally excluded consumers and other groups with specific needs and preferences will therefore require communication that is accessible and tailored. Specifically, it should include what could be termed ‘multi-modal’ communications, encompassing community events, doorknocking, postal, local radio, local media, and online as one strategy, as well as the involvement of trusted community partners to build trust with residents where necessary. This kind of approach was utilised in the HyDeploy trial at Keele University, and was noted by parallel social science research and evaluation “to be very effective in addressing any potential concerns.”³² However, this research and evaluation also noted that the economic

status of participants in the Keele trial was “*relative[ly] economically advantaged*”,³³ and as the village trial will take place on a larger public network, it is more likely that village trial participants may have additional communication needs and preferences. Accordingly, the lead GDN should work with charities and groups that support consumers with specific needs (e.g. older people, visually impaired, sight impaired, those who speak English as an additional language) to ensure that all relevant information (e.g. customer information packs, options for participation) about the trial is provided in a suitably accessible manner, such as through translations where appropriate. If this is not done, there is a possibility that these consumers will be unwittingly excluded from processes of engagement, and as noted elsewhere in our response, this means we will not be best equipped to support these consumers in any future hydrogen rollout in the 2030s as we will not have prior learnings from their experiences of conversion.

More generally, BEIS should work with Ofgem to establish a framework for assessing the extent to which GDN’s communications and information about the trial meet the criteria of comprehensive, clear advice tailored to individual circumstances, including the needs of vulnerable consumers, those who do not speak English as a first language, those with limited financial capability, those who are non-users or narrow-users of the internet, and finally those in the private and social rented sectors, where engagement with both tenant and landlord will be important.

References

- ¹ For more information visit: www.nea.org.uk
- ² NEA also works closely with our sister organisation Energy Action Scotland (EAS).
- ³ BEIS (2021) [Sustainable warmth: protecting vulnerable households in England](#).
- ⁴ BEIS (2021) [Hydrogen for heat: facilitating a ‘grid conversion’ hydrogen heating trial](#), Annex A, x and xii.
- ⁵ BEIS (2021) [Hydrogen for heat: facilitating a ‘grid conversion’ hydrogen heating trial](#), Annex A, i.
- ⁶ NEA (2020) [Connecting Homes for Health](#).
- ⁷ As, for example, the HyDeploy trials at Keele University and Winlaton have been.
- ⁸ Scott, M. and Powells, G. (2019) [Blended Hydrogen: The UK Public’s Perspective](#).
- ⁹ Scott, M. and Powells, G. (2020) [Sensing hydrogen transitions in homes through social practices: cooking, heating, and the decomposition of demand](#), *International Journal of Hydrogen Energy* 45 (7): 3870-3882.
- ¹⁰ Fylan, F; Fletcher, M. and Christmas, S. (2020) [H21: Public perceptions of converting the gas network to hydrogen](#).
- ¹¹ Lambert, V. and Ashworth, P. (2018) [The Australian public’s perception of hydrogen for energy](#).
- ¹² Lambert, V. and Ashworth, P. (2018) [The Australian public’s perception of hydrogen for energy](#), p.33.
- ¹³ For more about this project, see: <https://www.nea.org.uk/news/pioneering-new-safeguarding-scheme-hits-1000-referral-milestone>
- ¹⁴ [HyDeploy: Demonstrating non-disruptive carbon savings through hydrogen heating](#) (2021)
- ¹⁵ Fylan, F; Fletcher, M. and Christmas, S. (2020) [H21: Public perceptions of converting the gas network to hydrogen](#).
- ¹⁶ Scott, M. and Powells, G. (2019) [Blended Hydrogen: The UK Public’s Perspective](#).
- ¹⁷ See the summaries of research and references on willingness to pay for hydrogen in Scott, M. and Powells, G. (2020) [Sensing hydrogen transitions in homes through social practices: cooking, heating, and the decomposition of demand](#), *International Journal of Hydrogen Energy* 45 (7): 3870-3882 and in Scott M. and Powells, G. (2020) [Towards a new social science research agenda for hydrogen transitions: Social practices, energy justice, and place attachment](#), *Energy Research and Social Sciences* 61: 101346.
- ¹⁸ SGN (2020) [H100 Fife Full Submission](#); Ofgem (2021) [Network Innovation Competition: Decision on outcome of Condition 3 of the 2021 Project Direction for Scotland Gas Network Plc’s H100 Fife Project](#); [HyDeploy: Demonstrating non-disruptive carbon savings through hydrogen heating](#) (2021)

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- ¹⁹ Citizen's Advice (2020) [Hydrogen for homes: Discussion paper with questions about how hydrogen might work for homes in Great Britain](#).
- ²⁰ Cadent (2021) [Our Green Print: Future Heat for Everyone](#), p.19.
- ²¹ Cadent (2021) [Our Green Print: Future Heat for Everyone](#), p.26.
- ²² Northern Gas Networks, Cadent, and Equinor (2019) [H21 North of England](#), p.18.
- ²³ Madano and Element Energy (2018) [Public acceptability of hydrogen in the home](#), p.8.
- ²⁴ Fylan, F; Fletcher, M. and Christmas, S. (2020) [H21: Public perceptions of converting the gas network to hydrogen](#).
- ²⁵ [The Gas \(Standards of Performance\) Regulations 2005, Part II](#).
- ²⁶ For "vulnerable" households (those where at least one member is aged 75 or over, or at least one member has a long-term sickness or disability), a satisfactory heating regime can be defined as 23°C in the living room (zone 1) and 20°C in other rooms (zone 2), for 16 hours every day.
- ²⁷ Madano and Element Energy (2018) [Public acceptability of hydrogen in the home](#), p.6.
- ²⁸ Scott, M. and Powells, G. (2019) [Blended Hydrogen: The UK Public's Perspective](#), p.2.
- ²⁹ See for example Alanne, K. (2018) [A survey of Finnish energy engineering students' knowledge and perception of hydrogen technology](#), *International Journal of Hydrogen Energy* 43 (22): 10205-10214.
- ³⁰ Lloyds (2021) [UK Consumer Digital Index 2021](#).
- ³¹ Carnegie Trust (2016) [The role of digital exclusion in social exclusion](#); Helsper, E. and Reisdorf, B. (2017) [The emergence of a "digital underclass" in Great Britain and Sweden: Changing reasons for digital exclusion](#), *New Media and Society* 19 (8): 1253-1270; Low Incomes Tax Reform Group (2012) [Digital Exclusion](#); Ofcom (2019) [Adults: Media use and attitudes report 2019](#); Ofcom (2016) [Access and Inclusion in 2016: Outcomes for consumers in vulnerable circumstances](#); Philip, L. et al. (2017) [The digital divide: Patterns, policy and scenarios for connecting the 'final few' in rural communities across Great Britain](#), *Journal of Rural Studies* 54: 386-398; Seifert, A. (2020) [The Digital Exclusion of Older Adults during the Covid-19 Pandemic](#), *Journal of Gerontological Social Work* 63 (6-7): 674-676; van Deursen, A. et al. (2015) [A nuanced understanding of Internet use and non-use among the elderly](#), *European Journal of Communication* 30 (2): 171-187.
- ³² [HyDeploy: Demonstrating non-disruptive carbon savings through hydrogen heating](#) (2021), p.36.
- ³³ [HyDeploy: Demonstrating non-disruptive carbon savings through hydrogen heating](#) (2021), p.35.