The Hydrogen Energy Association's response to the Department for Energy Security and Net Zero: '**Hydrogen economic regulatory framework: developing an effective market framework for 100% hydrogen pipeline networks**'

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September 2025

The Hydrogen Energy Association (HEA) is the leading pan-UK trade body in the hydrogen energy sector, with a mission to support the growth of our members and the sector, and to ensure that the right policy framework is in place. Our 100 plus member companies represent over 200,000 employees globally, with combined revenues over £400 billion, and cover the entire value chain from raw material sourcing, to supply chain and components, financing, professional services, B2B and consumer facing solutions.

Opening remarks

The HEA welcomes the opportunity to respond to this consultation. We strongly support the government's efforts to establish an effective and proportionate regulatory framework for hydrogen pipeline networks, recognising the need to balance early-stage flexibility with long-term safety, transparency, and market confidence. For this we would like a multi-stage roadmap, evolving in step with the maturity of the sector to give clarity for the developing network.

In the early phases of hydrogen network deployment, projects will typically be modest in scale, often involving a single producer and a limited number of off-takers. For such systems, we believe maximum flexibility and minimal regulatory burden are essential. Overly complex licensing or balancing requirements at this stage could create unnecessary barriers to entry, particularly for small and innovative companies. These smaller operators are frequently the source of technological and commercial innovation, and their participation must be encouraged to ensure the UK maintains a competitive edge in the global hydrogen economy. To support this, we recommend adopting approaches similar to the BSI PAS model, where standards and requirements can evolve iteratively alongside market development.

At the same time, we recognise that as the hydrogen network expands, incorporating multiple producers and users, more robust regulatory structures will become necessary. We therefore recommend that the government establish clear transition points within the regulatory roadmap, supported by regular consultation milestones, so that industry has foresight and confidence in how and when requirements will change. This staged approach will allow Ofgem and other stakeholders to introduce additional obligations—such as licensing of system operators or more formal balancing structures—only when they are justified by market complexity and scale.

In summary, the HEA supports a flexible, staged, and innovation-friendly regulatory approach that encourages early market growth while providing a pathway to more structured regulation as the sector scales. By enabling small company participation, protecting innovation, and ensuring storage and balancing capabilities are properly recognised, the UK can position its hydrogen network development as a national competitive advantage.

We look forward to continuing engagement with DESNZ and Ofgem as the framework develops.

Question 1: **Do you agree with the identified core activities that hydrogen networks will need to undertake to balance their systems?** Please explain your answer and provide any supporting evidence, including any additional core activities hydrogen networks may need to undertake to balance their systems.

The HEA broadly agrees with the identified core activities outlined by the consultation; however we must highlight important factors for consideration. The association believes that balancing a hydrogen network must be storage focused and network size appropriate. Unlike the current Natural Gas network with multiple off-takers, seasonal demand and large storage facilities, the early hydrogen network is more likely to have fewer off-takers and steady demand. This early hydrogen network is expected to be modest scale with single producers serving limited off-takers versus future complex multi-producer systems therefore regulatory complexity must scale appropriately with network development to avoid bureaucratic barriers for initial projects. It is important to note that for 'early' hydrogen networks, load and supply must be sufficiently managed through a dedicated committee. In the absence of this support, the scale of changes in demand profiles called upon by a major off-taker may make or break the local network's economics.

Some members of the HEA have also flagged the some further activities to consider, such as;

- The role of ammonia cracking for the hydrogen network as analogous to that of LNG for natural gas balancing.
- That some offtakers will require that hydrogen is renewable to a defined sustainability standard (e.g., RFNBO hydrogen for transport requiring RTFO-compliant offtake). This may create a sub-requirement for balancing RTFO-compliant hydrogen within the system.

We recommend timely engagement with stakeholders to assess the needs of the network as the network develops and we stress a greater need for clarity on pipeline configuration before finalising balancing approach.

Question 2: **Do you agree with our assessment that primary and residual balancing licence structures should be maintained for 100% hydrogen pipeline networks?** Please explain your answer and provide any supporting evidence.

