

Woodside Energy
Maripat Sexton
1500 Post Oak Blvd
Houston, TX 77056
713-898-6085
maripat.sexton@woodside.com

Category A: Most effective demand-side support measure to support H2Hubs

Q1: What is the most effective way DOE could catalyze durable, bankable demand for clean hydrogen at DOE-funded H2 Hubs? Which of the following potential mechanisms would be most impactful?

- a) Pay-for-difference contracts that provide support to projects based on the price they can achieve in the market**
- b) Fixed level of support for projects (e.g., fixed \$/kg amount) that stacks on top of other sources of revenue**
- c) Funding to support feasibility analysis from potential offtakers near H2Hubs**
- d) “Market-maker” for clean hydrogen to provide a ready purchaser/seller for clean hydrogen**
- e) Other (please specify)**

Woodside anticipates hydrogen demand in the US will be driven by customer need and government policies, supported by hydrogen suppliers like Woodside that have a proven track record of producing and delivering energy safely. Together, we can offer a pathway to durable and bankable demand of hydrogen.

Of the proposed mechanisms, Woodside prioritizes pay-for-difference contracts that will support projects based on the price they can achieve in the market. Precedent exists for this type of mechanism, as a similar model is used in Europe. In 2022, the European Union’s newly formed European Hydrogen Bank launched a contracts for difference scheme that aims to close the market price gap between renewable green hydrogen and grey hydrogen. A mechanism of this kind has the potential to encourage scaling and to ultimately drive down the price of hydrogen. To further catalyze demand, Woodside recommends consideration be given to direct to end-user support such as fuel cards.

Woodside does not favor pursuing mechanisms, such as funding to support feasibility analysis as this is a relatively low expenditure or a “market maker” program that requires significant government involvement from both a time and effort perspective. Additionally, Woodside does not support competitive grant solicitations as these require too much overhead and resources for government to manage and industry to apply. Additionally, competitive grants are challenging to include in

financial modelling, which compromises a company's ability to accurately evaluate economics of a project when making investment decisions.

Q2: For eligible projects, what competitive process should be used to select projects that will receive demand-side support?

- a) **Reverse auction in which projects compete to bid the lowest level of support they need to make their project viable**
- b) **Request for proposal-like process in which projects apply and are selected based on a variety of factors**
- c) **Eligibility-based process in which all projects that meet certain threshold requirements receive some form of support**
- d) **Other (please specify)**

Woodside supports developing an eligibility-based process in which all projects that meet certain threshold requirements receive some form of support. Experiencing the positive impact the Production Tax Credit has had on developing the hydrogen industry, an eligibility-based process would be easier to implement and manage. It would also create a level playing field that provides clarity and defined targets.

An alternative and efficient way to deploy funds to generate demand would be through blanket federal incentives. For example, a dollar amount per hydrogen truck (or piece of equipment) purchased.

Woodside is not in favor of reverse auctions or requests for proposal-like processes to select projects, which is likely to create an incentive system and a competitive environment that spur unattainably low costs. This approach has the potential to risk execution by encouraging a 'race to the bottom' where elements like contingency, escalation, and inflation may be underestimated and/or underreported.

Q3: How can DOE design demand-side support to account for other kinds of support that H2Hubs projects may receive (e.g., tax credits, state and local government incentives, DOE cooperative agreement funding)?

Woodside recommends supporting the demand-side through pathways that complement the support H2Hub projects may receive. Woodside recommends providing a federal level subsidy per unit of zero emission equipment (e.g., fuel cell hydrogen truck) and for the operational expenditure of zero-emission equipment.

Direct funding to companies across the value chain should also be considered as it offers an immediate benefit to the hydrogen ecosystem compared to notional tax credits that have limited impact in the short-term.

Together, support of this nature – subsidies and direct funding – that can be stacked, has the potential to move the needle for the industry reaching diesel parity. Potential

customers have consistently indicated that reaching diesel parity will be the enabler for the industry to transition to alternative fuels, such as hydrogen.

Q4: How can DOE structure demand-side support for H2Hubs to best catalyze the formation of a mature commodity market for clean hydrogen?

- a) **How can DOE structure demand-side support for H2Hubs to best catalyze the development of standard contract terms for clean hydrogen?**
- b) **How can DOE structure demand-side support for H2Hubs to best catalyze the development of price transparency for clean hydrogen?**

To best catalyze the formation of a commodity market for clean hydrogen, the DOE must support industry and Society of Automotive Engineers (SAE) standard setting, such as base hydrogen purity and carbon intensity levels. This will ensure a consistent quality of hydrogen product for customers. These standards should be the base terms for all contracting.

Woodside strongly advises against the use of color which places limitations on the industry. Instead, Woodside recommends measuring projects by their Carbon Intensity ratings. Both electrolysis and natural gas reforming lead to an identical hydrogen product and are each expected to play a role in the future energy mix. The proper description should document the emissions intensity of the by-product, not the color.

Additionally, to support the development of the market, we must build an entirely new and fit for purpose, new energy supply chain, including efficient methods of distribution. This is complex. It must be orderly, and it must be affordable.

Price transparency within the industry is lacking. The DOE must avoid implementing programs or mechanisms that allow developers from projecting unattainably low prices that are unachievable and risk the ability to execute a financially viable project, and ultimately limit development of the hydrogen market.

Category B: Implementation of demand-side support measures

Q1 If DOE were to establish a demand-side support mechanism for H2Hubs with an independent implementing entity or entities, what capabilities and qualifications should DOE prioritize when selecting an entity or entities? Should DOE seek a single entity with national scope or several entities with regional scopes?

To successfully drive demand of hydrogen, an established mechanism must have clear guardrails, an efficient implementation process, and avoid lengthy reviews. A recommended approach for achieving this is by tasking the DOE with establishing a

single, independent entity with a national remit that is not subject to periodic change due to political shifts and can be solely responsible for establishing the necessary mechanisms.

Beyond establishing a demand-side support mechanism, Woodside is an advocate for the development of a clear and efficient pathway for permitting that reduces current timelines and overcomes regulatory challenges which have the potential to delay project advancement, and ultimately the development of the industry.

Q2: For any or all of the program design factors selected in response Category A, what existing entities could administer and oversee the demand-side support mechanism? If no existing entity currently exists with the necessary capacity or expertise, how long would it take to establish such an entity or entities? What are the necessary areas of expertise for DOE to prioritize in selecting an independent entity?

Woodside Energy has chosen to not respond to this question.

Q3: What are the risks to DOE in partnering with an independent entity to administer a demand-side support mechanism? What governance structures and guardrails should DOE consider in designing a demand-side support mechanism to help maximize impact and minimize implementation risk? Are there any models DOE should look to in establishing a governance structure?

When partnering with an independent entity to administer a demand-side support mechanism, the DOE must consider risks, such as perceived or actual bias and insufficient experience. The hydrogen industry is relatively nascent – an entity must be willing to work with players from across the value chain for input on programs and initiatives as we collectively build expertise and best practices.