



HyDeploy Frequently Asked Questions

HyDeploy is being delivered by the HyDeploy consortium which has a variety of technical expertise and practical experience.



1. About HyDeploy

1.1 What is HyDeploy?

HyDeploy is an energy trial to establish the potential for blending hydrogen, up to 20%, into the normal gas supply to reduce climate changing carbon emissions.

HyDeploy is taking place on the Keele University campus in Staffordshire and is led by Cadent Gas and Northern Gas Networks. It will be first project in the UK to inject hydrogen into a natural gas network.

It will help us find out how much hydrogen can be used by customers as a blend with natural gas, without having to change home gas appliances.

The UK Health & Safety Executive has approved the year-long trial to start in Summer 2019.

1.2 Why is Keele involved?

Keele University is committed to developing a carbon free future through its innovative Smart Energy Network Demonstrator Project ([SEND](#)).

The University is the ideal location for HyDeploy, as it has:

- the largest campus in the UK served by its own private gas network;
- a mix of residential and commercial buildings, similar to a small town; and
- an international reputation for research excellence.

1.3 Which parts of the campus are involved in HyDeploy?	Click here for a map of the campus showing the areas which are part of HyDeploy.
1.4 Why do you want to inject hydrogen into the normal gas network?	<p>The UK is committed to a reduction in climate changing carbon dioxide (CO₂) emissions of 80% by 2050.</p> <p>Over 80% of UK homes are heated by gas, with heat accounting for around one third of UK CO₂ emissions. Progress has been made to decarbonise electricity, but very little on decarbonising heat.</p> <p>Some green gases, like biomethane, are already fed into the national gas network. But further research is needed on the potential of other zero or low carbon gases. That's what HyDeploy is all about.</p> <p>Many experts see hydrogen as an adaptable alternative to fossil fuels. This is because when hydrogen is burned it doesn't produce CO₂, just water and heat.</p> <p>Hydrogen (up to 20%) blended with natural gas could mean no change for customers while delivering carbon reductions fast.</p>
1.5 Why has this particular area of the campus been chosen for HyDeploy?	<p>The specific HyDeploy area of the Keele private gas network has been chosen because it can be easily isolated from the rest of the gas network.</p>
1.6 What is happening now?	<p>The HSE has considered all of the evidence gathered from homes in the trial area and other research and has approved the year-long trial to start in Summer 2019. The approval is based on the gas being 'as safe as natural gas' for customers to use.</p> <p>The current phase of the project (to Spring 2019) involves building and installing the equipment to deliver the hydrogen and inject it into the gas supply on the Keele University site.</p> <p>The live trial will begin in early Summer 2019.</p>

<p>1.7 I'm a householder/tenant in the HyDeploy area, what do I have to do?</p>	<p>We are now in Phase 2 (to early Summer 2019). During this phase you will be invited to have a standard annual gas safety check in your home. This is the same gas safety check that was done in Phase 1, but will be a shorter check as it does not include the testing of the blended gases that was during Phase 1. We will get in touch with you to arrange a convenient time for the check.</p> <p>This phase will also include the build and installation on the Keele site of the hydrogen production and technical equipment needed for the live trial.</p>
<p>1.8 What will I need to do during the live trial?</p>	<p>No specific action will be needed from you during the live trial.</p> <p>The option of a further annual gas safety check and a free boiler service during the trial will be offered.</p> <p>You will also be given the option to participate in spot checks on the performance of your gas appliances; and/or give general feedback on your experience of using the blended gas for cooking, heating, etc.</p>
<p>1.9 I visit/work in one of the buildings in the HyDeploy area, how will it affect me?</p>	<p>If you visit/work in one of the faculty buildings that are part of the Keele HyDeploy area, you shouldn't notice any difference either before or during a live trial.</p>
<p>1.10 I live/work on a part of the campus that isn't in the proposed HyDeploy trial area. How will HyDeploy affect me?</p>	<p>You will not be directly impacted by HyDeploy.</p> <p>You may notice some minor disruption as works are carried out on site associated with HyDeploy. Works will be co-ordinated with other activities on the site to minimise this wherever possible.</p> <p>If you are interested in HyDeploy, please visit the website www.hydeploy.co.uk, ring the helpline on 01782 733777, or look out for other information in University e-mails and events on campus.</p>

