Alliance for Industry Decarbonization

Accelerating decarbonisation of industrial value chains

Dialogue and co-ordinated action in 2024

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About AFID

The Alliance for Industry Decarbonization aims to decarbonise industrial value chains and accelerate net-zero ambitions in accordance with the Paris Agreement. The Alliance's founders and partners, consisting of private and public organisations and stakeholders operating in energy-intensive sectors, commit to collaborate towards the common vision of a green future. The Alliance members believe in the power of partnerships based on honest dialogue and concrete actions.

The International Renewable Energy Agency (IRENA) co-ordinates and facilitates the activities of the Alliance, leveraging its considerable experience in hosting multi-stakeholder platforms. Siemens Energy and EMSTEEL co-chair the Alliance.

IRENA
International Renewable Energy Agency

Acknowledgements

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Disclaimer

"Industry has changed before and can do it again. The energy transition is essential, and we have the technology to decarbonise. Now, we need to act together for ambitious implementation."

Christian Bruch, President and Chief Executive Officer of Siemens Energy and co-chair of AFID

"As we stand at the crossroads of climate action, the commitments announced by the Alliance today reflect a collective and unwavering dedication to accelerating the transition to a sustainable, low-carbon future. Our enhanced targets to reduce greenhouse gas emissions, expand renewable energy capacity, and lead in green hydrogen and bioenergy solutions, are vital steps towards achieving a carbon-neutral world by 2050."

Eng. **Saeed Ghumran Al Remeithi**, Group Chief Executive Officer of EMSTEEL and co-chair of AFID

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1 Mission and vision

The Alliance for Industry Decarbonization (AFID) was established at the Investment Forum of the G20 Energy Ministerial in 2022 with the adoption of the **Bali Declaration** (AFID, 2022). This Alliance aims to decarbonise industrial value chains and accelerate ambitions towards net-zero greenhouse gas emissions in accordance with the Paris Agreement. The Alliance's members and partners, consisting of private companies, public organisations, and stakeholders operating in energy-intensive sectors, commit to collaborate towards the common vision of a green future. The Alliance members believe in the power of partnerships based on honest dialogue and concrete actions.

The objectives of the Alliance are to enhance dialogue and co-ordinated action among the members towards:

- raising aspiration for decarbonisation, aligned with global and national decarbonisation ambitions;
- supporting the development and implementation of decarbonisation strategies, leveraging the implementation of renewable energy technologies;
- stimulating exchange of knowledge and best practices among practitioners; and
- engaging with global and regional energy and climate platforms to foster action for the decarbonisation of end-use sectors, particularly industry.

The mission of the Alliance is to foster action for the decarbonisation of industrial value chains and to promote understanding of renewables-based solutions and their adoption by industry, with a view to contributing to country-specific net-zero goals (AFID, 2024a).

2 Growing membership

Since its inception in 2022, AFID has increased its membership nearly six-fold, growing from 14 partners and members in 2022 up to 83 in 2024, with members' operations expanding across five continents. This growth reflects the increasing global commitment to advancing the transition towards net-zero emissions in industry, as members commit to stepping up efforts to combat climate change and to work together to reduce their collective carbon footprint.

AFID members commit to strongly collaborating towards the common vision of a climate-neutral future. The members and partners believe in the power of partnerships based on honest dialogue and concrete actions. Ultimately, it is recognised that only a collective effort will accelerate the achievement of net zero goals. Together, the Alliance focuses on overcoming specific bottlenecks and aims to deliver tangible results (AFID, 2024b).

The membership is open for companies as members, and for organisations as eco-system knowledge partners, that are engaged in decarbonising industry based on renewable energy solutions.

In accordance with its **Implementation Plan**, the Alliance consists of the following entities:

Industry members – public/private companies and stakeholders operating in energy-intensive sectors (such as energy, petrochemicals, fertilisers, aluminium, cement, iron and steel, consumer goods and mining) that have the ambition to decarbonise their activities along their value chains.

Technology partners – companies that have expertise in the deployment of energy transition technologies and are prepared to share their knowledge and experience to support the efforts of industry partners in the design and implementation of their decarbonisation activities.

Eco-system knowledge partners – entities with diverse expertise who provide strategic advice and share knowledge.

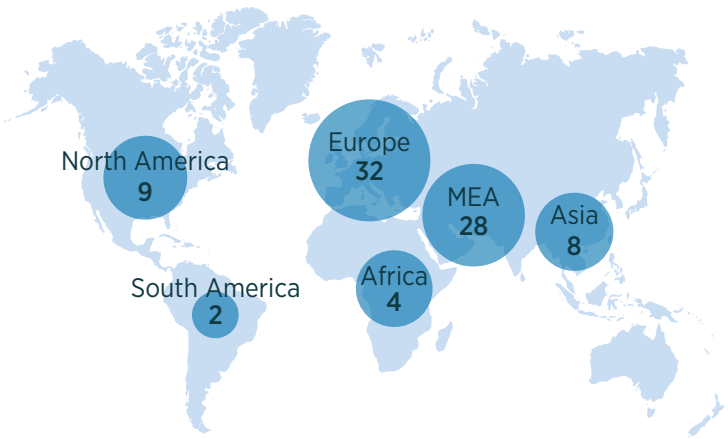
AFID members and partners include, but are not limited to, public and private sector industrial firms, industry associations, international initiatives, the financial community and inter-governmental organisations (Figure 1) (AFID, 2024a).

FIGURE 1 AFID members and partners

Members

Knowledge partners

Members by region



Total 83 members and partners with IRENA as Alliance Secretariat host

Members by sector

Energy	23
Industry services	26
Steel / aluminium	5
Chemicals	2
Mining	3
Waste and water	1
Capital goods	4
Consumer goods and IT solutions	2
Cross-sector knowledge	17

Note: MEA = Middle East and Africa.

