capital **hydrogen**

Working in partnership to deliver hydrogen for London, the East of England and the South East

UPDATES FROM OUR FIFTH CONSORTIUM MEETING

Cadent Your Gas Network

national gas

SGN

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FEATURED SPEAKERS

Kelly Manders, Cadent

Duncan Cairnie, Autoflame

Alan Stephen, National Gas

Marius Bosch, Rux Energy

Siobhan Grant, Cadent

FOREWORD

Kelly Manders
Regional Development Manager (East and London),
Cadent

We were delighted to welcome back members and industry experts for our 5th Capital Hydrogen Consortium meeting.

Momentum in the hydrogen landscape continues to build, and the sense of excitement and opportunity was clear throughout the session.

We were particularly pleased to share progress on the East London Hydrogen Pipeline, following its launch earlier this year. Siobhan Grant, Hydrogen Project Delivery Engineer at Cadent, provided an insightful update on the project's next steps, while Alan Stephen, Business Development Manager at National Gas, gave a valuable briefing on the National Gas hydrogen blending system - both strong indicators of the sector's rapid development.

Members Autoflame and Rux Energy also showcased the innovative hydrogen projects they are advancing, offering a glimpse of the exciting work happening across our network.

Our breakout sessions proved, once again, to be an invaluable space for collaboration and discussion. These conversations help us capture member insights and shape our collective response to the evolving hydrogen landscape.

A huge thank you to everyone who joined us, contributed, and helped make the meeting such a success. The energy in the room reflected a shared understanding that the hydrogen transition is no longer a future ambition - it's happening now.

FOREWORD

Donald Oleforo
Head of Hydrogen Business Development,
National Gas

Our Capital Hydrogen Consortium meeting brought together an inspiring group of partners and innovators – thank you to everyone who took part.

It's an incredibly exciting time to be part of the UK's hydrogen journey. Government policy signals a strong role for hydrogen as a key part of our energy future, with the recent Hydrogen Update to the Market reflecting growing momentum across the sector.

The meeting was filled with fascinating insights and forward-looking discussions that reflected the pace and ambition of the UK's hydrogen transition.

Thank you to our wonderful members Autoflame and Rux Energy who shared exciting updates on the pioneering hydrogen projects they're advancing - showcasing the innovation and ambition driving our network forward.

We also welcomed insights from Alan Stephen on the National Gas blending system, which will play an important role in enabling a robust hydrogen economy. This is a critical step in enabling a smoother transition to low-carbon energy across the UK.

The energy, innovation, and collaboration we witnessed at the consortium meeting truly captured the momentum behind the UK's hydrogen transition.

It's been brilliant to see the consortium continuing to grow, with our new members bringing fresh perspectives and expertise to the table. As we look ahead, this expanding network and shared commitment will be key to shaping practical solutions and driving real progress across the sector.

COLLABORATION IN ACTION

One of the highlights of the day was our breakout sessions, which provided a fantastic opportunity for members to engage directly with one another across all parts of the hydrogen value chain - from producers to consumers.

