SEPTEMBER 2024

# Unleashing market forces to scale green industry

## The role of Green Market Makers

MISSION POSSIBLE PARTNERSHIP

BEZOS EARTH FUND

# We have the power to unlock exponential growth in green industry

## A Market forces have historically propelled widespread adoption of new technologies and can be unleashed to drive a green industrial revolution

History shows that the uptake of new technologies becomes exponential, once a tipping point is reached. We've seen this in the deployment of rail, electric power, telegraph, oil pipelines and now solar power. A **tipping point** is typically triggered when a new technology reaches 5-10% of market penetration and becomes sufficiently affordable, available, and attractive to displace the incumbent option. This triggers reinforcing **feedback loops** that lead the new technology to rapidly dominate the market. **Green industry** can benefit from the same market forces if we nudge key green commodity markets towards a tipping point.

## B New markets are slow to scale at first, but targeted interventions can bring forward exponential growth

The deployment of green commodities like clean ammonia, green steel or low carbon cement is primarily inhibited by their production cost, which still carries a **green premium** and faces **limited demand**. To address this challenge, **market formation instruments**, primarily policies such as mandates and subsidies, can scale demand and reduce the green premium.

Thereafter, transactions are still slowed down by many **additional market failures** like heightened delivery risks, price uncertainty or absence of a common definition of "green" products. **Market acceleration instruments** such as product standards, buyers alliances, and book & claim systems can increase the pace and scale of transactions.

## C Green Market Makers (GMMs) are a dynamic and innovative solution to overcome multiple market failures at once

Green Market Makers are **intermediaries** that step into the value chain to buy and sell green commodities via a **price discovery and optimisation** mechanism to achieve the lowest costs from producers and highest willingness to pay from offtakers respectively. The **residual "green price gap"** can be covered by concessional capital, most often government funding. **H2Global** is the only Green Market Maker in operation globally as of September 2024 and has pioneered an approach that can be replicated across sectors and regions, jumpstarting markets and absorbing risk.

## D The sweet spot for Green Market Makers is commodities with a small to moderate green price gap

Green Market Makers are best suited to support the scale up of transactions in commodity markets where there is a **small to moderate green premium** and some **willingness to pay** from buyers. These include clean hydrogen and its derivatives, biofuels, green steel and low carbon cement. Depending on market maturity, it may be possible to attract market capital alongside concessional.

## E A series of Green Market Makers could bring several heavy industry sectors to their tipping point

If **major economies** join forces, tipping points unlocking exponential growth can be reached faster. Focusing on key sectors such as renewable ammonia for fertilisers can potentially unlock a cascade of tipping points across multiple industry sectors by driving down the cost of green hydrogen.

## F The green industrial revolution is in sight; let's unleash market forces to make it happen faster

**Governments** can fund GMMs to build their competitive advantage in green industry while pushing global green commodity markets toward tipping points.

**Private financial institutions** can join forces with green commodity buyers and sellers and market making experts to scale GMMs.

# Market forces have skyrocketed the uptake of new technologies from the industrial revolution to the take-off of renewable energy

**Historically adoption of new technologies has followed a "S-curve" pattern.** When markets reach a tipping point, market forces lead to exponential adoption thereafter.

Triggering a tipping point typically requires a new technology to surpass a threshold in affordability vs the incumbent, supported by improved availability or attractiveness. This has consistently shown to occur at a market penetration in the region of 5-10%.

**At this point, reinforcing feedback loops take hold and exponential growth can be unleashed.** There are numerous types of feedback loops, often coexisting, which include; learning curves, economies of scale, technological reinforcement, network and coordination effects, self-reinforcing expectations and contagion of social norms.

**Green industry could benefit from these self-reinforcing market forces if nudged toward tipping points.**

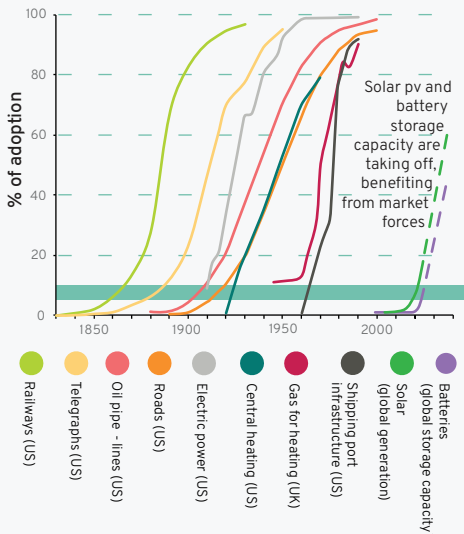
The decarbonisation of fertiliser, steel and cement production, long-haul shipping, and aviation will depend on new sector-specific low- or near-zero-carbon solutions, many using clean hydrogen or carbon capture.

The deployment of these technologies remain primarily at the inception stage. Building the first cohort of commercial-scale projects is essential to bring these sectors closer to a tipping point.

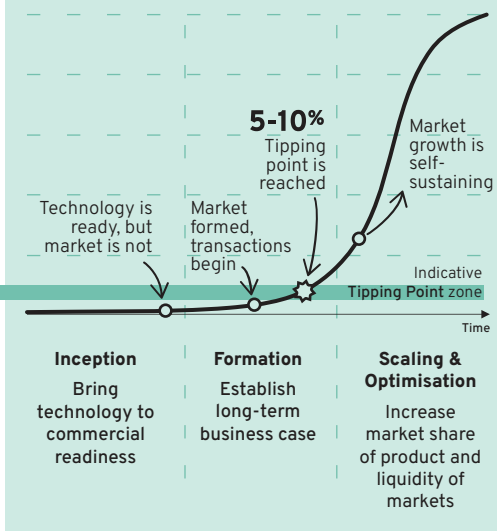
## S-curve deployment of new technologies: historical examples and typical stages

EXHIBIT 1

### The historical adoption of a sample of infrastructure and energy systems




### Stages in market formation and scale-up



# Greening industry is the next industrial growth opportunity: the transition is underway, but investment remains too slow