3 Decarbonisation commitment

During the second Chief Executive Officer (CEO) Dialogue at the 29th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 29), AFID adopted an enhanced "Decarbonisation Commitment", with the aim of raising its decarbonisation ambitions through tangible achievements by 2030 by undertaking the following activities (AFID, 2024b):

- increasing production/output of renewable energy and green hydrogen;
- increasing off-take/usage of renewable energy;
- reducing Scope 1 and Scope 2 emissions directly – through electrification, bioenergy with carbon capture, utilisation and storage (BECCUS), energy efficiency, circularity and storage – and engaging the supply chain on reducing Scope 3 emissions; and
- increasing investments in decarbonisation projects and energy transition technologies.

The members of AFID have individual plans to reduce greenhouse gas emissions 0.24 gigatonnes of absolute Scope 1 and 2 emissions (down 54%[1] from the baseline year) and 2 gigatonnes of Scope 3 emissions (down 43%[1] from the baseline year) by 2030.[2]

AFID members aim to achieve joint decarbonisation targets by 2030, which are updated on an annual basis to ensure that the Alliance is making significant progress towards a net-zero future.

AFID members collectively call for government support and urge governments to: create enabling policies, regulations and incentives that support greenhouse gas emission reductions; facilitate the transition towards a low-carbon economy; and invest in clean energy and sustainable technologies.

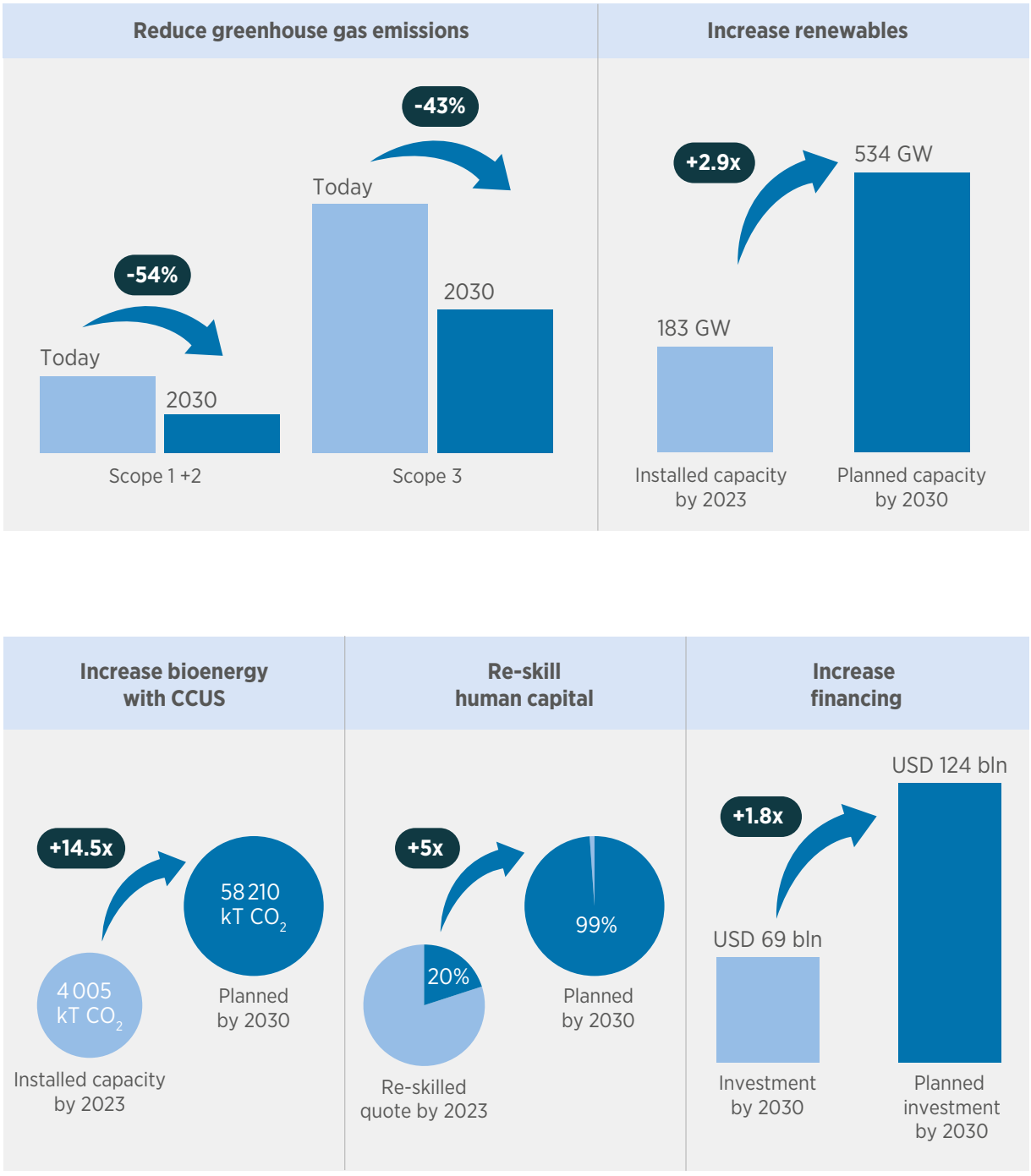
AFID members call on governments to collaborate with industry and other stakeholders to create a level playing field that fosters innovation, investment and sustainable economic growth. Together, we can build a more sustainable future for all.

Figure 2 represents the updated baseline and enhanced targets towards decarbonisation. These will be updated on an annual basis to represent the Alliance's ambition.

1 Percentages represent average reduction targets of all reporting AFID members as of December 2023.

2 Joint achievements and targets related to greenhouse gas emissions are aggregated based on the individual achievements and targets of AFID members as per different baseline years and reporting formats. Data to quantify the emission targets have been directly collected from AFID members and from the public reports published by AFID members. Not all AFID members have provided relevant data, and all members will be encouraged to publish sustainability reports. Numbers represent a first baseline and will be updated on an annual basis to represent the Alliance's ambition.

FIGURE 2 Joint achievements and targets of AFID members by 2030 (updated 16 November 2024)



Source: (AFID, 2024b).

