

National Planning Improvement
**Insights Report: Planning for
Hydrogen**
February 2025



Executive Summary

The [National Planning Improvement](#) team, based in the [Improvement Service](#), has undertaken scoping to ascertain the challenges involved in planning for hydrogen. This asked the hydrogen industry, planning authorities, government agencies and regulators:

- what they think the challenges are in planning for hydrogen
- the knowledge and understanding of planning and planning processes in the hydrogen industry
- how to access, and who could provide, expertise that could be deployed to support planning authorities
- what the pipeline of hydrogen projects are coming down the line
- the understanding of the preparedness of planning authorities to deal with hydrogen proposals
- what further support planning authorities would benefit from

In addition to the focus on hydrogen, we also used this opportunity to tentatively explore other areas that the national planning hub may be able to add value to inform the on-going development of the hub model.

This exercise identifies five key challenges on planning for hydrogen:

Understanding

It is considered that the understanding of hydrogen within planning authorities is variable and depends very much on the exposure they have had to hydrogen proposals. There is also a view that some hydrogen developers do not have a clear understanding of the how the planning system works and the best ways to engage with planning authorities. A key concern voiced across sectors was the lack of impartial information available to inform planners, communities and elected members on the health and safety impacts of hydrogen and mitigations that can be put in place to manage and control them.

Regulation

There appears to be a need for a better understanding of the different consenting and regulatory regimes in place and how they interact with one another. There are calls for better synergy between these to ensure complementarity and certainty for both industry and planning authorities. This includes a need for clarity on the different timelines involved.



Process

Industry partners are keen for as much certainty as possible in the planning process in terms of the likely decision, timescale for decision making and the type of information required when. There was a plea from planning authorities for early engagement from industry on proposals. All sectors wanted clarity on when Environmental Impact Assessments would be required.

Impacts

Linked to the need for a better understanding on hydrogen more generally, there was a specific discussion on the need for planning authorities to have clarity on the types of impact and risks of hydrogen manufacturing, storage and transportation of hydrogen and the mitigations that can be put in place to deal with these. The type and number of conditions placed on planning permissions would be key to this.

Spatial

It has been pointed out that hydrogen facilities require specific elements to allow them to function effectively. These include access to water to support the process, an ability for water to flow from the facility, access to the electricity grid and proximity to a customer base who can use the hydrogen. There is a question if it may be possible to identify suitable sites through the local development plan process.



Context

In September 2024, it was announced in the [Scottish Government's Programme for Government](#) that Scotland's first [planning hub](#) would be established to build capacity and resilience, and to improve consistency and efficiency in decision-making. The planning hub's initial priority would be to help planning authorities make quicker decisions on hydrogen planning applications. Hydrogen has been identified by industry as having great potential to support Scotland's ambitions on net zero, whilst there is a challenging consenting pipeline for hydrogen projects. Awareness of, and expertise in, planning for hydrogen is thought to be low amongst planning authorities and they would benefit from specialist expertise.

The establishment of the planning hub was taken forward within the context of the [Scottish Government's Hydrogen Action Plan](#). In introducing this the Cabinet Secretary for Net Zero, Energy and Transport said "As a government, we are convinced that hydrogen, alongside renewable electricity, will play an extremely important part in our energy system going forward... Scotland has vast renewable energy resources. Subject to planning and consenting decisions and finding a route to market, we have a potential pipeline of over 40 GW of offshore wind generation projects. This could enable the use of surplus electrons for the creation of low-cost renewable hydrogen. This generating potential opens up new economic opportunities for our nation to become a leading producer and exporter of renewable hydrogen."

The Action Plan highlighted that Scotland's "unique selling point is the combination of its natural resources, infrastructure and skilled energy workforce, which could enable it to become a low-cost producer of hydrogen in Europe." The Action plan pointed out that although Scotland's businesses are well positioned to help support and join the emerging hydrogen economy there was a need to support innovation and to demonstrate the potential of the sector. In doing this it has committed to:

- investing in early projects through encouraging the public and private sector in Scotland to work together to demonstrate these technologies, as much of the learning takes place before a single molecule of hydrogen is even produced
- building relationships and gain valuable knowledge of how to work with others to assess, approve, consent, and regulate these projects, as well as to address deployment constraints and challenges, including high production costs
- mobilising investment by supporting projects on the journey to decarbonisation

The planning hub and its initial focus on hydrogen is a response to this.