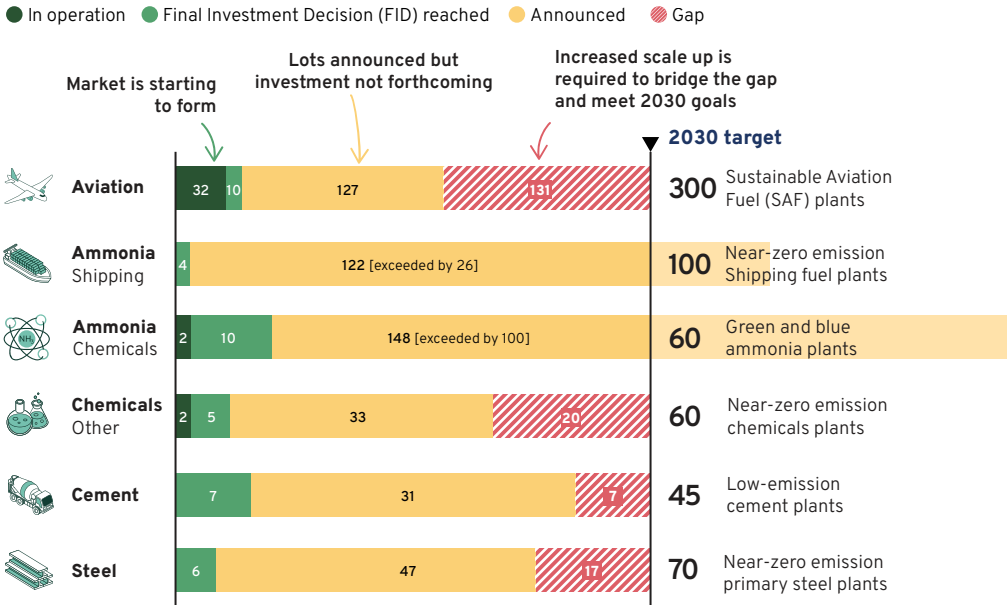
**Green industry is becoming a reality.** 110 net-zero-aligned industrial plants are in operation or have reached Final Investment Decision (FID) today globally across heavy industry sectors, and 473 have been announced but haven't reached FID yet. Some sectors and regions are transforming faster than others, achieving FID and operational maturity due to a supportive policy environment.

**But faster progress is needed to meet climate goals.** FID needs to be taken within three years on another 600 plants in order to have critical mass of plants operating by 2030.
**Multiple barriers are inhibiting investment in green industry.** The primary challenge is a fragile business case, due to the cost premium associated with the production of low-emissions commodities and lack of green demand – compounded by a competing set of downstream sustainability priorities for offtakers, challenges to wider infrastructure readiness, technology maturity, operational challenges, and political uncertainty risks. This makes projects un-bankable due to the inability to secure sufficient long-term offtake contracts.

**We can spur industrial growth and realise climate ambitions.** Governments and private sector players with conviction stand to benefit from outsized market acceleration, capturing early market share.

## Global pipeline of green industry projects

EXHIBIT 2



# Green commodity markets are slow to scale at first, but targeted interventions can bring forward exponential growth

**New products often face multiple market failures.** When they try to break the hold incumbents have on the market, new technologies and business models often face a suite of barriers. These relate not only to cost, but also to heightened risks and uncertainties on transactions between sellers and buyers. We can accelerate the take-off of new markets through targeted interventions from governments and private sector players to overcome market failures.

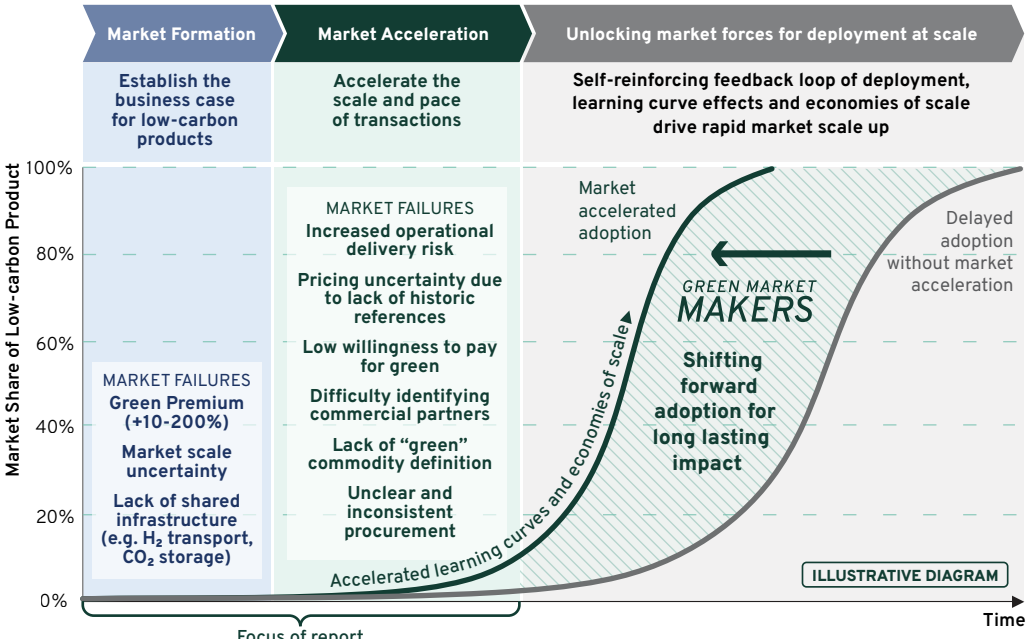
**The first step in market acceleration is to improve the business case for green products.** To address this challenge, market formation instruments, primarily policies such as mandates, subsidies and carbon pricing, can scale demand and reduce the green premium, therefore establishing a business case for transactions.

**After the market is formed, scale-up can be accelerated by facilitating and de-risking transactions between buyers and sellers.** This market acceleration phase occurs when the scale and pace of critical early transactions is supercharged.

**Acceleration efforts can have a long-lasting effect.** Interventions to accelerate markets can bring forward the tipping point after which reinforcing feedback loops can drive exponential market growth. Even after initial acceleration efforts have ceased, the effect of market acceleration will remain, putting green commodities on a path to push their high-carbon equivalent out of the market.

## Market formation and acceleration to bring forward exponential growth

EXHIBIT 3



# A toolbox of public policy and private sector instruments can form and accelerate green markets

**Policy constitutes the primary driver of the earliest stages of market formation.** A range of policy levers have been deployed already to initiate a market for low/zero-carbon commodities. The EU has implemented industrial decarbonisation targets, fixed subsidies, sector blending mandates, and green public procurement directives. In the US, production and investment tax credits, infrastructure funding and loan guarantees have been offered (IRA, 2020), alongside emphasis on sustainable public procurement. This policy landscape should be further strengthened, especially in markets that still face a significant green premium.

