



First Movers
Coalition



**WORLD
ECONOMIC
FORUM**

First Movers Coalition Impact Brief

**World Economic Forum
Annual Meeting
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Executive Summary | First Movers Coalition is catalyzing the world's largest private sector clean demand signal

FMC's Mission: By 2050, 50 percent of emissions reductions needed to achieve net-zero are expected to come from technologies not yet available at scale. Building early market demand for such technologies by 2030 will be critical to help scale and catalyze their mainstream adoption for carbon-intensive sectors.

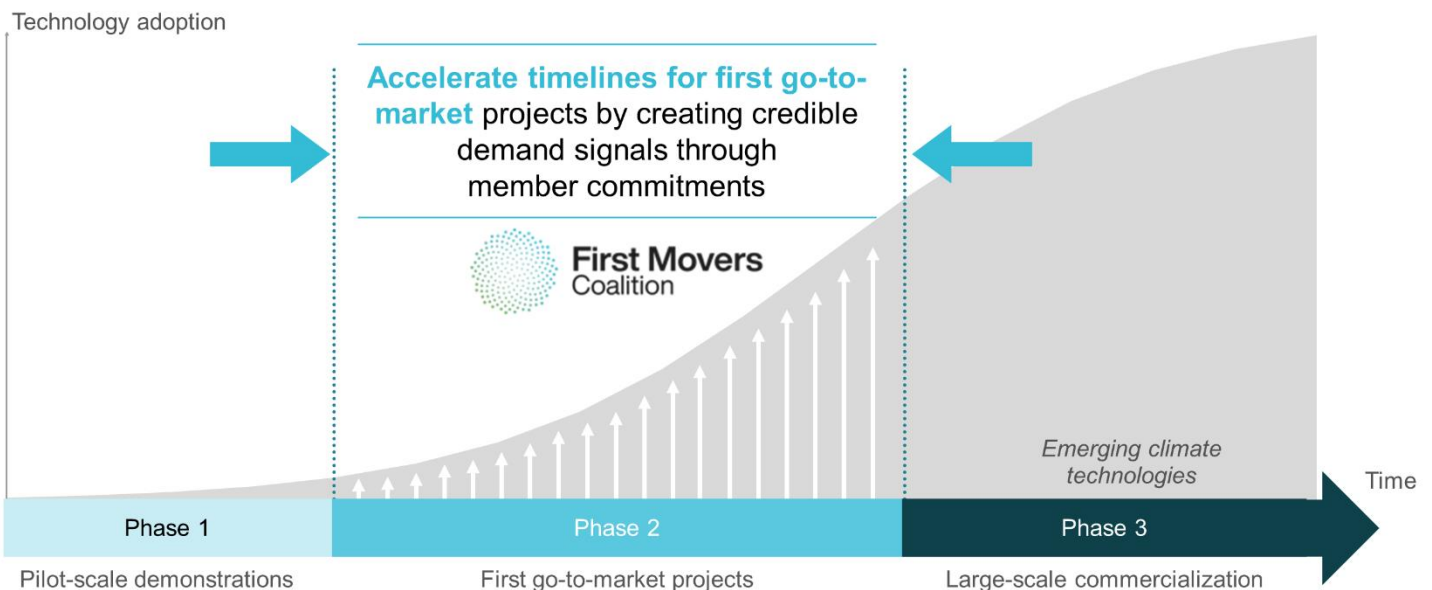
The First Movers Coalition ("FMC") advances the most critical emerging climate technologies required to decarbonize the world's heavy-emitting sectors. By translating member purchasing commitments into the world's largest, credible demand signal and connecting them with qualified suppliers, the FMC can accelerate first-in-market projects that deliver offtake and enable members to achieve green procurement commitments.

Impact of FMC's demand signal: In the two years since its inception, FMC has become the world's largest private sector clean demand signal. Today, members are moving from commitment to action: signing offtake agreements to purchase new, clean technologies, driving demand within global decarbonization initiatives, and fostering collaboration with global partners.

When FMC was launched at COP26, it had 35 members. As of today, FMC includes 96 members who have made a total of 121 commitments across 7 sectors. By 2030, these commitments will represent an annual demand of \$16 Billion for emerging climate technologies and 31 million tonnes (Mt) CO_{2e} in annual emissions reductions.