The National Planning Improvement Team and Hub

The planning hub is hosted in the [Improvement Service](#), with a small initial team including Improvement Service staff, and staff loaned from Scottish Government and [Planning Aid Scotland \(PAS\)](#). Governance and oversight are provided by the [High Level Group on Planning Performance](#), which is co-chaired by Scottish Government and [COSLA](#).

The planning hub provides planning authorities with access to specialist expertise, supports them to upskill their staff and prepare their workforce for the future. The model developed is currently funded by Scottish Government so that there are no costs to planning authorities. It comprises a small and agile team that works collaboratively with planning authorities, agencies and the hydrogen industry and draws on specialist expertise, not planners. In doing this, it aims to share and embed learning within and across planning authorities.



Purpose of this report

It was considered that a key starting point for the planning hub would be gaining insights into the challenges faced in delivering hydrogen projects through the planning system. This report aims to do this and sets out the findings from the initial scoping work on hydrogen applications covering planning authorities, industry, statutory consultees, and other stakeholders. In doing this we have engaged with:

- industry to understand their perspectives on challenges and opportunities to deliver hydrogen projects, and, to discover their understanding of the Scottish planning system
- planning authorities to gain a better understanding of their experience of hydrogen projects and the appropriate skills and knowledge they have or need
- Scottish Government to get an idea of the ambitions and potential of hydrogen and the policy context in place to support these
- agencies, regulators and permitting regimes to get an understanding of their roles, objectives, ways of working and relationships regarding hydrogen

It was envisaged that this would help to identify and engage with expertise and resources that can be deployed to support planning authorities. In turn, this will be used to inform the forward development of the planning hub delivery plan, to support planning authorities on the process for hydrogen planning applications.



Method

The scoping engagement was led by the National Planning Improvement Champion through a series of semi-structured conversations (mainly on MS Teams) between September – November 2024. These explored the current practice, experiences, issues, and challenges relating to hydrogen applications based on a semi-structured conversation that asked for thoughts on:

- what they think the challenges are in planning for hydrogen
- the knowledge and understanding of planning and planning processes in the hydrogen industry
- how to access, and who could provide, expertise that could be deployed to support planning authorities
- the potential future pipeline of hydrogen developments
- the understanding of the preparedness of planning authorities to deal with Hydrogen proposals
- what further support planning authorities would benefit from

The project team also conducted an initial mapping exercise for hydrogen planning applications, which was used to identify key planning authorities and developments, including the potential pipeline of applications over the coming years. This was used to inform the discussions, including on the type of support that the planning hub can offer.

This was also informed by the work with the National Planning Improvement (NPI) team on planning improvement, including the development of the new [National Planning Improvement Framework \(NPIF\)](#).

As part of these conversations, we also explored other participants that may be of benefit to include in this exercise and to further develop networks of those involved in hydrogen applications. These issues were also explored through engagement with industry and other stakeholders at the Hydrogen Scotland annual conference 29-30 October 2024.

Annex A contains the list of organisations that were involved in the scoping exercise.



Findings

Below are the findings from the scoping work based on the 35 scoping exercise meetings. These findings have also been tested through with engagement at the [Hydrogen Scotland](#) conference and at [Heads of Planning Scotland \(HoPS\)](#) Climate Change, Energy and Resources, and Performance and Practice sub-committees, and regular engagement with the Scottish Government hydrogen policy team.

Planning Authorities

The key role of planning authorities is to process planning applications for hydrogen projects and to set the context for future hydrogen development through local development plans. Discussion tended to focus on the former and from the scoping engagement, we found:

- **Regulation** – A key risk highlighted by planning authorities is the lack of clarity on who does what and when in the regulatory framework for hydrogen. This was echoed in discussions with agencies and industry. It was felt that more information is required to set out the role of planning in hydrogen developments, which will allow planning authorities to focus on what needs to be assessed from a planning perspective to avoid double handling areas that sit with other agencies such as [Scottish Environment Protection Agency \(SEPA\)](#) and [Health and Safety Executive \(HSE\)](#). Planning authorities need to be able to understand where planning fits, as part of the ongoing work to update this framework to take account of hydrogen opportunities and the emerging green economy. Without this, applications will take longer to determine, and unnecessary conditions could be applied. A key question raised was, should hydrogen related applications be treated like another industrial process?
- **Statutory consultees** – Statutory consultees are a key part of the planning process when determining a planning application. They already experience delays attributed to these consultees being under-resourced and are concerned this will be amplified with an increase of hydrogen related planning applications. Some planning authorities indicated significant delays with SEPA and HSE. Both these organisations told us of the work they are doing to provide resources and clarification on roles and regulations e.g. through the key agencies working group, and UK regulator forum on hydrogen.
- **In-house consultees** – Similarly, resource constraints within local authority teams can lead to delays in responding to planning applications, either due to capacity or not having specific in-house expertise, which can be a heightened issue for planning applications on a relatively new and novel topic such as hydrogen.

- **Safety** – Related to regulations, there are general safety considerations in the production of hydrogen which need to be clearly understood by planning authorities to help process applications and apply appropriate conditions.
- **Pipeline of applications** – For most planning authorities the pipeline of hydrogen related applications is unclear. Planning authorities need to be able to understand the pipeline of applications coming to them to allow them the opportunity to prepare and strategically resource themselves with the expertise required to deal with the applications.
- **Spatial planning for hydrogen** – It is considered that there may be opportunities under new NPF4 to take a strategic plan led approach but requires resource and capacity. This could involve using Evidence Reports to identify opportunities for hydrogen development that can then be included within local development plans and regional spatial strategies.
- **Training and education** – Hydrogen is new to the majority of planners in Scotland. Our scoping work identified a need for training for planners to help them understand what hydrogen is and what the material planning considerations are. There is also a need for elected member training and a demystification piece for the general public.
- **Environmental Impact Assessment** – This is an important gateway in the planning process, and has implications for resource and process timing, as well as the overall application. There was a general ask for more clarification around hydrogen applications e.g. the threshold for undertaking an [Environmental Impact Assessment](#) (EIA). There is a question about the skill sets and expertise required for managing and accessing EIA's, with regard to the pipeline of hydrogen applications.
- **New and emerging technology** – Hydrogen production is a new and emerging technology. Comparison have been made to the challenges that planning authorities have faced with Battery Energy Storage. There is a sense that planning authorities need to be proactive and ahead of the curve with hydrogen to mitigate as a new green economy development, also seems a bit further ahead in roll out.
- **Water** – Water quality and quantity is a major concern for planning authorities (and other agencies). Hydrogen production requires a lot of water and is therefore an important early consideration. Clarity is needed on how to take account of this in the planning considerations.
- **Public Engagement and objections** – Planning authorities highlighted how effective good public engagement can be when submitting a planning application. They recognise that this is a new and novel area and the public's knowledge is likely to be limited. As a new area, there is a risk of over-conditioning of applications, including to address public objections and concerns.

- **Hydrogen Allocation Rounds (HAR) Timeline** – The [Hydrogen Allocation Rounds](#) (HARs) are a government funding mechanism to support low carbon hydrogen production across the UK. It has an ambition to have up to 1GW of electrolytic hydrogen production capacity in construction or operation by 2025 and by 2030 to deliver up to 10GW of low carbon hydrogen production capacity by 2030. The hydrogen industry depends on this to finance projects and so need to have planning permissions in place by the deadlines for each round of HAR. It is therefore seen as an important driver in a lot of hydrogen applications. In December 2024 the UK Government signed the first of these contracts with two projects in Scotland through the Hydrogen Business Model (similar to the contract for difference mechanism), Scottish Power Whitelee Project and Storegga’s Crommarty Hydrogen Project.
- **Engagement with industry** – Planning authorities made a plea for early, pre-application engagement from hydrogen developers so that they can discuss the likelihood of consent and what is required to assess any planning application.
- A number of other areas were highlighted which has a bearing on the resource required to cover these, including noise, air quality, transport, gas dispersal, landscape and ecology and emissions.