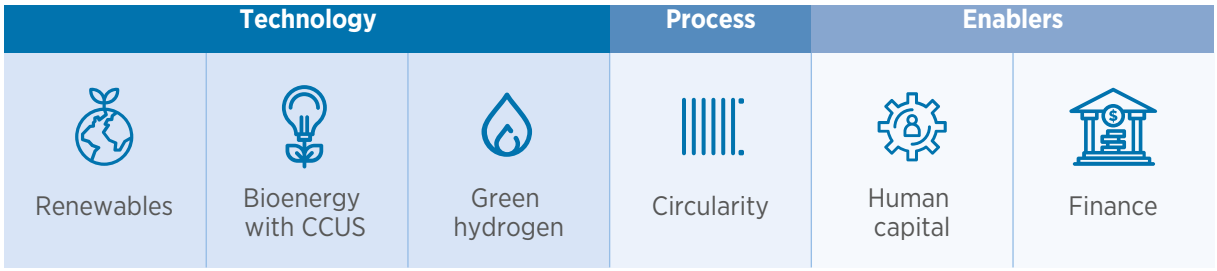
Notes: Joint achievements and targets are aggregated based on the individual achievements and targets of AFID members. Data to quantify the targets have been directly collected from AFID members and from the public sustainability reports published by AFID members. The term "Installed" has a wider meaning of "installed" and "supported to install". The numbers represent a first baseline and will be updated on an annual basis to represent the Alliance's ambition; bln = billion; CCUS = carbon capture, utilisation and storage; GW = gigawatt; kT CO_2 = kilotonnes of carbon dioxide.

Through common goals, willingness to change, and strong collaboration, industrial emissions will stop rising. Ultimately, only the collective efforts of the industrial sector will accelerate the achievement of a net-zero future.

4 Priority focus areas

The Alliance operates under six priority focus areas (Figure 3).

FIGURE 3 AFID focus areas



Source: (AFID, 2024a).

Note: CCUS = carbon capture, utilisation and storage.

The AFID focus areas are advanced by six working groups covering the key dimensions of industry decarbonisation (AFID, 2024a):

1) Renewables: share knowledge and experiences on technologies and infrastructure to enable the utilisation of large-scale deployment of renewable energy.
2) Bioenergy with CCUS: share knowledge and experiences on bioenergy with carbon capture, utilisation and storage.
3) Green hydrogen: facilitate the ecosystem for hydrogen with a focus on establishment, off-take and development agreements to enable the large-scale use of green hydrogen technologies.
4) Circularity: promote industry actions on accelerated circularity (reduce, re-use, recycle and remove) related to heat, waste, materials and emissions including electrification and digitalisation.
5) Human capital: collaborate to train, upskill and provide human capital to enable the successful implementation of decarbonisation plans.
6) Finance: promote access to finance for decarbonisation technologies.

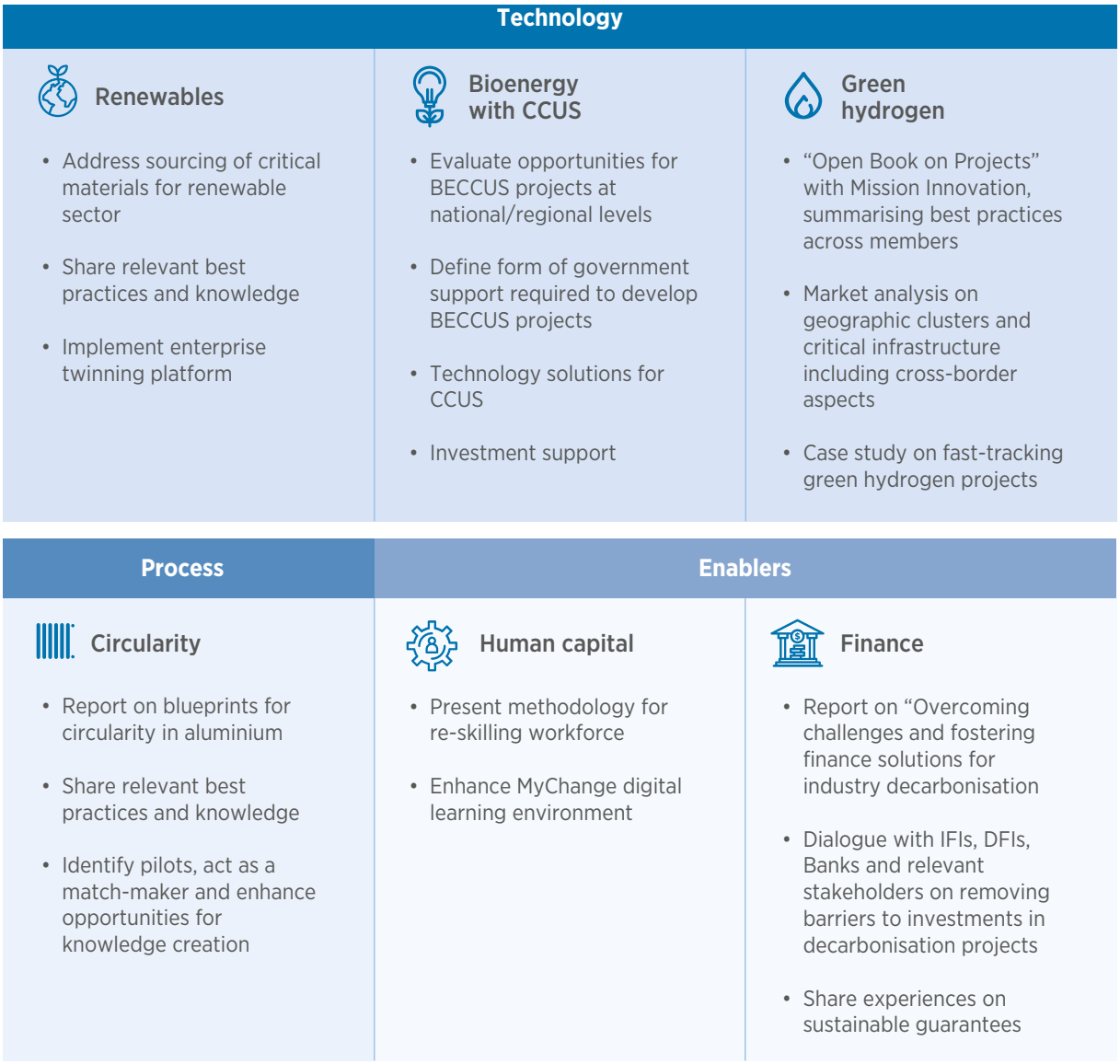
5 Actions in 2024

Through the collective efforts of the industry sector, the Alliance accelerates the achievement of a net-zero future.

