Why the UK must stop fragmenting its hydrogen supply chain

A more fragmented approach can make hydrogen projects harder to deliver and optimise, argues Andy Lane.

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Andy Lane, Siemens hydrogen lead

Hydrogen projects in the UK are entering a delivery phase.

The UK hydrogen sector is entering a delivery phase, with a growing number of projects progressing through government support mechanisms such as the hydrogen allocation rounds (HARs).

These rounds provide revenue support to low-carbon hydrogen projects, helping developers move from concept into construction.

The second round, HAR2, has increased both the scale of projects and expectations around UK supply chain involvement.

This has helped unlock investment and stimulate activity across the domestic market.

A strong ecosystem is now in place, spanning electrolysers, compression, storage, control systems and digital optimisation.

The broader technology landscape is also increasingly underpinning the success of hydrogen projects.

Automation, data and software are playing a greater role in how projects are designed, delivered and operated, with performance shaped by how well these systems are intertwined.

The challenge now is how effectively that capability is brought together.

Delivery model holding UK hydrogen sector back

Hydrogen projects in the UK are often structured as a collection of separate packages.

Different suppliers provide individual components or subsystems, which must then be brought together into a functioning plant.

This responsibility typically sits with an EPC (Engineering, Procurement and Construction) contractor.

EPC contractors oversee the design and build of a project, managing multiple suppliers and ensuring that all parts of the system work together safely and effectively.

In this model, EPC contractors must manage numerous “interfaces”: the points where different technologies, suppliers or systems connect.

For example, this could include how an electrolyser links with compression equipment, or how control systems communicate across the site.

Each of these interfaces introduces complexity. Misalignment between systems can lead to delays, additional cost or performance issues.

As a result, a significant amount of project risk sits in how well these interfaces are managed.

Hydrogen’s missed opportunity on digital and AI

Across sectors such as manufacturing, digitalisation and Industrial AI are already delivering measurable gains.

Predictive maintenance is reducing downtime, digital twins are improving design and commissioning, and AI-driven control systems are enabling real-time optimisation.

These gains depend on integration. Data must move across systems, control architectures must align, and software and hardware must operate as part of a unified whole.

Planned EET Hydrogen production facility in Cheshire.

In hydrogen, that opportunity is present, but current delivery models make it harder to realise.

A fragmented approach limits how effectively AI can be applied across the full system.

As the sector scales, it will need to set itself up for the onset of industrial AI by ensuring plants are designed as connected, data-enabled systems from the outset.

A growing competitive gap

In other hydrogen markets, including the US and parts of Europe, suppliers are increasingly offering integrated, turnkey solutions: a complete, ready-to-operate system delivered by a single provider or consortium.

For developers, this reduces interface risk and simplifies procurement.

It also provides a stronger foundation for digital optimisation, with systems designed to operate as a coherent whole.

Picture shows; Toyota Mirai hydrogen car. Abu Dhabi. Edward Reed/DCT Media Date; 17/01/2022

In the UK, a more fragmented approach can make projects harder to deliver and optimise.

In some cases, developers turn to international providers that offer more cohesive solutions, even where similar capabilities exist domestically.

The challenge is how UK expertise is organised and presented to the market.

Moving hydrogen towards integration

There are early signs of change. Suppliers across compression, storage and purification are beginning to work together earlier in the project lifecycle, aligning systems and developing more coordinated offers.

Innovative businesses like GeoPura are replacing the piecemeal approach with hydrogen-based energy-as-a-service.

Customers hire mobile Hydrogen Power Units and pay for the fuel while the provider produces green hydrogen, transports it to site and operates the units to deliver dependable, zero-emission power for off-grid, backup and event use, with water the only by-product.

A GeoPura hydrogen power unit.

These approaches bring integration into the design phase, enabling clearer alignment between equipment, control systems and digital platforms.

This supports more efficient delivery and creates a stronger foundation for optimisation once assets are operational.

This reflects a wider shift across industry, where integration and digitalisation are designed into systems from the start.

What the UK hydrogen sector needs to change

To accelerate progress, the UK hydrogen sector needs to adopt delivery models that bring together equipment, controls and digital systems within a unified architecture.

This requires earlier collaboration and clearer alignment across the supply chain.

Integration should be considered a core part of project design, enabling data, automation and AI to operate across the full system.

Policy can support this transition. UK content requirements have strengthened domestic capability.

The next step is to support how that capability is combined, encouraging coordinated bids and recognising the value of integrated, digitally enabled

solutions.

Global opportunity for UK hydrogen

The UK has strong foundations for a hydrogen economy, but long-term success will depend on how effectively those capabilities are deployed.

Hydrogen is becoming a global market for complete, scalable solutions.

These solutions will be defined by how well they integrate technology, data and automation.

The expertise is already in place. The priority now is to connect it so the sector can deliver high-performing, intelligent systems at scale.

Andy Lane is the hydrogen lead at Siemens

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