H2Global: a market maker for clean commodities

Introduction to the H2Global intermediary and double-sided auction mechanism



H2Global

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Glossary

Term	Full Title / Definition
CCfDs / CfDs	carbon-contracts-for-difference / contracts-for-difference
DSA	double-sided auction
EAC	environmental attribute certificate
e-fuels	synthetic fuels produced from renewable energy sources
e-SAF	electricity-based synthetic aviation fuel
ETS	Emissions Trading System
FID	final investment decision
HPA / HSA	hydrogen purchase agreement / hydrogen sales agreement
LCOH	levelised cost of hydrogen
LOHC	liquid organic hydrogen carrier
LOI	letter of intent
RFNBO	renewable fuels of non-biological origin

Foreword

H2Global is on a mission to accelerate the emergence of functioning markets for clean hydrogen. This publication provides a comprehensive account of the H2Global mechanism: what it is, how it works, why it has taken its current form and where it could go from here. It also showcases the design flexibility of H2Global´s architecture, allowing public funders to tailor the mechanism to their needs and priorities. As such, this paper is intended for a broad audience, ranging from researchers, policymakers, and public bodies to commercial stakeholders and investors across the hydrogen value chain.

The H2Global mechanism was developed in response to a concrete market failure in the nascent hydrogen sector: the price gap between the current cost of production and the market's willingness to pay, which prevents producers and offtakers of clean hydrogen from coming together. The mechanism was designed as a practical and innovative response to this deadlock. As such, it is shaped at every step by legal and regulatory frameworks as well as budgetary realities. Understanding these conditions is essential to comprehending both the current design and its future scope.

H2Global is designed to generate price signals from real transactions and to provide a framework in which private investors and lenders can engage with confidence.

Beyond overcoming clean hydrogen's chicken-and-egg problem, H2Global's key objective is to mobilise private capital at scale. Public money alone will never suffice to finance the energy transition. However, institutional capital will only follow where credible business cases meet reliable counterparties and functioning markets with transparent prices and sufficient liquidity. In other words, where hydrogen has become a tangible investment opportunity rather than a policy aspiration, H2Global is designed to foster precisely those preconditions, by generating price signals from real transactions and providing a framework in which private investors and lenders can engage with confidence.

In that sense, the mechanism is as much an exercise in financial architecture as it is in energy policy. The underlying conviction is that functioning markets are more sustainable and far more efficient than sustained and perpetuated subsidy regimes. Public support has an important role to play by catalysing market creation in a targeted way.

H2Global puts this principle into practice by deploying a temporary, state-backed intermediary that trades via a double-sided auction between producers and buyers. On the supply side, it concludes long-term purchase agreements; on the demand side, it sells through short-term auctions. Public funding dynamically covers the gap between the resulting prices.

The mechanism must therefore be understood as a bridge for a specific transition period, within a still-evolving regulatory framework. As carbon pricing tightens, quota obligations take effect, and sustainability requirements increasingly penetrate markets, the underlying economics of clean hydrogen will shift. While regulation is key to creating demand in the long term, technical progress and economies of scale will move the industry further along the learning curve, unlocking falling prices, and creating a dynamic, self-sustaining expanding market.

H2Global's role is to catalyse and cushion this transition, compress the timeline, and then step back once market participants are ready to operate without it. As part of that logic, the mechanism is also designed to lay the groundwork for the instruments that will follow, such as conventional contracts-for-difference at a later stage of market maturity.

It is hoped this publication makes for an engaging read and answers open questions, clears up potential misconceptions, and reveals aspects of the H2Global mechanism that may yet surprise even those already familiar with it.

Executive summary

Clean hydrogen is critical to decarbonising the sectors that cannot be fully electrified — namely, heavy industry, shipping, aviation, etc. Simultaneously, it strengthens energy resilience and sovereignty by diversifying energy value chains away from fossil fuel dependence. While the technology exists and policy ambitions are set, the market has yet to function at scale. This indicates that the nascent clean hydrogen economy requires a dedicated catalyst — a role that neither regulation nor subsidy schemes alone can fulfil.

Energy market history shows that new commodities need a bridging mechanism to move from promising technology to a regularly traded commodity. Clean hydrogen is no different. Currently, production costs are too high for buyers, demand is too weak for producers to commit capital, and neither side will move first. Without intervention, this deadlock could persist for many years to come, making net-zero targets unreachable.

H2Global compresses the market-creation timeline by blending best practice from public procurement, structured finance, and commodity trading, using public funds to unlock private investment and creating the signposts and pathways for private actors to take over.

The core of the H2Global mechanism is a temporary market intermediary sitting between producers and buyers. The intermediary acts as a neutral trader for hydrogen and its derivatives via its *double-sided auction (DSA)* mechanism: on the supply side, it tenders long-term *hydrogen purchase agreements (HPAs),* while on the demand side, it runs short-term auctions for *hydrogen sales agreements (HSAs)* that continuously reveal market prices and provide liquidity.

Expected trading losses between these long-term purchase and short-term sales contracts are covered by a government subsidy that is dynamically adjusted to the realised cost gap, effectively emulating a contract-for-difference (CfD) logic in a context where no reliable reference price yet exists.

For successful bidders in the purchase auctions, the HPA provides long-term cashflow certainty and a government-backed counterparty, turning early projects into bankable propositions, while the rolling HSA auctions yield granular price discovery and liquidity.

This constitutes a financial innovation designed to rapidly put in place the core preconditions for market creation: credible and evolving price discovery, robust counterparties, and sufficient trading depth to attract private capital at scale.

The H2Global mechanism catalyses market creation by simultaneously delivering five mutually reinforcing outcomes.

First, it accelerates final investment decisions (FIDs). Producers receive a bankable, long-term offtake contract from the market intermediary — backed by the implicit credit rating of a funding government — before they raise finance. Critically, this contract is awarded through a competitive auctioning process: the winning bid represents the most competitive overall proposal from a pool of projects already vetted for quality and delivery credibility.

Second, it enables early-stage project completion in the current market environment. Unlike conventional market logic, which pressures producers to achieve gigawatt-scale output immediately to compete on cost, H2Global allows projects to enter at megawatt scale today and grow as the market develops — removing the "race to scale" as a barrier to entry.

Third, it reveals real prices. Competitive auctions on both the supply and demand side generate reference points and form the basis for indexes that future investment, financial products, and instruments such as CfDs will rely on.

Fourth, it creates new energy trade partnerships. The intermediary acts as the contractual counterparty on both sides of the DSA and, through this back-to-back trading mechanism, physically connects producers and buyers across borders and value chains.

Fifth, it pioneers contractual frameworks and helps remove regulatory hurdles. It negotiates standardised terms that support the development of market standards for the emerging international hydrogen trade. By applying this contract architecture in real-world transactions, it also plays a pioneering role in uncovering regulatory hurdles, value-chain shortfalls, and design flaws, providing real-world feedback to regulators and public decision-makers and helping to shape more effective future frameworks.

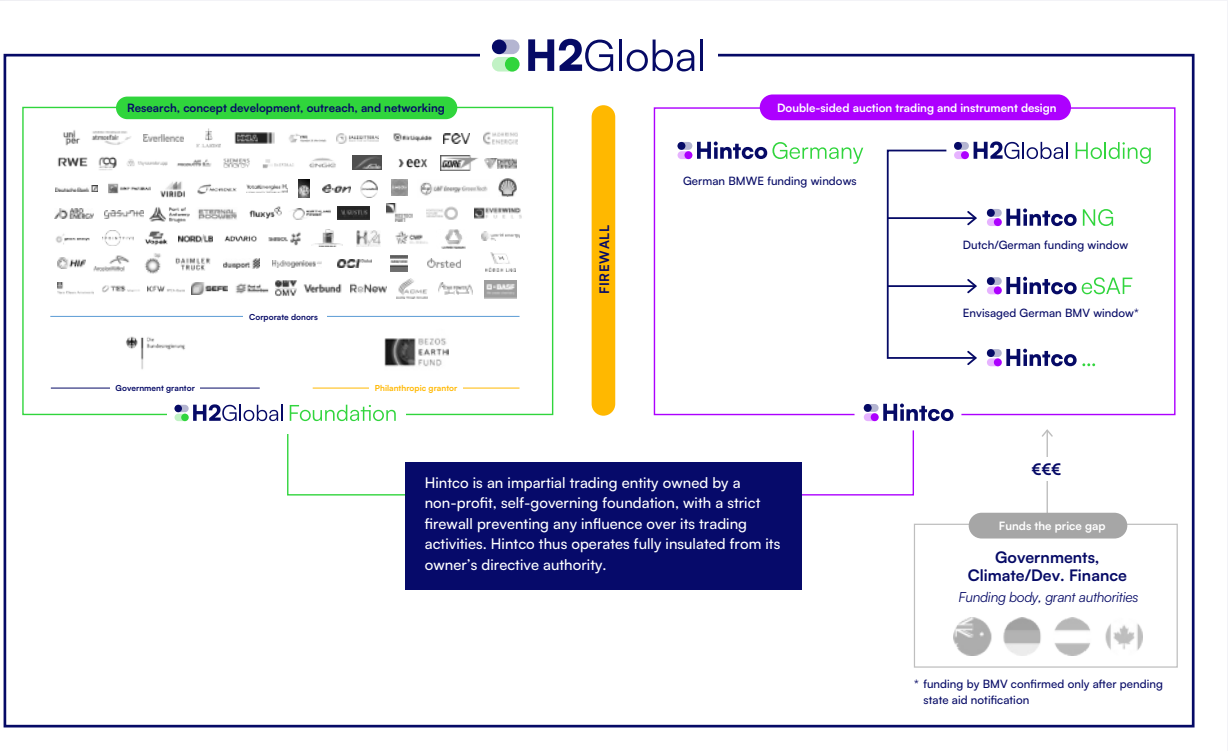
Crucially, H2Global is designed to make itself redundant. Governments considering the use of the H2Global mechanism should note that it is explicitly time-bound, as there is a clear, planned phase-out of support built into the model. H2Global is not a permanent subsidy — it is a market accelerator.

The market intermediary will step out of the market once a liquid market exists.

H2Global implementational set-up

Globally, the first entity currently developing the H2Global mechanism is Hintco, a temporary intermediary trading company which trades hydrogen and its derivatives via double-sided auctions. Hintco's impartiality is a fundamental design principle. To ensure its independence from both public and private interests, Hintco is constituted as a wholly owned subsidiary of a self-owned and fully independent non-profit organisation established specifically for this purpose, the H2Global Foundation. A core function of the foundation is to provide the institutional framework enabling Hintco's impartiality, ensuring it operates as a neutral intermediary independent of any single stakeholder group. Futhermore, the foundation disseminates information and advocacy about the H2Global mechanism to governments, industry, and civil society organisations. It also expands concepts and ideas for future application of the H2Global mechanism, based on the lessons learned from Hintco which designs and trades via double-sided auctions and is the sole recipient of public funding for the compensation of differential costs.

The support to date validates the model. By July 2026, governments around the world had committed, earmarked or are actively discussing public funding commitments of approximately USD 9 billion. Hintco has also completed its first supply-side auction for renewable ammonia. Germany and the Netherlands are already using the instrument. Further bilateral import/export windows, such as those between Germany and Canada or Germany and Australia, are currently in preparation or at the stage of notification under state aid law, while governments across Asia, Europe, and beyond are actively exploring adapting or supporting the H2Global mechanism.



1. Problem description

Hydrogen sector: market failure as the starting point

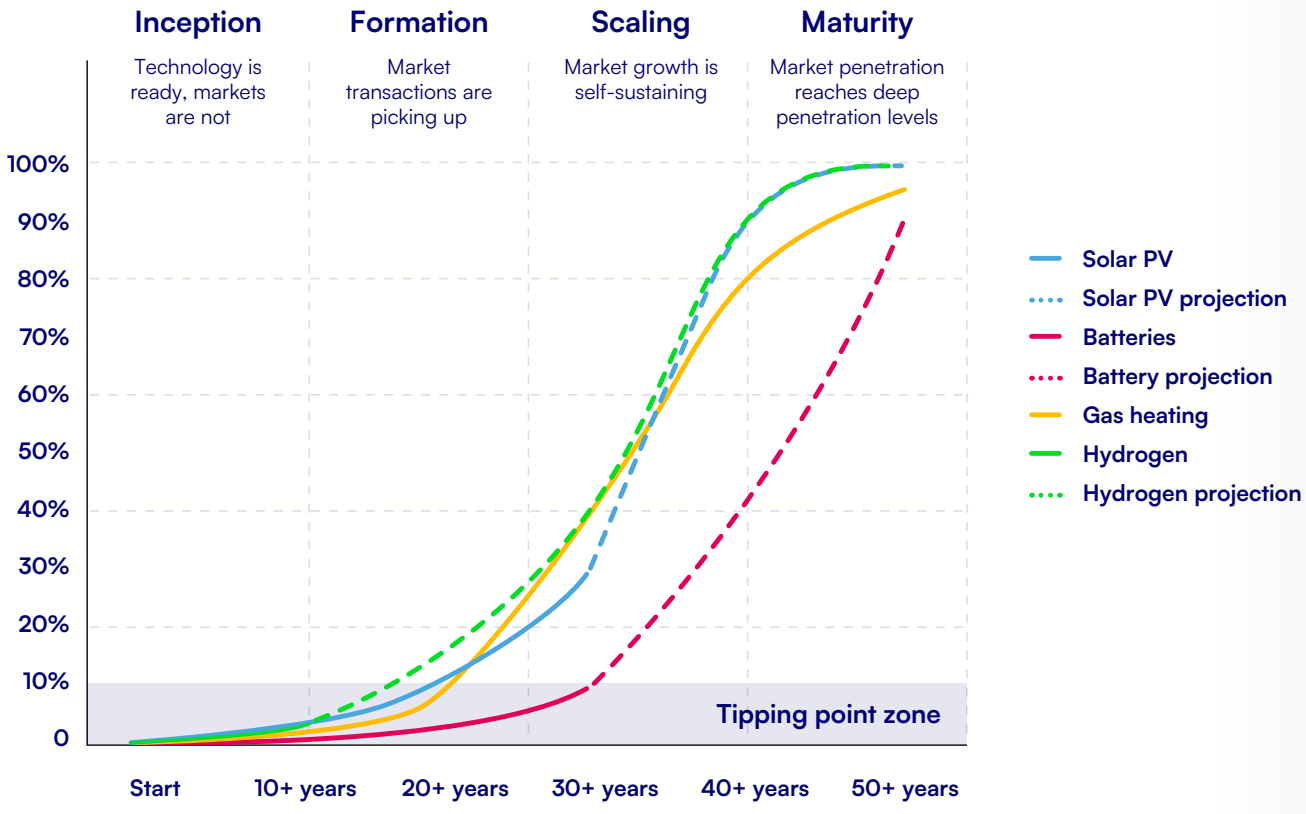
Sustainably produced hydrogen — including its derivatives — is a key component in the context of industrial decarbonisation and the achievement of climate targets,[1] whilst also enabling the diversification of energy supply chains and thus strengthening energy resilience.[2,3]

However, the supply and demand sides of the hydrogen sector are not expected to converge in the near term, as there is currently a significant gap between the (relatively high) production cost (levelised cost of hydrogen, LCOH) and the market's willingness to pay on the demand side. The latter is based primarily on the prices of fossil fuels plus regulatory costs, such as CO_2 taxes.