Yes, The HEA agrees with the assessment that primary and residual balancing licence structures should be maintained for 100% hydrogen pipeline network. The association feels that using the structure that is in place for existing pipelines will help the emerging hydrogen network establish itself. In the earlier stages of the network, initial point-to-point systems will require close coordination between production and consumption with minimal regulatory oversight. The current operations at Kiwa Cheltenham demonstrate this successfully as a single producer with limited users. The HAR projects will also have associated storage and so re-using familiar roles reduces start-up friction. As the network develops the HEA feels that a multi-producer network will require independent system operator for commercial arbitration and technical balancing. The HEA identified technical competency as an important determinator of a balancing authority, storage operators were highlighted as having technical capabilities and operational control for system balancing. Pipeline asset owners may need to develop these skills for hydrogen system management, but GDNs and National Gas, with experience in natural gas networks, should be capable undertaking system balancing.

Question 4: **Do you agree that producers are likely best placed to hold primary balancing responsibilities for hydrogen networks?** Please explain your answer and provide any supporting evidence.

Yes, for early single-producer networks, the HEA believes it is practical that the party with real-time control of dispatchable storage and production should hold primary balancing. Evidence from Kiwa's operations show that close cooperation between producer and off-taker is required to balance effectively. Though in the early stages, asset owners may not always be best placed for primary balancing, we note that responsibility of primary balancing must be transitional and remain open to future entities with the technical skills. As the systems grows, the association recommends that the primary balancing should be assigned to a neutral party (storage operator or independent body like NESO may be required for large network requirements), to ensure fair and efficient balancing.

The HEA highlights that different production paths for hydrogen may effect the level of responsibility for primary balancing of the network. In the case of electrolytic hydrogen from solar or wind, intermittency means these are not dispatchable sources of hydrogen. Other pathways, e.g. ammonia-based hydrogen, can provide dispatchable hydrogen for the network and offset intermittency.

Question 5: **Do you agree that other parties, for example hydrogen offtakers, should not be excluded from applying for a licence?** Please explain your answer and provide any supporting evidence.

The HEA believes that hydrogen off-takers and other parties should not be excluded from applying for a primary balancing licence, as long as this is assessed correctly with safeguards to avoid conflict of interest. In the early stages of the network, we do not see a scenario where off-takers will apply for a licence, however, in some circumstances, off-takers may be well positioned to fulfil the role, particularly where they have operational control over hydrogen flows, access to onsite storage, or the ability to modulate demand. Not excluding off-takers from taking licences will enhance balancing flexibility for the network.

