Clean Energy Transitions Programme

Annual Report 2025

International Energy Agency

INTERNATIONAL ENERGY AGENCY

The IEA examines the full spectrum of energy issues including oil, gas and coal supply and demand, renewable energy technologies, electricity markets, energy efficiency, access to energy, demand side management and much more. Through its work, the IEA advocates policies that will enhance the reliability, affordability and sustainability of energy in its 32 Member countries, 13 Association countries and beyond.

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Abstract

The IEA's Clean Energy Transitions Programme (CETP) helps countries around the world accelerate their transition to clean energy, with a focus on emerging markets and developing economies. By combining global analysis, high-level convening and hands-on technical support, the CETP ensures that evidence, policy guidance and practical tools reach those shaping energy strategies on the ground.

In 2025, the CETP has supported almost 350 high-level bilateral meetings with policy makers, over 700 workshops and technical exchanges, involving almost 13 000 participants, and 26 capacity-building events with over 1 700 policy professionals on energy efficiency, data and modelling. Additionally, the CETP has produced or enhanced more than 200 reports, policy briefs and data products.

Through its three pillars of supporting national transitions, enabling multilateral coordination and providing global analysis, the CETP translates international dialogue into concrete action. The programme drives progress in energy efficiency, renewable energy deployment, critical minerals, financing energy transitions, clean cooking, methane emissions reduction, digitalisation of energy systems, technology and innovation, and people-centred energy transitions. The CETP's flexible design allows it to respond rapidly to emerging challenges, scale successful initiatives and connect global insights with national policy making.

By linking robust and reliable data with practical support and high-level engagement, the CETP strengthens the IEA's leadership and empowers partner countries to move faster toward secure, sustainable and inclusive energy transitions.

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Driving global clean energy transitions

The Clean Energy Transitions Programme (CETP) is designed to deliver high-impact results by directing resources where they can drive the greatest change towards secure, affordable and sustainable clean energy transitions worldwide. Many countries have ambitious goals, but they lack decision-ready evidence, implementable policy options and delivery capacity. The CETP shortens the distance from analysis to action, helping governments move from plans to implementation at critical moments for policy and investment decisions. Working closely with partner countries, particularly in emerging and developing economies, the CETP targets its support where it can unlock the greatest downstream impact, strengthening institutional capacity, accelerating policy delivery and helping mobilise investment, while serving the interests of all IEA Member countries by advancing energy access, reliability and affordability.

The programme works across three pillars. The first and largest pillar is direct support for national transitions in partner countries. The second pillar is the IEA's work on strengthening multilateral coordination and cooperation. Under the third pillar, the IEA delivers global analysis and data to inform global dialogue on key drivers of energy transitions, fostering a virtuous cycle of inspiration and support for national action. These three pillars are mutually reinforcing: insights from global analysis guide multilateral and national engagement, multilateral coordination amplifies national action, and direct support to partner countries informs and strengthens the global evidence base.

Since its creation in 2017, the CETP has become one of the building blocks of the IEA's policy of opening doors to a new era of international energy cooperation, especially with Association countries. The programme has enabled the IEA to reshape its relationships and build a strong foundation of engagement, partnerships and trust with major emerging economies.

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Accelerating clean energy transitions in emerging economies

To deliver the CETP's mandate of accelerating clean energy transitions globally, the programme has worked closely with major emerging economies across all regions to deepen working relationships and jointly identify areas where IEA expertise can help to understand and overcome the critical barriers countries face in delivering their energy transition.

The breadth of IEA expertise and the whole-systems approach taken by the CETP have allowed the programme to respond flexibly to countries' individual circumstances and priorities and tailor IEA input to the areas where the Agency can provide the greatest additionality. This has resulted in the CETP undertaking a broad range of work right across countries' energy systems. This includes IEA roadmaps and energy policy reviews to inform countries' energy transition strategies and plans, analytical support to design the effective policies needed to implement and deliver these strategies and overcome delivery hurdles, collaborative work to strengthen countries' access to quality and timely energy data and statistics, and targeted capacity building to strengthen delivery capabilities and join up across countries' policy and regulatory systems.