For emerging technologies, this early demand is catalytic. For example, FMC commitments represent 0.5-1 Mt in annual

FMC provides early uplift to emerging climate technologies



Annual meeting 2022

\$6B

2030 annual demand

35

FMC members

44

Commitments

1

Government partner

Annual meeting 2023

\$12B

2030 annual demand

67

FMC members

89

Commitments

10

Government partners

Annual meeting 2024

\$16B

2030 annual demand

96

FMC members

121

Commitments

13

Government partners

clean H₂ demand by 2030. For green H₂, this translates to an estimated 150-300 new 20 MW electrolyzers (assuming 100% utilization) and 9-30 GW of new renewable electricity capacity. Alternatively, for blue H₂, this demand symbolizes 3-7 new 150 kilo-tonnes per annum (Ktpa) facilities.

From commitment to action: Demand signals themselves are not enough to push a market forward – they must be coupled with execution. In 2023 alone, FMC members collectively signed 35 offtake agreements that secured carbon reductions across all seven sectors, bringing the total number of offtake agreements signed in support of FMC commitments to 94.

FMC commitments represent a significant hydrogen demand signal by 2030



Some FMC members have also participated in collaborative efforts across multiple sectors, pooling demand to further accelerate progress. FMC and its members helped the launch of four global collaborative procurement efforts that directly connect FMC demand to suppliers across shipping, aviation, CDR, and steel sectors (ZEMBA, SABA, NextGen, Near-

zero 2030 Steel Challenge with RMI). FMC has additionally worked with a large network of implementation partners, governments, standards authorities, and more to further accelerate innovation in the most carbon-intensive sectors.

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FMC members mobilize action in 2023

Across sectors, FMC members are pursuing collaborative procurement to source supply

FMC members are leveraging collaborative procurement as a strategy to amplify their demand signal for emerging, clean technologies and more easily identify qualified supply to purchase. By

collaborating to pool their purchasing power, members can attract more supply and drive an improved procurement process that results in shared learnings.

Today, FMC members are actively partnering with each other and other leading implementation partners to procure near-zero emissions technologies. In 2024, FMC and its members are focused on continuing this momentum.

FMC members have led four major collaborative procurement efforts

 Aviation

 Shipping

 CDR

 Steel

Collaborative procurement

     	  RFP in progress	   商船三井	 RFI in progress
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Investments and Deals: Members sign offtake agreements and invest across seven sectors

FMC members have also taken meaningful action through individual initiatives, procurement strategies, and investments. These initiatives allow members to secure bankable, green offtake and progress on commitments while demonstrating impactful leadership in their respective sectors. Additionally, by collaborating with fellow members—including with some who are suppliers—to execute deals and projects, members expedite the fulfillment of commitments through an organic alignment of supply and demand for near-zero-emission products and services. This generates both demand signals that inspire

future supply and tangible investments in decarbonization projects today.

Aluminum

Eight new members joined the First Movers Coalition and made primary aluminum commitments within the aluminum sector in 2023: Coca-Cola, Companhia Brasileira de Alumínio, Danfoss, Speira, General Motors, Logitech, Norsk Hydro, and VELUX. This commitment entails purchasing at least 10 percent of primary aluminum as near-zero by 2030. Of these new members, Speira and Danfoss also made the optional commitment to increase the purchasing of secondary aluminum to at least 50% of their total aluminum use by 2030.

In 2023 alone, FMC members signed 35 offtake agreements with suppliers



★ Did not make a sector-specific commitment, but supplied and/or partnered with another member in the sector

FMC aluminum members have already started translating their commitments into offtake and action with six offtake agreements and investments since 2022, including the following notable achievements:

Hydro and Volvo: Announced at FMC’s COP28 event, the FMC members intend to form a roadmap towards supplying primary aluminum in 2030 with an 80 percent reduced carbon footprint compared to today’s global industry average.¹ The two companies will also take measured to improve circularity and explore how Volvo Group's innovative transport solutions can be used in Hydro's mining operations in Brazil.

Constellium: In service of its commitment to increase its secondary aluminum use, Constellium has announced a partnership with Renault Group to create a closed-loop recycling process for Renault’s brand new Megane E-TECH Electric. Constellium and Renault plan to bring manufacturing scrap directly back to Constellium, avoiding any loss of properties and no downcycling.