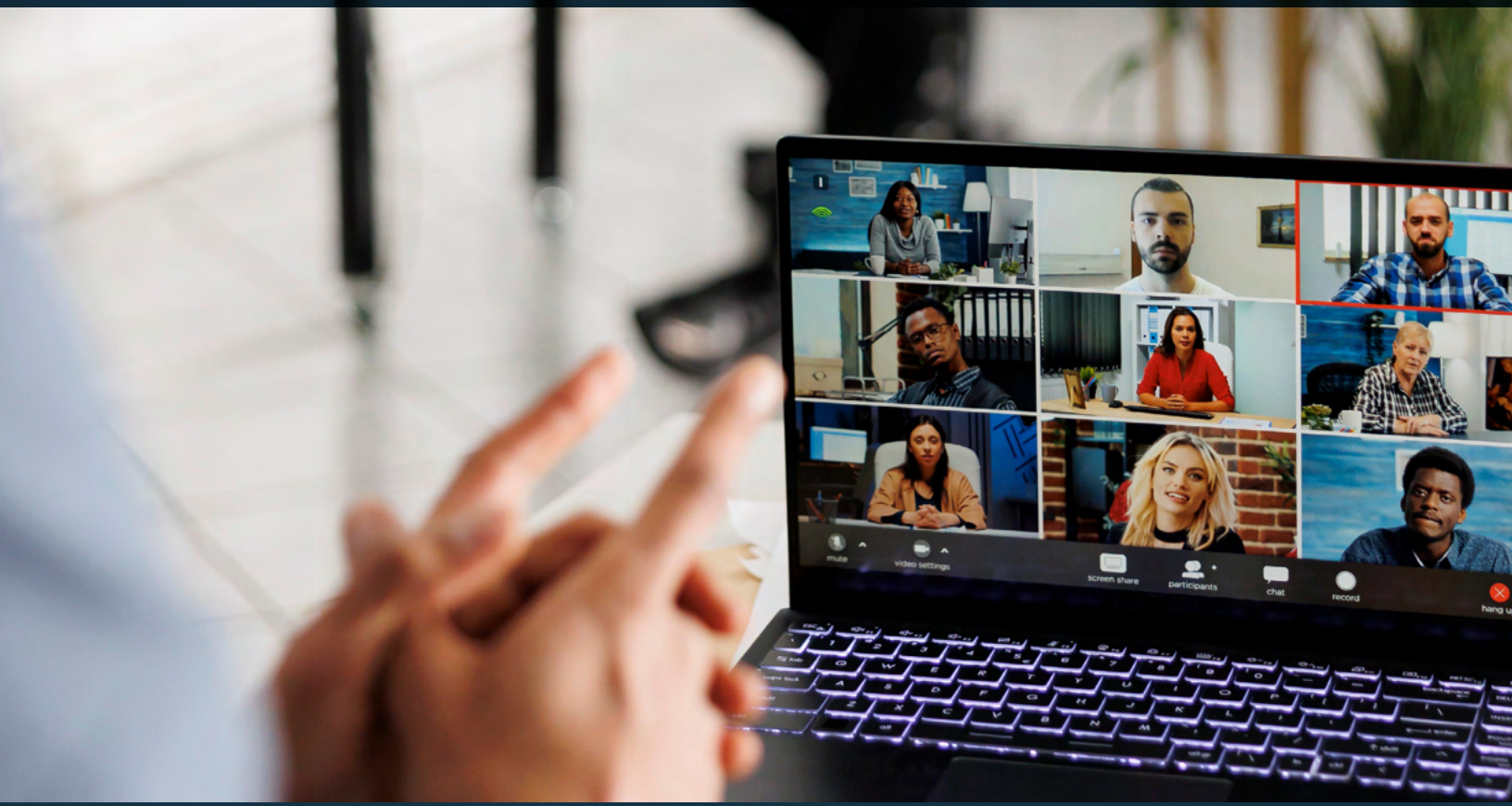
The sessions were facilitated around two key questions:

1. **What opportunities does hydrogen present for your company?**
2. **How can the Capital Hydrogen programme best support your organisation to achieve these opportunities?**

These sessions sparked rich conversations about current hydrogen projects, organisational goals, and the practical support needed to help kickstart or develop hydrogen initiatives.

Members shared insights into the challenges they're facing - such as capital expenditure, commercial risk, and internal sign-off processes - as well as the exciting opportunities hydrogen presents in helping companies meet their net zero targets.

A recurring theme was the momentum behind hydrogen and the sense that now is the time to act. Many participants spoke about how accessible and achievable the transition feels, describing it as an exciting time for innovation and collaboration.



Importantly, the breakout sessions reinforced the value of our Consortium meetings and creating spaces where stakeholders from across the hydrogen value chain can connect, share, and collaborate. It was fantastic to see such a high level of engagement and genuine collaboration, with members from across the value chain each bringing unique perspectives and experiences to the table.

Equally, participants from across the value chain highlighted the need for higher demand forecasts and greater certainty for the direction of the industry, alongside electricity price reform to lower the cost of low carbon hydrogen.