Substantial reductions in LCOH are only to be expected with economies of scale on the production side; however, such scaling requires corresponding demand, which in turn will only materialise once supply prices fall. The sector is therefore faced with a classic "chicken-and-egg problem".[4]

Historically, the introduction of new technologies and the emergence of new markets usually follow an S-curve: once a tipping point is reached, market forces set in motion a sharply accelerated, sometimes exponential, spread. Such a tipping point usually occurs when a new technology or product crosses a certain threshold in terms of cost and attractiveness compared to the status quo — empirically, this often happens once market penetration reaches around 5-10%.[5]

Figure 1: The importance of tipping points — market adoption of different technologies



Source: H2Global, Mission Possible Partnership

When markets reach a tipping point, market forces lead to exponential adoption thereafter.

Tipping points in terms of market deployment are usually reached at 5-10% market share.

Functioning markets as a prerequisite for capital mobilisation

The projected massive investment requirements for the energy transition, amounting to around USD 3.5 to 7.5 trillion annually,[6] can in the long term only be met by private-sector investments, not primarily by public funding.

The basis for broad private-sector engagement and corresponding investment is:

(i) clearly identifiable business and investment opportunities;

(ii) a transparent and liquid market; and

(iii) clearly defined and reliable (regulatory) framework conditions.

Against the backdrop of the current market failure, these prerequisites are either not yet in place or are only just being established at the current stage of development of the hydrogen sector.

A successful global energy transition will require USD 3.5 to 7.5 trillion in annual investment. Only the private sector can deliver capital at this scale. The role of public funding is to make that private capital flow.

Requirements for policy measures to build the hydrogen market

The establishment of a functioning market and the mobilisation of private capital, as well as the associated achievement of tipping points, must be realised as soon as possible to align with climate policy and energy resilience objectives.

This requires a careful balance between investment incentives and cost burdens to generate momentum for transformation without placing an excessive structural burden on businesses and industry.

Ideally, this will be achieved through a combination of complementary "carrots and sticks", with the clear aim of avoiding a long-term market reliance on state subsidies. "Sticks" primarily refer to regulatory frameworks that generate and secure reliable demand for sustainable hydrogen in the long term, for example through efficient CO_2 pricing or quota schemes.

The predictable and consistent implementation of the regulatory framework will be the most decisive factor for a successful transformation in the medium to long term.

However, in the meantime, it is essential to support the transformation of the hydrogen sector with a "carrot" in the form of a market-based support scheme designed in a way that the impact of this transition on the industry's competitiveness is cushioned within an evolving regulatory framework. Since public capital is a scarce resource, the scheme must maximise the efficiency of public funding, ensuring the greatest possible impact and catalytic effect for every unit of public expenditure.



IMAGE CREDIT: JACK / ADOBE STOCK

2. The core idea behind the H2Global mechanism

The H2Global mechanism, comprising a trading intermediary using a double-sided auction (DSA) mechanism, specifically expands the existing toolkit of government support policy to include a strongly market- and competition-oriented approach.[7] It aims to create the conditions for mobilising private and institutional capital along the hydrogen value chain through the efficient and targeted use of public funds, whilst simultaneously contributing to reaching tipping points in market development. Rather than placing a pure project-funding logic at the heart of a subsidy regime, H2Global's primary aim is to make a direct contribution to the establishment of functioning markets. This limits potential market distortions and promotes intense price competition on both the producer and offtaker sides.

Market intermediary and double-sided auctions

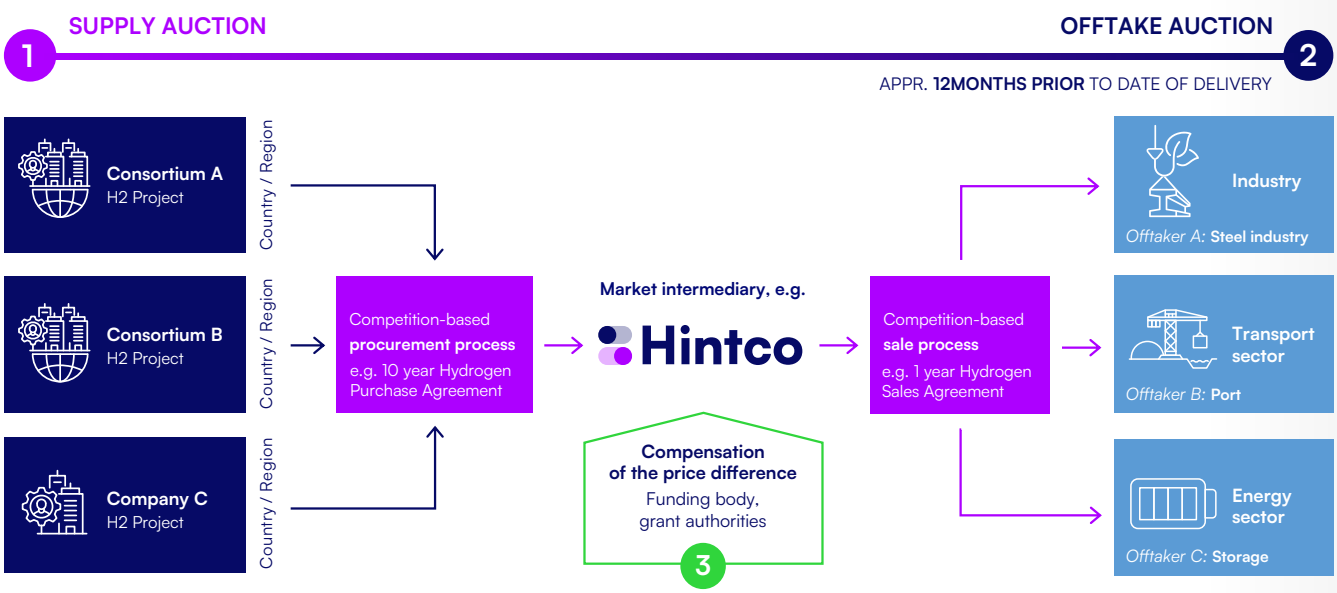
The central element of the H2Global mechanism is the creation of a state-backed trading intermediary with a mandate that is clearly defined in terms of both duration and scope. Even though the intermediary trades on a "back-to-back" basis,[8] it should be emphasised that the contracting party is the intermediary on both the supply and demand side. On the supply side, this intermediary purchases hydrogen or hydrogen-based products at prices fixed via long-term (e.g., 10-year), binding *hydrogen purchase agreements (HPAs).*

These prices are determined in competitive auctions[9] and awarded to the most competitive suppliers. This provides the successful producers with long-term cash-flow security and, in combination with the state-backed and hence "bankable" intermediary as a contractual partner, a viable business case. Ideally, the intermediary acts as an "anchor customer", whilst the producer has already identified or secured further buyers. The contract with the intermediary then forms the central element in enabling the final investment decision (FID), enabling the project to secure financing commitments and investors.

For some producers, the contract with the intermediary may form the basis for the first phase of a project that is initially focused exclusively on the HPA with the intermediary. Further scaling, unlocking further cost degression based on the associated additional economies of scale, then takes place step by step as the market develops. Under the H2Global mechanism, the intermediary reimburses the producer for the relatively higher LCOH associated with smaller plants, provided the producer wins the bidding process.

This enables entry into production at this early stage of the market formation, without being immediately forced into a "race to scale" simply to remain competitive with fossil fuels in terms of costs.

Figure 2: The double-sided-auction mechanism with Hintco as intermediary



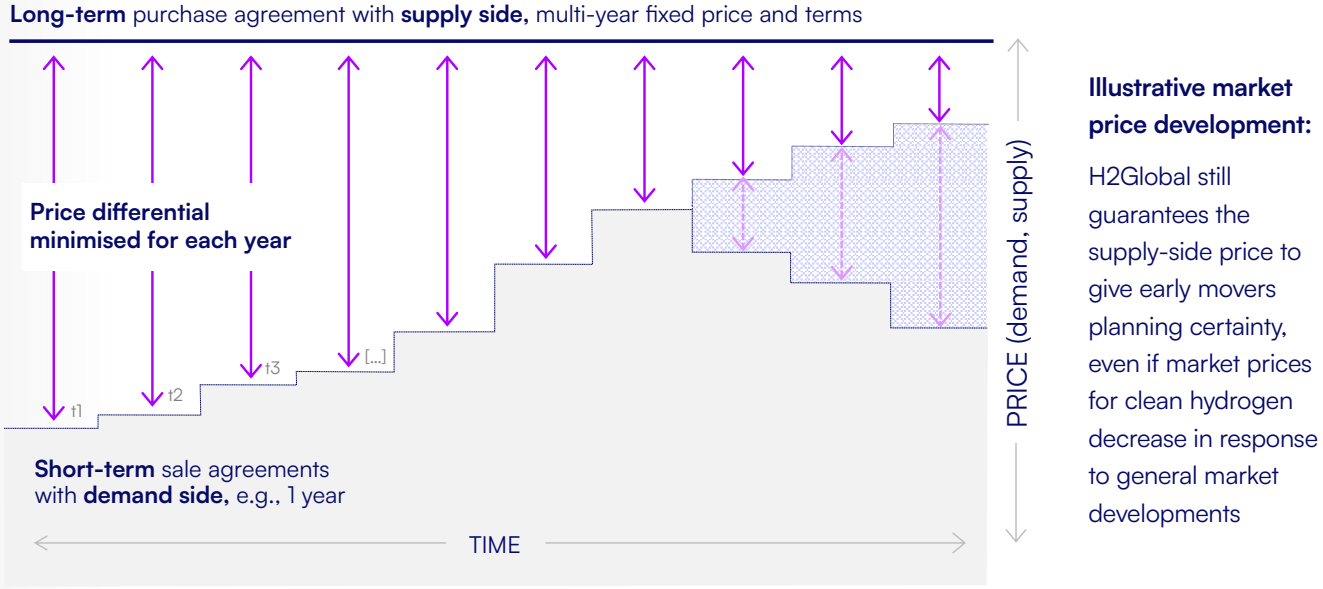
On the demand side, the intermediary again concludes a competitive auction procedure to sell the hydrogen in corresponding *hydrogen sales agreements (HSAs)* at the highest possible prices achievable. However, to enable the intermediary to benefit from a potentially rising willingness to pay for a clean energy carrier, the HSA contracts are of a short-term nature (e.g, one-year). The future development of the market's willingness to pay will mainly be triggered and determined by the developing regulatory framework. Because of this maturity/tenure transformation, there will be multiple revolving auctions on the demand side.

Since the intermediary's trading activities are expected to yield negative spreads at least in the short to medium term, public support is required to cover these losses, even as the double-sided auction mechanism aims to minimise the bid-ask spread. Essentially, the intermediary thus acts as a "state-backed paper trader". Based on this public support, the intermediary's creditworthiness and, consequently, the bankability of the HPA contracts are secured regardless of future market developments.[10]

Although producers and, where applicable, customers or buyers are indirectly materially favoured by the subsidy (and must meet certain legal requirements), they are not the addressees of the grant notification, not formal recipients, and not burdened with the administration of the subsidy.[11]

The HSA auctions on the demand side take place at a considerable time interval after the HPA awards. The start of the first HSA auctions is determined by the commissioning of supply-side production capacities (commercial operation date) and the announced first binding commissioning of product deliveries to the intermediary. A lead time of 12 to 18 months prior to the first delivery date is envisaged, as the intermediary can only give its customers a binding delivery commitment from this point onwards.[12] In the case of an earlier demand-side auction, the prices achieved would only provide a distorted reflection of the market's actual willingness to pay, as bids would be placed on a product that is still non-binding in terms of timing, quantity, and quality. Furthermore, it can be assumed that the cost differential gap in the period between the conclusion of the HPA and the HSA auctions would narrow due to increasingly stringent regulatory conditions (such as CO_2 pricing and quota requirements). An earlier HSA auction would therefore entail both higher costs for the public sector and misleading price signals that would be detrimental to market development.

Figure 3: The H2Global market-driven compensation mechanism ensures the most efficient use of funds for maximum impact



Illustrative market price development:

H2Global still guarantees the supply-side price to give early movers planning certainty, even if market prices for clean hydrogen decrease in response to general market developments

H2Global auctions uncover supplier and offtake pricing dynamics

To create liquidity and support market development, short-term and broad-based price signals are decisive.

3. Catalytic impact of the H2Global mechanism

In addition to creating business cases through HPAs for producers and HSAs for buyers (the number and volume of which are always limited by the available public funding budget), the intermediary in the H2Global mechanism also serves as a catalytic instrument for market formation, price discovery, and liquidity provision.

H2Global also triggers market formation, price discovery, and liquidity provision.

This is mainly achieved through the volume and maturity transformation built into the model.

As a result, the H2Global mechanism achieves the following effects:

1. **Maximum subsidy efficiency:** Through maturity transformation between long-term HPA contracts and short-term HSA contracts, demand-side market prices are continuously identified. Public subsidies thus adapt dynamically to the current marginal costs and are reduced to a minimum. In terms of its effects, this corresponds to a symmetric market premium model (e.g, a CfD), whilst market reference prices do not yet exist.