<p>1.11 How is HyDeploy being paid for?</p>	<p>£6.7m has been provided by Ofgem's Gas Network Innovation Competition. In addition, Cadent Gas Ltd and Northern Gas Networks have invested £375,000 each.</p>
<p>1.12 Will HyDeploy cause any disruption on the campus?</p>	<p>There are various activities related to HyDeploy which will happen on the campus between now and 2020.</p> <p>As part of Phase 2, the hydrogen generation unit and other technical equipment on the Keele University site.</p> <p>There will also be upgrades to certain parts of the Keele pipe network in preparation for a live trial. Wherever possible work will be coordinated with other estates work on the campus to minimise disruption.</p> <p>No disruption is expected during a live trial. Throughout the live trial, heating and hot water in homes and buildings will be provided as normal.</p>
<p>1.13 How much of a difference could 20% hydrogen make to UK carbon emissions?</p>	<p>If HyDeploy is successful a similar public trial could be carried out on a larger scale, and beyond that a blend could be rolled out across the UK. This would help to lower carbon emissions relatively quickly with limited disruption to customers, while wider decarbonisation projects are progressed.</p> <p>If hydrogen were blended with natural gas across the UK at a similar level to HyDeploy, it could save around 6 million tonnes of carbon dioxide emissions every year, the equivalent of taking 2.5 million cars off the road.</p>
<p>1.14 How much hydrogen will be blended with natural gas in a live trial?</p>	<p>The UK Health & Safety Executive has approved a blend of up to 20% hydrogen with natural gas for the HyDeploy live trial.</p>

<p>1.15 Why was the hydrogen level set at a maximum of 20%?</p>	<p>The decision to restrict the blend to 20% is based on:</p> <ol style="list-style-type: none"> 1. Earlier studies, (e.g. HSE Research Report RR1047, 2015) indicate that the addition of up to 20% hydrogen by volume is unlikely to present any extra risk that already associated with natural gas delivery. 2. 20% is the level where it is expected that gas customers use and appliances will not be affected. 3. Gas appliances manufactured after 1993 have been designed to operate with a hydrogen mix up to 23% <p>Beyond HyDeploy, other projects are looking at how higher concentrations of hydrogen could work on different parts of the national gas network in the future (Northern Gas Networks, H21), as well as with gas appliances (BEIS innovation funding).</p>
<p>1.16 How long does HyDeploy run for and what happens when?</p>	<p>HyDeploy runs for three years from April 2017 – March 2020. It has three phases. Click here to see a timeline.</p> <p>Phase 1 (To Sept 2018) Completed</p> <p>Laboratory testing of gas blends; safety checks in homes and buildings in the proposed live trial take place. A safety evidence case is prepared for the UK Health & Safety Executive (HSE) and reviewed.</p> <p>Phase 2 (Oct 2018 – May 2019 approx.)</p> <p>Following approval of the live trial from the HSE, the hydrogen production and blending units are installed on the Keele University campus; and improvements are carried out to the campus pipe network.</p> <p>Phase 3 (Early Summer 2019 for 12 months)</p> <p>Live trial.</p>

<p>1.17 What is the environmental benefit of using hydrogen?</p>	<p>When hydrogen is burned it doesn't produce carbon dioxide, just water and heat. Therefore it offers a way to deliver low carbon energy, providing it can be produced without creating carbon emissions. For more information on hydrogen production click here.</p>
<p>1.18 Will you stop using hydrogen at Keele after the live trial?</p>	<p>Yes. At the end of a live trial the normal gas supply will be resumed and the hydrogen production unit will be removed from the Keele University site.</p>
<p>1.19 How will you bill me for my gas when it is a mix? Will it cost me more?</p>	<p>The change from normal gas to blended gas during the live trial will not cost you more. We have worked with Ofgem, the energy regulator to ensure this is the case. Keele University will let you know your energy costs for 2019/20 in Spring 2019.</p>
<p>1.20 How was approval given for HyDeploy at the University?</p>	<p>HyDeploy was approved in September 2016 by Keele University's Council as the first large scale project within the SEND programme. The HyDeploy team is in continuous dialogue with the University's Research Ethical Review Panel to ensure compliance.</p> <p>HyDeploy is overseen by the SEND Project Executive Group chaired by the Deputy Vice-Chancellor. It is being facilitated by the Directorate of Engagement and Partnerships and the Estates and Development Directorate.</p>
<p>1.21 How will personal data from householders be used and/or protected?</p>	<p>Any personal, identifiable data will continue to be managed by Keele University's Estates & Development Directorate in accordance with standard guidelines, under data protection regulations.</p>



