

Plan to Accelerate Sustainable Fuels

Axis: 1 - Transitioning Energy, Industry, and Transport

Key objective: 2 Accelerating zero and low emission technologies in hard-to-abate sectors

Solution: CEM Future Fuels Action Plan

Host initiative: Clean Energy Ministerial

Scope:

- Geographic: Global
- Sectoral: A multi-technology effort to accelerate the deployment of Future Fuels such as sustainable biofuels, clean hydrogen and its derivatives, including ammonia, e-fuels, e-methane – an essential part of the transition to net zero, particularly for high-emitting sectors such as transport and industry.
- Other aspects: The [CEM Future Fuels Action Plan](#) is the **only global sustainable fuels platform** that brings together all technologies and sectors to accelerate deployment. This integrated and holistic approach to implementation brings together leading governments, industry and partner organisations from across global supply and demand chains, as well as the providers of enabling infrastructure. That is, CEM Future Fuels is forging linkages between low-emissions molecule resources and needs by ensuring supply and demand are aligned and by facilitating the development of the infrastructure and trade corridors necessary to move sustainable fuels and feedstocks at scale.

The Action Plan is based on 20 cross-sector activities to accelerate:

- **Demand Creation:** The CEM is creating new demand for all sustainable Future Fuels and related materials by assembling broadly-based implementation coalitions. These coalitions are translating low carbon objectives into demand for Future Fuels in key sectors such as maritime, aviation, heavy industry, and road transport.
- **Lifecycle Carbon Accounting:** The CEM is promoting the essential role of transparent and coherent approaches to Lifecycle Carbon Accounting for investment in Future Fuels, and the sustainable materials that rely on Future Fuels as feedstocks. This involves new collaboration and knowledge-sharing between suppliers and prospective buyers.
- **Markets and Infrastructure:** The CEM is working across sectors to develop market mechanisms and physical infrastructure for global Future Fuels value chains. Priorities include cross-border carbon trade and the production of low-emissions e-fuels.

This Plan provides an overarching approach to accelerate the delivery of the Belém Pledge on Sustainable Fuels to expand the use of sustainable fuels globally by at least four times by 2035 from 2024 levels and is complemented by individual Plans to Accelerate Solutions under the Action Agenda from the supply (Hydrogen, Bioenergy) and demand (Aviation, Maritime, Chemicals) sides which address sector-specific barriers and opportunities.

Levers assessment: *(each lever is described in the guidance document)*

- **Risk-informed decision-making:** **Low maturity**

Plan to Accelerate Sustainable Fuels

- *Rationale: Significant concerns and difficulties exist for policymakers and prospective investors in sustainable fuels due to fragmented approaches between different supply and demand options for sustainable fuels. This makes it difficult to compare production pathways and end-use applications in ways that fully account for opportunities and associated risks – such as compliance with emissions reduction objectives and other key sustainability criteria.*
- *GHG emissions lifecycle databases with a unified standard of analysis are still to be developed, so there is not a unified source of information that would allow for geographical comparisons of risk or, even, a standard for risk-informed comparison of the production of traditional or advanced biofuels.*
- **Technology shifts: Medium maturity**
 - *Rationale: Technologies to accelerate sustainable fuels consist of both proven and emerging technologies. That is, there are different levels of technological maturity for each fuel type. Varying maturity levels affect options for supply, demand, and key enabling infrastructure for deployment, and can significantly impact the cost competitiveness of decarbonisation solutions for high-emitting sectors.*
- **Knowledge & Capacity building: Medium maturity**
 - *Rationale: Significant technical expertise exists across all technology pathways and supply chains. However, this knowledge is not yet widely enough understood and reflected in policy frameworks to accelerate the deployment of sustainable fuels on a global scale.*
- **Inclusive decision-making governance & design: Low maturity**
 - *Rationale: Ambition to accelerate sustainable fuels remains largely siloed for individual technology pathways. Further, in many countries there is incomplete recognition of cross-sectoral benefits across the energy, industry, transport, and agriculture sectors. Finally, there remains a need for increased international collaboration on the development of global sustainable fuels supply chains that can achieve multiple sustainable development objectives.*
- **Standards & Taxonomies: Medium maturity**
 - *Rationale: Significant technical expertise exists to develop, implement, and monitor compliance with technical standards for GHG, plant and equipment, enabling infrastructure, and local regulatory requirements. However, significant policy reform is needed to elevate the importance of standards and taxonomies for investment decisions and to promote greater transparency and coherency across technology pathways.*
- **Supply: Medium maturity**
 - *Rationale: Sustainable fuels are increasingly available. However, there is significant divergence in feedstock availability, cost, carbon intensity, and distribution options between different technology pathways. Given the strong influence of location over supply availability, these variances also occur within each technology pathway. Nevertheless, there are promising prospects for supply to increase with improvements to key production technologies and end-use technologies / industrial processes.*
- **Demand: Low maturity**
 - *Rationale: Unlocking demand for sustainable fuels, across all technology pathways, remains a critical policy challenge with fragmented and incomplete regulatory frameworks across key sectors and markets. More aligned decision-making is needed across global value chains.*
- **Public/private finance: Medium maturity**
 - *Rationale: Investment in sustainable fuels is growing but progress is unevenly distributed between economies. Particular effort is needed to align production with the full potential for sustainable feedstocks globally, and to align investment appetite for green goods and services with the offtake guarantees needed for investments in the supply of sustainable molecules.*
- **Partnerships and collaboration: Medium maturity**
 - *Rationale: Multi-stakeholders platforms existing for individual fuel types, however coordination is still fragmented and not fully embedded at national / regional levels. There is also a sizeable gap in collaboration across sectors, which is needed to link supply and demand as well as develop the required infrastructure and trade rules to develop global sustainable fuels supply chains.*