What stood out most was the recognition of the Capital Hydrogen programme not just as a strategic initiative, but as a community builder. Members spoke enthusiastically about the value of opportunities like these to come together, exchange ideas, and build momentum.

It was brilliant to hear how the programme is helping to unite diverse voices to shape the future of hydrogen in the region, and how the sense of urgency and excitement around hydrogen is growing.

ELHP UPDATE

Siobhan Grant
Cadent

Siobhan Grant shared a fantastic update on the progress of the East London Hydrogen Pipeline (ELHP), offering valuable insights into the findings from the Pre-FEED (Front-End Engineering Design) study and the exciting potential this project holds for the region's hydrogen future.

Where we are now

Siobhan explored the technical and strategic foundations laid during the Pre-FEED phase, confirming that the ELHP is technically viable and well-positioned to support the UK's hydrogen ambitions. The study validated that a 500mm diameter polyethylene (PE) pipeline, operating at up to 7 barg, is suitable for transporting hydrogen across East London.

The pipeline is designed to connect three hydrogen producers with 20 industrial customers, without the need for large-scale hydrogen storage - an important milestone in demonstrating the practicality of hydrogen distribution at scale.

One of the standout highlights was the project's potential for carbon emissions reduction. The ELHP could save emissions equivalent to 9,449 one-way flights from London to New York every year. To put that into perspective, this is roughly the same as the carbon absorption capacity of thousands of trees annually.

Route planning & asset reuse

Route development has been a major focus in the development of plans for the ELHP. The team initially explored 11 potential pipeline routes, which have now been refined down to three viable options. These routes were assessed against a range of criteria including technical feasibility, environmental impact, consenting requirements, and constructability.

Siobhan also discussed the exciting possibility of asset reuse, which could significantly reduce costs and environmental disruption by repurposing existing infrastructure.

Next steps

The Pre-FEED study has laid a strong design foundation for the entire project lifecycle. A phasing strategy has been developed to enable customer connections between 2032 and 2035, ensuring a smooth and scalable rollout.

In addition, a consenting strategy has been mapped out, and the requirements and objectives for the next phase (FEED) have been clearly identified. This positions the ELHP project to move confidently into its next stage of development.

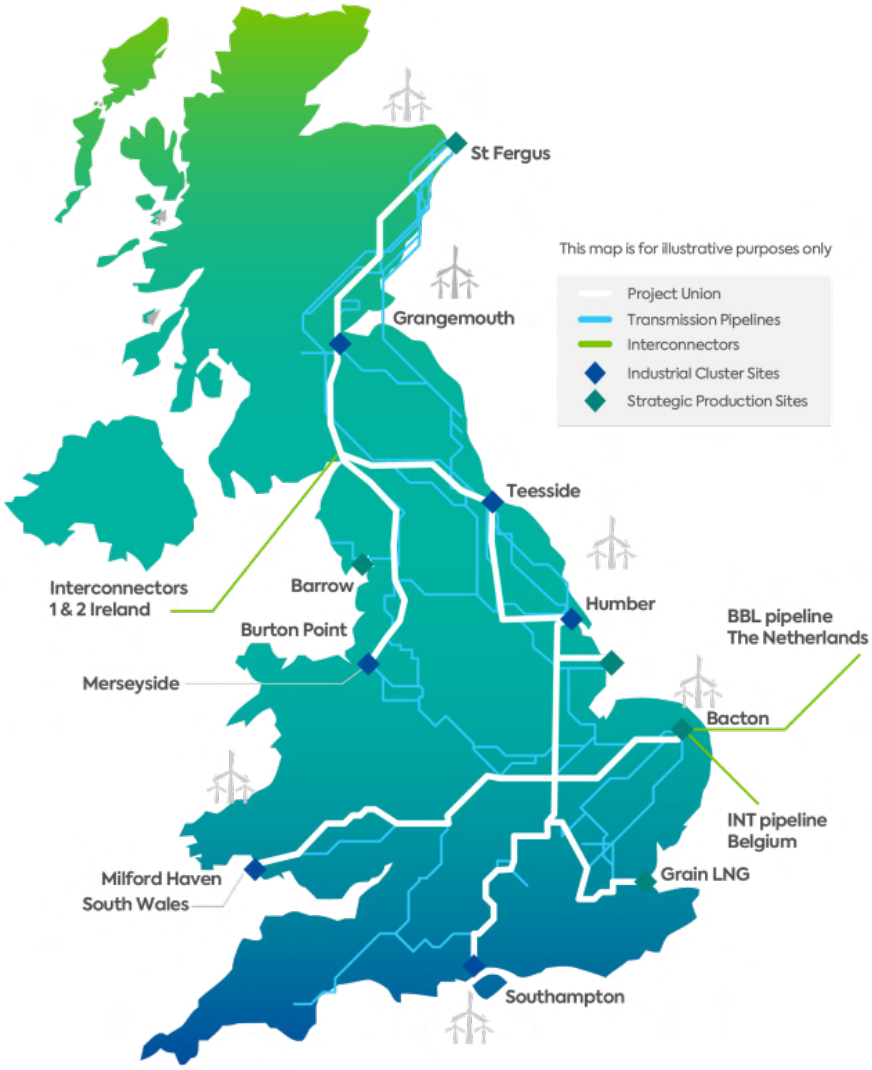
Watch our short video showcasing the ELHP