The industry sector accounted for more than one-third (36%) of global final energy consumption in 2020. Moreover, production processes are carbon intensive, making industry responsible for one-quarter of global energy-related carbon dioxide (CO_2) emissions – the second-largest emitter after the power sector (IRENA, 2023a).

The Alliance is advancing a wide range of joint initiatives defined by the working groups aimed at addressing key decarbonisation challenges, as per the **Action Plan 2024** (AFID, 2024c). These actions (Figure 4) reflect a collaborative approach to driving the industry sector towards a sustainable, net-zero future.

FIGURE 4 Action plans of the six AFID working groups in 2024



Source: (AFID, 2024c).

Note: BECCUS = bioenergy, carbon capture, utilisation and storage.

Renewables

Action: AFID Renewables Traceability Guideline and critical materials

AFID's Renewables working group has developed a traceability guideline that sets the minimum recommended requirements to guarantee full transparency of the supply chain of raw materials used in electrical energy technologies. The AFID Renewables Traceability Guideline will be published during the first quarter of 2025. It defines the rules for the traceability management system as well as the evidence required to record the sequence of companies and individuals that have custody of materials as they move through a supply chain.

The ability to track the provenance of components through the supply chain, from input materials to the finished product, provides openness and transparency. This tracking is necessary to uphold sustainability principles and to guarantee quality assurance and environmental performance.

Implementing this guideline offers significant benefits to companies, including competitive advantages, enhanced supply chain resilience, improved customer satisfaction, and opportunities for quality and continuous improvement. It also supports the transition to a circular economy by encouraging the use of recycled materials and sustainable practices.

The core objectives of the AFID Renewables Traceability Guideline are to provide a common standard for implementing Chain of Custody systems in the raw materials value chain, to serve as an open-source document for organisations to develop and enhance their initiatives, and to increase transparency and sustainability in supply chains. For downstream tiers, it offers stakeholders and final customers clear visibility into the provenance of raw materials used in projects, ensuring accountability and trust.

AFID members discussed that the current patterns of production and processing will remain largely unchanged in the coming years, pointing to the importance of international co-operation and prudent policy choices to ensure that the energy transition advances at the necessary speed worldwide. It was urged to advance the development of transparent markets with coherent standards and norms, grounded in human rights, environmental stewardship and community engagement. AFID members welcomed the report, which examined possibilities for developing countries to advance their industrialisation strategies and to capture greater economic value from their mineral wealth (IRENA, 2023b).

Action: Sharing of best practices on copper traceability in wind turbine transformers

AFID presented strategies to enhance transparency, sustainability and resilience in the journey towards a sustainable supply chain for wind turbine transformers. Alliance members and partners considered a case study and shared insights on the challenges of measuring sustainability performance throughout the supply chain.

Key messages highlighted the importance of due diligence at the supplier and material levels, the need for transparency across multi-tier supply chains, and the potential of blockchain technologies to clarify the chain of custody. Building transparency within complex supply chain networks was emphasised as essential for identifying lower-tier suppliers to engage in the supplier due diligence process.

Action: Sharing of knowledge on life cycle assessment (LCA)

The International Organization for Standardization (ISO) shared insights on LCA as a recognised methodology for evaluating the potential environmental impacts associated with a product system (ISO, 2006). LCA makes it possible to assess the environmental impact of a product or system over its entire life cycle, using a multi-criteria approach. To do this, the input and output flows of the product or service studied, for each of its life stages, are accounted for and associated with environmental impacts (climate change, eutrophication, depletion of resources, *etc.*). LCA provides a standardised methodological framework.

One of the key messages voiced by the industry included the multiple benefits that LCA offers – ranging from its contributions to developing strategies with environmental considerations; to complementary insights for research, development and innovation (RD&I) efforts, to support for institutional communication. Moreover, being a standardised methodology, LCA is widely adopted by various stakeholders internationally including global companies, executive authorities, legislative bodies and universities.

Action: Enterprise Twinning Platform

The Alliance has developed an Enterprise Twinning Platform to enhance collaboration by supporting AFID members and partners in exchanging innovations and best practices for climate action and energy transition. It aims to build business partnerships by establishing mutually beneficial collaborations between enterprises in developing countries and other regions to support the energy transition. The platform helps companies integrate sustainability by embedding it into their strategies through environmental, social and governance (ESG) knowledge-sharing to advance sustainable energy. The platform is open for any external organisation interested in collaborating with AFID members and partners.

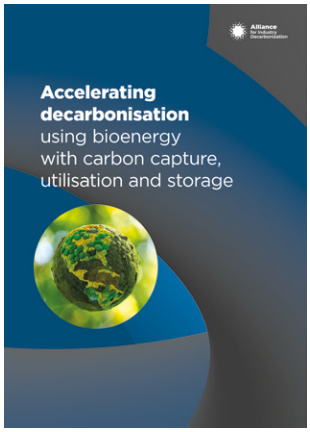
Bioenergy with carbon capture, utilisation and storage (BECCUS)

Action: Investment support

AFID members and partners were introduced to the International Finance Corporation (IFC) portfolio of activities and financial services aimed at supporting private sector development, specifically for CCUS projects. Key messages emphasised the IFC's proven track record in opening markets for renewables and other climate technologies, combined with its deep expertise and trusted relationships with clients in hard-to-abate sectors. This positions the IFC uniquely to open carbon capture and storage (CCS) markets in developing countries.