**A complementary set of instruments, many developed by the private sector, have emerged to accelerate market growth.** Policy instruments are insufficient to address the multiple market failures inhibiting a scale-up. Other instruments have proven essential, including:

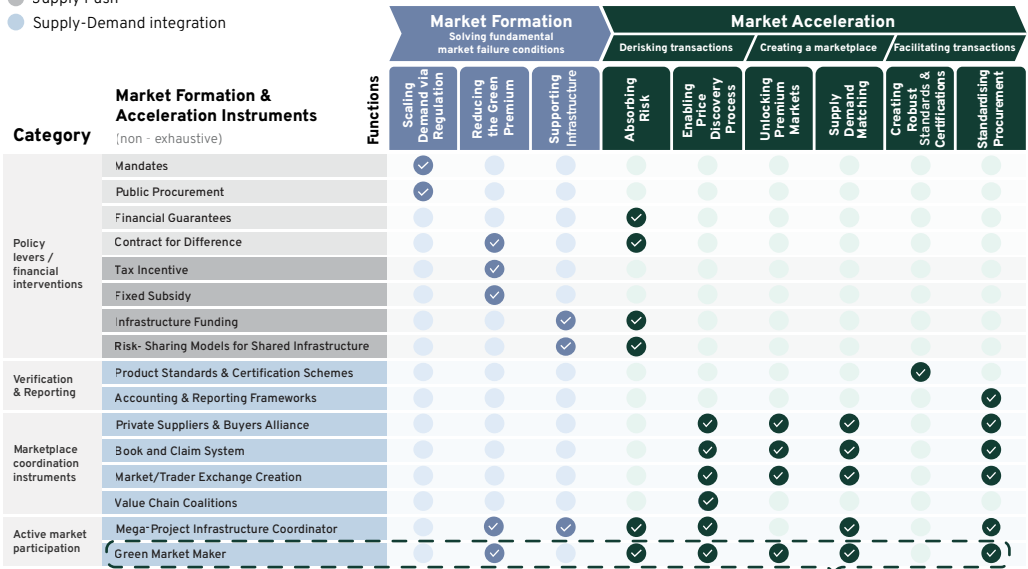
> **Low/zero-carbon product standards and certifications schemes,** enabling clarity on the characteristics of the product purchased;
>
> **Buyers alliances,** aggregating demand for early transactions and standardising procurement practices;
>
> **Book & claim systems,** which enable a sustainability claim by a company to be separated from the physical product flow.

**Green Market Makers are emerging as an innovative approach to solve multiple market failures at once.** GMMs work to simultaneously form and accelerate markets, bridging the green premium and facilitating transactions.

# Toolbox to form and accelerate green markets

EXHIBIT 4

- Demand Pull
- Supply Push
- Supply-Demand integration




See chart full-size in main report

# Today, green commodity markets benefit from a rich, but fragmented landscape of market acceleration instruments

**The development of market acceleration instruments for green commodities is underway.** Many instruments exist or are under development to facilitate transactions in green commodity markets, which sellers and buyers can already or will soon be able to leverage. Several buyers alliances are driving voluntary demand for green commodities, including the First Movers Coalition, the SteelZero and ConcreteZero initiatives, and buyers platforms like the Sustainable Aviation Buyers Alliance (SABA), Zero Emission Maritime Buyers Alliance (ZEMBA) in shipping, and the Sustainable Steel Buyers Platform in steel.

**This landscape still suffers from gaps and inefficiencies.** The maturity and completeness of the toolbox differs significantly by sector. Some instruments have only been developed very recently, are not yet operating at scale and the lack of coordination between instruments fragments the landscape.

**New efforts can fill the gaps, augment quality, and support coordination across entities.** A high priority should be to ensure availability of appropriate standards, certification, accounting and reporting frameworks across all key green commodity markets.

The **Center for Green Market Activation** is scaling proven models like book-and-claim and demonstrating the power of multi-stakeholder engagement to not only bring forward clear demand signals but also turn them into executed contracts.

## Landscape of market acceleration instruments in green commodity markets

EXHIBIT 5

Multiple Exist | Single Exists | In development (or comparable) | Nothing in operation | Working in conjunction

**NON-EXHAUSTIVE** key examples highlighted


| | | Hydrogen | Shipping | SAF | Steel | Cement |
|---|---|---|---|---|---|---|
| **Corporate Enablers** | | SBTi sector guidance, GHG - Protocol | | | | |
| **Verification and Reporting** | Product standards & certification schemes | Open Hydro Initiative, Green Hydrogen Organisation, CertifHy | RSB, ISCC | RSB, ISCC (CORSIA, EU RED, PLUS) | Responsible Steel Standard | Concrete Sustainability Council |
| | Buyer Corporate Claims Guidance | | RMI & MMMCZCS Maritime B&C Scheme | SAFc B&C Guidance | RMI Green Iron B&C scheme | GMA-RMI Concrete initiative |
| **Marketplace Coordination** | Value chain coalitions (buyer commitments) | Clean Hydrogen Mission | First Movers Coalition | First Movers Coalition, IATA | First Movers Coalition, SteelZero | First Movers Coalition, ConcreteZero |
| | Private Suppliers and Buyers Alliance | Multiple regional efforts exist | Zero Emission Maritime Buyers Alliance (ZEMBA) | Sustainable Aviation Buyers Alliance (SABA) | Sustainable Steel Buyers Platform | GMA-RMI Concrete initiative |
| | Book and Claim System | | RMI & MMMCZCS B&C registry, RSB | SAF Certificates (e.g., SAFc registry, RSB, Fly-I) | | |
| **Active Market Participants** | Green Market Makers | H2Global | | | | |

# A new game-changing instrument has emerged to jumpstart markets: the Green Market Maker

**A Green Market Maker (GMM) is an active market participant that overcomes numerous market failures simultaneously.** GMMs are intermediaries that step into the value chain to buy and sell green commodities, becoming a direct trading and contractual partner of buyers and sellers. They aim to both bridge the "green price gap" between sellers and buyers, and to address numerous other market failures.

**A GMM aims to optimise green commodity pricing.** It uses a price discovery and optimisation mechanism to buy a low-carbon commodity at an optimised premium and sell it at an optimised market price, minimising the concessional capital required to bridge the residual green price gap. This can take the form of a double-sided auction, which enables price discovery in a market with no historic references.

By engaging on both sides of the transaction, the GMM also facilitates supply-demand matching. It overcomes the mismatched needs of suppliers (who need long-term offtake contracts) and offtakers (who might only be able to commit to 1-2-year offtake contracts). As the initial buyer of the low-carbon product, the GMM also absorbs delivery risks.

**The likely primary funders of GMMs are governments.** Market capital may also be attracted in some cases (see further details in Sections 9 and 11). H2Global is the only Green Market Maker in operation globally as of September 2024 and has pioneered the double-sided auction approach which can be replicated across sectors and geographies.