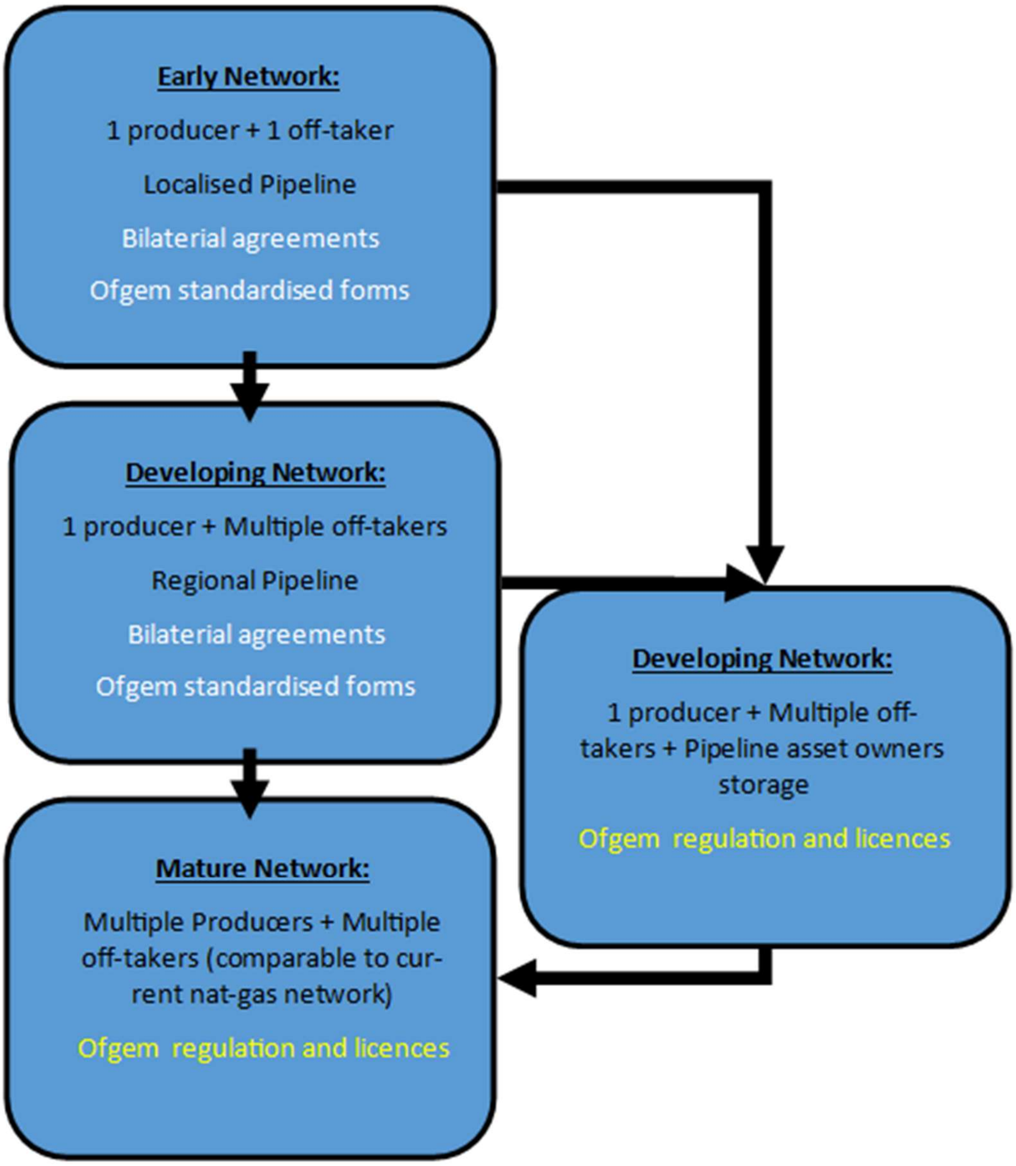
Question 7: **Do you agree that responsibility for the system operation of hydrogen pipeline networks will need to be allocated to an entity through licence?** Please explain your answer and provide any supporting evidence.

Yes, the HEA agrees that responsibility for the system operation of hydrogen pipeline networks should be formally allocated to an entity through a licence. This is essential to ensure clear roles and accountability from the outset, particularly as networks expand in complexity and interconnectivity before defining licence conditions. Licensing a system operator will help protect the integrity of the network and ensure public safety by establishing responsibilities for maintaining pressure limits, implementing real-time control systems, and managing emergency procedures. In addition to system security, a licensed system operator will be critical to ensuring transparent and non-discriminatory access to hydrogen infrastructure. Licensing the system operation function will provide a stable regulatory foundation and support the evolution of the hydrogen economy from isolated networks into an interconnected, market-ready infrastructure system.

That said, in the early stages of hydrogen network development, we recognise that licences may not be necessary where systems are simple and based on bilateral agreements between producers and off-takers. In such cases, we suggest that Ofgem could provide a standardised contractual framework to underpin these arrangements.

As the system grows in size and complexity, however, bilateral approaches will no longer be sufficient. At that stage, we strongly support the formal allocation of system operation responsibilities through Ofgem-issued licences, ensuring that operational safety, commercial fairness, and market confidence are preserved as networks scale and interconnect.

The following diagram illustrate our vision for regulation and licencing:



Question 8: **In your view, what are the key activities that a hydrogen pipeline System Operator will need to undertake?** Please explain your answer and provide any supporting evidence.

The HEA have identified a number of key operational activities for hydrogen pipeline System Operators as managing gas flows, pressure levels, and network constraints. This means maintaining network pressures and chemical quality within safe and acceptable thresholds, operating real-time control systems to monitor and adjust system performance, and coordinating planned and unplanned outages across multiple stakeholders.

The System Operator should also be tasked with managing emergency response procedures, ensuring readiness to act swiftly in the event of a supply disruption, equipment failure, or safety incident. This will need to include coordination across energy vectors, particularly with the electricity system, given the reliance of electrolysers on grid power. We note that effective use of the Hydrogen Transport Business Model can minimise supply chains risks.