1.22 How will you deal with complaints and concerns?	<p>The Estates and Development office will be the first point of contact for complaints and concerns relating to HyDeploy. This is the normal process for raising an issue with energy supply at Keele.</p> <p>Call 01782 733777</p>
1.23 If HyDeploy at Keele is a success will hydrogen blended gas be rolled out nationally?	<p>The next step for hydrogen blended gas is a trial on a small public network. The team leading HyDeploy are looking at potential locations for a further trial. It would provide more evidence about how a blended gas would worked for a larger number of customers and on a wider range of appliances in different types of homes and buildings.</p> <p>If evidence from HyDeploy at Keele and future trials is positive there is potential for hydrogen blended gas at a similar level to be rolled out nationally.</p>



2. The HyDeploy Project partners

2.0 Who is involved in HyDeploy?

HyDeploy is being delivered by the HyDeploy consortium, which has technical expertise and practical experience.

Consortium members: Cadent Gas Limited, Northern Gas Networks, Keele University, Health & Safety Laboratory, ITM Power and Progressive Energy.

Delivery of HyDeploy is also supported by specialist gas safety testing specialists **Kiwa**, industry research experts **Dave Lander** and technical consultants **Otto Simon Limited**.

2.1 What are the roles and responsibilities of the HyDeploy project partners?

HyDeploy is being delivered by the HyDeploy consortium, which has technical expertise and practical experience. The partners are:-

[Cadent Gas](#) (formerly National Grid Gas Distribution) is leading HyDeploy. It owns and operates four of the eight gas distribution networks in the UK, including the West Midlands.

[Northern Gas Networks](#) is partnered with Cadent to deliver HyDeploy. The project supports its work exploring the future role of gas. It owns and operates the gas network in the North East, Northern Cumbria and much of Yorkshire.

[Keele University](#) is hosting HyDeploy on its campus and the University's Materials Department are carrying out research on the impact of hydrogen on materials.

[Health & Safety Laboratory](#) is the scientific arm of the Health & Safety Executive. It will be providing the scientific evidence which will support the safety case for the trial.

[ITM Power](#) manufacture integrated hydrogen energy solutions. It will be supplying the hydrogen production unit for HyDeploy.

[Progressive Energy](#) is an independent UK clean energy company. It will be supporting HyDeploy through development and implementation

<p>2.1 Continued...What are the roles and responsibilities of the HyDeploy project partners?</p>	<p>Supporting companies</p> <p>Kiwa specialise in gas testing. It is carrying out offsite testing on a range of common household appliances to inform the project; and will lead the gas safety appliance checks on the campus.</p> <p>Dave Lander - is an internationally recognised expert in gas quality and safety and is co-ordinating the application to the HSE.</p> <p>Otto Simon Limited - is an engineering consultancy and project delivery organisation, responsible for the installation of hydrogen equipment onsite.</p>
<p>2.2 What role does Ofgem have?</p>	<p>Ofgem (Office of Gas and Electricity Markets) is the energy industry regulator. Its overall role is to protect the interests of existing and future electricity and gas consumers.</p> <p>HyDeploy has received £6.7m in funding under Ofgem’s Gas Network Innovation Competition. This competition is an annual opportunity for gas network companies to compete for funding to develop and demonstrate new technologies, operating and commercial arrangements for the industry. Funding is provided to the best innovation projects which help all network operators understand what they need to do to provide environmental benefits, cost reductions and security of supply as the UK moves to a low carbon economy.</p> <p>Annual and final reports will be provided to Ofgem on the progress of HyDeploy.</p> <p>In its role as regulator, Ofgem will also need to approve the approach used for billing customers during HyDeploy, to ensure their interests are fully protected.</p>

2.3 Who has overall control and final say on HyDeploy?

Cadent is leading HyDeploy. It is supported by the steering committee which is made up of representatives of all the project partners.