Industry

From the scoping engagement, we found:

- **Statutory consultees** - Industry (and planning authorities) perceives the same delays with agencies particularly with feedback regarding to HSE, and SEPA. HSE highlighted the challenges of trying to forecast and manage the applications coming to them and clarifying their role as a statutory consultee that can only give advice in certain circumstances. Bespoke safety cases are required for each project because the feedback says there is a gap in HSE guidance. More widely, there can be issues with conflicting advice from the agencies and this can result in the planning authority needing to include conditions that cover everything at a time when proportionate conditioning is desired. There can be perceptions that some of the consultees are not well informed, and this is leading to the wrong advice being provided to planning authorities.
- **Environmental Impact Assessment** - EIA is seen as a sensitive issue for industry as there is a cost attached. It was outlined how there is some uncertainty about the thresholds as to when an EIA is required and the complexities of assessing when an EIA is required if the proposal needs to be altered. Industry is calling for proportionality with EIA and when it applies, and for a consistent oversight of hydrogen outside of EIA.



- **Water** – As highlighted by planning authorities and industry trade associations, water is a key consideration for industry, important to understand where the water is coming from and what the impact will be on the water quality. Key feedback has been that there is an imbalance between where most of the hydrogen developments are being considered (east coast, mainland Scotland) and water abundance (mainly west coast). Desalination could also be a factor and could be helpful in areas of water scarcity. Reflection from industry that this needs to be considered earlier in their process.
- **Planning conditions** – Industry is concerned that planning permissions may be ‘over-conditioned’ given a lack of understanding within planning authorities on the development’s impacts and mitigations that can be put in place. They raised concerns about the time and costs that may be incurred in cleansing conditions. Issues include a lack of certainty over the regulatory framework which might use conditioning as a means to mitigate risk; if there is pressure to speed up the consent process, this can impact on conditions as a consequence; and asks for specificity of design in comparison to other planning applications (which can be difficult due to the relatively newness of this emerging technology). Also, there needs to be regard given to the role of other statutorily consultees e.g. planning authorities might be under pressure from public objections, to impose conditions that could cut across, for example the HSE.
- **Complex Objections** e.g. - Industry highlighted how providing information and evidence to questions about emissions from hydrogen manufacturing can take time and resource to address, with knock on impact on timescales.
- **New and Emerging Technology** – This coupled with supply chain issues that the industry is currently facing. This is leading to some uncertainty and changes to the design of facilities. It can therefore be challenging to be specific on design plans as some new technology does not have real examples yet or might fail or need to be significantly amended affecting overall build and design.
- **Hydrogen Allocation Round timeline** – Industry pointed out that planning applications will be tied to HAR ‘strike price’ deadlines and planning consent can be significant for their investment and business model. Planning consent is often a key gateway for Financial Investment Decision (FID). They raised policy issues around achieving Scottish and UK Government ambitions and the role of planning in this process in this with some of industry players unsure if planning authorities have an awareness of this and the associated timescales.
- **Public Engagement** – industry understand that there needs to be a much wider public engagement and explainer piece on hydrogen and how it can safely play a part in our future energy mix and transition to net zero.

Experience has already shown that communities can react negatively to hydrogen proposals based upon their perception of the health and safety impacts.

- **Planning authority resources** – understanding that there is more limited resource within planning authorities and that this is causing a lot of pressure. Understanding that most planning officers have not dealt with a hydrogen related application. There needs to be clearly signposted resources.
- **NPF4** – Industry generally felt that the 4th National Planning Framework gave strong support for renewable energy develop, thereby providing clear direction on Hydrogen, and that this needed to be reflected in decisions on planning applications.
- **Regulations** – Industry want more clarity on who is dealing with what and when and how planning fits into the regulatory framework.

Statutory Consultees

A range of organisations and agencies can be involved in approval of hydrogen manufacture, storage transportation. The planning application process is part of this, if development or change of use is required the planning authority may have to consult with others to get their advice. From the scoping engagement, we found:

- **Complexity** – Regulators, agencies and permitting organisations generally felt that they were clear on what their role was in the hydrogen process. However, many of their ‘customers’ feel that there is a need for a better understanding of how the different consenting and regulatory regimes interact with one another. There are calls for better synergy between these to ensure complementarity and certainty for both industry and planning authorities. This includes a need for clarity on the different timelines involved.
- **Pipeline** - [Scottish Enterprise](#) are concerned that planning authorities do not know the extent of the pipeline of applications coming their way. This needs better sharing of information and early engagement between industry and planning authorities. Role of Pre-application discussions and Pre-Application Consultation with communities and stakeholders
- **External Consultees** – HSE and SEPA highlighted the challenges of dealing with [Control of Major Accident Hazards](#) (COMAH) procedures and synergies with other requirements.
- **Resources** – Consultees, agencies, regulators and permitting organisations outlined how they are having to work with constrained resources. This has made them look to different ways of working through, for example, prioritising their engagement to particular organisations or proposals and providing core generic advice through FAQs, guidance, or general advice.