## How a Green Market Maker operates

EXHIBIT 6

### GMM value chain & how they add value


Long-term offtake contracts from high-creditworthy counterparty make one or multiple production facilities investible

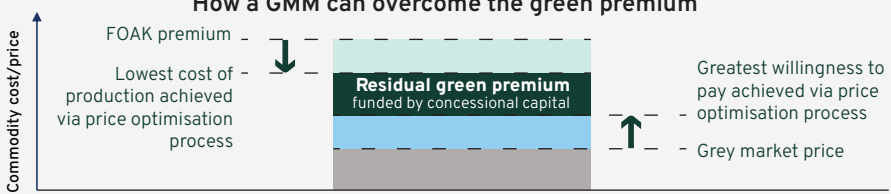
Price optimisation process ensures the most competitively priced production of green commodity

Concessional capital subsidises the residual green premium

Price optimisation process captures market increased willingness to pay for green commodity

Short-term offtake contracts provide offtakers with green commodity at the evolving market rate over time instead of long-term arrangements

### How a GMM can overcome the green premium



**7** SWEET SPOT

# Green Market Makers are best suited to boost transactions for green commodities with a small to moderate green price gap

**There is a sweet spot for Green Market Makers (GMMs).** Not all green commodity markets are suitable for the implementation of a GMM today. GMMs can have the greatest impact upon markets sufficiently mature to reach a tipping point in a reasonable time frame. GMMs are also best targeted towards midstream markets such as fertiliser or steel, where green premium demand needs to emerge first to spur demand signals for upstream production of low-carbon hydrogen.

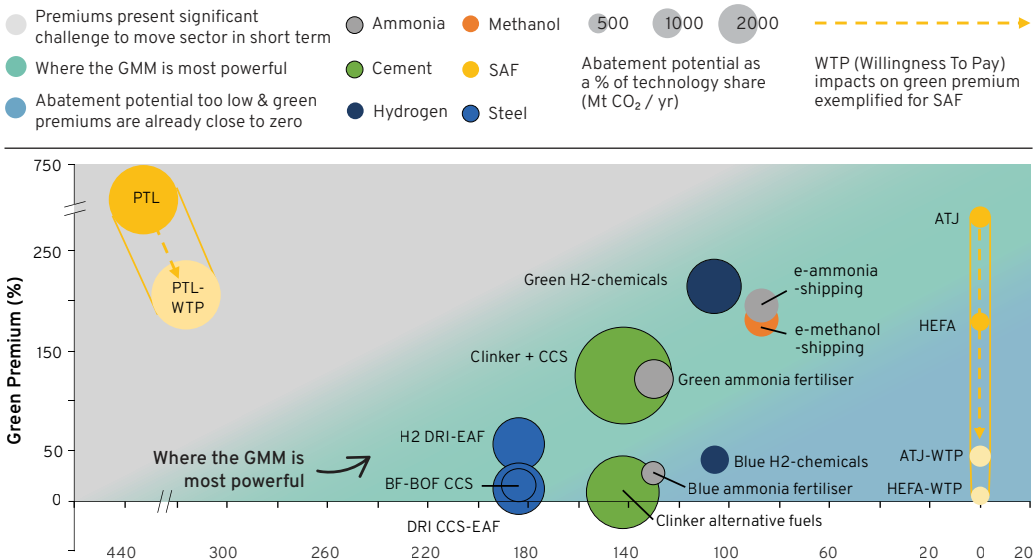
**GMMs should target commodities with small to moderate green premiums to optimise use of concessional capital.** This is where initial concessional capital investment can unlock large enough production volumes to make progress towards tipping points. Sectors such as ammonia, cement and steel are where GMMs could have the greatest initial impact.

**For more mature sectors, e.g., HEFA for SAF, GMMs may be designed to bring in market capital alongside concessional.** HEFA and to a lesser extent ATJ may achieve profitability in the coming 12-36 months. They also benefit from supportive market conditions such as a willingness to pay from certain buyers and the ability to trade value products such as environmental attributes separately from the underlying fuel.

**Note** - Profitability based on analysis performed by report contributors. | **ATJ**: Alcohol-to-Jet | **HEFA**: Hydrogenated Esters and Fatty Acids.

EXHIBIT 7

## Prioritisation of sectors based on green premium and concessional capital requirements



# Green Market Makers can be tailored to the needs of the markets they serve for greatest economic and environmental impact

**Each GMM tender can be tailored to a different market.** A Green Market Maker could focus on one specific commodity market or develop different tenders targeting different markets. Each of those can then be tailored to suit the needs of the chosen market along several dimensions relating to its scope, funding model, and financial mechanism design.

**Scope:** Each GMM tender can target a particular commodity, geographic scope, and scale, based on the priorities of the relevant government(s) or other funding entities.

**Financial mechanism design:** Different design options could be explored to magnify the impact of scarce concessional capital, including capital recycling, derivatives for hedging, price collars to fix minimum and maximum prices, and crowding in market capital. These are estimated to extend impact of concessional capital anywhere between 20-150%.

**Funding model:** The share of concessional funding applied to the GMM can in principle vary depending on the maturity of the market and whether profitability within 2-3 years can be expected. Early-stage markets are likely to remain funded at 100% by concessional capital, while more mature markets close to price parity could attract market capital alongside concessional into a mixed capital model. (see further details in section 9). Design options ensure complete flexibility and are being pioneered by H2Global.

## Design options for Green Market Makers

EXHIBIT 8

### Scope

Funding tender scope can be set by three main criteria to target scale up of commodity value chains in specific locations

**Commodity**
e.g. Hydrogen, ammonia, methanol

**Geographic scope**
Domestic, bi-lateral, multi-lateral economies

**Scale**
Absolute quantum $£€ of concessional funding

### Financial mechanism design

The impact of concessional capital can be magnified by integrating instruments to transfer more risk to the market:

**Capital Recycling**
Capital from annual sales reused, reducing concessional capital requirements

**Derivatives trading**
Decreases collateral requirement by securing a minimum sales price for physical product

**Price Collars**
Offtakers bidding on max. & min. prices for long-term offtake contracts to set minimum price range

**Market capital**
Amplifying impact of government capital by sharing the collateralisation burden

**Magnification of concessional capital:**

| 70-90% | 20-35% | 70-90% | 80-150% |
|---|---|---|---|

### Funding Model

The level of concessional funding used can vary depending on the maturity of the market and the related expectation of profitability:

*Early-stage market / High risk / High green premium* — *More mature market / Close to price parity*