Plan to Accelerate Sustainable Fuels

- **Policy & regulatory: Medium maturity**
 - *Rationale: Only a handful of leading countries have comprehensive, economy-wide frameworks to accelerate the production, transport, and use of sustainable fuels in line with sustainability and energy security objectives. Policy complexity is compounded by the disconnected nature of benefits, risks, and decision-making across multiple key sectors such as energy, industry, transport, and agriculture.*
 - **Public opinion: Medium maturity**
 - *Rationale: Partial community acceptance and support exists for accelerating the deployment of sustainable fuels. However, key concerns remain for each technology. For example, bio-based fuels raise concerns about feedstock availability and non-emissions sustainability criteria. All technology pathways raise concerns about cost premiums compared with unabated fossil fuels.*
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Plan to Accelerate Sustainable Fuels

Expected impact of this plan on the 2030 targets (if any): **High**

Accelerating the deployment of sustainable fuels such as biofuels and bio-based materials, clean hydrogen, ammonia, e-fuels, and other hydrogen derivatives is a key priority for Brazil's COP30 Presidency. Momentum is building among leading countries to support the **Belém Pledge**, a global target to accelerate the deployment of sustainable fuels. Based on analysis by the International Energy Agency, implementing the Pledge will see a **four-times** increase in the global use of sustainable fuels by 2035 (based on 2024 levels).

The **CEM Future Fuels Action Plan** is the **only global sustainable fuels platform** that brings together all technologies and sectors to focus on implementation and deployment. This implementation platform builds on the successful launch of the Action Plan at the 15th Clean Energy Ministerial in Foz do Iguaçu, in support of Brazil's 2024 G20 Presidency to accelerate the production and use of sustainable fuels. This implementation platform provides an **integrated model to accelerate all sustainable fuels**. The Action Plan brings together leading countries, all relevant technology pathways, industry partners from across global value chains, and leading international organisations. In this way, it supports collaborations and actions to make investment in sustainable fuels and materials more simple, transparent, and coherent.

The CEM Future Fuels community stands ready and willing to provide the **key implementation platform** for the Belém Pledge. In particular, the Future Fuels Action Plan will support implementation of the Belém Pledge by driving international collaboration under three 'priority pillars'.

1) Demand Creation

Demand Creation is the leading pillar of the CEM Future Fuels Action Plan. This pillar aims to align the significant interest in developing new projects with the need to decarbonise high-emitting sectors. That is, investment decisions are facilitated by showcasing the potential market demand for sustainable fuels and materials. Multiple activities and public-private collaborations are underway to promote new demand for all sustainable fuels. In particular, the Action Plan focuses on key transport and industry sectors such as aviation, shipping, road transport, and the heavy industry production of steel, cement, chemicals, and other sustainable materials.