Through this close collaboration across the energy systems of key emerging economies, the CETP has been highly effective in helping to accelerate countries' energy transitions. In 2025, selected highlights illustrating the measurable impact the CETP is continuing to have across the globe include:

- **Brazil –** Under the CETP the IEA continued its close collaboration with the government of Brazil right across the energy transition landscape. This included publishing a landmark policy review of Brazil's energy system, at the government's request, and work to support the implementation of its National Energy Transition Plan, as well as convening and analytical work to support scaling clean energy investment via the Brazil Investment Platform. In 2025, the IEA also played an important role in advancing the country's leadership on sustainable fuels, contributing to the announcement of the Belém 4x Pledge, committing to quadruple production of sustainable fuels. The strength and impact of these longstanding close collaborations is further underlined by Brazil's 2025 request to join the IEA as a Member country.
- **China –** As the People's Republic of China (hereafter "China") is the world's largest energy producer, responsible for around a third of global emissions, accelerating its energy transition is critical for achieving a global clean energy transition. The IEA continues its position as a bridge between its Member countries and China in order to deliver unparalleled insights to IEA Members and to support the shift to sustainable energy systems. In 2025, the CETP continued to support the development of renewable targets and energy efficiency measures

within China's 15th Five-Year Plan, as well as analytical work that directly informed its 2025 Heat Pump Action Plan and engagement.

- **Indonesia –** The CETP has enabled the IEA to establish a sustained and successful programme of work with Indonesia, with actions taken in 2025 building on previous large-scale achievements such as the joint production of Indonesia's long-term energy sector roadmap to net zero emissions. These actions include providing continued support to Indonesia's Ministry of Energy and Mineral Resources in order to develop ambitious fuel economy standards for heavy trucks, strengthened regulatory frameworks for mining emissions, and tailored analysis to support the financing and deployment of 6 GW of storage over the next decade.
- **India –** The IEA continued to collaborate with India in support of its ambitious clean energy objectives, including the rollout of 500 GW of renewables by 2030, and in advancing its application to become an IEA Member country. Under the CETP in 2025, this included analytical collaboration with the Bureau of Energy Efficiency to advance policy on grid-interactive buildings and close collaboration on critical minerals with India's Ministry of Mines, which supported the National Critical Mineral Mission policy released in 2025. The IEA also carried out a range of work to inform India's renewable power rollout, such as providing targeted capacity building to support grid management, and early analysis to inform the Ministry of New and Renewable Energy's considerations on scaling offshore wind.
- **Middle East and North Africa –** Under the CETP, the IEA continued to work across many countries in the Middle East and North Africa to help them manage their rising demand for electricity, as well as the region's distinct vulnerabilities due to extreme heat and water shortages. In 2025, this included publishing a landmark regional report to highlight these pressures and provide evidence-based pathways to manage them, working with Algeria, Egypt, Iraq and Libya to support the development of policy on reducing methane emissions and, as requested by the Algerian government, a National Climate Resilience Assessment. The CETP also enabled the IEA to work closely with Morocco's Ministry of Energy Transition and Sustainable Development to inform the design of key renewable energy support policies and begin preparations for an energy policy review of their system.
- **Sub-Saharan Africa –** The CETP has enabled the IEA to deepen its engagement and collaboration across sub-Saharan Africa. In 2025, the IEA launched the world's first tracking of investment spending and needs and the business models to close this gap. The programme allowed the IEA to support the design of national energy transition plans by carrying out an energy policy review of Ethiopia and launching reports for Kenya and Mozambique, as well as developing investment plans for Uganda's transmission infrastructure and clean cooking goals in both Kenya and South Africa. Support on clean cooking was also taken forward at a regional level in 2025, including by publishing targeted regional analysis to track progress and inform policy on delivering universal

access to clean cooking, as well as collaborating with South Africa's G20 Presidency to secure endorsement of the Voluntary Infrastructure Investment Action Plan, a major step forward in global efforts towards universal access to clean cooking.