**100%-concessional GMM** ▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶ **Mixed Capital GMM**

# Two major archetypes of GMMs can be considered depending on market maturity to bring green commodities to scale

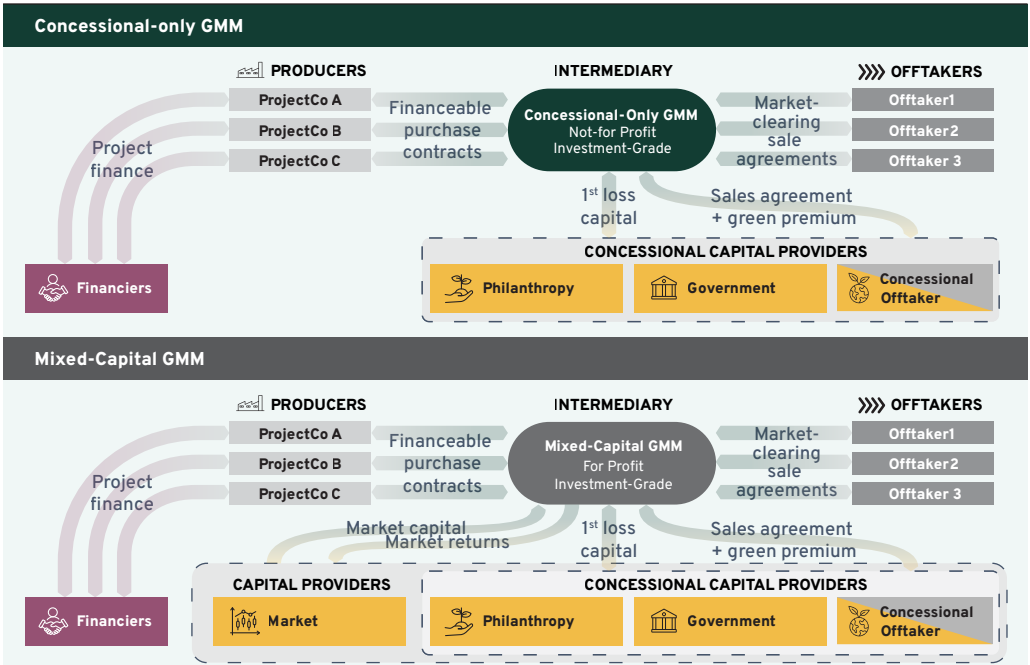
**While a market maker can take many forms, two main GMM archetypes have emerged: a Concessional-Only and a Mixed-Capital.** Both archetypes may support pace and scale of transactions in nascent markets, but they distinguish themselves by their capital structure, which leads to different business models. Both archetypes are highly flexible, and have many permutations depending on the needs of specific markets.

**The Concessional-Only GMM** is collateralised up to 100% with concessional capital and can be applied in sectors without near-term line-of-sight to profitability, i.e. sectors with green premiums which can be reduced with scale but are unlikely to disappear entirely in the near future. Applying this instrument can drive production scale to reduce cost and risk to improve the business case over time. Here, the GMM deploys concessional capital to bridge the residual green premium.

**The Mixed-Capital GMM** aims to bring market capital alongside concessional capital to drive scale. It requires commodities with clear, near-term line of sight to profitability to give market investors confidence it can deliver returns. As such, it cannot address markets with sustained long-term price gaps between producers and offtakers. However, it can be used to scale sectors with separable environmental attributes that can be decoupled and traded separately from the underlying commodity to reach positive margin.

## Design options for Green Market Makers

EXHIBIT 9



# H2Global has pioneered an innovative double-sided auction mechanism, accelerating market formation and expansion

**H2Global was established to accelerate clean hydrogen markets.** H2Global is an international organisation, which was established, with the initial support of the German government, to accelerate the emergence of markets for clean hydrogen and other low-emission fuels worldwide.

**H2Global has pioneered a double-sided auction mechanism.** The double-sided auction ensures the most competitive cost and price are achieved for taxpayers, reducing the residual green price gap to be covered by concessional funds (see Exhibit 10). This mechanism not only ensures the use of concessional capital is optimised, but also enables price discovery and transparency.

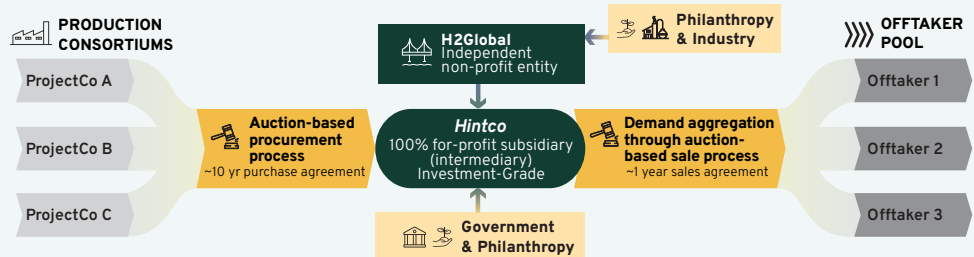
**The first purchase auction was completed in July 2024.** This auction saw a €900m "concessional-only" tender for three procurement lots of renewable hydrogen derivatives: ammonia, methanol and e-SAF. Fertiglobe (Egypt), won the ammonia auction, securing a contract value of €397m for a potential cumulative supply of 397,000t of renewable ammonia between 2027-2033.

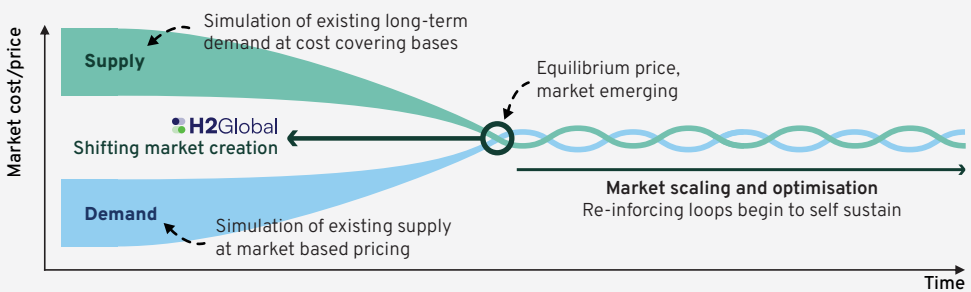
**H2Global is expanding with interest from numerous countries.** As of 2024, 5.83bn EUR (6.48bn USD) have been committed to H2Global auctions by the German, Dutch and Australian governments. H2Global is engaging countries spanning Austria, Belgium, Canada, India, Japan, Korea, Saudi Arabia, and UAE, all seeking to kickstart green commodity markets.

## H2Global's pioneering double-sided auction model

EXHIBIT 10

### Concessional-only GMM



**11** CASE STUDY: POTENTIAL MIXED-CAPITAL GMM

# The US bio-SAF market appears as a frontrunner for the development of a potential world-first Mixed-Capital GMM

**A Mixed-Capital GMM could further drive scale in nascent markets with a near-term line-of-sight to profitability.** Such a model has not yet been implemented, but leading financial institutions are actively championing this model, recognising the commercial potential in accelerating scaling markets near-parity.