NATIONAL GAS BLENDING PROGRAMME

Alan Stephen
National Gas

Alan Stephen provided an exciting update on the hydrogen blending programme. Alan discussed how enabling Hydrogen Blending on the NTS is crucial to building a Hydrogen market.

The Department for Energy Security and Net Zero (DESNZ) published a blending consultation in early July, which has now concluded.



Why is Hydrogen Blending Important?

Blending is a transition tool that supports:

- The growth and stabilisation of the hydrogen economy
- Derisking investment for hydrogen producers
- Infrastructure development (e.g. pipelines)

Blending Mechanism

Hydrogen is blended into the natural gas transmission system at a set percentage, this:

- Diversifies the demand base for hydrogen producers.
- Creates a commercial incentive for production and infrastructure investment.
- While decarbonisation is a benefit, the primary driver is economic and market development.

DESNZ Consultation Overview

National Gas has been working closely with government to demonstrate the need for blending. The consultation aimed to:

- Understand the impacts of blending on the transmission system and end users.
- Conduct a cost-benefit analysis to assess whether blending supports hydrogen users.
- Establish a needs case for blending.

Key Points from the Consultation

- Government proposed a 2% hydrogen blend into the transmission system.
- National Gas responded with a recommendation for up to 5% blend, arguing:
  - This would maximise derisking for hydrogen producers.
  - It would still be manageable for end users.
  - A higher blend would help create a commercial driver for hydrogen.

Strategic Position

- National Gas believes the government should take a strategic policy position on blending.
- The goal is to enable the hydrogen economy to scale effectively while maintaining system integrity and user accessibility.

AUTOFLAME

Duncan Cairnie
Autoflame

Who are Autoflame?

Autoflame is a London based British manufacturer of combustion management solutions, control systems, and industrial monitoring systems. Earlier this year, the Cadent team had the pleasure of visiting Autoflame's R&D and manufacturing site near Bromley.

The site visit allowed us to get a firsthand look at the manufacturing process for Autoflame's dual-fuel, hydrogen-ready burners and control systems. Innovations like these will be crucial as we transition to lower carbon fuels such as hydrogen, helping to maximise efficiency savings while cutting costs for their customers.

What can Autoflame's systems do?

Autoflame's hydrogen approved equipment can provide a number of solutions for customers looking to utilise hydrogen within their industries. In the consortia meeting, Duncan Cairnie highlighted how their products can help organisations overcome a number of barriers preventing them from process decarbonisation.

Working with each customer to understand their bespoke needs, Autoflame's technology can help end-users with:

- Monitoring energy outputs
- Improved safety and reliability, particularly in combustion, steam and hot water applications
- Maximising fuel savings and cost reductions throughout manufacturing processes
- Bolstering compatibility in dual-fuel systems
- Generating lower greenhouse gas emissions through system optimisation
- Better data integration and analysis to help customers understand how their equipment is working and how to fine tune their systems and processes
- Providing hydrogen approved and ready systems, from 10% to 100% hydrogen integration.