Additionally, Constellium is broadly expanding its recycling capacity with a €130M new recycling center in Neuf-Brisach, France.²

Novelis and Ball: Novelis and Ball were both early members with commitments in the aluminum sector for both primary and secondary aluminum. The two members partnered in 2023 to achieve aluminum recycling advancements, via a \$2.5B investment by Novelis in a new recycling plant and an offtake agreement from Ball. The agreement was signed 2 years before plant completion, which is expected to create up to 1,000 new jobs and 600 Kt of finished goods.³

ELYSIS: In 2023, Rio Tinto announced an additional follow-up investment of \$1.1B to expand the ELYSIS complex in Quebec, Canada. The investment is set to expand the annual capacity of the smelter by 160 Kt of primary aluminum and will draw \$113M in support from the Quebec government.⁴ FMC members Rio Tinto, Apple, Ball, Novelis, and Ford have all been driving force of the ELYSIS success story since its revolutionary

¹ [Hydro and Volvo Group join forces to accelerate net zero transportation](#)

² [Constellium / Renault Recycling Partnership](#)

³ [Novelis / Ball Bay Minette Recycling Plant](#)

⁴ [ELYSIS Expansion 2023](#)

discovery. ELYSIS, a Rio Tinto-Alcoa joint-venture, produces zero-emission primary aluminum refined with hydropower and smelted using a GHG-free inert anode technology. This breakthrough has been made possible by a \$13M (CAD) investment and technical support from FMC member Apple, plus additional investment of \$80M (CAD) from the Canadian and Quebec governments. Apple plans to produce the new iPhone SE from 100 percent low-carbon aluminum as soon as ELYSIS begins commercial shipments in 2024.⁵

To read more about the latest FMC news in the aluminum sector, visit the latest agenda blog: [Aluminum demand will rise 40% by 2030. Here's how to make it sustainable.](#)

Aviation

Six new members have joined the First Movers Coalition and made commitments within the aviation sector in 2023: Qatar Airways, Lufthansa, Boom, Choose, Eni, and the University of Michigan. Members with an aviation commitment have set a target of replacing at least 5% of their jet fuel demand with sustainable aviation fuels (SAFs) that reduce life-cycle emissions by 85% or more when compared with fossil jet fuel, and / or use zero-carbon emitting propulsion technologies. FMC aviation members have already started translating their commitments into offtake and action with 23 offtake agreements and investments since 2022, including the below achievements:

Minnesota SAF Hub: FMC members Delta, Bank of America, and EcoLab have partnered in the development of the Minnesota SAF Hub, the world's first large-scale SAF Hub. Through this initiative, Delta

aspires to use SAF for more than 10 percent of its fuel at Minneapolis-Saint Paul International Airport (MSP) by 2027, and 50 percent by 2035. Together, the coalition aims to achieve progress as quickly as possible, while accelerating the technologies with the greatest carbon reduction potential.⁶

United Airlines Sustainable Flight Fund for SAF Investment: FMC members BCG, Boeing, Amex GBT, and Bank of America all joined the United Airlines' Sustainable Flight Fund, helping the fund grow to \$200M in just its first five months since its inception. The fund invests in startups working on SAF research, technology advancement, and production. In doing so, the funds' members simultaneously gain first access to SAF offtakes that advance their own decarbonization goals, while simultaneously investing in the growth of companies and technologies that actively increase global SAF supply. This collaborative approach sends a strong demand signal to future suppliers, encouraging add-on investments, and advancing the aviation industry's pathway to achieve net zero goals.⁷

Airbus: Airbus has announced a strategic partnership with DG Fuels to advance SAF production. DG Fuels' system, based on cellulosic waste and renewable energy sources like wind and solar power, aims for an initial production of 120M US gallons of SAF annually by 2026, potentially reducing CO₂ emissions by 1.5 Mt each year. This initiative is part of the U.S. government's SAF Grand Challenge, seeking to significantly boost domestic SAF production and reduce greenhouse gas emissions.⁸

Avelia: Amex GBT and Shell's SAF program, Avelia, has continued to grow – recently adding FMC member Bank of

⁵ [Apple / ELYSIS Announcement](#)

⁶ [Minnesota SAF Hub](#)

⁷ [United Airlines Sustainable Flight Fund](#)

⁸ [Airbus / DG Fuels SAF Partnership](#)

America. The program launched in 2022, with 1M gallons of SAF available for corporate customers.⁹

To read more about the latest FMC news in the aviation sector, visit the latest agenda blog: [Aviation must make these changes to meet long-term emissions goals.](#)



Cement and Concrete

FMC launched the cement and concrete sector at COP27 in November 2022. In just one year, seven FMC members have committed that at least 10 percent of the cement/concrete procured for their new facilities and projects annually will meet or exceed the FMC's definition for near-zero emissions. In 2023, ZGF Architects and Consolidated Contractors Company joined the FMC as new members within the sector.