**A Mixed-Capital GMM could extend the deployment of concessional funds with inclusion of private market capital.** By introducing market capital (equity and debt) in this for-profit model, the GMM may achieve greater efficiency from the concessional capital invested because the market capital can fulfill the temporary collateralisation requirements.

**The market for sustainable aviation biofuels in the US is being explored as a potential world-first application.** The US SAF market currently suffers market failures preventing scaling of bankable transactions, however it exhibits specific characteristics that may enable a GMM to be profitable. Advanced regulatory support, subsidies and separable attributes provide a path to market scale up, yet a fragmented offtaker landscape for the value components and limited reach of early-stage producers to optimise bilateral agreements with purchasers hinders momentum. A GMM could be a creditworthy counterparty for long-term offtake for SAF producers, de-couple green attributes to sell them separately, and provide liquidity at scale to this nascent market.

EXHIBIT 11

## A Mixed-Capital GMM may be a solution when three key premises are met

### Preconditions for Mixed Capital GMM

**1 Market calls for growth & scale**

There is a market need, and viable pathway, for significant volume flows and **growing supply and demand** for the green commodity

**2 Expectation of positive margin**

As green commodity production and demand scales, the **unfunded price gap** for the green commodity is expected to close

**3 Repackaging & risk warehousing gaps**

There is a mismatch in how sellers want to **sell** the green commodity, and buyers want to **buy** the green commodity

### The case for a US bio-SAF Mixed Capital GMM

**4.5M** **Current** estimated annual production Gallons

**3Bn** Target annual production by **2030** Gallons

**35Bn** Target annual production by **2050** Gallons

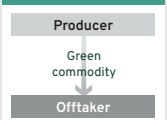
The six largest US airlines constitute **~80%** of passenger miles and all have SAF commitments of **5-10%** by 2030.

HEFA & ATJ have premiums **~150-250%** above fossil, lower than e-SAF.

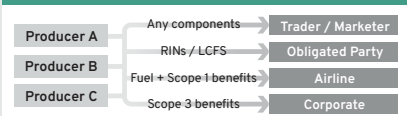
Unfunded price gap will close through two avenues, 1) wider availability of SAF (HEFA/ATJ) and increased product demand, 2) ability to repackage purchased commodity into different value components e.g., SAF can be separated into the physical fuel, scope 1 and 3 benefits, RINs - Renewable Identification Numbers (RINs) / LCFS - Low Carbon Fuel Standard (LCFS) credits and tax credits).

**Example: SAF Certificates** – a new product encompassing the Scope 3 emissions reduction benefits from a gallon of SAF – are separated from the physical SAF and marketed to corporate buyers to address Scope 3 emissions

**Status quo**




**SAF contracting optimisation**



# A key priority is to scale up renewable ammonia, which can unlock a cascade of tipping points across multiple sectors

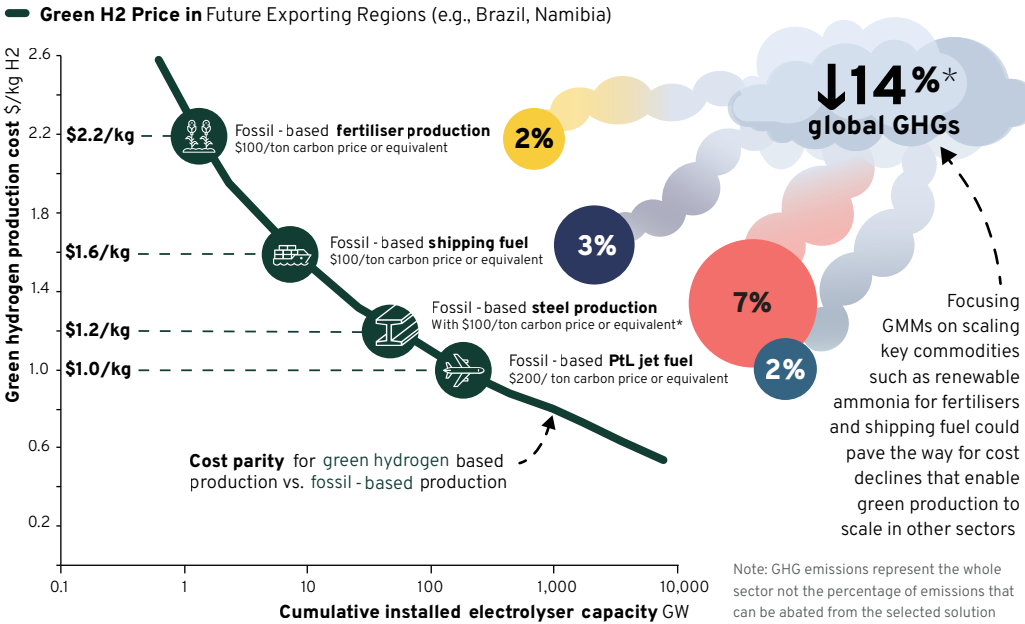
**A few key clean energy solutions underpin the decarbonisation of multiple heavy industry sectors.** Critical technologies also includes clean hydrogen, which is an input for various chemicals, fuels, and materials, and carbon capture, which is a key solution for green cement and across several other industry sectors.

**Technology spillover effects mean that certain sectors can have an outsized impact on green industry scale-up.** Scaling up low-carbon production in the sector with the most compelling business case for green products today can drive economies of scale and learning curves for the relevant clean energy solution and reduce the cost of this technology for other sectors that will also use it. Subsequently, it would reduce overall concessional capital needs to develop GMMs in sectors that currently face higher premiums.

**Scaling renewable ammonia production via GMMs may drive a cascade of tipping points in heavy industry sectors.** The deployment of renewable ammonia in the fertiliser sector may scale electrolyser capacity sufficiently enough to unlock green hydrogen cost reduction, improving the business case for other renewable hydrogen dependent sectors such as shipping, steel, and aviation. Targeting renewable ammonia could play a role in unlocking up to 14% of global greenhouse gas abatement.

# Tipping point cascade in sectors using green hydrogen

EXHIBIT 12




Note: GHG emissions represent the whole sector not the percentage of emissions that can be abated from the selected solution

# If major geographies join forces, tipping points unlocking exponential growth in green markets can be reached faster

**Some countries are sufficiently large that they could drive toward a global tipping point for a green commodity alone, but at a high cost.** This is true for aviation fuel in the US which is roughly one quarter of global demand. A 20-25% transition to SAF in the US could contribute the volume needed to hit global tipping points. However, acting alone means a few nations would need to shoulder a disproportionate responsibility for scaling green commodities.

**Driving market growth across several countries simultaneously appears to be a more effective route to tipping point.** The largest amenable nations are essential to lead the transition, but engaging with a broader set of nations will help distribute the concessional investment required more equitably. Conversely, engaging a very long tail of small economies globally would likely lead to complexity coordinating large numbers of governments.