- **Ukraine –** Work under the CETP in 2025 has contributed to the IEA's broader support to Ukraine under the IEA-Ukraine Collaboration Programme, which sets out the broad and growing engagement to support Ukraine's short- and medium-term priorities to overcome the complex challenges it faces during the ongoing war. The IEA is helping to strengthen Ukraine's medium-term energy security and energy transition priorities by supporting the design and implementation of a more decentralised electricity system and providing analysis to support the rollout of energy-efficient buildings.

The CETP has played a pivotal role in amplifying the strength of the strategic relationships and longstanding collaborations between the IEA and the major emerging economies that are playing a key role in shaping the global energy landscape. These partnerships are also helping the IEA to deliver on its mandate to enhance global energy cooperation and to provide the reliable and timely evidence needed to inform policy making and to overcome major barriers to delivering a clean energy transition worldwide, including finance, critical minerals, jobs, affordability and supply chains.

This includes ensuring access to reliable and timely energy data. In 2025, CETP support and the strategic partnerships it has helped to strengthen contributed to the IEA producing energy data for 156 countries and 35 regional aggregates. This also included expanding the coverage and quality of data to ensure high-quality evidence on fundamental energy and emissions statistics, as well as providing data on pertinent energy issues, such as tracking changes to the global energy workforce, energy access, energy finance flows and critical minerals.

These high-quality data and analytical resources also provide a foundation for broader action beyond the IEA. By leveraging the strengths of its three pillars (global analysis, multilateral coordination and direct national engagement), the CETP ensures that insights from partner countries are widely applicable and accessible. IEA data and analysis, alongside the frameworks and policies the CETP helps to inform, are used by other international partners. For example, the Sustainable Development Goal 7 report, produced jointly with the United Nations, the World Bank, the World Health Organization and the International Renewable Energy Agency, helps track global progress on energy access, energy efficiency and clean energy investment. In this way, the CETP amplifies its impact by supporting both national transitions and wider international decision making. Similarly, the reliable, expert and often publicly available advice that the CETP provides to countries, such as our long-term net zero

roadmaps and sector investment plans, also helps inform broader institutional strategies and investment approaches.

Global leadership in support of national clean energy transitions

Reinforcing the IEA's bilateral engagement, the CETP helps countries progress their clean energy transition pathways by promoting ambitious outcomes in multilateral forums and tackling key global barriers, such as finance, critical minerals, employment, supply chains and affordability.

CETP-supported work is designed to move from global analysis under Pillar III to targeted bilateral engagement under Pillar I. It typically begins when countries confront fast-evolving challenges and existing data or policy tools are no longer sufficient. The IEA builds the evidence base, producing new data, analysis and practical tools that clarify what is at stake and inform concrete policy choices. These insights are then shared with IEA Member and partner countries through flagship reports, global convening and high-level dialogue (under Pillar III) and taken into multilateral forums, such as the Group of 7 (G7), the Group of 20 (G20) and the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) (under Pillar II). This helps build political momentum, align decision makers around credible solutions and coordinate action across countries while anchoring global discussions in robust evidence. In parallel, the IEA works directly with national institutions to strengthen their capacity to act, providing hands-on technical support, targeted workshops and bilateral engagement to turn ambition into delivery (under Pillar I). Each CETP workstream moves through this cycle at its own pace, shaped by partner-country needs, institutional readiness and the urgency of the policy challenge at hand.