2. **Creation of reference prices and increased market transparency:** The DSAs unveil price discovery which is generated on a competitive basis within the model itself (in situ). This creates transparency which, in conjunction with the provision of liquidity, makes a significant contribution to the development of a functioning market. In the long term, these price signals support the formation of widely accepted reference prices and price curves (indices) in the market, upon which further instruments (such as CfDs) and financial products, including hedging instruments and forwards, can be developed.[13]

3. **Minimal market intervention:** Suppliers and consumers operate in a "normal" market environment. They do not compete for subsidies but must stand ground in a competitive process to secure offtake or access to a commodity. In effect, a functioning market is "simulated" via the competitive auction process.

4. **Demand aggregation:** In the absence of a functioning market, the intermediary functions as a demand aggregator. It makes advance commitments on the future expected offtake and absorbs the existing price and volume risk.

5. **Temporal and contained policy impulse**: The intermediary assumes a deliberately temporary role and withdraws from the market as soon as public funding is no longer necessary or the basis for other market-based instruments has been established. This means that the instrument enables governments to have a time-bound, controllable, and highly efficient catalytic use of public capital with a clearly planned phase-out of support, once a functioning market is established.

6. **Market formation:** As the intermediary trades on a "back-to-back" basis and different buyers may be involved in each of the annual HSA auctions, it brings the producer into contact with a wide range of different buyers over the term of the HPA. This directly promotes market formation, as producers, midstream players, and offtakers are systematically brought together in this process. Thus, the intermediary acts as a "pioneer" for established and future market participants, such as midstream companies or traditional commodity traders.

Viewed as a whole, the intermediary assumes the role of both a concrete "business case creator" and an overarching "market maker".[14]

In principle, the H2Global mechanism can also be adapted beyond energy commodities and applied to any product facing a similar market failure situation involving differential costs, lack of transparency, and illiquidity.

Figure 4: Timing, interaction, and foundation for different support mechanisms

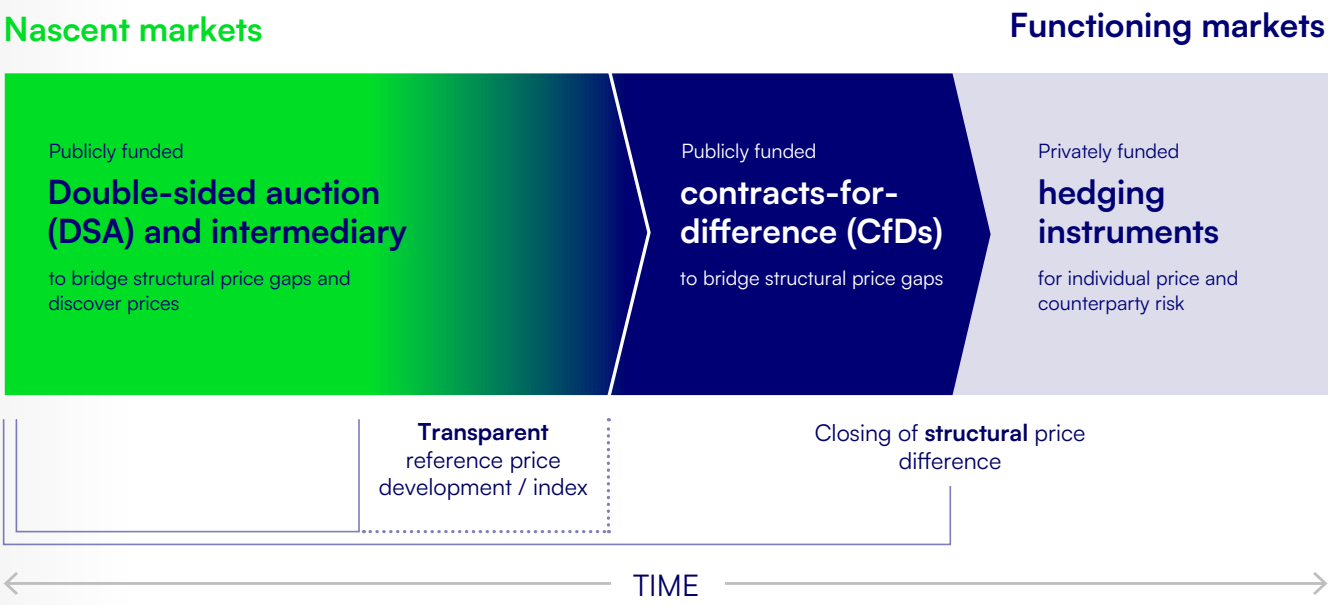


Table 1: H2Global DSA mechanism bridges the early market phase, while CfDs support more mature markets once a reference price exists

	Contracts-for-difference (CfD)	H2Global DSA mechanism
Price mechanism	Guaranteed long-term certainty for producer via strike price.	Guaranteed long-term certainty for producer via offtake contract with intermediary according to awarded bid price.
Counterparty	Producer signs contracts with offtakers.	Producer signs contract with credit-worthy intermediary who sells product to offtakers.
Requirements	Requires a liquid, transparent, and reliable reference market price.	Requires a state-backed entity to manage counterparty risk.
Budget efficiency	High in an efficient, liquid, and transparent market. High risk of excess returns and windfall profits in juvenile markets due to high uncertainty on determination of strike-price-formula incl. high level of complexity. Low risk on ”stranded investments”.	High as ”in-situ” price discovery guarantees a dynamic adaption of budget allocation according to actual price gaps. Low risk of windfall profits and excess returns as well as ”stranded investments”
Impact market creation	Effective for scaling volume once a market and price indices exist but does little to activate demand.	Creates price transparency for the true cost of the green premium. Enables the development of future price indices due to price discovery. Supply and demand are activated simultaneously.

Whilst in more mature markets symmetrical market premium models such as contracts-for-difference (CfD) offer an efficient means of state support without significant market distortions, such instruments reach their limits in nascent markets that are still in the process of development. The lack of transparent reference prices (the "strike-price" in the CfD model) and insufficient market liquidity limit their applicability. Synthetically derived reference prices, such as those linked to a fossil gas price index plus a pricing formula, can only partially replace trade-based indices. Realistic pricing formulas are often complex, whilst the direct correlation with fossil fuel prices is limited in the long term. Consequently, there is a correspondingly high risk of market distortions and excess returns. Furthermore, existing counterparty and regulatory risks in this early market phase cannot be adequately addressed by a pure CfD approach.[15]

Unlike many investment grants provided ex ante, public support under H2Global is granted exclusively when, and to the extent that, clean molecules are actually produced, supplied, and marketed. Government funds are thus disbursed on a performance-related basis ex post and are directly linked to actual supply volumes, without the risk of providing public support to a "stranded asset".

Furthermore, such an instrument should ideally be embedded within a broader landscape of public and private-sector instruments that also address the financing of the underlying projects. These should include access to risk capital in the early development phase and the provision of debt capital within the framework of project financing. The H2Global framework concept, originally developed in 2020[16], goes well beyond the DSA mechanism currently in place. Rather, the concept is designed as a holistic framework that integrates the DSA mechanism and the intermediary with various financing instruments from the outset.[17]

The initial and overall H2Global 3 pillar idea: An interlinked yet independent framework approach

The aim of the H2Global Framework is to reduce the risks associated with hydrogen projects at multiple levels, thereby enabling the large-scale mobilisation of institutional capital into an emerging "hydrogen asset class". According to the underlying hypothesis, access to equity and debt capital during the various phases of project development and implementation is just as critical for a rapid market ramp-up as the creation of concrete investment opportunities and functioning markets. The H2Global Framework therefore consists of three complementary but independent pillars. While the pillars are interlinked at arm's length, they involve different stakeholders and are expected to have partly private ownership structures; their complete institutional separation is intended to prevent potential conflicts of interest. So far, only the second pillar, comprising the intermediary and the double-sided auction (DSA), has been implemented.



IMAGE CREDIT: ADOBE STOCK / PAWINEE

Pillar 1: Venture capital funds for project development

A venture capital fund explicitly geared towards hydrogen projects in early development phases provides equity and debt capital to selected projects along the hydrogen value chain. The fund's investors are private and philanthropic investors with return expectations in line with market standards for this asset class. In combination with public grants and technical assistance pooled at fund level, the projects receive the necessary resources to drive their development forward and, for example, complete cost-intensive front-end engineering (FEED). This positions them well to participate, for instance, in the HPA auctions described in Pillar 2.

Pillar 2: Trading intermediary, for example, Hintco

A trading intermediary (e.g., Hintco), established for a limited period, acts as a trader for hydrogen and its derivatives by implementing DSAs. On the supply side, long-term purchase agreements (HPAs) are auctioned; on the demand side, short-term sales contracts are auctioned. Expected trading losses incurred by the intermediary are offset by a government subsidy and dynamically adjusted to the actual difference costs.

For the successful bidders in the purchase auctions, the HPA offers long-term cash flow security as well as a government-backed counterparty risk.

Pillar 3: Structured infrastructure investment fund

A structured infrastructure investment fund provides debt and, where applicable, equity capital for the implementation of projects and the associated final investment decision (FID) and financial close, for example, for projects with a long-term HPA with Hintco. The fund combines concessional capital provided by public investors, who subscribe to a "first-loss" tranche, with philanthropic capital in a mezzanine tranche and institutional capital in a senior tranche. This is therefore a classic blended finance approach: losses are initially absorbed by public investors, followed by philanthropic investors, before institutional investors are affected, whilst distributions and interest payments are made in the reverse "waterfall principle".

Overall, the H2Global three-pillar framework concept reduces the risk for mandate-driven, risk-averse institutional investors on three levels: (i) project development level through the provision of risk capital, (ii) project execution level through long-term secured cash flow, and (iii) fund level through the structured blended finance architecture, whilst simultaneously achieving a risk-diversifying portfolio effect.

In principle, Pillars 1 and 3 can form the equity and debt investment sleeves of a single fund structure.



IMAGE CREDIT: ANDREI / ADOBE STOCK

H2Global: Initial idea and framework concept

The three holistic pillars

The overall scope of the H2Global concept, first presented in 2020, is based on three independent, yet mutually reinforcing, pillars:

- **Project development fund:** A venture capital fund, combining private capital and public grants, focusing on early-stage projects in the pre-FEED and FEED phases.
- **Hintco as intermediary trader:** Hintco supports market creation through trading via a DSA mechanism — creating business cases, liquidity, and price transparency while de-risking regulatory insecurity.
- **Infrastructure investment fund:** An alternative investment fund structured to provide debt and equity for H2 project implementation and construction by combining private and concessional capital.

Holistic framework approach



4. Flexibility of the H2Global mechanism for public funders

The H2Global double-sided auction (DSA) mechanism is deliberately designed as a highly modular instrument that can be tailored to different policy objectives, market conditions, and risk profiles along the entire value chain. The following exemplary list of "flexibility points" illustrates how the mechanism can be finetuned to the requirements of a funding body. They range from the choice of auctioned products and contract durations, through regional focus and sector targeting, to the design of funding structures, multilateral windows, infrastructure integration, and cross-sector applications. In this way, funding bodies can steer market development depending on the objectives, while preserving competition, technological openness, and the efficient use of public resources.

Funding bodies should be aware that a single H2Global tender may not be able to achieve all political and market-related objectives simultaneously.[18] It is therefore recommended that the public sector clearly defines the objectives for the use of the H2Global mechanism and aligns funding with these objectives to avoid potential conflicts of interest (e.g., price optimisation vs. increased resilience). Conflicting objectives should therefore not be mixed but ideally addressed in H2Global tenders specifically tailored to the achievement of each respective objective.[19]

Figure 5: Mechanism flexibility in fine-tuning to funding bodies' requirements

1	Auctioned product	Product open (any clean shipping fuel)	*or*	Product specific (e.g. ammonia)	*or*	Environmental attributes	*or*	...
2	Contract duration	1 year	*or*	2 years	*or*	10 years	*or*	...
3	Floor and cap	Without floor and cap pricing	*or*	With floor and cap pricing	*or*	...	*or*	...
4	Geography	National	*or*	Group of countries/region	*or*	Global	*or*	...
5	Sector-specificity	Sector-agnostic demand auction	*or*	Sector-specific demand auction	*or*	...	*or*	...
6	Auction method	Pay-as-bid sealed-bid	*or*	(reverse) English auction	*or*	(reverse) Dutch auction	*or*	...
7	Risk-sharing objectives	Full risk coverage	*or*	Cost differential approach	*or*	Hybrid	*or*	...
8	Provision of public funds	Guarantee	*or*	Upfront capitalisation	*or*	Annual callable drawing rights	*or*	...
9	Number of fund providers	1 (unilateral tender)	*or*	2 (bilateral tender)	*or*	3 (multilateral tender)	*or*	...
10	Scope of intermediary	Back-to-back trader for physical product	*or*	Back-to-back trader for environmental attributes	*or*	Back-to-back trader and infrastructure aggregator	*or*	...
11	Legal entity	State-owned entity	*or*	Independent non-state-owned SPV	*or*	...	*or*	...
12	Management fees	Ex-ante/ex-post upfront payment	*or*	Indirect payment via contract fees by bidders	*or*	Indirect payment via interests from upfront	*or*	...
13	Applicability	Hydrogen	*or*	Clean fuels	*or*	Clean metals and critical raw materials	*or*	...

Flexibility 1: Selection of the auctioned product

In the context of hydrogen, the H2Global DSA mechanism can be designed to be product- or vector-open as well as product- or vector-specific, if targeted steering effects are desired. In a *product-specific* approach, the fund provider would determine the exact product for which a cost differential would be covered by public funding. Irrespective of a specific or open approach, the product's regulatory compliance (e.g., EU renewable fuels of non-biological origin, RFNBO), as well as additional sustainability criteria, can be determined according to the requirements of the public funding body.

In a *product-open* approach, producers can select a supply product within a previously defined product group.[20] Within these lots, not only do different producers compete with one another, but to a certain extent the products do too, as the suppliers offering the lowest price per unit of energy are awarded the contract.[21] This process provides the public sector with valuable insights, for example regarding the targeted or preferential consideration of certain products in future funding programmes.

In the hydrogen context, a *vector-open* approach means that only molecular, for example, RFNBO-compliant, hydrogen is purchased. However, the vector by which the molecules are transported to the virtual trading point or point of sale, for example using liquid organic hydrogen carriers (LOHC)[22] or cracked ammonia, remains flexible as long as the delivered or converted product is molecular hydrogen.