Heidelberg, Cemex, and Holcim: While focused on achieving their trucking commitment, Heidelberg, Cemex, and Holcim are leading the way in implementing the use of CCUS in cement production. Together, the three organizations have approximately 19 pilot or full-scale projects that are using or planning to use CCUS. These projects reflect almost two-thirds of all CCUS cement and concrete projects worldwide.¹⁰

To read more about the latest FMC news in the cement and concrete sector, visit the latest agenda blog: [Why near-zero cement and concrete are crucial building blocks to reach net-zero.](#)



Carbon Dioxide Removal

⁹ [Amex GBT SAF Initiative](#)

¹⁰ Heidelberg, Cemex, and Holcim have not made cement / concrete commitments, but are industry leaders in the path to decarbonization.

(CDR)

Capgemini and Drax joined the FMC as new members in 2023 with a CDR commitment: 50 Kt or \$25M of durable and scalable net CO₂ removal to be achieved by the end of 2030. FMC CDR members have already started translating their commitments into offtake and action with eight offtake agreements and investments since 2022. Currently, FMC members and implementation partners represent more than 80% of all engineered CDR credits purchased globally to date.

Microsoft: Microsoft has been a leader in the carbon removals market and has gone above and beyond their FMC commitment to contract for at least 50 Kt of durable and scalable CDR. Today, Microsoft represents ~64% of all engineered CDR purchases made to date. For example, in 2023 alone: Microsoft has partnered with fellow FMC members Ørsted and Aker Carbon Capture, committing to one of the world's largest carbon removal agreements of 2.76 Mt of durable CDR credits over 11 years. Additionally, Microsoft has signed a long-term contract with Heirloom to purchase up to 315 Kt of CO₂ removal, marking it as one of the world's largest bankable direct air capture and storage deals.¹¹

BCG: BCG has secured a five-year purchase agreement with CarbonCapture for 40 Kt of CO₂ removal credits, delivering one of the largest direct air capture (DAC) deals within the professional services industry. Credits are tied to CarbonCapture's Project Bison facility in Wyoming, which is forecasted to capture and store 5 Mt of atmospheric CO₂ per year starting in 2030.¹²

¹¹ [Microsoft / Ørsted Carbon Capture Program](#)

¹² [BCG / CarbonCapture Agreement](#)

To read more about the latest FMC news in within carbon dioxide removal, visit the latest agenda blog: [Why carbon dioxide removals are crucial to tackling hard-to-abate emissions.](#)

Shipping

Four new FMC members have made commitments within the shipping sector in 2023: Logitech, Neutron Holdings (Lime), DP World, and Hanwha Ocean. Members with a Carrier focused shipping commitment have set a target to power at least 5% (on an energy basis) of their deep-sea shipping with zero-emission fuels by 2030 whereas members with a Cargo owner focus have set a target to ensure that at least 10% of their volume of goods shipped via deep-sea shipping will be on ships using zero-emission fuels by 2030. Many FMC shipping members have already started translating their commitments into offtake and action with 22 offtake agreements and investments signed since 2022, including the following achievements:

Maersk: Maersk has announced a pioneering offtake agreement with Chinese clean energy leader Goldwind, marking a significant stride in the global shipping industry's shift towards sustainable operations. The long-term contract involves the supply of 500 Kt annually of green methanol, fueling Maersk's first 12 methanol-enabled vessels. Earlier this year, Maersk launched the Laura Maersk, the world's first green methanol enabled container ship. This green methanol is a blend of bio-methanol and e-methanol, produced using wind energy at a new facility in Hinggan League, China. The production, commencing in 2026, supports Maersk's

goal of achieving net-zero greenhouse gas emissions by 2040.¹³

Additionally, Maersk has collaborated with its majority owner to set up a green methanol company, C2X. Recently, Maersk signed an agreement worth \$3B for production of green fuel in the Suez Canal economic zone with the government of Egypt and completed a land acquisition in Huelva, Spain for the development of a facility with a potential capacity of 1 Mt/year. C2X aims to have a total production capacity exceeding 3 Mt by 2030.¹⁴