Prioritised investment opportunities are given to hard-to-abate industries such as cement, steel and chemicals. Furthermore, the IFC is pursuing opportunities across the CCUS value chain – capture, transport and storage – but is only considering CCUS projects that have a clear climate benefit. A key point highlighted was that when commercial markets are in sight, the IFC's access to concessional financing can help bridge project finance viability gaps for first-of-a-kind investments in a country.

Finally, an important takeaway for the Alliance is that the IFC serves on the advisory group of the CCS+ Initiative, which is working to develop CCUS standards for voluntary carbon markets.



Action: Report on Accelerating decarbonisation using bioenergy with carbon capture, utilisation and storage

The report focuses on the role that carbon capture and storage and bioenergy with CCUS will need to play in meeting the world's decarbonisation commitments. It covers the global status, costs and prospects of CCS, with and without bioenergy, as well as a brief overview of policy and regulation. The report includes global case studies of carbon capture and storage.

Action: Report on Advancing bioenergy with carbon capture, utilisation and storage: Policies, regulations, MRV and certification.

This report explores the integration of BECCUS into energy systems. It covers essential policies, regulations and certification standards needed to scale up BECCUS and to ensure sustainable biomass sourcing and reliable long-term CO_2 storage. The report also underscores the importance of robust monitoring, reporting and verification (MRV) standards for carbon credits, and provides actionable insights for policy makers and industry leaders.

Action: Technology solutions

The Alliance discussed the topic of biochar production, highlighting its potential as a scalable, low-cost carbon sequestration solution. With the market projected to reach USD 3.1 billion, and carbon pricing revenues at USD 104 billion in 2023, biochar offers a proven way to avoid 270 million tonnes of CO_2 emissions annually by converting 500 million tonnes of crop residue into a nature-based solution that enriches soil while storing carbon.

The presentation, led by AFID member APChemi, showcased advancements in biochar technology, which deliver 10-20% higher carbon sequestration compared to conventional methods and align with European Union (EU) Biochar Standards. With successful large-scale projects and the potential to benefit over 1 million farmers globally, biochar is emerging as a vital tool for decarbonisation and sustainable agriculture.

Green hydrogen

Action: Report on Green hydrogen: A cross-industry dialogue for sustainability

This report underscores the crucial role of green hydrogen in the global energy transition. It emphasises the importance of green hydrogen in decarbonising transport, power and industry, advocating a global shift towards sustainable energy practices. Highlighting the need for international co-operation, the report calls for standardised definitions, safety standards and regulatory frameworks to accelerate the development and adoption of green hydrogen. It sets a goal to establish green hydrogen as an accessible and cost-effective technology option by 2030.

Action: Open Book on Projects

The AFID member Topsoe shared experiences from the solid oxide electrolysis cells (SOEC) factory in Herning, Denmark, which represents a key step in scaling renewable hydrogen production. With an initial capacity of 500 megawatts, expandable to 5 gigawatts, this initiative highlights the need for industrial-scale solutions to accelerate decarbonisation.

High-temperature SOEC technology produces 20-30% more hydrogen per unit of power input than conventional methods. When paired with waste heat from industries such as ammonia or steel production, it achieves the lowest levelised costs of hydrogen, making it ideal for chemical and e-fuel production.

For the Alliance, this underscores the importance of innovation, waste heat integration and scalable infrastructure to enable cost-effective decarbonisation across hard-to-abate sectors.

This key case study was published in the "Open Book on Projects" on the Mission Innovation website.

Topsoe's SOEC manufacturing facility

Source: (Topsoe, 2024).

FIGURE 5 SouthH2 Corridor

Source: (SouthH2 Corridor, 2024).

Disclaimer: This map is provided for illustration purposes only. Boundaries and names shown on this map do not imply the expression of any opinion on the part of AFID and its members, concerning the status of any region, country, territory, city or area or of its authorities, or concerning the delimitation of frontiers or boundaries.

Action: Building blocks of hydrogen clusters

The AFID working group on Green Hydrogen is preparing a report that aims to conceptualise and design a framework to analyse the building blocks of hydrogen clusters. The analysis will showcase a unique case study from the Mediterranean region, where green hydrogen could be produced in North Africa and shipped via the existing natural gas infrastructure (a project known as the SouthH2 Corridor) for off-takers in Austria, Italy and Southeast Germany.

AFID brings the voice of the industry on the challenges that the nascent (green) hydrogen market will face. By applying the framework, the industry believes that policy makers and decision makers can take tailored actions to foster and support the market, thus realising the role of hydrogen in decarbonising the industrial and transport sectors.

Challenges for the Mediterranean cluster include, but are not limited to, the choice between direct use of renewables and production of green hydrogen; the necessity for clear rules on green hydrogen certificates and Guarantees of Origin (GOs); access to clean water supplies, especially in regions of North Africa farther from the coast; the challenge of transitioning infrastructure that is currently transporting natural gas; and, finally, the challenges of ramping up the hydrogen market from zero.