Flexibility 2: Control of contract durations

When designing the maturity transformation within the DSA mechanism, the H2Global mechanism offers a high degree of flexibility and adaptability. Regarding the duration of the supply-side hydrogen purchase agreement (HPA) contract, the key consideration is that the offtake period must be sufficiently long to enable at least partial amortisation of the underlying asset under realistic load factors. As a useful benchmark, renewable power purchase agreements (PPAs) typically span 10-20 years, often aligned with the depreciation periods of the associated renewable energy generation assets.[23]

Funders set the goals, the products, and the standards. Flexibility is built into the DSA mechanism.

By contrast, in the hydrogen sector, governments and funding bodies have generally shown a preference for shorter support tenors. Production support schemes, for example, commonly fall within an 8-12-year range.[24]

Within H2Global, a contract duration of around ten years has so far emerged as a pragmatic compromise between investment certainty and public budgetary flexibility. This duration is also broadly mirrored in the design of the European Hydrogen Bank auctions[25], suggesting a converging market standard for early-stage hydrogen support mechanisms.

Looking at the demand side, the H2Global mechanism can deliver its strongest catalytic impact on market development through the price signals generated in the hydrogen sales agreement (HSA) auctions, as well as the liquidity it injects into the market.

In an early-stage market environment, this argues for a focus on shorter-term offtake agreements, which facilitate continued price discovery, reduce lock-in risks, and preserve flexibility as cost structures and demand evolve.

As already outlined, this approach reflects a deliberate emulation of a classic CfD logic whilst market reference prices do not yet exist. Long-term price stabilisation is provided on the supply side to enable investment, while the demand side remains more market-based and dynamic. The aim is to build a sufficiently granular price portfolio as quickly as possible, serving as the foundation for a reference price accepted by the market because it reflects real trading data. Building on this, HSA contracts with different maturities (for example, one, three, five, or ten years) can be integrated into the instrument to derive robust price curves in the long term. Thereby, bidders would, for example, be able to bid not only on price and volume but also on contract duration.

Flexibility 3: Possibility of floor and cap pricing mechanisms

Many customers and sectors traditionally meet their energy needs on a short-term basis, for example, via spot markets, and are unable to bear either the price or volume risk associated with longer-term supply contracts. Short-term HSA contracts hence suit these supply management practices, especially if customers can source alternative (including fossil) energy carriers and are not reliant on RFNBO conformity.



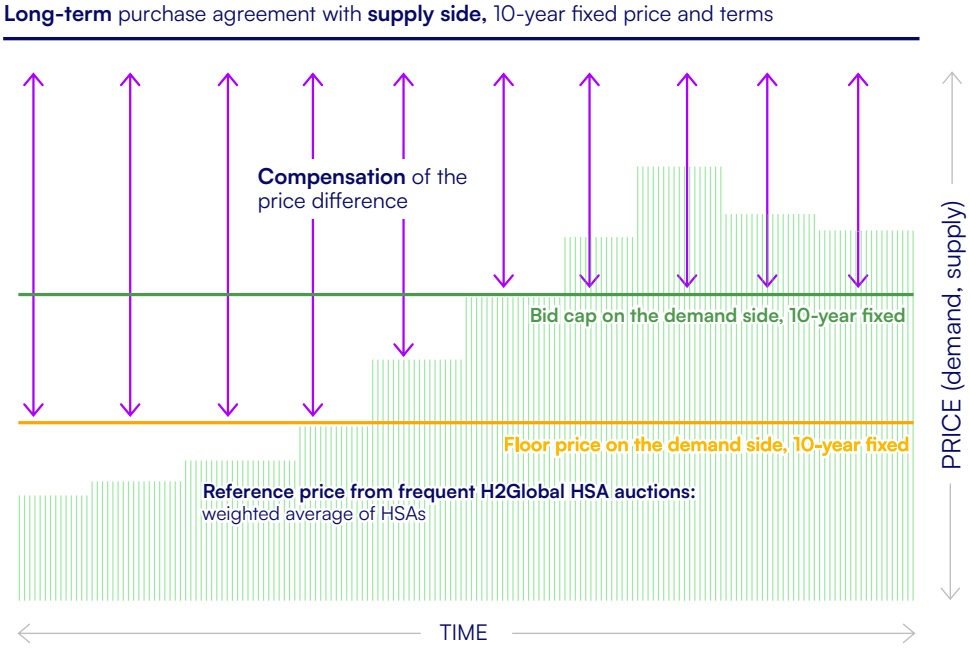
IMAGE CREDIT: ISTOCK / LIM WEIXIANG - ZEITGEIST PHOTOS

Buyers want spot-market flexibility. Suppliers need long-term certainty. Double-sided auctions bridge the gap.

Other sectors, such as the steel industry, on the other hand, require long-term volume security that can be planned for, but are unable to shoulder the price risk of fixed long-term contracts. Also, the counterparty risk currently associated with the steel sector makes long-term contracts even more difficult. In collaboration with the steel industry, initial concepts have therefore been developed for dedicated H2Global windows aimed at decarbonising the steel industry.[26] To address the price risk, the concept envisages that steel producers bid in the demand-side auction for a combination of floor and cap prices for ten-year contracts. Prices within this range would be determined based on price signals from short-term sales auctions in other H2Global windows, thus representing a first step towards the application of a price index.

Figure 6: Application of DSA providing volume security to offtakers

- Offtakers bid on a fixed floor price (fixing the green premium) and a cap price (limiting price exposure)
- Range between floor and cap floats: short-term HSA auctions determine the index price
- Offtakers achieve long-term volume security without taking on uncalculated price exposure



Flexibility 4: Control of production and procurement as well as offtake locations

The public sector can also flexibly adapt to geopolitical objectives. For example, by establishing various regional or local H2Global tenders, the procurement and thus the production of the molecules can be geographically limited to individual regions or countries. This enables, if politically desired, a targeted diversification of energy supply chains and strengthens energy sector resilience.

Equally, development policy priorities can be brought to the fore when using the instrument and determining the procurement region, as exemplified and detailed within the framework of the "H2Global meets Africa" research project.[27]

The emergence of regional hydrogen markets is also often linked to the promotion of specific "Hydrogen Valley" or "Hydrogen Hub" approaches.[28] An intermediary and DSA mechanism can be integrated seamlessly into this context and provides a practical complement for hydrogen supply. For example, in 2023 the US Department of Energy (DOE) under the Biden administration developed a demand-side support programme for regional clean hydrogen hubs, drawing on auction-based designs such as H2Global's DSA mechanism.[29] Through specialist workshops and dialogue formats, H2Global has advised the DOE on DSAs, contract design, and risk sharing. Additionally, it has developed concrete application concepts for transferring the approach to the hydrogen hub context, which have been incorporated into the design of the programme.

Flexibility 5: Decarbonisation of dedicated sectors

Demand-side auctions can be designed with a sector-neutral approach, allowing maximum competition and enabling all potential offtakers to participate in the process. However, the demand-side auctions can also target specified sectors that the fund provider wishes to decarbonise. This can be achieved through the selection of auctioned products or by limiting eligibility.

Conversely, specific sectors can be excluded from demand-side auctions, for example, to prevent these sectors from accounting the auctioned molecules against sector-specific national quotas.

Early movers in both aviation and shipping back the H2Global mechanism as a route to clean fuels.

Concrete aspirations already exist for the aviation and maritime sectors. For example, in its Sustainable Transport Investment Plan (STIP) published at the end of 2025, the European Commission explicitly highlighted the H2Global instrument as an existing market-enabling instrument for a European DSA for electricity-based synthetic aviation fuel (e-SAF).[30] Against this backdrop, the H2Global mechanism is regarded as a potential key component for the implementation of the "e-SAF Early Movers Coalition", within the framework of which several member states have expressed an interest in contributing financially to the design of the market ramp-up phase for e-SAF.[31] Subsequently, and building on the experience of the German e-SAF auction currently in preparation, this initiative aims to pool the contributions of interested member states within a joint European H2Global window for e-SAF, thereby enabling a coordinated, scalable market ramp-up. The "Project SkyPower" initiative, launched by Systemiq and bringing together 100+ industry stakeholders across the European aviation value chain, also explicitly recommends the H2Global mechanism as an implementation model for a government support scheme to decarbonise aviation, which should ideally be funded by revenues from the EU ETS as well as penalties for non-compliance with e-SAF quotas under ReFuelEU Aviation.[32]

Furthermore, the e-Sustainable Marine Fuels Early Movers Initiative (e-SMF EMI), launched in June 2026, calls on the European Commission and its member states to jointly use the H2Global DSA mechanism to scale up the production and procurement of clean shipping fuels through a multilateral H2Global tender. Such an initiative could strengthen Europe's industrial competitiveness, increase its energy independence, and contribute to the success of FuelEU Maritime.

In the future, H2Global will also explore the viability of sectoral tenders in the iron/steel industry (covering both hydrogen and hot briquetted iron, HBI), the ammonia fertiliser industry, or the high-value chemicals industry.

Flexibility 6: Auction methods

The H2Global mechanism is currently designed around pay-as-bid sealed-bid tenders, where bidders submit confidential offers and successful participants are awarded at their respective bid prices. This format is not the only option, however. The mechanism could, in principle, be structured around alternative auction designs, including: unified pricing, widely used in more developed electricity and energy markets to balance grid supply; Dutch auctions, where a price descends until a bidder accepts; or Vickrey-style auctions, in which sealed bids are submitted but winners are settled at the next-best price. Each format carries different implications for price discovery, bidder behaviour, and strategic incentives.

Flexibility 7: Risk-sharing objectives

There are various options for how the risks involved in DSAs are distributed between the fund providers and the private sector.

Option A — Full risk coverage: Given a cap on public funding exposure, the total amount the intermediary can commit to buying from producers is capped by the public funds available. When the intermediary receives revenues from the demand-side auction, that money flows back to the fund provider, thereby reducing the total amount of public money actually spent rather than unlocking additional purchasing capacity. The real cost to the public is what the intermediary pays producers minus what it collects from offtakers. While the maximum public exposure is fixed upfront, competitive auction prices can bring the actual spending well below that ceiling — providing budget certainty while keeping costs down.

Option B — Cost differential concept: To get the most out of available funds, that is, to maximise the capital efficiency of the H2Global mechanism, the funds should be sized to cover the expected price gap between supply and offtake as closely as possible — no more, no less.



IMAGE CREDIT: SHUTTERSTOCK / HXDBZXY

In this scenario, the intermediary must at least achieve sales revenues in the order of magnitude of the anticipated price gap, since the financial obligations under the supply side contracts must ultimately be serviced from a combination of these sales revenues and the public funding envelope. To safeguard its creditworthiness and the bankability of long-term purchase contracts under such an “extended cap” design, the intermediary therefore also would need to be backed by an additional public guarantor, or alternative public or private insurance mechanism, that is drawn upon if realised differential costs exceed the forecast price gap. In practical terms, the fund provider estimates the cost differential over the funding horizon using conservative scenario analysis — ideally developed together with leading research institutions and based, for example, on a P95 confidence level — which then informs both the volume of purchase contracts and the sizing of the guarantee framework.

Option C — Hybrid concept: Options A and B can also be combined to enable risk sharing between the public fund provider and private producers regarding future market and price developments. This can be achieved by introducing “optional volumes” on the supply side, whose offtake by the intermediary is contingent on the sales revenues generated from the “firm” offtake volumes that are 100% backed by public funding (see also section on current H2Global implementation). In this way, public funds can be used almost fully, whilst no additional guarantees are required and the maximum public budget exposure remains clearly defined in advance and is not subject to ex post changes driven by market developments.

Flexibility 8: Provision of public funds

The way funds are made available to the intermediary can be tailored to budgetary preferences and constraints, ranging from cash-based pre-funding through guarantee-backed arrangements to annual commitment authorisations or hybrid solutions, allowing governments to align the mechanism with their fiscal planning and budget law constraints.

Option A — Guarantee: A public guarantee offers an obvious option of providing funding support to the intermediary by covering, in whole or in part, the risk that future demand-side auction revenues may be insufficient to meet the intermediary's payment obligations under long term purchase contracts. The fund provider commits to step in up to an agreed ceiling if realised price gaps or price volatility cause the cost gap to exceed the intermediary's sales revenues. Properly structured and priced in line with state-aid rules, such a guarantee can significantly enhance the leverage of limited public funds, mobilise private finance into supported projects, and retain flexibility for governments to adjust direct budgetary contributions over time while keeping their maximum exposure clearly defined.

