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Japan's hydrogen subsidies kicking-off in Summer 2024

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The Japanese government passed the Hydrogen Society Promotion Act (the **Hydrogen Act**) on 17 May 2024, further to which the government is expected to implement two subsidy schemes commencing in the summer of 2024:

- A supply-side subsidy structured on the basis of a contract for differences, providing support for the price gap between the sourcing of low carbon hydrogen and its derivatives as compared to conventional fuels (the **CfD Scheme**); and
- An industrial development support subsidy scheme, providing subsidies for the development of specific industrial areas (or "clusters") that have the

capacity to accommodate large-scale hydrogen/ammonia projects (the **Clusters Support Scheme**).

The start of these subsidy schemes marks a significant milestone in Japan's journey to achieve carbon neutrality by 2050 and presents exciting opportunities for private sector investors seeking to enter the low carbon hydrogen market. The dual subsidy approach seeks to address the 'chicken-and-egg' challenge of being unable to stimulate supply without demand and vice versa by tackling supply and demand side needs.

▼ **What do you need to know in 60 seconds?**

- Japan's Hydrogen Act implements a twin-track approach to subsidising the hydrogen economy that addresses the need for supply side subsidies (the **CfD Scheme**) and demand side stimulus (the **Clusters Support Scheme**).
- The Clusters Support Scheme involves a cluster selection process offering financial support to credible operators who bring forward business plans demonstrating a commitment to self-sustaining supply chains at selected industrial locations in Japan.
- The first phase of the cluster selection process has already been completed, with the selection of 10 feasibility studies announced in May 2024. A further selection round is expected to start in June 2024.
- The CfD Scheme addresses the price gap between low carbon fuels and conventional fuels through a contract for differences. Selected suppliers will receive a difference payment covering the additional cost of low carbon fuels as compared to an index representing the landed cost of conventional fuels in Japan.
- The Japanese government expects carbon pricing to reduce the overall level of subsidy required under the CfD Scheme over time, contributing to a sustainable low carbon hydrogen industry.
- Japan's low carbon standard is technology-neutral, requiring a 70% saving in greenhouse gas content as compared to fossil fuel comparators, without regard to the production method. For hydrogen and ammonia the low carbon standard is expected to be determined at the point of production, making it a lower threshold than that applicable in Europe.

- The Basic Policy is expected to be published in the summer of 2024 and to establish detailed eligibility and evaluation criteria for participation in the Hydrogen Act subsidy schemes.

Key features of each scheme

▼ CfD Scheme

Japan's Low Carbon Standard

In order to be eligible for support under the Hydrogen Act's CfD Scheme, hydrogen (and its derivatives – ammonia, e-methane and e-fuel) (**Low Carbon Fuels**) must meet a specified maximum carbon intensity that differs depending on the type of fuel. The low carbon standard (set out below), established by the Ministry of Economy, Trade and Industry (**METI**), reflects a CO2 emissions reduction of 70% as compared to a fossil fuel comparator (an approach consistent with the European requirements for low carbon fuel, save that METI's interim summary dated 4 January 2023 indicated that in the case of hydrogen and ammonia it is measured at the point of production, rather than the point of consumption). Further details on the low carbon standard (including whether it is measured at the point of production or the point of consumption) are anticipated to be provided in the subordinate regulations that are expected to be published shortly and finalised in the summer of 2024.

Type	System boundary	Carbon Intensity
Hydrogen	Well to Gate	3.4kg-CO2e/kg-H2 (or lower)
Ammonia	Well to Gate	0.87kg-CO2e/kg-NH3 (or lower)
E-fuel	Whole supply chain	39.9g-CO2e/MJ (or lower)
E-methane	Whole supply chain	49.3g-CO2e/MJ (or lower)

By focusing on CO2 content rather than the method of production, the Japanese low carbon hydrogen standard creates flexibility for Japan's Low Carbon Fuel demand to be met by blue or green products. This makes sense given Japan's proximity to the US and Canadian production markets, in which significant

volumes of blue hydrogen are forecast to be produced at competitive prices. It also contrasts with the European position, where green hydrogen is prioritised through the quotas established by the Renewable Energy Directive.