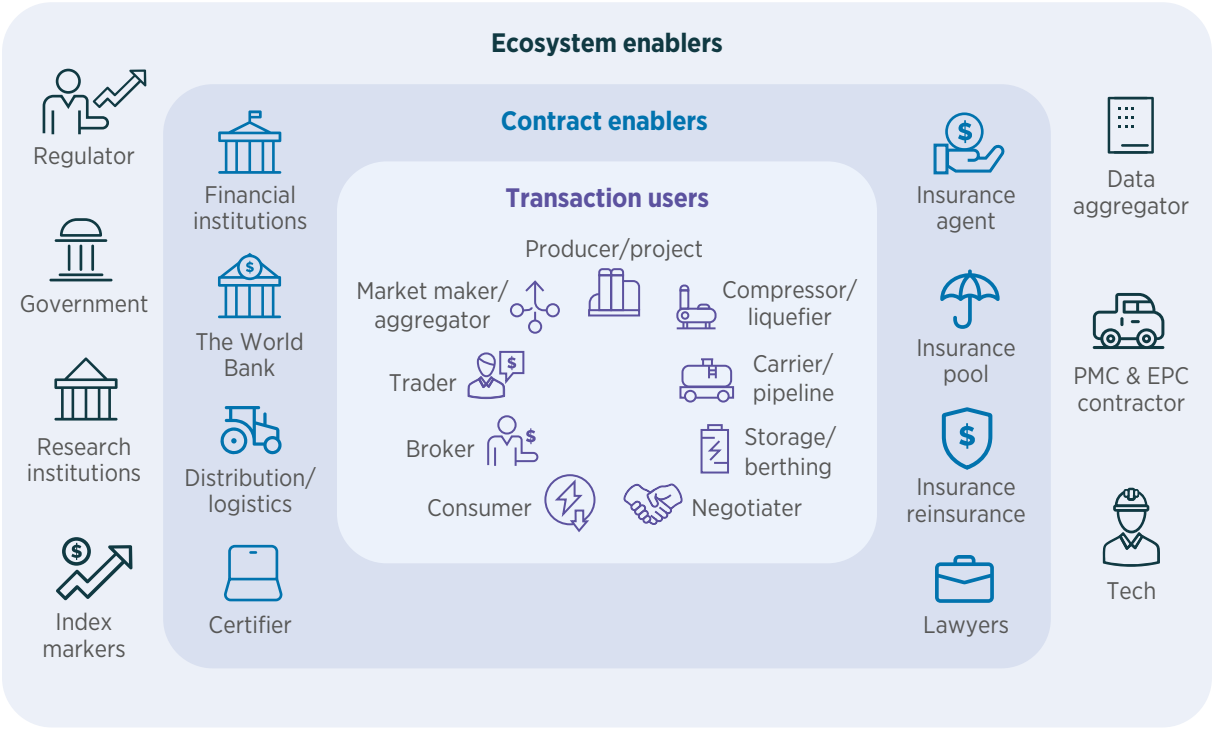
Key insights from the SouthH2 Corridor case study – a 3 300 kilometre hydrogen pipeline network linking North Africa to Central Europe – highlight its strategic importance, emphasising benefits such as low-cost hydrogen production. North African countries are identified as optimal locations for large-scale renewable hydrogen generation due to their high wind and solar potential. Moreover, the corridor offers significant transport capacity, infrastructure designed to support efficient market ramp-up, and cross-border connectivity to establish a diversified, interconnected hydrogen market linking production with demand.

Action: Digital platform case study

Green EarthX presented a platform that facilitates a marketplace where buyers and sellers can connect (Figure 6), addressing challenges such as producers struggling to secure off-takers or financing.

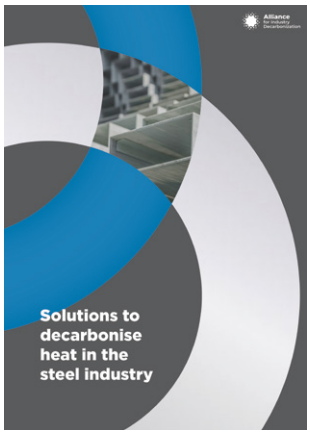
Key messages underscored the value of this platform, including its ability to unify the entire stakeholder ecosystem – bringing together brokers, traders, lawyers, insurance providers and banks worldwide. It enables the global listing and ownership of hydrogen molecules and credit tokens while allowing trading across different currencies and geographies. Additionally, the platform ensures that trades can be settled easily and transparently, among other benefits.

FIGURE 6 Green EarthX marketplace



Source: (Green Earthx, 2024).

Circularity



Action: Report on Solutions to decarbonise heat in the steel industry

This report details a range of solutions to decarbonise steel manufacturing, such as shifting to low-carbon fuels like hydrogen, electrifying processes with renewable energy, and utilising waste heat recovery systems to improve efficiency and reduce emissions. The report emphasises the importance of collaboration among governments, industry stakeholders and research institutions to create supportive policies and incentives. It calls for significant investment in research, the implementation of pilot projects, and workforce training to advance decarbonisation technologies and ensure their successful implementation.

Action: Circularity blueprint solutions for the aluminium industry

The Alliance member Tadweer Group shared insights from the Aluminum Recycling Coalition (ARC), which aims to increase aluminium recycling rates in the United Arab Emirates (UAE). Founded by Emirates Global Aluminium (EGA) and key partners, ARC brings together major players to address recycling challenges through collaborations and policy advancements. The coalition advocates for improved recycling infrastructure, aligning with the UAE's sustainability goals.

The discussion also highlighted current recycling challenges, including limited sorting infrastructure, which leads to a heavy reliance on landfills and a high dependency on exports due to the lack of local can-to-can recycling. Key areas for improvement were identified, such as standardising multi-fraction collection across the emirates to improve source separation and expanding Material Recovery Facility (MRF) capacity to handle more waste efficiently.

Strategic recommendations were shared, including Extended Producer Responsibility (EPR), which places responsibility on producers to manage post-consumer waste, and the Deposit Return Scheme (DRS), designed to incentivise consumers to return cans through a deposit scheme. Additionally, the Pay as You Throw (PAYT) model was proposed, which charges consumers based on the amount of waste generated to encourage recycling.

AFID member Ball company underscored its efforts to provide innovative, sustainable aluminium packaging for beverage, personal and home care products, emphasising that aluminium's physical properties make it better positioned to thrive in increasingly circular societies compared to other materials.

Key messages focused on Ball's sustainability strategies for circularity, including product re-design, the development of new business models, circular life cycle assessments and the electrification of processes. Ball is committed to decarbonising operations, expanding remelting and rerolling capabilities, and achieving 90% recycling rates. Well-designed EPR and DRS across Europe and North America were also highlighted as essential elements in driving circularity.

The members emphasised the importance of demand signals through bold commitments and policy advocacy, with a focus on leveraging partnerships – such as through the Global Beverage Can Circularity Alliance – to strengthen the impact of these efforts.

Based on shared experiences by the members, AFID's Circularity working group is developing a report identifying strategies to improve aluminium production efficiency.

The aluminium industry is integral to modern industrial sectors, from construction to consumer electronics, due to aluminium's lightweight, durable and corrosion-resistant properties. As global economies grow, demand for aluminium is expected to rise, driven by its role in enhancing energy efficiency and sustainability.