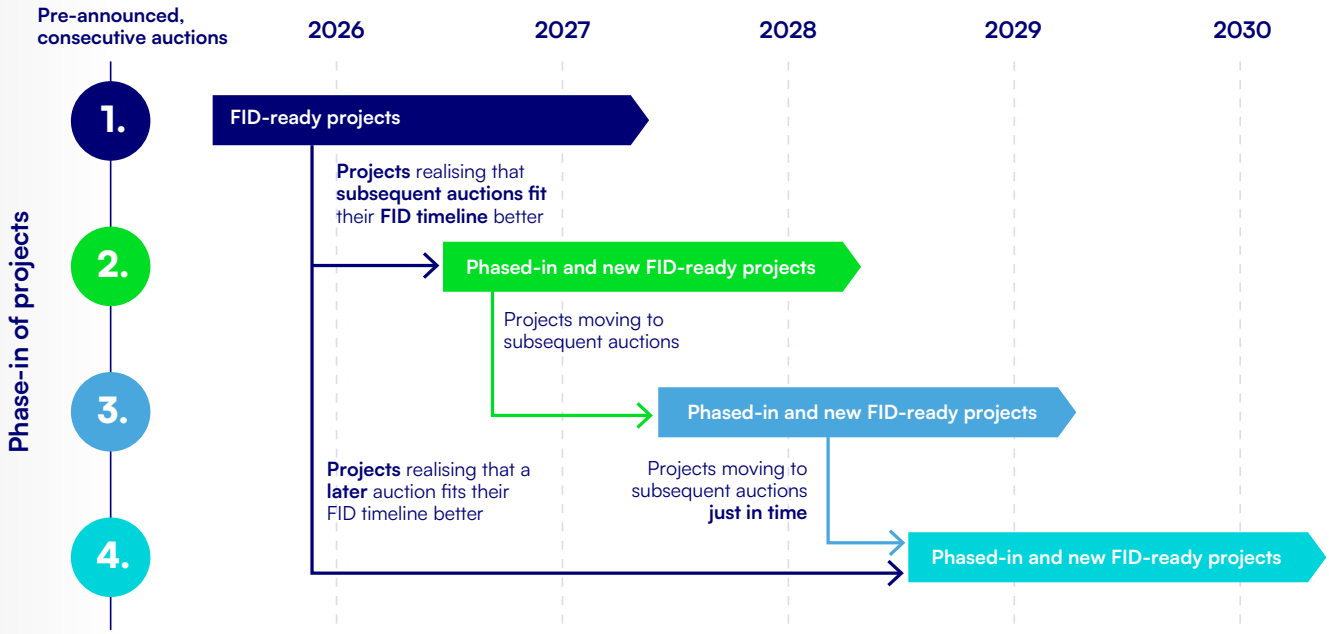
Option B — Upfront capitalisation: Cash-based pre-financing involves the direct or indirect provision of funds in advance to the intermediary (effectively as cash collateral), which can then be used to cover differential costs. This option is particularly suitable where funding bodies prefer an immediate budgetary outflow and full upfront visibility on their financial commitment. In the case of such "frontloading", the instrument can also assume a broader catalytic role beyond merely providing a viable business case via the intermediary's trading activities. For example, the funds could be channelled via a multilateral finance institution (such as the World Bank or the European Investment Bank, EIB) into a structured investment vehicle, managed by an independent fund manager, which then provides concessional debt to projects that have signed HPAs with the intermediary. The debt will be repaid from the secured cash flows under the HPA. In this way, the compensation of the cost differential at the intermediary level is effectively fed by loan repayments from HPA counterparties, allowing a financing solution to be integrated into the H2Global mechanism and helping projects reach final investment decision (FID) and financial close more rapidly as part of a "one-stop" package. A further variant would be to source the public funds not from ordinary budgets but via dedicated bond issuance, potentially combined with a guarantee instrument. Thereby additional private capital would be mobilised whilst retaining the benefits of cash-based pre-funding.

Option C — Annual callable drawing rights: An annual callable commitment appropriation is another way of providing support to the intermediary and, in practice, has so far been the option chosen by all funding bodies. It functions economically in a similar way to a guarantee but differs from advance- or guarantee-based financing models as the support is provided via binding multi-year budget authorisations (e.g., grant notifications) rather than pre-funded cash or a separate guarantee facility. In this set-up, the intermediary's maximum contractual purchase volume under HPAs is effectively capped by the authorised annual funding envelope, ensuring that it can meet all payment obligations in full even in a conservative scenario where no sales revenues are generated on the HSA side. This provides a high degree of planning certainty and bankability for financiers, whilst the actual public outlay remains equal to the difference between purchase-side obligations and realised auction revenues, implying efficient use of funds but also that the originally allocated volume may not be fully drawn.

Regardless of the chosen form, the guiding principle in all scenarios should be the security and predictability of state funding. Only if the fulfilment of the funding commitment — regardless of changing political conditions or market circumstances — is beyond question can large-scale investment decisions be reliably based on it. Ideally, the funds for covering the difference in costs should not come from a regular government budget, but be drawn from other state instruments, such as the recurring proceeds from CO_2 pricing schemes such as the EU ETS.

Ideally, such recurring proceeds would feed into a series of pre-announced, consecutive auctions. This approach is particularly advantageous in nascent markets characterised by highly heterogeneous levels of project maturity, as developers can prepare specifically for upcoming supply-side auctions. An auction schedule communicated well in advance — for example, covering a five-year horizon[33] — would allow market participants to align their project development with the corresponding maturity requirements, thereby substantially increasing planning certainty. Beyond this, revenues generated by CO_2 pricing mechanisms such as the EU ETS, collected within a given sector, could be deployed to support the scale-up of clean products within that very same sector.

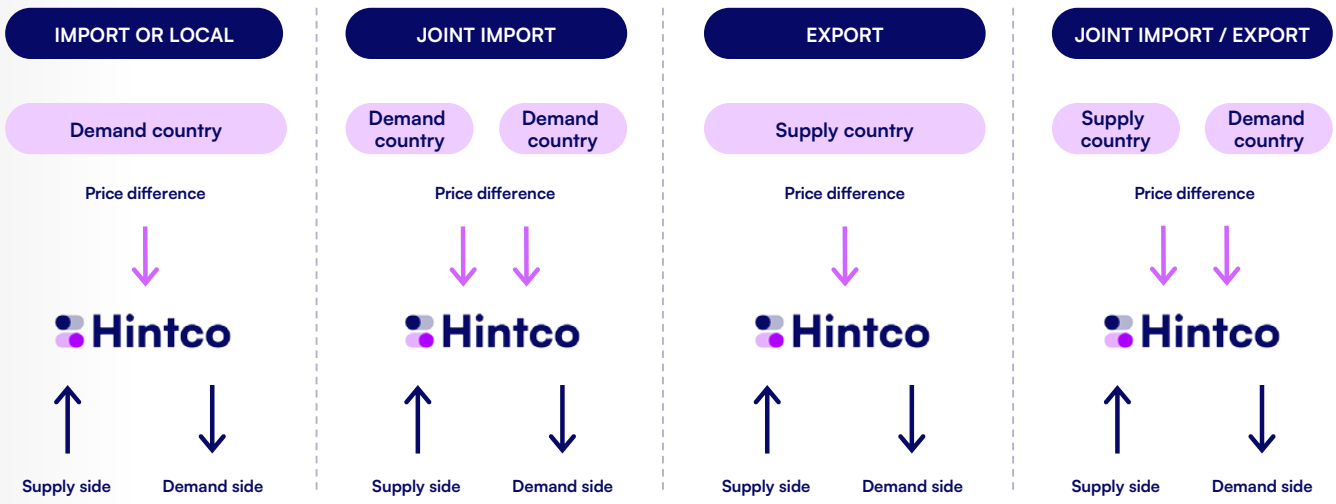
Figure 7: Consecutive auction approach



Flexibility 9: Possibility of multilateral fund pooling

A unique feature of the model is the possibility of pooling funds from different governments or donors under a single instrument, which can be used to establish joint H2Global windows. This enables economies of scale, more efficient use of funds, and the use of the instrument even with smaller individual contributions. Similarly, exporting and importing countries can finance "bilateral H2Global windows", thereby creating a win-win situation by sharing the market ramp-up costs. Furthermore, multilateral fund pooling can serve as a tool for building international hydrogen and energy alliances, an aspect that is becoming particularly significant against the backdrop of current geopolitical shifts.

Figure 8: Demand and supply countries can design their H2Global tenders individually, or join forces



Flexibility 10: Scope of the intermediary

In addition to the "chicken-and-egg" problem on the production side, a dilemma is emerging regarding hydrogen infrastructure. Investments in storage facilities, crackers, and other port-side or on-shore facilities only occur if utilisation rates are foreseeable, yet the development of production capacity depends on infrastructure that is already in place.[34]

Currently, while acting as a state-backed hydrogen trader, the intermediary operates on a "back-to-back" basis and does not play an active role in the underlying logistics chain. These aspects are entirely the responsibility of producers or buyers. The producers' supply obligation therefore encompasses not only the provision of the auctioned products but also their transport and logistics up to a defined handover point at the designated delivery location or within the specified delivery region.

By incorporating additional parts of the value chain, such as hydrogen infrastructure, into the instrument design, the H2Global mechanism can address industrial policy objectives beyond the mere procurement of hydrogen and its derivatives, directly stimulating infrastructure investment. Corresponding concepts have already been developed and provide, amongst other things, for the intermediary to bundle the demand for logistics and infrastructure services based on the underlying requirements deriving from the intermediary's supply- and demand-side auctions.[35] The intermediary would put these logistics and infrastructure requirements out to tender and contract them on a long-term basis. This offers infrastructure and logistics service providers long-term capacity use and thus the cash-flow security required for a FID.

Where funding by a European member state is involved, national and European requirements must also be observed.

Looking ahead, the intermediary concept could also be extended to the infrastructure and logistics sector, for example, through a dedicated entity such as a 'Hydrogen Intermediary Logistics Company' (Hilog). The logistics intermediary would benefit from the trading intermediary acting as its "anchor customer", whilst placing further logistics capacity in the market. Finally, a market intermediary could also auction environmental attribute certificates (EACs) within a book-and-claim system, separating the trading of the grey product (physical molecule) from the trading of the EACs.



IMAGE CREDIT: ADOBE STOCK / ЕЛЕНА БИОНЫШЕВА-АБРА

Flexibility 11: Legal entity of the intermediary

In principle, a temporary intermediary can be established as a state or (semi-) private entity. When identifying a suitable implementation model, state aid and competition law considerations should be taken into account from the outset. “The risk of creating a ‘national champion’ with privileged, exclusive state support must be avoided entirely under European state aid law.[36] In principle, such a funding instrument operates within an interdependent network of diverse legal fields and state or multilateral administrative frameworks. Of particular relevance here are grant law, public procurement law, contract law, competition law, and budgetary law. Where funding by a European member state is involved, national and European requirements must also be observed, especially regarding the notification of state aid to the European Commission.

Flexibility 12: Management fees of the intermediary

Another defining feature of the H2Global DSA mechanism is the fee model for successful bidders under the HPA and HSA auctions. One option is that, upon conclusion of contracts, bidders pay a non-refundable fee to the market intermediary. On the one hand, this model is intended to underline the commitment and engagement of the contracting parties (“skin in the game”) whilst on the other hand, it serves to finance the intermediary’s operational activities and to build up a risk buffer. [37]

Flexibility 13: Applicability beyond the hydrogen sector

In principle, the application of the H2Global mechanism is not limited to the hydrogen sector; it can be applied across a wide range of sectors where comparable market failures exist or where economic policy resilience targets are being pursued.[38]

As such, the H2Global mechanism can be understood as a general-purpose, market-oriented instrument for strengthening industrial and raw-material resilience.



IMAGE CREDIT: ADOBE STOCK / DAVID MADDOCK

By deploying a time-limited, state-backed but operationally independent intermediary that procures critical industrial products or raw materials via competitive long-term auctions and resells them through shorter-term, market-based tenders, the mechanism can help secure minimum production capacities, diversify supply relationships, and support reindustrialisation in strategically important sectors, while keeping subsidy needs and market distortions as low as possible.

Because the model is fundamentally product-agnostic and designed around transparent price formation, volume, and maturity transformation, it lends itself to applications ranging from the diversification of supply chains and the creation of raw-material partnerships to targeted support for local and regional value creation. This is provided that its use is grounded in a prior assessment of critical dependencies, clear resilience thresholds, and compliance with state aid and competition rules.

5. Implementation of the H2Global mechanism to date

Origins of H2Global

The German government is the largest financial contributor to the H2Global mechanism and was also the first government to adopt it. The implementation of the mechanism has been significantly influenced by the Federal Republic, and H2Global is explicitly anchored in Germany's National Hydrogen Strategy and Hydrogen Import Strategy, where it is highlighted as a key tool for scaling international hydrogen value chains and securing long-term import partnerships.[39] Nevertheless, H2Global is neither an initiative of the German government, nor do its constituent entities (the Foundation and Hintco) form part of a federal government institution.

In accordance with the German government's guidance, the implementation of the instrument and the governance structure of the intermediary (Hintco) were not organised through a "state-owned entity", as envisaged in the original concept,[40] but through an independent foundation structure. The aim was to establish the intermediary independently of the state and the private sector, whilst maintaining close links with both public and private stakeholders. To this end, the non-profit H2Global Foundation was established in 2021 with the specific purpose of promoting environmental and climate protection, as well as science and research in the field of sustainable energy sources.

Donation commitments from industry, philanthropy, and the public sector fund the activities of H2Global Foundation,[41] which develops models for the sustainable production and use of climate-neutral energy sources and serves as a platform for knowledge exchange between science, business, and politics.[42] The Foundation provides the institutional framework that underpins the intermediary's impartiality. As the sole shareholder of the intermediary, it anchors this independence at a structural level — without thereby exercising principal oversight or influence over the intermediary's business operations. Deliberately erected "firewalls" exist between the Foundation and Hintco, and the intermediary is free from instructions regarding its auction and trading activities.

This applies not only to the actual trading and conduct of DSAs, but also to their respective conceptual design and preparation. In combination with Hintco being the direct and sole recipient of state subsidies for differential cost compensation within the H2Global set-up, its necessary independence is ensured under all circumstances.

H2Global as an integrated one-stop shop

H2Global can be understood as an integrated one-stop shop in which Hintco and the Foundation work closely together. Hintco acts as a market intermediary and green market maker and develops and uses the DSA mechanism operationally in real trading activities, thereby generating valuable practical experience regarding the development and implementation of market-based instruments as well as the identification of existing market barriers, price formation processes, and contract structures.

Building on this empirical foundation, the Foundation's Solutions Lab develops targeted new concepts for the application of the mechanism for different sectors and market segments, whilst the Foundation's research team provides the analytical basis for this. The Foundation's outreach division channels these insights into targeted advocacy with governments, regulators, and other key stakeholders, encouraging them to embed market-based instruments, such as the H2Global mechanism, into their funding programmes.

The interplay of the various components within H2Global thus enables concept development, implementation, and policy advice that is not based on abstract theory but on concrete market practice derived from the mechanism itself.

Figure 9: H2Global is a one-stop-shop green market maker

Hintco

As an impartial market intermediary, the trader trades clean hydrogen-based products through a double-sided auction that it develops and designs to support market creation while uncovering the most significant existing market barriers.

Research

(Part of the H2Global Foundation)

Building on Hintco's practical market experience, the research team conducts applied research to develop a broad, openly accessible knowledge base that supports a better understanding of market barriers.



Outreach

(Part of the H2Global Foundation)

These market mechanisms are presented to governments and international financial institutions to help unlock billions in concessional capital, accelerating the emergence of global markets in the most effective and catalytic way.

Solutions Lab

(Part of the H2Global Foundation)

H2Global's Solutions Lab translates this knowledge into concrete financial instrument concepts, testing them with a wide range of stakeholders, including industry, financiers, and NGOs.

if tenders implemented by different intermediary

6. Auction process

An intermediary trader such as Hintco operates at the intersection of various legal fields, political requirements, and existing regulatory frameworks. As a result, its practical implementation differs in some aspects from ideal scenarios, aiming to identify pragmatic solutions within the existing framework.