Keele University has oversight and final approval of all activities on the campus and the running of the live trial on the campus gas network.

The Health & Safety Executive is responsible for approving the blend of gas that will be delivered in the live trial.

Ofgem has awarded the funds to HyDeploy and through its governance process ensures that it is properly delivered.



3. Safety

3.0 What are the risks of having hydrogen blended with normal gas in my home or in the gas pipes, compared with normal gas?

The HSE is satisfied that the blended gas will be as safe to use as normal gas for customers to use; and that existing equipment and established procedures are just as effective at managing the risks.

3.1 Hydrogen is invisible and does not smell. How will we know if there is a leak?

Neither hydrogen nor natural gas smell in their normal state. Natural gas supplied via gas mains has a special odorant added to it to give it its characteristic smell, so that leaks can be detected. Adding some hydrogen to natural gas may dilute the smell, but will not change its effectiveness. If required, additional odorant will be added to compensate for this. Tests will be carried out on the Keele network to ensure the required levels are maintained through the trial.

There are also other gas safety measures in place on the gas network, including routine leak detection, which uses specialist equipment.

Standard gas safety checks for homes also include a leak test.

For HyDeploy, all the equipment and procedures used for leak detection have been thoroughly tested to make sure they are as effective on the blend as on natural gas.

3.2 How can you be sure we only receive 20% hydrogen when the gases are blended together?

The Project team will make sure the hydrogen is blended with natural gas reliably, at a consistent level and maintains a steady flow. This is important for HyDeploy.

The equipment to mix and inject the blend into the grid will be designed and supplied by one of two industry specialists who have built some of the 70 biomethane grid injection units in operation in the UK today, and who have the necessary expertise in gas handling. This equipment will be designed to ensure:

- it never exceeds the permitted blend rate and mixes the two gases effectively,
- it delivers gas over the range of flows experienced on the Keele network,
- that the blended gas is within specification even when the quality of the underlying natural gas varies as it does today,
- it maintains gas delivery to customers under all circumstances,
- the gas has the necessary 'smell' for detection; and
- the integrated system has the necessary control and Safety Instrument Levels required for this kind of processing equipment.

3.3 What safety requirements does HyDeploy have to meet?

The percentage of hydrogen that will be delivered has been approved by the Health & Safety Executive (HSE). The HSE is satisfied that the blended gas is 'as safe as natural gas' and has given permission for it to be distributed through the Keele network. With this approval, the gas is compliant with the standard regulations will be supplied to customers for the 12 month trial, as normal gas is today.

3.4 Will the gas safety advice be different when the hydrogen is added?	<p>Gas safety advice for consumers will remain the same during a live trial of blended natural gas and hydrogen, and the number you call in an emergency remains the same.</p> <p>General gas safety advice can be found on the Gas Safe Register website.</p>
3.5 What happens if something goes wrong at any time during HyDeploy?	<p>As in any gas related emergency, the 24 hour National Gas Emergency Service will attend. This service is operated by Cadent.</p>
3.6 Will this affect household insurance policies?	<p>No. The gas delivered will be approved for delivery as an exemption under the current Gas Safety Management Regulations and is therefore legally compliant the same way as normal gas.</p>
3.7 Has there been any safety incidents associated with blending hydrogen with gas?	<p>No incidents have been found that relate to the use of the hydrogen and normal gas blend proposed for use at Keele.</p>

3.8 Have there been other trials showing safe use of hydrogen blended with gas?

Hydrogen and natural gas blends have previously been used safely in Europe.

Netherlands

A project in Amerland in the Netherlands was safely undertaken to inject hydrogen at up to 20% volume into their natural gas grid for use by domestic consumers.