In recent years, the industry has made significant progress in reducing its environmental impact, largely through renewable energy adoption and advancements in recycling technologies. These efforts align with global sustainability goals and help reduce the carbon footprint of aluminium production.

Looking ahead, the sector's growth will be shaped by innovations and regulatory frameworks promoting the use of recycled materials and energy-efficient methods. Key opportunities for efficiency improvements have already been identified, including energy optimisation (with a key focus on process electrification), innovative smelting processes, recycling and process optimisation.

Human capital

Action: Methodology for reskilling workforce

Eni has developed, alongside Strathclyde University of Glasgow, a specific methodology for reskilling the workforce from traditional energy job profiles to new energy transition roles. The goal of this initiative is to map the skills and competencies already existing within the traditional energy sector and to understand how these can be adapted through tailored training programmes.

This reskilling programme can support the energy transition and could become a model for the entire renewable energy sector.

Eni applied this methodology to a reskilling programme from the offshore upstream sector to the offshore wind sector, as floating offshore wind is emerging as a new frontier, expanding the potential of offshore wind and creating opportunities for new markets.

Action: Enhance the MyChange digital learning environment

The MyChange platform, developed for the Alliance, allows people to actively participate in the cultural change that organisations are undergoing, via an interactive, dynamic learning path enriched by content provided by AFID partners (Figure 7).

The platform allows people to deepen personal knowledge and acquire new competences to play an active role in the fields of energy transition, sustainable development and digital transformation.

It offers a variety of contents in different formats – such as videos, e-learning pills, articles and podcasts – made available by Alliance members. Users can easily navigate filtering the contents by values connected to the Sustainable Development Goals (SDGs) and Agenda 2030 or by drivers of change.

FIGURE 7 Overview of the MyChange platform

Source: (AFID, 2024d).

New AFID members have joined the MyChange platform and continue to provide learning content to further develop this platform.

Finance

Action: Promoting access to finance

AFID identified the challenge of bridging the capital gap in industrial decarbonisation, highlighting the critical role of small and medium-sized enterprises (SMEs), which generate 60-70% of global industrial emissions (Schneider Electric, 2023). While global corporations lead with large green initiatives, the real key to accelerating industrial decarbonisation lies in enabling SMEs to develop and scale sustainable solutions.

APChemi presented an alternative solution for restructuring decarbonisation funding for SMEs through a two-stage funding model:

- 100 feasibility studies
- **Stage 1:** 8-15% initial de-risking funding
- **Stage 2:** Select top 10-15 projects
- 50-60% validated success rate
- 5-6 successful projects expected

This model allows experienced advisors to reduce de-risking capital requirements from 20% to 8% (Table 1).

The importance of creating value chains that connect SME suppliers with global corporate buyers is essential.

For example, SMEs can convert biomass waste into biochar for industrial decarbonisation, which can then be purchased by global corporates for their processes. Similarly, SMEs processing plastic waste into purified pyrolysis oil can supply large refineries for circular plastics production.

TABLE 1 SME funding model comparison

SME funding aspect	Conventional approach	Two-stage approach
Funding approach	Does not consider 8-15% initial for de-risking	Considers 8-15% initial for de-risking
Initial assessment type	Feasibility study (theoretical desktop evaluation)	De-risking activities (practical pilots, market validation, supply chain verification)
Initial investment	100% upfront, not connected with project de-risking	8-15% initial for de-risking
Projects evaluated	10 projects	100 projects
Geographic coverage	Limited to a few locations	Comprehensive (one entrepreneur per district)
Risk level	High (full investment at risk)	Reduced through de-risking phase
Resource utilisation	Less efficient (full funding lost on failed projects)	More efficient (minimal loss on unsuccessful pilots)
Project selection	Based on proposals only	Based on pilot data and demonstrated success
Total successful projects	20% (2 out of 10 projects)	50-60% (5-6 out of 10 selected projects)

Source: (APChemi, 2024)

Action: Overcoming challenges and fostering finance solutions for industry decarbonisation

AFID's Finance working group is preparing a report on overcoming challenges and fostering financial solutions for industry decarbonisation.

In the report, the Alliance will highlight industry's challenges, particularly the lack of standardised definitions for what qualifies as a green project and the difficulties this creates in securing finance. For example, detailed carbon and emissions data may not be available until later in the project life cycle, and the varying ways that energy statistics and ministries around the world classify energy sources can complicate financial access.

Preliminary challenges identified for industrial decarbonisation include, but are not limited to, disproportionate financial support for emerging markets and developing economies (EMDEs) and SMEs, technological barriers, traditional financial models, uncertainty in policy frameworks, and fragmented decarbonisation efforts.

AFID Innovation Competition

AFID, in collaboration with the Net Zero Technology Centre, has launched an Innovation Competition to identify and accelerate the deployment of decarbonisation technologies for AFID beneficiary companies, with a focus on innovations with a high technology readiness level (TRL). The competition is open to energy transition technology innovators around the world. The top finalists will pitch their innovations to judges in 2025, with winners offered to pilot technology with AFID beneficiary companies.

6 AFID outreach and events

Fourteenth session of the IRENA Assembly

Abu Dhabi, UAE, 16 April 2024

AFID at the Fourteenth session of the IRENA Assembly

Source: (AFID, 2024e).

The session presented a set of actions and joint initiatives for the short and long-term plan of the Alliance. The key topics of this session included the need for robust financing mechanisms to support the tripling of renewable energy deployments, and the development of concrete business cases to secure essential funding. Further discussions underscored the importance of regulatory clarity and global consistency in defining and maintaining the "green" labelling of renewable projects as geographic discrepancies persist. Finally, the participants emphasised the critical role of collaborative platforms and policy frameworks, integrating advanced technologies, circular economy principles, and CO_2 trading systems to drive forward industrial decarbonisation effectively. They noted that the cost of inaction today could lead to significant economic and environmental challenges in the future, underscoring the urgent need to advance decarbonisation efforts globally.