How Autoflame are enabling the transition to hydrogen

In the hydrogen sector specifically, Autoflame's systems have enabled some of the most exciting transformations for a number of industrial customers.

- **Scottish whiskey**: Autoflame is in the process of providing support to enable a Scottish whiskey distillery to operate using 100% hydrogen
- **Low carbon football**: By using Autoflame's control systems, one football stadium has seen a 20% fuel reduction from their system upgrade, and a further 32% due to enhanced sequencing thanks to Autoflame's system monitoring solutions
- **Brick manufacturing:** Autoflame was involved in the world's first 100% hydrogen-fired clay brick, using their systems in an industrial setting
- **Decarbonising the NHS:** Autoflame equipment at Guy's and St Thomas' Hospitals provided impressive energy savings for the steam boilers at St Thomas' Hospital, reducing gas usage by upgrading burners and controls.

Autoflame's products are also compatible with hydrogen, with a number of their installations now hydrogen ready when their customers choose to make the switch.

RUX ENERGY

Marius Bosch
Rux Energy

Rux Energy is an Australian based nanoporous materials and hydrogen storage system manufacturer who recently opened a UK subsidiary, showcasing the vast opportunity for a thriving hydrogen economy that the UK offers.

We were joined by Rux Energy's Head of Strategy & Commercialisation Marius Bosch in our recent consortia call. He outlined how hydrogen is still too expensive for many potential end-users, but that innovations across production, storage, and distribution can help to reduce costs.

Hydrogen storage and transportation

Marius highlighted how higher carbon fuels such as diesel have smaller storage and distribution costs, resulting in cheaper products for the end-user. Storage and distribution are the highest costs facing the hydrogen sector, and storing hydrogen can be difficult.
Rux Energy have developed their 'harmony' storage solution which claims to solve some big scaling issues within the hydrogen sector. The storage technology:

- Creates improved cost party versus diesel
- Improves safety and efficiency throughout hydrogen transportation
- Offers an interoperable, high-capacity packaged gas solution.

How does Rux Harmony work?

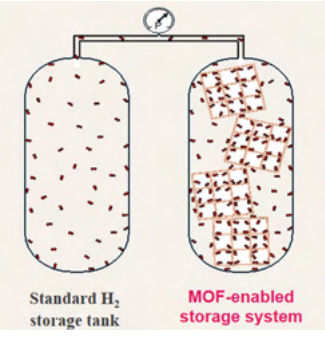
Rux Energy's storage solution integrates nano-porous materials that allow hydrogen to be absorbed into storage tanks.

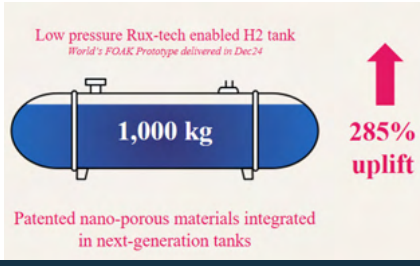
As a result, Rux Energy claim that their tanks can reach up to 1,000kg energy density, an uplift of 285% versus other tanks.

The material inside the tanks act like a modular sponge for hydrogen, however the hydrogen still remains gaseous, with seamless absorption with no energy required.

Alongside this, the absorbtion technology also allows for a lower pressure tank.

Rux Energy hope that their products can slash hydrogen delivery costs by **up to 75%.**





Progress towards commercialisation

Rux Energy's innovative hydrogen storage solution was developed in late-2024, in collaboation with the National Composites Centre (NCC) UK.

The prototype:

- Validated the technology, delivering three times the capacity of other 350bar storage tanks
- Is compatible with ~25kg of nanoporous material
- Confirmed strong alignment with uptake modelling.

Rux Energy's other projects

Rux Energy are working to innovate within the hydrogen sector to help accelerate the energy transition across heavy industry, trucking, maritime, rail and innovation. Their hydrogen storage projects are key to making this happen.