Conclusion

The engagement with stakeholders has provided valuable insights on the challenges faced by planning authorities, industry, regulators, and agencies and allowed us to identify key issues including:

- a need to develop a deeper understanding of planning for hydrogen and how it interacts with hydrogen developments.
- a need for a better understanding of the different consenting and regulatory regimes in place and how they interact with one another.
- a need for clarity in the planning process in terms of the likely decision making and the type of information required when.
- a need for a better understanding on the impact and risks of hydrogen and the mitigations that can be put in place to deal with these.
- the possibility of identifying suitable sites for hydrogen facilities through the local development plan process.

These insights have helped to shape the outline delivery programme set out below.



Next steps

The planning hub has recently set out its outline delivery programme for 2024-25, that aims to provide support to planning authorities on accessing capacity and expertise, learning and knowledge exchange for hydrogen, and performance insights to support improvement. This was informed by the scoping work and findings of this paper. The programme comprises:

- An **Access to Expertise** programme that works closely with planning authorities to help them obtain the skills and expertise that they need to work effectively and efficiently, including on strategically important planning applications. It aims to:
 - understand the drivers of performance in the planning system, in particular the capacity and resource requirements of planning authorities in achieving their performance aims.
 - identify what specialist skills and expertise planning authorities have and what they require to meet their priorities.
 - identify sources of appropriate expertise that can be deployed to support planning authorities.
 - provide funding and facilitate access to planning authorities to allow them to use this expertise.
 - identify common themes and opportunities for strategic pooling and sharing of resources.

- An **Insights** programme involving scoping, research and analysis to help provide a better understanding of the challenges and opportunities faced by planning authorities, building on the work and evidence base of the National Planning Improvement Framework to support improvement within the Scottish planning system. This includes:
 - engaging with planning authorities, agencies, and the hydrogen industry to identify the challenges and opportunities of planning for hydrogen, the scale of the task and steps that can help.
 - identifying a hydrogen planning applications pipeline to inform work to support hydrogen applications through the hub.
 - supporting the roll out and embedding of guidance published by Scottish Government on Planning for Hydrogen.
 - rolling out explainer programmes that provide impartial information on key planning issues for planners, councillors, and community members.
 - a series of blogs highlighting good practice, lesson learned and future issues facing planning for hydrogen.

- A **Learning and Knowledge Exchange programme** that aims to support planning authorities and the organisations they work with to improve their understanding of priority issues they face. It comprises:
 - An Action Learning Programme where planning authorities and other relevant organisations work together to solve identified problems and develop support tools to help others facing that problem.
 - Learning resources and events that gather and share learning from programmes, projects, and experiences to help provide a better understanding of challenges and issues.
 - Training modules that provide detailed insights on specific priority issues.
 - A Knowledge Exchange programme that provides financial support for planning authorities to access learning on planning priorities and share this with others.



ANNEX A: List of organisations involved in the scoping exercise

Regulators, Agencies and Consultees

Health and Safety Executive
Highlands and Islands Enterprise
Key Agencies Group
NatureScot
Scottish Enterprise
Scottish Environment Protection Agency
Scottish Futures Trust
Scottish Water
Scottish Water Solutions
South of Scotland Enterprise

Planning Authorities

Aberdeen City Council
Aberdeenshire Council
Argyle and Bute Council
Comhairle nan Eilean Siar
Dumfries and Galloway Council
East Ayrshire Council
Falkirk Council
Fife Council
Glasgow City Region
Highland Council
Moray Council
Shetland Isles Council
South Lanarkshire Council

Industry

ARUP
Green Cat Renewables
Hydrogen Scotland
Scottish Gas Networks
Scottish Hydrogen Industry Forum
Scottish Power Renewables
Scottish Renewables
Storegga

Others

Scottish Government Hydrogen Policy Team
Scottish Government Marine Directorate
Scottish Government Planning and Regeneration Directorate
Scottish Carbon Capture and Storage