While the German government's pilot funding for Hintco in 2021 was approved under the previous guidelines for state environmental and energy aid (UEBLL), the auctions currently underway are based on the new guidelines for state climate, environmental and energy aid (KUEBLL).[43] These contain detailed specifications regarding award criteria and process design which the intermediary must adhere to when designing the tender procedures.

The DSA process is fundamentally designed as a multi-stage procedure comprising a pre-qualification phase, a negotiation phase, and a bidding phase.[44] All bidders invited into the negotiation phase will — on the basis of a unified, draft contract provided at the start of the procedure — provide suggestions for alterations which will be discussed and negotiated within bilateral formats. The outcomes of these negotiations may be reflected in the final contract, which applies equally to all bidders and forms the basis for the submission of final bids. As such, the contract is developed as part of a transparent, dialogue-oriented negotiation process.

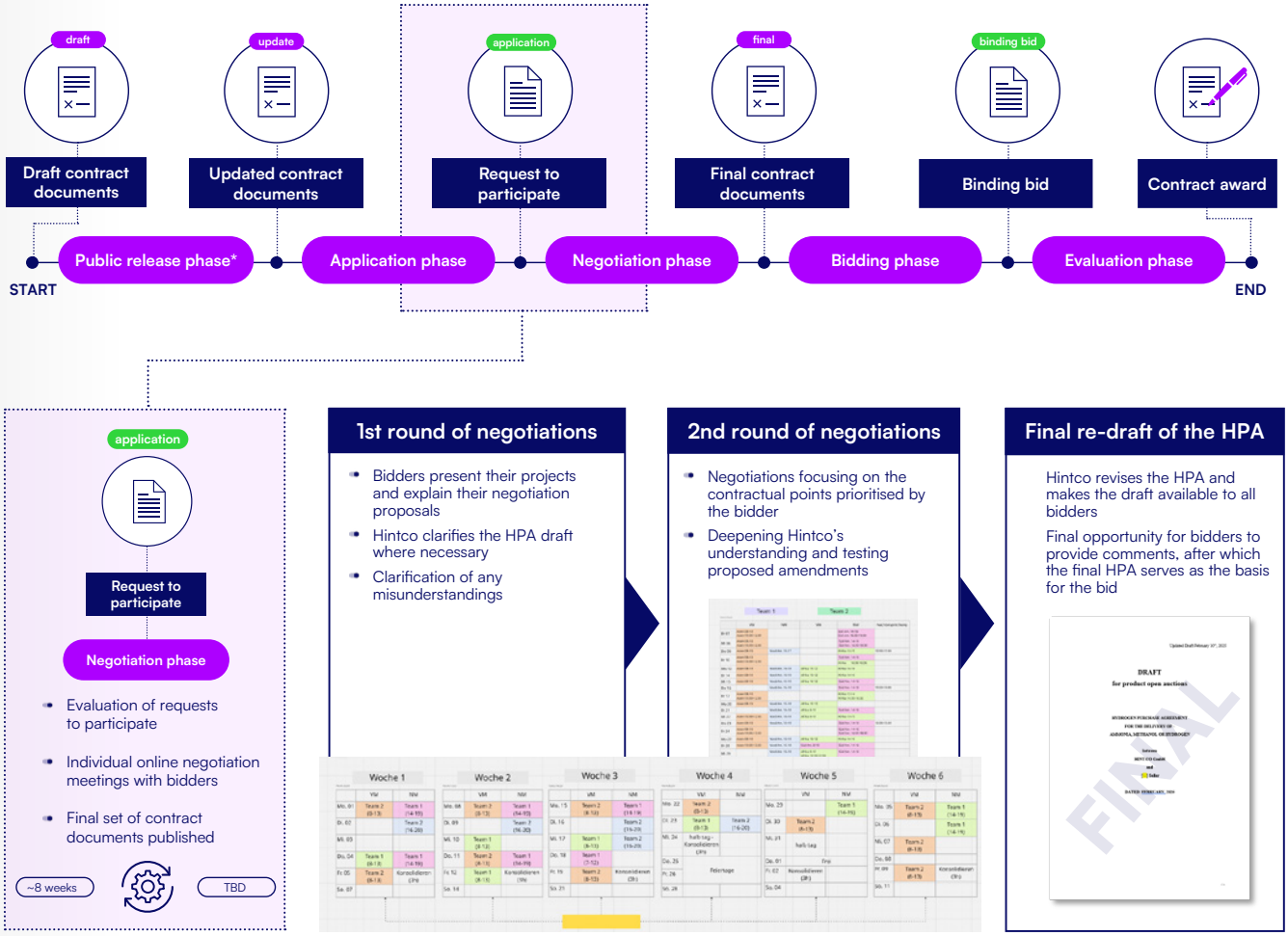
In a market segment still taking shape, this procedure is making an important contribution to the establishment of market-accepted, standardised contract structures and thus to the institutional maturation of international hydrogen markets. This approach sets the H2Global mechanism apart from traditional funding mechanisms, which typically rely on direct project funding or pure grant models. In those approaches, long-term supply contracts between producers and consumers are usually concluded only after the funding decision, and these contracts are negotiated outside the actual subsidy relationship. This can be time-consuming[45] and carries the risk that projects later prove operationally or, in some cases, economically unviable.

In contrast, in H2Global auctions, all contract negotiations take place prior to the award of the contract. This also means that a considerable number of initially interested bidders are likely to drop out during the negotiation phase, leaving only those projects that can submit firm, bankable offers based on a robust assessment of their technical, financial, and organisational implementability. By the time contracts are awarded, the remaining projects therefore exhibit a significantly higher probability of actual, timely, and sustained performance over the contract term.

Contracts are developed as part of a transparent, dialogue-oriented negotiation process.

Differences in the timing and complexity of the procurement process compared to traditional funding instruments therefore stem primarily from the specific structure of H2Global auctions. An entity such as Hintco acts as an intermediary in these negotiations and concludes the hydrogen purchase agreement (HPA) and hydrogen sales agreement (HSA) contracts as the sole contracting party, whilst the public sector's role is essentially limited to designing the funding programme, issuing grant notifications, and monitoring. Consequently, administrative and compliance costs remain broadly comparable to those of other established funding instruments.

Figure 10: Negotiation phase as part of the auction process



H2Global accelerates the emergence of global markets for clean hydrogen-based products through innovative financing instruments.

7. H2Global auctions to date

So far, the H2Global mechanism has been developed solely by Hintco, even though double-sided auctions (DSAs) could also be implemented via a different market intermediary. By May 2026, Hintco had received funding commitments or earmarkings for cost differential compensation totalling approximately USD 9 billion from various governments, with Germany being the largest contributor.[46] In addition to the Federal Republic of Germany, other European member states, such as the Netherlands, as well as exporting countries such as Australia[47] and Canada,[48] are using the H2Global mechanism within the framework of multilateral H2Global tenders.

To date, all funding bodies have stipulated in their grant notifications to Hintco that funding is provided exclusively for the trading of hydrogen or its derivatives that meet the requirements for renewable fuels of non-biological origin (RFNBO) in accordance with the relevant delegated acts of the European Commission.[49] Under current regulatory requirements, RFNBOs can only be traded throughout the logistics chain via a mass balance system. This means that the physical supply chain must be tracked for accounting purposes.[50] A more flexible "book-and-claim" approach, in which guarantees of origin could be traded independently of the physical product, is currently not permitted, at least in Europe.

Funding sources and provision

So far, all funding bodies have chosen annual callable commitment appropriations as their means of providing funding to Hintco rather than the model of advance or guarantee-based financing that the instrument was originally designed for. With annual callable commitment appropriations, the cost difference is reimbursed to Hintco via an irrevocable grant notification.[51] This notice is based on commitment appropriations[52] approved by parliament for future federal budgets. The commitment appropriations specify both the financial scope and the temporal allocation[53] for the respective financial years; these can only be amended or adjusted through a new parliamentary procedure but can never be withdrawn. There is no additional guarantee beyond the commitment appropriations in the sense of a call-up obligation towards Hintco.

Consequently, Hintco's maximum firm contractual purchase volume under the HPA agreement (HPA) contracts — not the volume of the difference costs — is effectively "capped" by the commitment appropriations. Even in the theoretically possible but in reality highly unlikely event that no revenue is generated at the HSA auctions over the entire term of the HPA, Hintco would be able to meet in full all financial obligations under the HPA contract. In this case, the differential cost compensation would amount to 100%. The advantage of this approach lies in the clear risk assessment and the high "bankability" of the HPA contracts for financiers and investors. At the end of the HPA term, it is likely that only a portion of the funds provided by the funding body will actually be drawn down by Hintco — namely, the difference between Hintco's purchase-side payment obligations and the sales proceeds generated through the HSA auctions. This can be seen as an expression of efficient use of public funds. At the same time, it may be viewed as a disadvantage, in the sense that allocated funding volumes are not fully used. A further consequence of annual commitment appropriations is that any funds not used within a given financial year cannot simply be carried over to subsequent years. A parliamentary procedure is required before any such carry-over can take place.

As current fund providers nevertheless aim for the most comprehensive use possible of the funds made available, the current auction design provides for the possibility of integrating optional supply volumes, as outlined in the previous section on flexibility options. In this case, an HPA contract under this design has two parts:

- A **firm** commitment: a fixed volume and price for the full contract duration
- An **optional** component: additional volumes the producer commits to supply if Hintco generates enough offtake revenue to pay for them.[54]

When bidding, producers and their financiers can form their own view of what offtakers will be willing to pay — effectively forecasting the revenues Hintco will generate in the demand-side auction. Based on that assumption, they may submit bids for optional supply volumes on top of their firm commitments, taking on the associated market and price risk. Hintco then holds either a call option or a

binding obligation — depending on the HPA design — to use incoming offtake revenues to purchase those optional volumes from the winning bidder. This gives bidders the opportunity to look beyond Hintco and make their own assessments of future market and price developments.

From a risk perspective, the HPA is consequently split into two parts: a fully secured cash flow for firmly agreed volumes, and an optional component whose volume depends on future market developments. There is no obligation on bidders to submit a bid for optional quantities, and each bidder may, depending on their risk appetite, include optional quantities in their bid. These optional quantities allow the funding provided to be used (theoretically) almost entirely to offset the actual difference costs incurred, without requiring an additional guarantee from the funding provider.

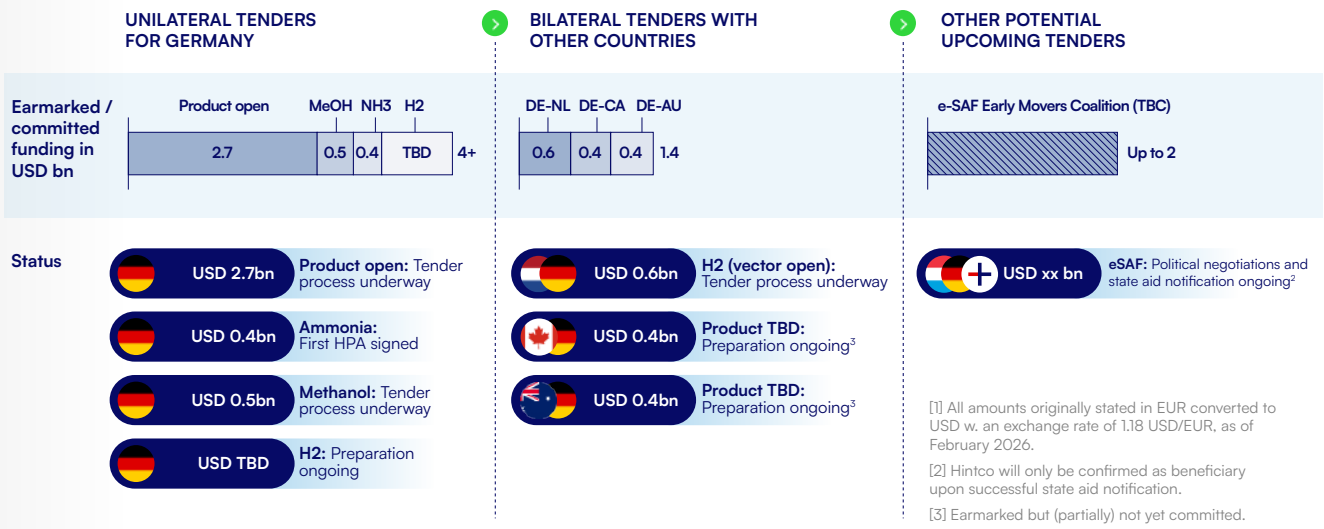
First pilot auctions (unilateral funding windows for Germany)

In mid-December 2022, just a few weeks after Hintco received the final grant notice for the first EUR 900 million — allocated by the German Bundestag in 2021 to cover the cost differential — Hintco launched its first pilot auction, structured across three lots covering renewable ammonia, renewable methanol, and electricity-based synthetic aviation fuel (eSAF).[55]

The ammonia auction was successfully concluded in 2024[56], whilst the renewable methanol auction has been re-opened and is now in its final phase, following a reallocation of funds from the e-SAF lot. The e-SAF auction did not reach a contract award due to a combination of regulatory constraints,[57] relatively limited funding volume,[58] and geographic restrictions on eligible production sites. Those learnings are now being implemented in a larger e-SAF tender (see second wave of H2Global auctions below).[59]

Hintco is among the first actors to apply European RFNBO requirements to a non-European context, and international tenders and negotiations with numerous bidders from different regions have exposed challenges, ambiguities, and gaps along the hydrogen value chain and in the underlying regulation. This learning process makes an important contribution to policy development; practical experience feeds back into regulatory debates and can inform the further evolution of European frameworks and the design of future hydrogen and energy partnerships. In this sense, apparent setbacks or auction rounds without successful bids are part of the catalytic function of the instrument: they reveal market conditions, regulatory barriers, and design issues just as much as successful awards do.

Figure 11: Status and overview of Hintco tenders



[1] All amounts originally stated in EUR converted to USD w. an exchange rate of 1.18 USD/EUR, as of February 2026.

[2] Hintco will only be confirmed as beneficiary upon successful state aid notification.

[3] Earmarked but (partially) not yet committed.