2) Lifecycle Carbon Accounting

Across technology pathways and demand-side sectors, CEM Future Fuels is promoting **transparent and coherent** approaches to Lifecycle Carbon Accounting (LCA) for sustainable fuels. LCA is another essential element for facilitating new investment in sustainable fuels and materials. It provides the transparency and confidence that investors require to demonstrate the full sustainability impact of their purchasing decisions. Through the multilateral, public-private LCA Working Group, select CEM Members and key partner organisations are sharing knowledge and best-practice policy to support coherent implementation of LCA approaches in key sectors.

3) Markets and Infrastructure

Plan to Accelerate Sustainable Fuels

Identifying opportunities to *connect supply and demand* is another key priority to quadruple the use of sustainable fuels by 2035. The CEM is working across sectors to develop market mechanisms and physical infrastructure for global Future Fuels value chains. This essential element of the Action Plan connects sustainable resources with emerging new demand centres for sustainable fuels and materials on a global scale. This unlocks new sources of investment and promotes more efficient deployment, by aligning industry participants across value chains. Under the Action Plan, select CEM members and key partners are convening energy and maritime leaders, creating new green corridors for the global trade of sustainable fuels, scaling cross-border carbon trade, and facilitating cross-sectoral collaboration to produce low-emissions e-fuels.

Plan to Accelerate Sustainable Fuels

Output	Action Scope	Action	Type of action	Implementation Lever	Responsible	Time horizon	Stakeholder engagement ¹	Committed Stakeholders
Call to Action on Clean Hydrogen	Demand Creation	Call to Action to Promote Low-Emissions Hydrogen at COP30. Backed by governments and industry, the Call to Action will accelerate deployment by aggregating demand creation coalitions, advancing international collaboration on LCA approaches for hydrogen, and scaling new cross-border value chains for hydrogen and its derivative products.	New action	Supply Demand Partnerships and collaboration Public opinion	CEM Hydrogen Initiative's International Hydrogen Trade Forum CEM Secretariat	Ongoing		Several CEM members CEM Hydrogen Initiative UNIDO Hydrogen Council
Call to Action on Bio-based Chemicals and Materials	Demand Creation	Call to Action to Promote Bio-based Chemicals and Materials to be launched at COP30. Backed by governments and industry, the Call to Action will accelerate the adoption of sustainable carbon feedstocks in the chemical industry. Participants will collaborate to remove policy barriers, encourage new demand, and develop new international markets and supply chains.	New action	Supply Demand Partnerships and collaboration Public opinion	CEM Biofuture Platform CEM Secretariat	Ongoing		Several CEM members CEM Biofuture Platform Molecule Group
Strengthened cross-sector engagement between energy, transport and industry sectors to accelerate the use of	Demand Creation	Convening key partner organisations such as the International Transport Forum, International Civil Aviation Organization, International	New action	Demand Partnerships and collaboration	CEM member governments and key partner organisations	Ongoing	Countries, companies, International Organisations, NGOs	Select CEM members, workstreams, and key partner organisations

¹ Such as countries, companies, investors, cities and local governments, technical institutions, MDBs, regulators & public agencies, utilities & system operators, youth & indigenous groups, multi-stakeholders platform (non-exhaustive)

Plan to Accelerate Sustainable Fuels

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sustainable fuels		Chamber of Shipping, UNIDO, and the Mission Possible Partnership to jointly promote and align demand creation efforts for sustainable fuels.		Public opinion				
Expanding the Green Public Procurement Pledge	Demand Creation	Expand the Green Public Procurement Pledge to increase support and relevance among key emerging markets and developing economies to scale demand for low-emissions industrial materials.	Existing actions	Demand Knowledge & Capacity building Policy & regulatory	CEM Industrial Deep Decarbonisation Initiative UNIDO	Ongoing	Countries International organisations	Several CEM members CEM Industrial Deep Decarbonisation Initiative UNIDO
Green Public Procurement policies for Low-Carbon Building Materials	Demand Creation	Green Public Procurement Factsheet to provide governments with practical guidance on how to use public procurement to drive new demand for buildings with low-carbon materials and fuels.	Existing actions	Knowledge & Capacity building Policy & regulatory	CEM Industrial Deep Decarbonisation Initiative UNIDO	Ongoing	Countries International organisations	Several CEM members CEM Industrial Deep Decarbonisation Initiative UNIDO
Green Public Procurement and Harmonised Eco-Labels	Demand Creation	Policy guidance on Green Public Procurement and Ecolabels to help governments harmonise environmental criteria across procurement for low-carbon materials and feedstocks.	Existing actions	Knowledge & Capacity building Policy & regulatory	CEM Industrial Deep Decarbonisation Initiative UNIDO	Ongoing	Countries International organisations	Several CEM members CEM Industrial Deep Decarbonisation Initiative UNIDO
Transparent and coherent	Lifecycle Carbon	Cross-sector consultation group	Existing actions	Standards &	CEM member	Ongoing	Countries,	Select CEM