- **Rail:** In North America, Rux Energy are helping to transport hydrogen via a dedicated rail line in bulk using low-cost transportation processes. The hydrogen will enable e-methanol production at industrial scale. This is perfect in remote and inaccessible regions where electrification or battery operation is not feasible.
- **Maritime:** Rux Energy are aiming to outperform fossil fuels under carbon pricing for workboat operations. The company expects that each tonne of their installed nanomaterials will abate up to 1 tonne of carbon emissions per year.

NEW MEMBERS

We were particularly pleased to welcome the newest members of the Capital Hydrogen programme in our consortium meeting. Their involvement marks an exciting step forward as we continue to explore the future of hydrogen in the region and drive forward our ambitious plans to decarbonise industry.

If you're interested in joining, please Contact us today

Limpsfield

Limpsfield are a specialist burner manufacturer based in Biggin Hill, Kent. They design and produce clean-burning burners for commercial and industrial process plants, supplying clients worldwide. Their burners are engineered to operate on natural gas, liquid fuel oils and hydrogen.

Limpsfield deploy hydrogen burners globally and have been actively involved in two UK government-funded hydrogen projects through BEIS and DESNZ. The team is a proud supporter of the Capital Hydrogen programme and recognises hydrogen's vital role in decarbonising industry and developing a low carbon economy.

Fuse Energy

Fuse Energy is a London-based energy supplier with operations across the UK, New York, Spain, and India. Their mission is to accelerate the global transition to renewable energy by building a cleaner, more flexible electricity grid. In addition to developing solar and wind projects, Fuse is also advancing hydrogen initiatives, with its first production centre based at its engineering and research facility in Hackney, London.

The team at Fuse Energy have joined the Capital Hydrogen programme to investigate how they can get involved in pioneering hydrogen infrastructure projects such as the ELHP to accelerate the creation of a low carbon economy in the region.

Autoflame

Autoflame is the global leader in commercial and industrial combustion control and monitoring solutions that empower customers to monitor and reduce emissions, fuel and maintenance costs, while increasing reliability.

They are a trusted, family-owned, British manufacturer with a global footprint. Over the last 50 years, they have grown into a multi-award-winning export champion with a highly successful global partner network of over 150 Technology Centres that deliver and support their products. Autoflame is proud to collaborate with the Capital Hydrogen programme to support the industry through their decarbonisation journey, ensuring safe and efficient operations when using natural gas and/or Hydrogen as an energy source.

Dunphy Combustion

Dunphy Combustion, based in Rochdale, specialises in designing and manufacturing industrial burners, packaged plant rooms, control systems, and gas boosters. They were the first burner manufacturer in Europe with full UKCA and CE certification for their hydrogen burners and their low NOx hydrogen burner recently won the King's Award for Innovation (2025). This burner uniquely allows industry to burn hydrogen and natural gas simultaneously or independently in any blend.

Dunphy is committed to helping industries decarbonise in a practical, flexible way, playing an active role in supporting businesses along the path to net zero through safe and reliable hydrogen-ready technology.

Amentum

Amentum combines programme, project and engineering experience with deep technical capabilities to solve complex challenges for major UK organisations in the energy sector. They are committed to advancing energy initiatives providing expertise in renewable energy development, energy efficiency, and resilience projects.

By leveraging advanced technologies and a deep understanding of regulatory frameworks, Amentum helps clients achieve environmental stewardship and energy sustainability, contributing to a safer, cleaner future while supporting mission-critical operations.

Thank you to our Consortium Members

Capital Hydrogen is a collaboration between Cadent, National Gas and SGN. It is a 15-20 year programme that will allow a transition from a natural gas network to a hydrogen network in London, the East of England and the South East.

Working with key stakeholders, Capital Hydrogen will identify and realise the potential which hydrogen brings to the development of the low carbon economy in the region.

Kelly Manders, Regional Development Manager (East and London), Cadent:

“A huge thank you to all our Capital Hydrogen members and partners. Your continued commitment, insight, and collaboration are what make this programme thrive. From shaping strategic direction to sharing on-the-ground expertise, you’re helping build a stronger, more connected hydrogen future for London and beyond.”

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