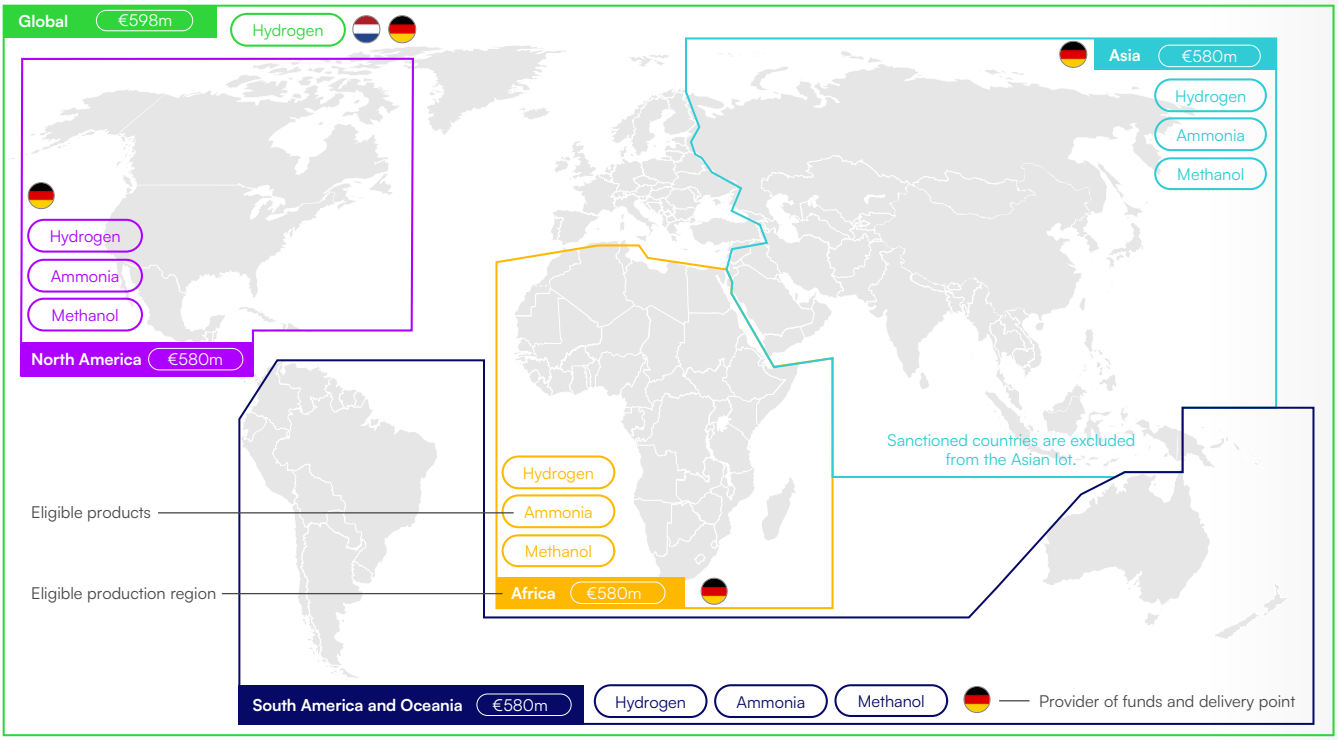
The specified **funds are available to bridge the gap between the purchase and sale price**. The **actual purchase volume** of the Hydrogen Purchase Agreements (HPAs) is expected to **significantly exceed the amount of government funding** provided.

Second wave of H2Global auctions (uni-, bi- and multilateral funding windows)

Building on the experience gained from the pilot auctions, Hintco is currently auctioning hydrogen and its derivatives (e.g., ammonia, methanol, e-fuels) on the supply-side in various H2Global tenders, each comprising sub-lots.[60] These include the "Joint Dutch-German Import H2Global Window",[61] the first multilateral collaboration between European member states under the H2Global mechanism. In this context, it will be worth observing how two new elements play out — the inclusion of pipeline-linked transport routes, now permitted for the first time, and the first-time eligibility of European production. Further bilateral import/export windows, such as those between Germany and Canada or Germany and Australia, are currently in preparation or at the stage of notification under state aid law.

Whilst three different hydrogen derivatives were auctioned in separate lots in the initial pilot auction, the lots in the current H2Global windows are, for the first time, partly product- or vector-open. The current auction design also differs regarding geographical scope.[62] In the current "regional lots", which are open in terms of product, the reference is divided across four geographical regions (Africa, Middle East/Asia, North America, and Latin America/Oceania). This ensures diversification of the origin of supply in the allocation of auction lots, regardless of potentially differing levelised costs of hydrogen (LCOH) and corresponding price bids between the various regions. Furthermore, an initial H2Global EU-wide auction[63] is currently (as of July 2026) in preparation for European state aid notification, highlighting that H2Global can function as a regional or local funding mechanism to support European value creation.

Figure 12: Four regional lots for RFNBO hydrogen, ammonia or methanol, and one global lot for hydrogen



The funding countries, Germany and the Netherlands, as well as sanctioned countries are excluded from the global lot.

The current auction round includes:

- **Four regional lots** for the supply of RFNBO hydrogen, or RFNBO ammonia, or RFNBO methanol,
- Along with **one global lot** for the supply of RFNBO hydrogen.

Bidders are free to choose their **preferred mode of transport** (final product, LOHC, LH2, etc.) to the designated delivery point.

Bidders can participate with a single project in both regional and global lots.

After the e-SAF lot from the pilot auction could not be concluded, the German government made a further EUR 2 billion available for the 2028-2037 reference period to cover the differential costs for an e-SAF auction under a DSA. Further European member states might join under the scheme and Hintco is currently commissioned to support the German government during the state aid notification and principal auction design process of this DSA scheme. The potential nomination of Hintco as trading intermediary under the scheme will only be concluded after a successful notification under EU state aid legislation. As of July 2026, this support scheme is in the process of notifying the relevant authorities under state aid law.[64]

In addition to direct cooperation with governments in the context of secured or planned H2Global funding schemes, H2Global offers advisory and dialogue activities with governments and other stakeholders within and outside Europe, with the aim of helping market-based instruments for the market ramp-up of hydrogen achieve a breakthrough.

To facilitate networking with the political, industrial, and financial sectors, H2Global maintains representatives in Brussels and Tokyo and is currently establishing representation in Oman and Brazil to further deepen cooperation with partners in key markets. This is underpinned, among other things, by formalised cooperation agreements with key institutions such as the Japanese Energy and Natural Resources Agency (JOGMEC), with which H2Global Foundation has been collaborating since 2024/25 under a memorandum of understanding (MoU)[65] to design a contracts-for-difference (CfD)-based hydrogen support scheme in accordance with the Hydrogen Society Promotion Act, as well as a partnership with the Omani hydrogen authority, Hydrom, to develop auction and export models based on the H2Global Framework.[66] In addition, H2Global signed an MoU in 2024 with the Solar Energy Corporation of India (SECI) to jointly promote market-oriented support mechanisms in India, for example in the maritime sector.[67] Furthermore, during COP30 in Brazil, an MoU was signed with the Brazilian government, establishing H2Global as an advisory partner in the design of Brazil's national hydrogen support framework.[68]

Wider resonance of the H2Global mechanism

H2Global has gained increasing recognition in international expert discourse. During New York Climate Week 2024, for example, leading stakeholders highlighted the H2Global mechanism, implemented by Hintco, as the first model of a "global green market maker". This assessment was supported by analysis from the Mission Possible Partnership and the Rocky Mountain Institute, in cooperation with J.P. Morgan and Systemiq.[69]

The H2Global mechanism also scores highly in civil society assessments: the Research Institute for Sustainability (RIFS) classifies the criteria developed in the context of the H2Global auctions as particularly relevant for a sustainable and holistic hydrogen economy[70], while the Fraunhofer Institute regards the H2Global mechanism as one of the most significant contributions and a 'best practice' for the development of practical sustainability criteria for green hydrogen.[71]

International awards won by H2Global, such as the 2023 World Hydrogen Award and the European Commission's 2025 European Innovation Procurement Award, further underscore the innovative strength and market relevance of the underlying intermediary and DSA mechanism.



IMAGE CREDIT: ADOBE STOCK / YULIA BUCHATSKAYA

Annex

Figure 13: Deep Dive of intermediary auction configurator (EU background)

1 Risk sharing · 2 Funding provision · 3 Funding sources · 4 Potential funding linkages · 5 Tenure transformation & auction staging · 6 Legal entity & geography · 7 Mgmt. fees

Category	Description of options		Considerations per option
Risk sharing	**Cost differential concept** • Government defines an expected cost difference based on expected supply and offtake prices (informed by market intel) • Intermediary auctions volume within the boundaries of the maximum expected cost difference		• **Capital leverage:** high likelihood of full utilization of funds • **Risk exposure of government-backed intermediary:** Clearly limited to maximum expected cost difference between supply and offtake price • **Risk exposure of bidder:** Price and market risk in case cost difference exceeds government expectations (potential de-risking for bidders via insurance)

	Firm + optional volume concept
	• Intermediary auctions pre-defined supply contract value for firm offtake volumes
	• Bidder can take assumption on sales revenues of intermediary (based on expected willingness to pay) and can offer optional volumes exceeding firm offtake volumes
	• Intermediary has a call option for optional volumes that could be unlocked via sales revenues
			• **Capital leverage:** high likelihood of near-to-full utilization of funds
			• **Risk exposure of government-backed intermediary:** Clearly limited to full, pre-defined supply contract value for firm offtake volumes
			• **Optional risk exposure of bidder:**
			  • Price and market risk for optional volumes in case offtake revenue expectations by bidder are not realized (potential de-risking for bidders via insurance)
			  • Actively catalysing risk-sharing opportunity by private sector

	Full risk coverage • Intermediary draws only on funds to compensate cost difference (resulting from double auctions) • Unused funds are not utilised		• **Capital leverage:** high likelihood that not all funds will be utilised • **Risk exposure of government-backed intermediary:** Clearly limited to full, pre-defined supply contract value • **Risk exposure of bidder:** None, apart from counterparty risk (which is minimal, as quasi-government)
Funding provision	**On-demand**	**Guarantee**	• **Timing of public capital flows:** continuously during fuel delivery • **Budgetary logic:** via gov.'s creditworthiness / general budget • **Flexibility:** high
		Grant notification with irrevocable drawing rights	• **Timing of public capital flows:** continuously during fuel delivery • **Budgetary logic:** via dedicated government budget set aside • **Flexibility:** low — changes dependent on Parliamentary approval
	Upfront	**Upfront capitalisation**	• **Timing of public capital flows:** prior to FID • **Budgetary logic:** via dedicated government budget set aside • **Flexibility:** high

Category	Description of options		Considerations per option
Funding sources (non-exhaustive)	National budgets		• **Based on national budget cycles; fund pooling across MS possible** • **EU State Aid notification needed**
	EU MFF budget		• **Based on EU budget cycles; cross-border; strong political signal** • **No EU State Aid notification needed**
Potential funding linkages	Recycling of EU ETS revenues		• **Multi-year; high volume** • **Budget risk due to ETS price fluctuations;** EU and MS budget responsibility
Tenure transformation & auction staging	Yes	...with serial auctions	• **Dynamic minimization of cost difference** • **Continuous price discovery — however, for parallel auctions: opaque, low-quality price signal** • **Liquidity provision**
		...with parallel supply and first offtake auction	
	No → parallel auctions		• **No dynamic minimization of cost difference** • **One-off price discovery only** • **Limited liquidity provision**
Legal entity & geography	State-owned		National mandate; double-auction capacity to be built
	EU institution (e.g., EIB or CINEA)		EU mandate and legitimacy built-in; double-auction capacity to be built
	Independent non-state owned SPV (incorporation location flexible)		Ring-fenced risk; existing structure; if EU-funded, then pillar assessment needed
Mgmt. fees[1] by intermediary	Direct ex-ante upfront payment		National mandate; double-auction capacity to be built
	Direct ex-post payment via monthly invoicing		EU mandate and legitimacy built-in; double-auction capacity to be built
	Indirect payment via contract fees by bidders (from both supply and offtake auctions)		Ring-fenced risk; existing structure; if EU-funded, then pillar assessment needed
	Indirect payment via interests incurred from upfront capitalisation (only valid for that capitalisation form)		Predictable cash flow; simple to budget; secured risk buffer for intermediary

[1] Management fees are required to (1) cover operational costs as well as (2) build up cash and risk buffers (only necessary if there is no government guarantee). The management fees of an intermediary are usually 1-2% of supply total contract value and subject to strict audits on expenditures. Any remaining funds will be paid back to fund provider at the end of funding period.

Endnotes

1 See the European Commission's European Hydrogen Strategy and REPowerEU (2021), https://energy.ec.europa.eu/topics/eus-energy-system/hydrogen_en.

2 Stiftung Wissenschaft und Politik (2021): A New Hydrogen World: Geotechnological, Economic, and Political Implications for Europe, https://www.swp-berlin.org/10.18449/2021C58/.

3 Environmental sustainability, economic efficiency, and security of supply (= resilience) have always been regarded as equally important components of the "energy policy triangle"; see also Section 1(1) of the Energy Industry Act (EnWG): "The purpose of this Act is to ensure a supply of electricity, gas, and hydrogen to the general public that is as secure, affordable, consumer-friendly, efficient, environmentally sustainable, and greenhouse gas-neutral as possible, and that is increasingly based on renewable energies." https://www.bundeswirtschaftsministerium.de/Redaktion/EN/Artikel/Energy/security-of-supply.html.

4 G. Flis, M. Deutsch (2022): 12 Insights on Hydrogen, Agora Energiewende https://www.agora-energiewende.org/fileadmin/Projekte/2021/2021_11_H2_Insights/A-EW_245_H2_Insights_WEB.pdf.

5 Mission Possible Partnerships and Rocky Mountain Institute (2024): Unleashing market forces to scale green industry: The role of Green Market Makers https://gmm.missionpossiblepartnership.org/.

6 BloombergNEF: New Energy Outlook 2026: https://assets.bbhub.io/professional/sites/44/NEO_2026_Executive_Summary.pdf; Energy Transitions Commission: https://www.energy-transitions.org/bitesize/three-key-policies-can-scale-1-trillion-investment-for-the-energy-transition/.