World Future Energy Summit (WFES)

Abu Dhabi, UAE, 18 April 2024

This event provided an in-depth look at the global effort to decarbonise industrial value chains and accelerate net-zero ambitions. Speakers from Topsoe, Subsea 7, Net Zero Think and IRENA shared insights on how international organisations and the private sector collaborate, showcasing successful stories and recommending policies to enhance global decarbonisation efforts.

The Industry Perspective session:
The Global Decarbonisation of Industries at the WFES

Source: (AFID, 2024e).

The discussions underscored a robust commitment from industrial partners and stakeholders in energy-intensive sectors to collaborate towards a common vision of a green future. The session provided insights into how these collective efforts support the decarbonisation of industrial value chains and accelerate net zero ambitions in line with the Paris Agreement, showcasing the AFID as a key example in this regard. It also facilitated an open dialogue, sharing valuable lessons learned and addressing the common challenges that obstruct a fully decarbonised world.

AIM Congress

Abu Dhabi, UAE, 8 May 2024

A session on Exploring Innovative Financing Solutions to Tackle Commercial Barriers in Global Industrial Decarbonisation at the AIM Congress

Source: (AFID, 2024e).

The event brought together representatives from IRENA, the Emirates Development Bank (EDB), Gulf Cryo and Siemens Energy to discuss strategies and innovative financing approaches to overcome the barriers to achieving global industrial decarbonisation goals. The session highlighted the critical importance of robust financing mechanisms, enhanced financial policy integration, and strong industrial networks to streamline and expedite the effective financial adoption of energy technologies.

IRENA 27th Council

Abu Dhabi, UAE, 14 June 2024

The session facilitated exchange among IRENA Members and the private sector on how net-zero and decarbonisation goals set at a national level could be practically supported by industry for an accelerated energy transition.

Participants stressed the role of multi-stakeholder partnerships in fostering innovation and sharing best practices. The session also underscored the urgency of adopting pro-active regulations and market adaptations to enable renewable energy integration, and the critical role of technological innovation in achieving these objectives.

27th Council: Industry Driven Partnerships for Accelerated Energy Transition – AFID

Source: (AFID, 2024e).

Climate Week NYC 2024

New York, United States, 25 September 2024

AFID at Climate Week NYC 2024 – Decarbonizing Hard-to Abate Sectors with Renewables

Source: (AFID, 2024e).

Leaders from the Alliance convened a high-level roundtable discussion hosted by Topsoe during New York Climate Week (NYCW) to share industry experiences and discuss what must be done to decarbonise hard-to abate sectors.

Participants highlighted the urgency of decarbonising hard-to-abate sectors through collaboration, investment and policy support. Key discussions focused on creating market conditions for green solutions, financing mechanisms such as carbon pricing and long-term off-take purchase agreements, and advancing technologies such as renewables, green hydrogen and energy efficiency. Emphasis was placed on enabling policies, streamlined permitting and human capital development to accelerate progress. The event underscored that collective action and innovation are essential to address the challenges of decarbonising hard-to-abate sectors.

Accelerated Partnership for Renewables in Africa (APRA) Investment Forum

Nairobi, Kenya, 14-16 October 2024

A session on the Accelerated Partnership for Renewables in Africa (APRA) Investment Forum

Source: (IRENA, 2024).

The APRA Investment Forum, organised by the Government of Kenya and IRENA, highlighted the critical role of renewable energy in driving Africa's green industrialisation. Siemens Energy shared experiences from its projects in Africa. Participants in the session identified key priorities that included fostering public-private partnerships, stabilising energy systems with storage solutions, and leveraging Africa's rich critical minerals for local value chain development. Regional collaboration, grid efficiency, and infrastructure investments were emphasised to meet industrial energy demands.

Financing challenges, such as regulatory barriers and project readiness gaps, were addressed, with solutions focusing on local currency financing and streamlined processes. The Forum showcased 25 renewable energy projects worth USD 2.7 billion, fostering connections between developers and financiers. Targeted reforms, skills development and community involvement were underscored as essential for scaling green industrialisation.

IRENA 28th Council

Abu Dhabi, UAE, 24 October 2024

A session on Accelerating Renewable Demand in Industries and Transport to Achieve the COP28 Tripling RE pledge, IRENA 28th Council

Source: (AFID, 2024e).

This session facilitated exchange among IRENA Members and the private sector on how to achieve the goal of tripling renewable energy by 2030, with an emphasis on decarbonising industries and transport, as highlighted at the 28th Conference of the Parties to the UNFCCC (COP 28). An IRENA report on decarbonising hard-to-abate sectors was presented, underscoring the importance of green hydrogen and electrification as viable pathways to net zero, particularly in sectors such as heavy-duty transport, aviation and steel manufacturing.

Member countries and stakeholders emphasised the need for continued collaboration to overcome barriers to renewable energy adoption in industry and transport. They identified critical next steps, including creating enabling infrastructure, scaling up green hydrogen production and developing a skilled workforce. The session concluded with a call for actionable commitments to support the COP 28 goals and further decarbonisation across hard-to-abate sectors.

COP 29

Baku, Azerbaijan, 16 November 2024

CEO Dialogue on Enhancing Commitment to Deep, Rapid and Sustained Emission Reductions at COP 29

Source: (AFID, 2024e)

This pivotal event brought together executive leaders who shared key messages and jointly addressed the challenges related to decarbonisation across industrial sectors. The discussions centred around the urgent need for enhancing commitment to deep, rapid, and sustained emission reductions, particularly across different industries. The event featured the launch of the **AFID Innovation Competition**, in Collaboration with the Net Zero Technology Centre, aiming to identify and accelerate the deployment of decarbonisation technologies.

During the event, AFID adopted its enhanced **Decarbonization Commitment** with joint targets for 2030 and collectively endorsed joint statements of the global decarbonisation initiatives, including Scaling International Assistance for Industry: the COP29 Global Commitment and the ITA Open Letter on Demand Stimulating Policies.

The high-level dialogue explored co-ordinated actions to raise aspirations for decarbonisation, aligned with global and national decarbonisation ambitions. This discussion emphasised the importance of supporting the development and implementation of decarbonisation strategies, leveraging technology solutions and deploying renewable energy on a large scale.

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