Germany

A trial was successfully carried out by E.ON Technologies in the Klanxbüll/Neukirchen region of Germany where around 170 gas customers were supplied with a natural gas blend containing up to 10% volume hydrogen.


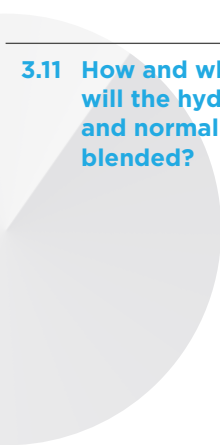
France

The GRHYD project is currently underway in France. It will be injecting up to 20% vol. hydrogen into natural gas to deliver to around 100 domestic customers and a hospital. As with HyDeploy, this project has gathered the scientific evidence to support the case for the trial. Based on this, permission has already been granted by the French authorities and injection is due to commence towards the end of 2017.

These trials are all different in a number of respects from each other and from HyDeploy. In particular HyDeploy is focused on using an existing gas network and one designed to UK specifications. If you would like further details of these trials please contact the project team at info@hydeploy.co.uk.

The permitted levels of hydrogen in the gas supply vary across Europe. [Click here](#) to see a graph showing permitted levels.

Safety is the most important factor for this project. That's what the checks are all about, ensuring that it meets the highest standards demanded by the Health and Safety Executive.

<p>3.9 Is there additional danger for buildings which are close to the trial area?</p>	<p>The hydrogen blended gas has been approved by the Health & Safety Executive to be 'as safe as natural gas' for any potentially affected party.</p> <p>This means the blended gas will not pose a greater risk to buildings on or close to the live trial area than the normal gas supply.</p>
<p>3.10 Are there any risks associated with producing the hydrogen?</p> 	<p>The hydrogen for HyDeploy will be generated on demand at the Keele site using an electrolyser. Electrolysis uses electricity to split water into hydrogen and oxygen.</p> <p>The electrolyser installation will be assessed to ensure safe operation. In addition, the electrolyser and blending units will be fitted with gas detection and response systems.</p> <p>A number of electrolysers produced by ITM are currently operating in the UK and abroad for both blending into the gas grid and for hydrogen refuelling stations.</p>
<p>3.11 How and when will the hydrogen and normal gas be blended?</p> 	<p>A blending unit will be installed next to the electrolyser. This will take gas from the existing supply and add the hydrogen before it is pumped into the network.</p> <p>This equipment will be designed and supplied by specialists to make sure the permitted blend rate is not exceeded; that the gases are mixed effectively and; that gas supply is always maintained to customers.</p>

4. Technology

<p>4.0 How will the hydrogen be generated for HyDeploy?</p>	<p>The hydrogen for HyDeploy will be generated using an electrolyser on the Keele University site. An electrolyser uses electricity to split water into hydrogen and oxygen so hydrogen can be used as energy. It will be powered by renewable energy sources.</p> <p>Electrolysis is widely used internationally for hydrogen production, with a number of units operating reliably in the UK, primarily for use in the transport sector. In the unlikely event of a shortfall in hydrogen production, the existing gas supply is more than adequate to maintain sufficient gas supplies on the network.</p>
<p>4.1 What is an electrolyser and how does it work?</p>	<p>An electrolyser uses electricity to split water into hydrogen and oxygen so hydrogen can be used as energy.</p>
<p>4.2 Will the electricity used to produce the hydrogen come from renewables?</p>	<p>Yes. Keele University's electricity supply is 100% renewable in line with the University's commitment to leading the way in reducing carbon emissions and tackling climate change.</p>
<p>4.3 Why are you using an electrolyser to produce the hydrogen?</p>	<p>This is the most practical way to produce hydrogen for a project of this size and duration. It avoids the need to transport and store hydrogen on site or build extensive infrastructure. On a larger scale, hydrogen can be produced by electrolysis using renewable energy such as wind and solar power.</p>
<p>4.4 Where is the electrolyser coming from?</p>	<p>HyDeploy project partner ITM Power will supply the electrolyser.</p> <p>ITM Power manufacture advanced hydrogen energy solutions and have provided electrolyser units to several other projects. These include two in Frankfurt and Ibbenbüren, injecting hydrogen into the German gas network; as well as several hydrogen filling stations for Fuel Cell Electric Vehicles in the UK.</p>