From a commercial and system access perspective, the System Operator will need to oversee capacity allocation and the management of connection queues, ensuring information transparency and fairness in how network access is granted. This also includes responsibility for supervising metering and nominations processes, which are critical to maintaining balance and supporting commercial operations across the network. We also see the System Operator as responsible for any government level reporting for customs; transport of energy.

Finally, the System Operator should play a proactive role in system planning and development. This includes facilitating the integration of new connections and pipeline links, supporting long-term infrastructure planning, capacity allocation, congestion management, enabling strategic coordination across producers, users, storage operators, and other energy networks.

Question 9: **Do you agree with the assessment that hydrogen pipeline network owners are best placed to hold responsibility for system operation, under their hydrogen transporter licence?** Please explain your answer and provide any supporting evidence.

In the early stages we believe that single-producer networks should allow production facilities and asset owners to assume system operator responsibilities through derogation mechanisms. We are of the opinion that storage operators best positioned for balancing responsibilities due to technical capabilities and operational control. As the system matures then, multi-producer systems require independent third-party system operator for commercial arbitration. Some members have noted the pipeline operators could hold responsibility for system operation in a mature network due to ability to balance capex and opex. In a mature system, we consider an overarching entity like NESO's involvement appropriate only for large-scale interconnected networks, not local or regional systems.

Question 10: **Do you agree with the assessment that persons supplying hydrogen through pipes to premises should be exempted from supplier licence requirements, but that this arrangement should be kept under review as hydrogen networks develop?** Please explain your answer and provide any supporting evidence, including in support of any alternative options, such as a new exemption threshold

Yes, The HEA agrees with the assessment that persons supplying hydrogen through pipelines to premises should be exempted from supplier licence requirements in the early phases of market development. At this point, the hydrogen market is still immature, with most networks expected to be small in scale, relatively simple in design, and tailored to a limited number of industrial or commercial offtakers. Imposing full supplier licensing requirements at this stage would be disproportionate, add unnecessary compliance costs, and risk slowing investment and participation, particularly from SMEs, industrial clusters, and local authorities.

Early hydrogen customers are likely to be sophisticated commercial or industrial users who can manage risk through bilateral contracts with producers or developers. These arrangements already provide the necessary commercial protections without the need for prescriptive supplier regulation.

That said, the absence of a formal licensing regime should not mean a lack of visibility. We recommend a central registration requirement for hydrogen suppliers, potentially administered by the Low Carbon Contracts Company (LCCC) or another designated body, to give government and regulators oversight of active market participants. Suppliers should also be expected to follow baseline standards of operational integrity, safety, and fair commercial practice, set out through codes of conduct or guidance.

Finally, this exemption should be time-limited and subject to regular review. As hydrogen supply evolves into larger, more complex, or potentially retail markets, licensing requirements may need to be introduced to safeguard customers, ensure fair competition, and support wider market confidence.

Question 12: **Do you consider that any other activities in 100% hydrogen pipeline networks should be regulated under licence, for example the activities of production and/or storage?** Please explain your answer and provide any supporting evidence.

No, at this stage, the HEA does not believe that production or storage activities should be regulated under licence. The market remains at an early stage and flexibility is needed to encourage investment and innovation. Adding licensing obligations now could create unnecessary barriers to entry, particularly for smaller developers or localised projects.

Safety and operational integrity are already covered through existing frameworks such as the Pressure Systems Safety Regulations (PSSR), Control of Major Accident Hazards (COMAH), planning law, and oversight by the Health and Safety Executive (HSE). These provide robust controls without the need for additional licensing. Additionally, the HEA recommend that a standard form of bilaterial agreements could be produced by Ofgem, who would them become involved in licencing as the network matures.

However, as the market evolves into larger, interconnected systems with potentially system-critical storage hubs or concentrated production capacity, this position may need to be revisited. A future licensing regime could help ensure transparent access, prevent anti-competitive behaviour, and maintain market confidence. We therefore recommend keeping licensing powers in reserve, subject to a clear review process aligned with network growth milestones.