Plan to Accelerate Sustainable Fuels

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framework for LCA approaches between countries and sectors	Accounting	to coordinate the implementation of LCA-related policies under the Future Fuels Action Plan. Member-led, the Working Group facilitates improved information sharing between sectors, CEM members, and key partner organisations – including industry partners and investors.		Taxonomies Partnerships and collaboration Policy & regulatory	governments and key partner organisations		companies, International Organisations, NGOs	member governments, workstreams, and key partner organisations
Develop a new ISO Workshop Agreement for Heavy Industry	Lifecycle Carbon Accounting	Preparing and consulting on a proposed new ISO Workshop Agreement to accelerate carbon accounting for heavy industry products and low-carbon fuels as feedstocks.	Existing actions	Standards & Taxonomies Knowledge & Capacity building Partnerships and collaboration	CEM member governments and key partner organisations	Ongoing	Countries, companies, International Organisations, NGOs	CEM Industrial Deep Decarbonisation Initiative Industrial Transition Accelerator International Standards Organization
New cross-technology collaboration on e-Fuels and negative emissions Bio-CCS	Markets and Infrastructure	New collaboration between the CEM Biofuture Platform and the CCUS Initiative to build new networks and policy knowledge in support of low-to-negative emissions BECCS and e-fuels.	New and existing actions	Inclusive decision-making governance & design Supply Partnerships and collaboration Policy & regulatory	CEM member governments and key partner organisations	Ongoing	Countries, companies, International Organisations, NGOs	Select CEM member governments, workstreams, and key partner organisations
New cross-technology collaboration to establish ports as unique Carbon	Markets and Infrastructure	New collaboration between the CEM CCUS Initiative and CEM-Hubs to develop policy	New and existing actions	Partnerships and collaboration	CEM member governments and key	Ongoing	Countries, companies, International	CEM member governments, workstreams,

Plan to Accelerate Sustainable Fuels

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Management hubs		expertise and provide guidance to governments and industry on establishing ports and shipping infrastructure as hubs for carbon capture and storage.			partner organisations		Organisations, NGOs	and key partner organisations
Future Fuels and Maritime Sector Investment Recommendations	Markets and Infrastructure	Report with policy recommendations for new investment to scale the use and transport of Future Fuels by the maritime sector. Based on advice from 20 energy and maritime CEOs and other private sector leaders.	Existing actions	Public/private finance Policy & regulatory	Clean Energy Marine Hubs International Chamber of Shipping	Ongoing	Countries, companies, International Organisations, NGOs	Several CEM members and private sector partners
Carbon Management Glossary	Markets and Infrastructure	Launch of a new carbon management glossary to promote a common understanding of key terms and technologies essential to the production of BECCS, e-fuels, and low-carbon industrial feedstocks.	Existing actions	Knowledge & Capacity building Policy & regulatory	CEM CCUS Initiative 'Gigatonne by 30' Campaign CEM member governments and key partner organisations	Ongoing	Countries, companies, International Organisations, NGOs	Several CEM members

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IEA Annual tracking towards the 4x sustainable fuels by 2035	Global Sustainable Fuels	Review progress towards the global pledge on an annual basis until 2035 , for example via dedicated ministerial meetings, or annual reports, building on tracking and reporting activities of the Biofuture Platform and IEA.	New action	Knowledge & Capacity building	IEA, Governments	November 2028 (COP33)	Multi-stakeholders platform	IEA, Biofuture Platform