7 Bollerhey T., Exenberger M., Geyer F., Westpfahl K. (2022): H2Global — Idea, Instrument and Intentions, Policy Brief H2Global Foundation 01/2022, ISSN: 2940-8628. https://h2-global.org/library/h2global-idea-instrument-and-intentions/.

8 The intermediary allocates responsibility of the logistical value chain, such as transport, storage, and product handling, and all logistical liabilities are the responsibility of the producer and offtaker(s). Both parties are "connected" via the intermediary, who is the physical owner of the product only for a theoretical "split second". It is important to note that there is maturity transformation incorporated in the double-sided auction process; hence, the wording "back-to-back" only refers to the logistical aspects of the trading process.

9 Legally, the 'auctions' conducted under H2Global are understood as competitive award or tendering procedures, and thus differ from the traditional concept of an auction (e.g., in the sense of a stock exchange or public auction). However, they can be designed flexibly — also as (reverse) English, Dutch, etc. auctions.

10 Maciej van der Steen (2025): H2Global — can private investment help in scaling the European Green Hydrogen Economy (Deloitte) https://www.deloitte.com/uk/en/services/tax/blogs/can-private-investment-help-in-scaling-the-european-green-hydrogen-economy.html.

11 From a state aid perspective, the classification may differ; for instance, the EU Commission assumes that this constitutes indirect state aid, which is also attributable to the producers or offtakers. European Commission (2024): https://ec.europa.eu/competition/state_aid/cases1/20257/SA_108511_143.pdf.

12 The planned "German-Canadian H2Global Window" forms an exception. Here, a double-sided auction with matching timeframes and a 10-year duration on both sides will take place, meaning that both auctions are expected to be implemented entirely "back-to-back".

13 Bauer F, Bollerhey T, Egerer J, Erdmann MC, Exenberger M, Geyer F, Grimm V, Hofrichter A, Krieger M, Runge P, Sterner M, Wirth J, Wragge D (2023): The Market Ramp-Up of Renewable Hydrogen and its Derivatives — the Role of H2Global, https://www.eex.com/en/newsroom/detail?tx_news_pi1%5Baction%5D=detail&tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Bnews%5D=7214&cHash=094d2c5b706cf6d7b20e66b4d4351bbb.

14 Mission Possible Partnerships and Rocky Mountain Institute (2024): Unleashing market forces to scale green industry: The role of Green Market Makers https://gmm.missionpossiblepartnership.org/.

15 Oxford Institute for Energy Studies (2024): Can UK green hydrogen contract for difference (CfD) match the cost-saving success of renewable electricity? ISBN 978-1-78467-254-6.

16 T. Bollerhey, M. Exenberger (2020): H2Global Concept Draft.

17 Note that H2Global is currently only implementing Pillar 2 of this framework concept — other pillars will likely require the set-up of new legal entities, in line with applicable laws and independent from the current H2Global set-up.

18 An 'H2Global window' refers to a specific tender implementing the H2Global mechanism. It is defined in terms of both content and time. It combines a specific budget, clearly defined product and sustainability criteria, and a specific regional and temporal focus. Each window has its own state aid framework, may be funded by different grant providers (e.g., individual ministries or international partners), and has its own tender and contract periods within which the respective DSAs are conducted.

19 H2Global Foundation (2024): Keep it simple — Aligning auction objectives for success, https://h2-global.org/library/keep-it-simple-aligning-auction-objectives-for-success/.

20 For example, as part of the second H2Global Auction Window, the eligible product group consists of RFNBO-compliant hydrogen, ammonia, and methanol.

21 All award criteria — such as price or CO_2 reduction — are specified by the funding body or agreed upon by the intermediary in consultation with the funding body. To minimise legal risks in the tendering process, the criteria catalogue should be as transparent as possible and, wherever possible, defined unambiguously or in binary terms.

22 LOHC are substances in which hydrogen is chemically bound, transported, and released again at the destination. Ammonia cracking refers to the thermocatalytic splitting of ammonia into hydrogen and nitrogen to recover the bound hydrogen.

23 Twobirds 2018: Corporate PPAs - An international Perspective https://www.twobirds.com/-/media/pdfs/an-international-perspective.pdf?la=en&hash=0E11643EB55F70E910FDF2349F721B061018397F.

24 European Clean Hydrogen Alliance: Learnbook — Finance of Hydrogen Infrastructure, https://www.entsog.eu/sites/default/files/2024-09/European%20Clean%20Hydrogen%20Alliance%20T&D%20RT_Learnbook%20on%20Financing%20of%20Hydrogen%20Infrastructure.pdf.

25 European Commission: European Hydrogen Bank https://energy.ec.europa.eu/topics/eus-energy-system/hydrogen/european-hydrogen-bank_en.

26 German Steel Association (2025): Hydrogen supply contracts enable/bridge the risks — creating the conditions for a market ramp-up, https://www.wvstahl.de/wp-content/uploads/20250708_Pos_H2_Liefervertraege_ermoeglichen.pdf ; Bauer F, Bollerhey T, Egerer J, Erdmann MC, Exenberger M, Geyer F, Grimm V, Hofrichter A, Krieger M, Runge P, Sterner M, Wirth J, Wragge D (2023): The Market Ramp-Up of Renewable Hydrogen and its Derivatives — the Role of H2Global, https://www.eex.com/en/newsroom/detail?tx_news_pi1%5Baction%5D=detail&tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Bnews%5D=7214&cHash=094d2c5b706cf6d7b20e66b4d4351bbb.

27 H2Global Foundation (2025): Clean hydrogen as a catalyst for development: Re-defining Africa's role in a changing geopolitical context https://h2-global.org/library/clean-hydrogen-asa-catalyst-for-developmentre-defining-africas-role-in-achanging-geopolitical-context/.

28 H2Global Foundation (2024): Unlocking potential: Scaling demand through hydrogen hubs, https://h2-global.org/library/unlocking-potential-scaling-demand-through-hydrogen-hubs.

29 White House (2023): https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/07/Issue-Brief-Demand-Side-Support-for-Clean-H-Hubs-070323-1230pm-1.pdf.

30 European Commission Nov 2025: Commission boosts Europe's competitiveness with new plans for high-speed rail and sustainable fuels for aviation and waterborne sectors (https://ec.europa.eu/commission/presscorner/detail/en/ip_25_2547).

31 European Commission (2025): https://transport.ec.europa.eu/news-events/news/eu-launches-early-movers-coalition-accelerate-sustainable-aviation-fuel-uptake-2025-12-04_en.

32 Systemiq (2026): https://www.systemiq.earth/project-skypower/.

33 In such a case, the public funding body undertakes to provide a fixed budget for five consecutive years to offset the expected incremental costs, covering the respective ten-year period of the planned H2Global auctions.

34 H2Global Foundation (2024): Bridging the gap: Mobilizing investments in hydrogen infrastructure, (https://h2-global.org/library/bridging-the-gap-mobilizing-investments-in-hydrogen-infrastructure/).

35 Hilog concept paper — forthcoming.

36 EU Commission (2022): Guidelines on State aid for environmental protection and energy 2014-2020 https://competition-policy.ec.europa.eu/sectors/energy-environment/legislation_en.

37 The public grant is intended exclusively to cover the difference in costs and may not be used by Hintco to cover operating expenses. A positive trading margin from an intermediary's activities is also not to be expected; hence operational cost must be covered by different sourcing.

38 The approach can also be used to achieve industrial and economic policy objectives in a wide range of market segments, even where there is no clearly identifiable market failure. This encompasses both its use for diversifying supply chains (counterparty resilience) and for cushioning differential costs within the context of local or regional value creation (import resilience) — or a combination of both dimensions.

39 BMFTR (2023): https://www.bmftr.bund.de/SharedDocs/Downloads/DE/20/230726-fortschreibung-nws.pdf?__blob=publicationFile&v=4.

40 T. Bollerhey, M. Exenberger (2020): H2Global — Concept and Idea.

41 The H2Global Foundation is now supported by ~75 leading companies and institutions across the entire hydrogen value chain from all regions of the world, thus making H2Global a truly global, internationally anchored platform. Donors are not members of the foundation but support its work through financial contributions in the form of traditional foundation donations (endowments).

42 H2Global (2026): https://h2-global.org/.

43 "CEEAG" are European Commission's "Guidelines on State aid for climate, environmental protection and energy 2022" (2022/ C 80/01), published in the Official Journal of the European Union on 18 February 2022 and "EEAG" are the European Commission's "Guidelines on state aid for environmental protection and energy 2014-2020" (2014/C 200/1) published in the Official Journal of the European Union on 26 June 2014.

44 The specific structure of the bidding process and its individual phases may vary between the different H2Global windows, particularly depending on the respective requirements of the state aid notification.

45 Whilst complex but largely standardised business-to-business (B2B) contracts can usually be concluded within a few weeks to a few months, experience from new raw materials and energy sectors shows that projects in early market phases often take significantly longer than anticipated to be secured contractually and institutionally. Against this background, it can be assumed that complex contracts in emerging markets without established standards will, on average, involve noticeably longer lead times and negotiation periods, and may in some cases take up to 1.5 years.

46 In total, the German Federal Government has so far committed or earmarked approximately EUR 6.3 billion (USD ~7 billion) for compensation of the cost differential within the context of various H2Global windows (as of May 2026).

47 H2Global (2024): https://h2-global.org/news/australia-and-germany-commit-eur-400-million-to-joint-h2global-auction/.

48 H2Global (2024): https://h2-global.org/news/canada-announces-cad-300-million-for-h2global-initial-auction/.

49 RED III (Directive (EU) 2018/2001, as amended on 16 July 2024) requires Member States to meet certain sustainability targets in the form of quotas, in particular Article 3(1) (Member State target), and Article 22a(1) (quota for RFNBOs in industry) and Article 25(1) and (2) (quota for RFNBOs in transport). To meet these requirements, RFNBOs must, pursuant to Article 29a(1), achieve a greenhouse gas emission reduction of at least 70 per cent. Furthermore, pursuant to Article 30, economic operators are obliged to carry out audits to verify compliance with these requirements, which are regulated in detail in delegated acts (and voluntary schemes). The reduction of at least 70% must be demonstrated throughout the supply chain and, where applicable, using a mass balance system. A 'physical' delivery of the molecule is therefore absolutely essential.

Admittedly, Article 19 of the RED expressly provides for the possibility of issuing guarantees of origin for RFNBO hydrogen. Guarantees of origin can be traded separately from the molecule and, where appropriate, monetised. This approach, also known as 'book and claim' and well-established in the electricity and gas markets, is valued by market participants for the flexibility it offers: consumers can claim the 'green' attribute without the need for a physical supply chain for the 'green' molecule. Unlike audits under Articles 29a and 30, the guarantees of origin under Article 19 do not stipulate a minimum reduction in greenhouse gas emissions across the supply chain. Consequently, it is also not possible to count them towards Member States' sustainability targets and quota requirements. The double-sided auctions conducted by Hintco to date have therefore focused exclusively on audited products within the meaning of Articles 29a and 30.

50 Mass balance refers to a system for tracking material flows along a supply chain. This ensures that the quantities of a product — such as RFNBO — fed in and withdrawn match mathematically, even if there is no consistent physical separation of sustainable and conventional molecules. This requires comprehensive documentation of material flows throughout all process steps, so that the assigned sustainability attributes can be plausibly traced at any time.

51 A grant notification is a written administrative act by which the funding body grants Hintco financial resources for the implementation of specific auction windows and sets out the underlying ancillary provisions, conditions, and reporting obligations. On the basis of a budgetary commitment authorisation, the grant notification can already secure payment obligations for the entire, multi-year term of the HPA contracts, even though the corresponding expenditure is only gradually budgeted for in the federal budget in future financial years.

52 A commitment authorisation within the meaning of German budgetary law is the parliamentary authorisation granted to the executive to enter into legally binding commitments in the current financial year that will lead to expenditure in future financial years. It is essential for multi-year projects, providing budgetary transparency on the extent to which current decisions commit future budgets. See also: https://www.bundestag.de/resource/blob/514314/0ad037338a0cc8218a502353ec1767bb/verpflichtungsermaechtigung-data.pdf.

53 The commitment appropriations allocated to H2Global in the federal budget are shown in so-called "annual tranches", meaning that the total multi-annual commitment framework approved is broken down across individual financial years. This makes it clear to what extent annual payment obligations to Hintco arise from the long-term HPAs and to what extent future financial years are burdened by commitments already entered into. For Hintco, this allocation in annual tranches forms the budgetary basis for planning and securing the compensation payments due over the entire term of the HPAs. Regardless of changes in government during the term of the HPAs, the commitment appropriations are irrevocable. Any changes can only be made with Hintco's consent. See also: https://www.bundeshaushalt.de/static/daten/2026/soll/epl09.pdf.

54 The price of the optional quantities is also fixed on an annual basis for the entire duration of the HPA as part of the bid.

55 Slaughter and May (2023): https://www.slaughterandmay.com/insights/importedcontent/h2global-the-emergence-of-a-new-standard-offtake-agreement-for-synthetic-fuels/.

56 Hintco (2026): https://hintco.eu/lot-1-renewable-ammonia/.

57 The existing European requirements for RFNBO were difficult for many non-European bidders to meet, particularly with regard to the use of a compliant carbon source and the flexible allocation of the green attribute in the synthesis process.

58 The auction volume was capped at EUR 300 million.

59 Hintco has been nominated to accompany the German Ministry of Transport (BMV) during the state aid notification process. Subject to notification, Hintco will then be nominated as an intermediary benefiting from the scheme.

60 Each of the lots has a minimum purchase volume of approximately EUR 600 million. See also: https://www.bundeshaushalt.de/static/daten/2026/soll/epl09.pdf.

61 Each government will provide Hintco with EUR 300 million for cost differential compensation in this lot.

62 With the exception of one location within the European Fair Trade Association (EFTA), the production sites in the pilot auction were not geographically restricted. The background to this is the funding allocation in the German government's Corona economic stimulus and future package, which earmarks EUR 9 billion for hydrogen, of which EUR 2 billion is for international partnerships. https://www.bundesfinanzministerium.de/Monatsberichte/2020/06/Inhalte/Kapitel-2b-Schlaglicht/2b-umsetzung-des-konjunkturprogramms.htm.

63 Funded by the Federal Republic of Germany.

64 Hintco will only be formally nominated as the beneficiary intermediary following notification under state aid law.

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