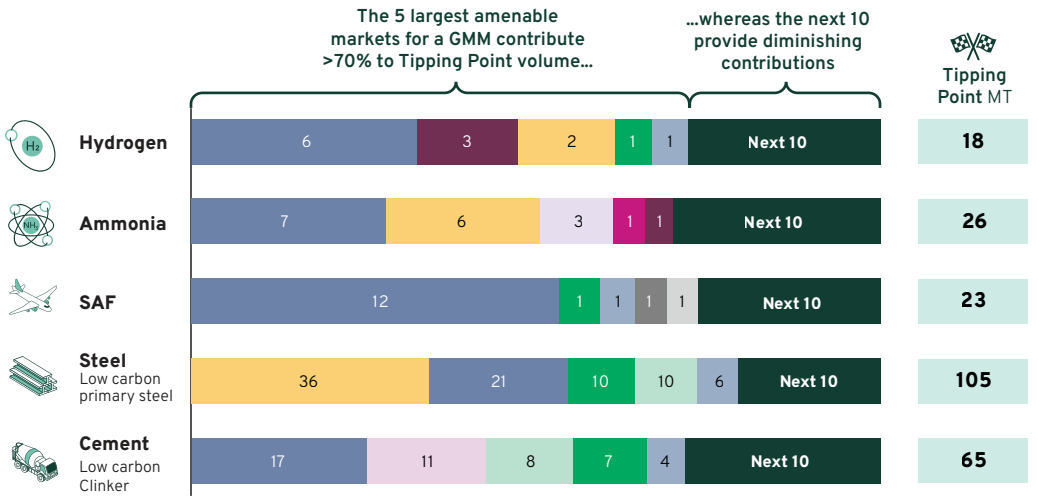
**The top five economies per sector can constitute the majority of the global low-emissions commodity volumes needed to hit tipping points** (as per Exhibit 13). Thereafter, the next 10 largest economies have a complementary role to get the global volume of green transactions to a tipping point. If the top 15 most amenable economies were to transition their industrial sectors at a similar pace, each economy would need to convert between one third (i.e. for ammonia) and one seventh (i.e. for SAF) of their expected 2030 demand to low-emissions commodities to achieve a global tipping point.

## Share of 5 largest and next 10 markets in volume of transactions required to reach global tipping point

EXHIBIT 13

Low carbon demand required to achieve global tipping points of the 15 largest economies* (MT).

US · Japan · Indonesia · South Korea · Saudi Arabia · India · Canada · Germany · Singapore · UAE · Next 10 economies



# A targeted roll out of Green Market Makers could efficiently bring several industry sectors to tipping point

**The potential of GMMs to unleash exponential industrial growth is in the hands of governments.** The first countries to move can ensure they build their competitive advantage in the new green industrial revolution, secure future volumes of low/zero-carbon commodities that are likely to be scarce, and build necessary supply chains. Nations with shared interests may seek to participate in joint bi-lateral and multilateral tenders. This not only helps to pool concessional capital to support larger funding tenders but enables stronger supply chains to be built between producing and consuming nations, supporting the emergence of new production hubs.

**GMMs will develop organically**, responding to political momentum in different jurisdictions. Taking account of known government appetite, sectorial prioritisation, market size and market co-location opportunities, we have drawn an illustrative implementation roadmap for rapid progress to tipping points.

**First Movers:** It is paramount to harness the existing interest in GMMs focusing on sectors ready to move like ammonia (predominantly for fertiliser) in Europe and the US; likewise HEFA for aviation in the US.

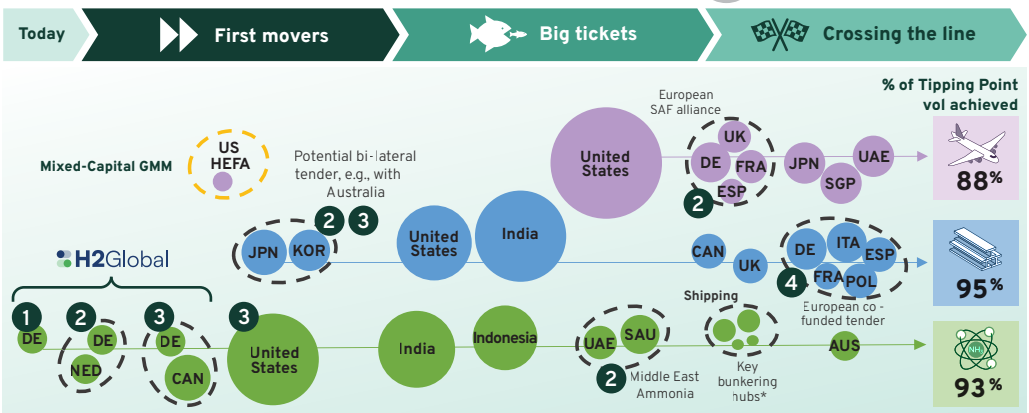
**Big tickets:** Activating the largest developed and emerging markets in steel, fertiliser and aviation is the next priority if tipping point volumes are to be achieved.

**Crossing the line:** To reach volumes able to unlock tipping points, several smaller markets will likely need to then be activated, possibly through multi-lateral tenders.

## Illustrative roadmap assessing scale, feasibility and sectoral readiness for GMMs

EXHIBIT 14

Ammonia (Fertiliser, Shipping) | Primary Steel | Sustainable Aviation Fuel | Illustrative tender development | <10% 25% Size represents relative impact to Tipping Point (%)




**Indicative Tender Development**

1. **Single nation tender** (import focussed)
2. **Co-funded tender** (whereby multiple nations pool concessional funding for larger auction lots)
3. **Bi-lateral tender** (between importing nation and production (export) nations)
4. **Asymmetrical tender** (where developed economy concessional capital can support production in emerging economies)

*Key ports included Singapore, Algeciras, Corpus Christi, Rotterdam.

# Governments have the power to unleash green industrial growth by working with the private sector to set up GMMs

**National governments are primary candidates for initiating the scale up of existing (and new) GMMs**, driving toward the development of multiple, large sized tenders that build on current knowledge and expertise.

**National government action steps include:**

**1. Identify country-specific priorities.** Based on their strategic priorities, each national government will identify one or several target sector(s) that represent a strategic interest for their country.

**2. Assess concessional and market capital** requirements for chosen market(s) rapidly through engagement with producers and offtakers, as well as public and private financial institutions.