Addressing the Price Gap

The cost of producing low carbon hydrogen is widely recognised as being higher than producing traditional grey hydrogen. The CfD Scheme will tackle this price gap between low carbon hydrogen and conventional fuel by providing subsidies to eligible suppliers of Low Carbon Fuels through a "contract for differences" (**CfD**) for a term of up to 15 years. This subsidy will be provided by The Japan Organization for Metals and Energy Security (**JOGMEC**), which will administer the CfD Scheme.

In structuring the subsidy arrangements as a CfD, the Government has referred to UK's approach to delivering subsidies for hydrogen production. The contract for differences mechanism has proved to be very effective in the UK's offshore wind sector and has been redeployed as a means of injecting operational support to hydrogen projects in the UK. However, it will be interesting to see how the Government addresses some of the more challenging aspects of the UK's hydrogen CfD design when structuring its hydrogen CfD to support the supply of low carbon fuels to Japan.

The total budget which the Government intends to allocate to the CfD Scheme is JPY 3 trillion (c. US$19 billion) over the scheme's 15-year term. This represents a significant financial commitment, which the Government hopes will create a more level playing field for Low Carbon Fuels, thereby stimulating growth of industrial-scale demand for Low Carbon Fuels within Japan.

CfD Scheme Applications and Eligibility

The Government plans to accept applications under the CfD Scheme from the summer of 2024, with the first participants to be selected by the end of 2024.

The CfD Scheme is open to suppliers of Low Carbon Fuels that have either been produced domestically or which are imported into Japan, provided that their business plans are approved by the Government.

The Hydrogen Act stipulates that, in order to obtain Government approval, a project must, among other things, satisfy the following requirements:

- Meet the eligibility criteria set out in the basic policy to be published by the Government (the **Basic Policy**);
- Have an economically viable and reasonable business plan that has been created jointly by the supplier and offtaker(s) of Low Carbon Fuels;
- Contribute to increasing the international competitiveness of Japanese industries associated with the supply and use of Low Carbon Fuels;
- Be expected to start supplying Low Carbon Fuels by FY2030 and to continue supplying Low Carbon Fuels for at least 10 years after the cessation of the 15-year subsidy programme; and
- Lead to development by offtakers of new businesses to use Low Carbon Fuels, with a particular focus on "hard-to-abate" industries such as steel and chemicals, and/or develop innovative methods for improving the environmental impact of the use of raw materials and fuel, (the **Hydrogen Act Requirements**).

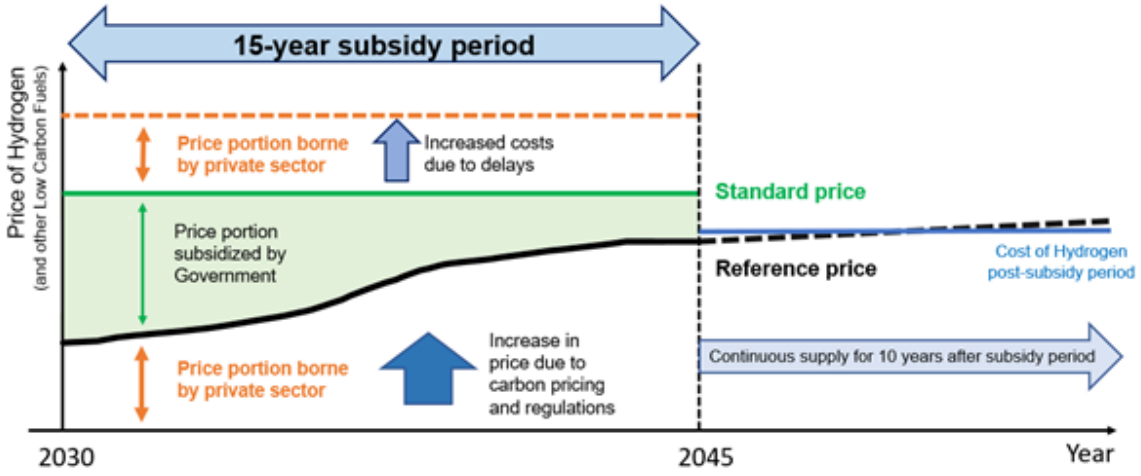
The Basic Policy setting out the detailed eligibility criteria to be used by the Government and JOGMEC when evaluating projects has not yet been published but, based on the Government's interim report of 29 January 2024 (the **Interim Report**), is expected to include, among others, the following as eligibility criteria:

- The "S+3E" Policy Criteria (being "Safety, Energy Security, Environmental Capability and Economic Efficiency)" – this requires the project to: hold all relevant permits and licences under all applicable safety related laws and regulations; contribute to the security of supply by delivering at least 1,000 tonnes (hydrogen equivalent) of Low Carbon Fuels per year; lower the carbon intensity; and reduce the cost of supply to a level that will allow for self-sufficiency after the support ends;
- GX policy criteria – the project must strengthen industrial competitiveness and contribute to economic growth. This will involve an assessment of whether the project promotes the energy transition in hard-to-abate industries and reduces emissions; and
- Criteria relating to project completion – this includes consideration of: the credibility of the business plan, including whether offtake has been secured; and risk sharing between the government and the project, such as whether the project is susceptible to geopolitical risks.

How will the CfD mechanism work?

Rather than paying importers a tax credit per volume of Low Carbon Fuels produced, the Government has opted to compensate suppliers for the price gap between conventional fuels and Low Carbon Fuels. Suppliers that benefit from support under the CfD Scheme will receive a top-up payment according to the amount by which the cost of Low Carbon Fuels production (the **Standard Price**) exceeds a reference price representing the cost of conventional fuels landed in Japan (the **Reference Price**).

To provide guidance on the CfD mechanism, below is a simplified diagram of the CfD Scheme based on that published by METI in June 2024.



Establishing the Standard Price

The Standard Price may be a fixed or variable amount, determined based on a formula proposed by the supplier and approved by the Government and JOGMEC, as reflecting the price at which the project is able to recover its cost of production, importation and supply of Low Carbon Fuels and make a reasonable profit. Subject to a pre-agreed cap, the formula may:

- Include a contingency amount equal to 10% of anticipated construction costs as a buffer for cost overrun that cannot be quantified at the evaluation stage, provided however that this must be refunded or deducted from the Standard Price calculation if such costs are not incurred; and
- Reflect fluctuations in foreign exchange rates, inflation and/or raw material costs.

The Standard Price formula is not permitted to include cost overruns due to events or circumstances that are (or should have been) within the control of the

supplier.

Once approved, the supplier is not entitled to any adjustments to the Standard Price formula for the 15- year term of the CfD Scheme. It should however be noted that, according to the Interim Report, the Standard Price may be adjusted downwards at the request of the Government if there is a reduction in market prices for Low Carbon Fuels (e.g. as a result of the introduction of innovative technology that is expected to reduce production costs). This is unusual when compared to similar support schemes in other major hydrogen consuming markets as it is widely anticipated that technology enhancements over time will reduce the cost of Low Carbon Fuels. Reducing support for first mover projects that bear a higher production cost may therefore create bankability issues for such projects reliant on the CfD Scheme. That being said, this was not mentioned or referred to in the latest material published by METI and therefore we will need to see whether the Basic Policy and/or any subordinate regulations adopt this measure.

Determining the Reference Price

The Reference Price is intended to represent the landed cost of conventional fuels in Japan and will be set based on a publicly available index. The index is intended to reflect the prevailing cost of conventional fuels based on empirical data.

In some cases, an "environmental value" will be added on top of the figure determined by reference to the index when setting the Reference Price, and the Government envisages that the Reference Price will increase over time due to the influence of carbon pricing on conventional fuels. This will decrease the amount of support provided under the CfD Scheme, thereby creating a path to a self-sustaining Low Carbon Fuel industry in Japan.

▼ Clusters Support Scheme

Developing Industrial Clusters

The Clusters Support Scheme focuses on the development of industrial clusters for the use of Low Carbon Fuels. This furthers the vision of METI of stimulating the Low Carbon Fuel economy by aggregating industrial demand in designated locations around Japan. This approach is consistent with the evolution of

government support for hydrogen demand in North America and the UK, with clusters of hard-to-abate industry being identified and hydrogen infrastructure being developed through a concentration of grant funding.