Höegh Autoliners and Yara: Yara Clean Ammonia and Höegh Autoliners have announced a groundbreaking partnership for the supply, potential distribution, and delivery of clean ammonia for use in Höegh Autoliners' new Aurora-Class PCTC vessels. Twelve new Aurora class vessels, with the option to convert to ammonia propulsion, are expected to be delivered starting in 2024.¹⁵

Mitsui O.S.K. Lines: MOL has recently announced an agreement on time charter with Kambara Kisen for a dual-fuel bulk carrier designed to use e-methanol produced with recovered CO₂ and bio-methanol. The vessel is expected to be delivered in 2027. Earlier this year, MOL also signed an agreement with Mitsubishi Gas Chemical for a dual fuel carrier expected in 2025. MOL has committed to operating 90 LNG/methanol-fueled vessels by 2030.¹⁶ Additionally, MOL has signed an MOU with Hy2gen Deutschland, who is planning to begin producing e-methanol in Lower Saxony, Germany in 2028. Fellow FMC members Trafigura and Airbus have also placed an investment in Hy2gen.¹⁷

To read more about the latest FMC news in the shipping sector, visit the latest agenda

¹³ [AP Moeller - Maersk / Goldwind](#)

¹⁴ [AP Moeller - Maersk C2X](#)

¹⁵ [Höegh Autoliners / Yara Ammonia Partnership](#)

¹⁶ [MOL / Kambara Kisen Dual-Fuel Bulk Carrier](#)

¹⁷ [MOL / Hy2gen MOU](#)

blog: [3 ways unique partnerships are decarbonizing shipping.](#)

Steel

Six new members have joined the FMC in 2023 with steel commitments: Consolidated Contractors Company (CCC), Iberdrola SA, Alfa Laval Corporate AB, Bharat Forge Ltd, EGUI SA, and GE Vernova. CCC has made commitments in both steel and cement / concrete sectors. Members with a steel commitment set a target that at least 10 percent of their annual steel procurement volumes will meet or exceed the FMC definition for near-zero emissions by 2030. FMC steel members have already started translating their commitments into offtake and action with 20 offtake agreements and investments since 2022, including the following achievements:

Vattenfall, SSAB, and Volvo Group:

Vattenfall has partnered with fellow FMC member SSAB for the Hybrit fossil-free steelmaking project, with Volvo as the pilot customer. The project, which uses hydrogen direct reduced ironmaking (DRI), will reach commercial scale by 2026, producing 1.3 Mt of clean iron/year. Vattenfall, SSAB, and Volvo are all FMC partners. The plant is already delivering steel (500 tons in 2022) to key customers such as Volvo group. An investment decision for a new EAF of 6.2B SEK was reached in June 2023.¹⁸

Scania and SSAB: Scania has signed a letter of intent with fellow FMC member and steelmaker SSAB to secure near-zero steel shipments starting in 2026. In a groundbreaking and milestone achievement, Scania has announced that its lineup of heavy-duty trucks will be manufactured almost entirely from the Hybrit hydrogen-based steel by 2030. The longstanding

relationship between the two organizations is marked by a new chapter in their journey to fossil-free steel.¹⁹

ZF, Marcegaglia, Scania, Ford, and GM:

ZF, Marcegaglia, and Scania have all independently reached offtake agreements with Swedish steelmaker H2GS for future near-zero steel supply. Meanwhile, Ford and GM have developed partnerships with Tata and Arcelor, respectively.

To read more about the latest FMC news in the steel sector, visit the latest agenda blog: [4 breakthrough actions to decarbonize steelmaking.](#)

Trucking

Two new members joined the FMC with trucking commitments in 2023: Norge Mining and Toll Group. Truck owners and operators with a trucking commitment have set a target to ensure at least 30% of their heavy-duty and 100% of their medium-duty new truck purchases to be zero-emission trucks by 2030 whereas retailers and manufacturers making a commitment require the same of their service providers. FMC trucking members have already started translating their commitments into offtake and action with 10 offtake agreements and investments since 2022. Some notable achievements include:

Holcim and Volvo: FMC founding members Holcim and Volvo are driving EV truck offtake by completing an agreement to provide 1,000 electric trucks by 2030. This agreement represents Volvo's largest electric truck order to date. The record order reflects a deep partnership and collaboration between the two members, with the first 130 trucks being delivered to France, Germany,

¹⁸ [SSAB Oxelösund Investment](#)

¹⁹ [Scania / SSAB Announcement](#)