4.5 Is electrolysis the best way to produce hydrogen?	There are a number of ways to produce hydrogen. Electrolysis is the most practical way to produce hydrogen for a project of this size and duration. It avoids the need to store hydrogen on site or build extensive infrastructure. For more information about hydrogen production click here .
4.6 Will the hydrogen have a long-term effect on my domestic gas appliances?	<p>The Health & Safety Laboratory and Kiwa have tested hydrogen blends (up to 20%) on a range of common household gas appliances. This has shown that hydrogen at this level does not affect the safe day to day operation of appliances. As part of the laboratory testing programme, the impact of long term operation on hydrogen is being evaluated, and will form part of the definition of the hydrogen blend proposed.</p> <p>Gas appliance safety checks have been carried out on the Keele site and spot checks during the live trial will provide valuable additional information about the performance of appliances on a real network. All appliances sold after 1993 must comply with a 1990 Gas Appliance Directive which demonstrates that they can operate on a wider range in gas quality than specified in the current regulations. This includes a gas composition of 23% hydrogen.</p>
4.7 Will the University continue to inject hydrogen after the live trial?	The electrolyser which generates the hydrogen will be transferred on to future HyDeploy projects after the live trial. The University will evaluate the evolving technology and could include this in its future plans to take the University campus to zero emissions.

5. Gas appliance safety checks and servicing

<p>5.0 Will you be carrying out further safety checks?</p>	<p>All private householders will be offered a standard gas safety check in Phase II (2018/19) and Phase III (2019/20) of HyDeploy. This brings all homes in the trial area in line with the University's legal obligations for gas safety check requirements in its tenanted properties.</p> <p>We will be contacting householders and tenants about these checks in early 2019.</p>
<p>5.1 Will the HyDeploy project arrange for my boiler be serviced?</p>	<p>Free, optional gas boiler services will be offered during the live trial (2019/20).</p>
<p>5.2 I have a boiler servicing contract, what should I do?</p>	<p>If you have an existing boiler servicing contract, please contact the HyDeploy project team for further advice on 01782 733777 or email info@hydeploy.co.uk</p>
<p>5.3 Why do you need to carry out gas safety checks on my appliances?</p>	<p>The standard gas safety checks for HyDeploy are the same checks that are carried out by landlords in all tenanted properties. They provide reassurance that gas installations meet current safety standards. The checks will provide a Gas Safety Certificate for your home.</p>
<p>5.4 Will the gas appliance safety checks cost me anything?</p>	<p>No. The checks and any associated costs will be paid for by the HyDeploy project.</p>
<p>5.5 What if I don't agree to have my appliances checked?</p>	<p>You can decide not to have your gas appliances safety checked. It is a standard gas safety check as would be carried out in any tenanted property, and it is highly recommended that you do take the opportunity.</p>

5.6 How do I set up a time to have my safety check?	We will be in touch in early 2019 to arrange a convenient time for you to have a safety check.
5.7 Do I have to be at home for the safety checks to be done?	No. If you prefer, you can leave your keys with the Keele Estates department on the day of your scheduled safety check appointment. You will need to collect your keys from the Estates Office later that day.
5.8 What happens if one of my appliances isn't working properly?	<p>The gas safety check will follow the industry standards for testing gas appliances. In the unlikely event that this test finds that one of your appliances is immediately at risk or dangerous, it may be disconnected. If this happens, you will be provided with temporary heating, and the Keele Estates team will work with you to get you back on to gas as soon as possible.</p> <p>If one of your appliances is recommended for repair or replacement; the Keele Estates team will work with you to arrange this. The HyDeploy project will pay for the full cost of repairing and replacing gas appliances.</p>
5.9 What happens if I change one of my appliances between now and the live trial?	If you replace one of your appliances or you are concerned about the performance of one your appliances ahead of a live trial, please contact the project team on 01782 733777 or info@hydeploy.co.uk .





Ways to get
in touch.

website www.hydeploy.co.uk

email info@hydeploy.co.uk

call [01782 733777](tel:01782733777)