The Government is expected to select eight to ten industrial clusters over the next decade, focusing on, in particular, three large scale clusters in the metropolitan areas and a further five medium sized clusters in regional locations throughout Japan. METI envisages that industrial clusters will contain a concentration of one or more of the following:

- Large-scale power generation, such as existing gas/coal-fired power stations, where hydrogen/ammonia power generation can be deployed as a replacement fuel;
- Heavy industrial processes such as refineries, still production facilities and petrochemical facilities, where low carbon hydrogen could be used to displace grey hydrogen in existing industrial processes; and
- Renewable energy production facilities that can be used to produce hydrogen/ammonia domestically, reducing the logistic and transportation costs of meeting the demand for Low Carbon Fuels.

Cluster Selection Process

The process of selecting the industrial clusters is expected to involve a three-stage process comprising the following steps:

- Stage 1 - Feasibility Study Phase – where METI (via the Consortium for Resilient Omni-energy Supply System (**CROS**)) is expected to initiate a public tender process for cluster selection, as a result of which it expects around 15 feasibility studies to be chosen for implementation;
- Stage 2 - Front-End Engineering and Design (FEED) Phase; and
- Stage 3 - Construction / Engineering (or Infrastructure Development) Phase.

The 15 initial clusters going through the feasibility study phase will gradually be whittled down to the eight to ten clusters desired by METI, as Stage 2 and Stage 3 progress. There is no published timeline for the completion of Stage 2 and Stage 3, but market expectations are that all Stages will be completed by FY2030.

Eligibility Criteria

The Hydrogen Act (which leaves the details specifically applied to each scheme to the Basic Policy and/or subordinate regulations) does not differentiate between the requirements to be met for participation in the Clusters Support Scheme and in the CfD Scheme. Therefore, the Hydrogen Act Requirements described above will apply equally to the Clusters Support Scheme.

It is also expected that the Basic Policy will set out in detail eligibility and evaluation criteria specific to the Clusters Support Scheme which would, among others, include criteria for:

- Individual companies forming the clusters – such as whether companies have an innovative and/or competitive advantage in relation to decarbonisation technology;
- The project site as a whole – such as whether the site is capable of hosting industry capable of using a minimum of 10,000 tons of Low Carbon Fuels per year and whether the site will contribute to the local economy;
- Medium-to-long term development potential – such as whether the business plan for the project has a medium-to-long term outlook that can incorporate emerging usage needs in the surrounding area and new technologies including carbon recycling and carbon capture, utilisation and storage; and
- Feasibility – such as whether the project has a clear vision for cluster formation and is led by one or more companies having a strong leadership and commitment to promote cluster formation, with an appropriate project structure to achieve this.

At each stage of the cluster selection process, applicants are expected to solicit and take account of input from various stakeholders connected to the development of the clusters, including Low Carbon Fuels suppliers, large-scale consumers, financiers, local government, technology providers, transport and storage providers, and regional stakeholders (such as universities and local residents in the relevant area). This ought to assist in the deliverability of clusters.

Level of Subsidy for Selected Clusters

According to the CROS's application guidelines, a budget of JPY1,438 million (c.US$9.1million) is already secured to fund approximately 15 feasibility studies selected by public tender. JOGMEC will therefore make available JPY 100 million

to JPY 200 million (US$635,000 – 1,270,000) for each feasibility study (subject to a cap of JPY 200 million).

The first public tender process has already completed and CROS announced the selection of 10 feasibility studies on 31 May 2024. An additional public tender round is expected to commence in June 2024.

At this stage, the level of subsidy to be made available to support Stages 2 and 3 of the cluster selection process and the timing of the legislative programme to establish the budget is not yet known.

▼ No double-dipping of Japanese Subsidy Schemes

Both the CfD Scheme and the Clusters Support Scheme preclude the compounding of subsidies under those schemes with other Japanese government subsidies, such as NEDO or the Green Innovation Fund. However, the Hydrogen Act does not prevent Low Carbon Fuels suppliers or cluster developers from receiving subsidy or support from foreign governments, therefore allowing Japanese producers and supply chain participants to take the benefit of production subsidies available outside of Japan.