Switzerland, and the UK throughout 2024.²⁰

Heidelberg and Volvo: Volvo Group and Heidelberg Materials have embarked on a groundbreaking partnership to dramatically reduce carbon emissions in the construction industry. This collaboration will deploy Volvo's electric vehicles and services across Heidelberg's Northern European operations, including the innovative 20-ton L120H Electric Conversion wheel loader. Aimed at transforming transportation and loading activities, this alliance could significantly lower annual emissions by up to 200 Kt. A key element of this partnership is a six-month feasibility study, set to map out and implement a comprehensive CO2 reduction strategy, marking a pivotal step towards decarbonizing the construction sector and setting a precedent for sustainable industry practices.²¹

PepsiCo: FMC member PepsiCo recognized that procurement of zero emission trucks is not a stand-alone solution. This needs to be supported by investment in enabling infrastructure. Within the industry, there has so far been a chicken

and egg dilemma with questions on what needs to be scaled first – zero emission trucks or charging infrastructure. To tackle this, PepsiCo Beverages North America has gone the route of investing in both. With a fleet of Tesla Semis currently being run in Sacramento for a mix of delivery and long-haul travel reaching up to 520 miles per trip, PepsiCo has also installed four 750kW Tesla charges at their Sacramento facility to support operations.²²

Agility: FMC founding member Agility has signed an agreement with Hyliion, a pioneer in electrified powertrain solutions for commercial vehicles, to pre-order 1,000 electric Class 8 commercial vehicles. These Hypertruck ERX trucks, featuring a fully electric drivetrain and a natural gas-powered onboard generator, offer over 1,000 miles of range, significant cost savings, and meaningfully lower carbon footprints.²³

To read more about the latest FMC news in the trucking sector, visit the latest agenda blog: [How to scale up and accelerate the supply of zero-emissions trucks.](#)

Supporting Commitment Delivery: FMC partnerships

²⁰ [Holcim / Volvo Offtake Agreement](#)

²¹ [Heidelberg / Volvo Offtake Agreement](#)

²² [Pepsico Sacramento BEV Trucking](#)

²³ [Agility and Hyliion](#)

help members move from commitment to action

FMC partners with global initiatives to create an enabling environment for offtake

FMC actively partners with global implementation organizations to magnify and enable member impact. By actively connecting members with other global initiatives, FMC ensures members are supported in translating their commitments into action. Some partners (such as standard-focused organizations) clarify technical requirements for clean technologies while others (such as industry alliances) provide forums for members to engage with the broader industry on decarbonization topics. FMC's broader partnership network has grown to include various leading organizations and NGOs. These partners amplify impact and contribute to the enabling environment for emerging technologies via their expertise, solutions, network, and technology, both sector-specifically and across sectors.

FMC surfaces local supply

through in-country workshops (ICWs)

As global demand, driven by FMC members' purchasing commitments, for low and zero-emission technologies grows, it's crucial to surface local supply. By organizing a series of in-country workshops (ICWs), FMC aims to bolster local supply chains and foster the adoption and expansion of clean technologies within all sectors: aluminum, aviation, cement / concrete, shipping, steel, and trucking.

These workshops convene domestic suppliers, FMC member companies, technology experts, government partners, financial entities, nonprofits, academia, and the public. Their agenda is to exchange knowledge and insights on emerging clean technologies within the host country, pinpoint best practices, and craft cooperative strategies that reinforce the local market for low and zero-emission technologies.

In 2023, FMC held ICWs in Brazil, India, and Singapore across aluminum, aviation, cement and concrete, and steel sectors. The

FMC and its members collaborate with implementation partners to drive offtake

	Mobility: Aviation, Shipping, Trucking	Materials: Aluminum, Cement, Steel	CDR
FMC drives collaborative procurement with partners	 		
FMC members drive collaborative demand initiatives	   	 	 
FMC drives shared goals with initiatives	     	     	    

Brazil ICW counted 80+ attendees in total, representing industry, academia, the public sector, and more. Nine supplier organizations were in attendance from aluminum, aviation, and steel sectors. The India ICW ([Surfacing Supply of Near-Zero Emissions Fuels and Materials in India](#)) had a total attendance of 95+, including multiple government stakeholders, 10 supplier organizations, and five financing organizations. The Singapore ICW ([How](#)

[Singapore can lead the way on scaling up sustainable aviation fuels](#)) was attended by 17 representatives including four supplying organizations, one civil body, and three financing organizations

In 2024, FMC will continue to host In-Country Workshops and work with our government partners to advance and surface credible supply for our members.