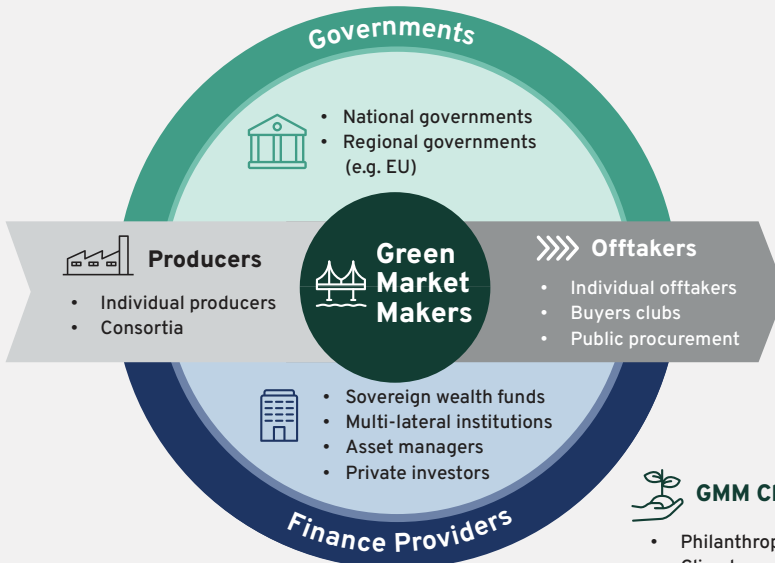
**3. Consider international collaboration**; partnering with one or multiple other nations may hold efficiencies to achieve a critical mass of transactions, or to pool concessional funds for greater impact.

**4. Design the GMM tenders to meet specific needs.** Multiple design options previously highlighted can be considered depending on the targeted green commodity market(s).

**5. Launch GMM,** inviting producers and offtakers to the table. Producers and offtakers are critical stakeholders to engage throughout the development of a new GMM or tender to ensure fit-for-purpose GMM design. Once launched, the GMM will enter contractual agreements with selected producers and offtakers via the tender process.

## Stakeholder universe essential to establishing GMMs

EXHIBIT 15



# The green industrial revolution is in sight; we can unleash market forces to make it happen faster

**The green industrial revolution is in sight.** Critical technologies to produce green commodities like near-zero-carbon ammonia, sustainable fuels for shipping and aviation, green steel and green cement are starting to be deployed on a commercial scale. Realising the current pipeline of announced green industrial projects represents an investment opportunity of ~$700Bn globally.

This is our chance to spur green industrial growth while cutting greenhouse gas emissions to limit the impact of climate change.

Within 10 years, we can see exponential growth in green industry. Green commodity markets can be nudged toward tipping points to unleash market forces.

**We have many market formation and acceleration tools in our pocket to fast-track progress.** Governments, private sector, and the climate community can join forces to ensure companies in industrial value chains benefit from the right incentives and have the appropriate tools to scale transactions of green products.

**Let's invest in market acceleration now to see green markets flourish tomorrow.** Investing the money, time, and collaborative spirit needed to build this market infrastructure now will have long-lasting impact on green commodity markets, shaping the map of the upcoming green industry revolution and of the trade flows that will power the future global green economy.

# The green industrial revolution is in sight

Let's invest in market acceleration now to see markets flourish tomorrow

CONTACT

# Further information

For further information email **gmm@missionpossiblepartnership.org**
A full version of this publication (including references and notes) and an interactive version are available by scanning this QR code or by visiting at **gmm.missionpossiblepartnership.org**
Footnotes and sources are provided in main report.

MISSION POSSIBLE PARTNERSHIP

This report was prepared by the Mission Possible Partnership with the support of the Bezos Earth Fund and in collaboration with RMI; Systemiq; Bain & Company; Center for Green Market Activation; H2Global; J.P.Morgan; Morrison Foerster.

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BAIN & COMPANY
CENTER FOR GREEN MARKET ACTIVATION
H2Global
J.P.Morgan
MORRISON FOERSTER

# Notes

## Glossary of key terms

| | |
|---|---|
| **Capital recycling** | The ability to use the same concessional capital to fund multiple tenders because mechanism design allows capital to remain in the GMM or to be quickly returned to the GMM |
| **Concessional capital** | A type of financing that has more favorable terms than those set by the market, e.g., low to no interest loans or first loss absorbing investment. |
| **Contract for differences subsidy** | A support mechanism in which the subsidy provider sets a “strike price”. makes payments to recipients if the market price is below the strike price, and receives payment if the market price is greater than the strike price. |
| **Funding tender** | The interval in which the GMM accepts bids and makes contracts. The intervals may be discrete or continuous and may repeat or not. |
| **Green commodities** | Includes low-carbon and near-zero-carbon commodities, produced from a varied set of production pathways including based on renewable electricity and carbon capture |
| **Green Market Makers** | Market accelerating instruments that actively participate in the market by stepping into the value chain to buy and sell green commodities. A GMM uses market-based tools to optimise realised prices, reduce the green premium, enable price discovery, deliver price transparency, provide liquidity and absorb risks. |

| | |
|---|---|
| **Hintco** | The actual trader and implementing entity of the H2Global instrument, which develops and oversees the bidding process, is the contractual partner and manages contracts, and is the receiving entity of government funds to compensate for potential cost of difference occurred in trading activities |
| **Market acceleration** | The later phase of market development in which transactions are already occurring but are slowed down by barriers to pace and scale. |
| **Market accelerating instruments** | Any of the long list of instruments that overcome barriers to market acceleration, including the producer offtaker intermediary. |
| **Market capital** | Debt or equity sources of financing that expect competitive market returns |
| **Market formation** | The early phase of market development in which support mechanisms focus on creating demand, establishing common definitions, and building out fundamental enabling infrastructure. |
| **Market forming instruments** | Any of the long list of instruments that overcome barriers to market formation, including mandates, tax incentives, etc. |
| **Mega-Project Infrastructure Coordinator** | State funded entity that steps in to manage the delivery of shared infrastructure and first of a kind projects otherwise too risky or cost prohibitive for industry to deliver alone |
| **Tipping points** | A tipping point can occur when a new product or technology reaches a critical mass of adoption, leading to rapid and widespread acceptance; typically occurring at 5-10% of final market size when conditions of affordability, attractiveness and accessibility are met. |

MISSION POSSIBLE PARTNERSHIP

The Mission Possible Partnership (MPP) is a not-for-profit organisation focused on decarbonising seven of the highest-emitting sectors in heavy industry – aluminium, chemicals, concrete, and steel – and in heavy-duty transport – aviation, shipping, and trucking.

MPP's ambition is to unlock a first wave of deep decarbonisation projects across those sectors before 2025 and inspire a second wave of projects before 2030 to put those sectors on a trajectory that would help limit the rise in global temperatures to as close to 1.5°C as possible.

**Full GMM report here:**