The **clean cooking** workstream provides a clear example of how this cycle plays out in practice. Over the past three years, the IEA has helped elevate clean cooking as a core pillar of the net zero agenda in several African countries, starting with global analysis such as two 2023 reports, A Vision for Clean Cooking Access for All and Financing Clean Energy in Africa, which clarified the scale of the challenge and the central role of climate finance. This evidence underpinned high-level convening, including the first leaders-level Clean Cooking Summit in 2024, which mobilised a record USD 2.2 billion in public and private commitments and reinforced momentum through the G20 process. In 2025, CETP support focused on turning this momentum into delivery. In July, the IEA released another report, Universal Access to Clean Cooking in Africa: Progress Update and Roadmap to Implementation, which tracks how pledges and national commitments are translating into action and identifies priority policy reforms and

investment needs. This work shaped global and multilateral dialogue through a series of COP30 High-Level Energy Transition Dialogues, the UN General Assembly and the Africa Climate Summit.

In parallel, the IEA worked closely with governments to support national implementation. In Kenya, IEA clean cooking analysis helped shape the review of the draft National Energy Policy 2025-2034. This was followed by a formal request for IEA support from the Ministry of Energy and Petroleum to develop an investment plan for the Kenya National Cooking Transition Strategy, turning policy ambition into a clear, finance-ready pathway for delivery. Beyond Kenya, the analysis was also integrated into IEA Energy Policy Reviews for Mozambique and Ethiopia, supporting national authorities in aligning clean cooking priorities with wider energy and development strategies.

Building on the COP28 pledges to triple renewable energy capacity and double the pace of energy efficiency improvements by 2030, the IEA enabled international **energy and climate initiatives** of its Member countries in multilateral forums, while guiding and supporting national implementation. Through its work under Pillar II, including the UNFCCC COP process, the IEA provided a shared evidence base that countries can use to benchmark ambition and strengthen their national plans. By analysing updated nationally determined contributions submissions, national renewable targets and policy reforms, the IEA identified where ambition was rising and where further action was needed, feeding these insights into flagship tools such as the Renewables 2025 market report, the Energy Efficiency Progress Tracker and the Climate Pledges Explorer.

This multilateral engagement directly supported national policy making under Pillar I. The IEA's assessments helped governments understand how their nationally determined contributions targets and policy choices aligned with the COP28 pledges, informed revisions to national energy and climate plans, and strengthened the credibility of commitments ahead of COP30. These tools also formed the analytical backbone of the UNFCCC COP tracking framework and the first Global Stocktake energy outcomes tracker, ensuring that global discussions were grounded in transparent, country-level evidence. In parallel, the IEA supported the next wave of global ambition by advising Brazil's COP30 Presidency, underpinning the launch of the Belém 4x Pledge and strengthening the investment case for clean energy through the Baku to Belém Roadmap to USD 1.3 trillion.

CETP-supported work on **methane emissions abatement** follows a similar cycle. In the years leading up to 2025, the IEA steadily built a robust global evidence base. In 2025, methane work continued the production of global data and analysis with the Global Methane Tracker and Data Explorer. These outputs

fed into global discussions at COP30, the G20 and regional forums, including the Latin America Regional Summit in Lima and the Africa Regional Roundtable in Abuja, which helped align countries around credible abatement pathways.

In parallel, the IEA offered hands-on regulatory support to several countries. In Africa, the IEA worked closely with Nigeria's Ministry of Petroleum Resources and the African Energy Commission, providing national methane estimates, abatement options, regulatory guidance and targeted workshops for ten regional partner countries. In Central Asia, the IEA worked with the government of Kazakhstan to develop regulations on methane emissions from oil and gas operations, including guidelines for Leak Detection and Repair and Measurement, Monitoring, Reporting and Verification procedures. In Iraq, the IEA partnered with the International Methane Emissions Observatory to design an emergency response plan for alerts from the Methane Alert and Response System.

Building on the IEA's work to generate evidence on **critical minerals** through the Global Critical Minerals Outlook, Data Explorer and policy analysis, the programme continued to link global insights to national action in 2025. The IEA contributed to the G7 Critical Minerals Action Plan and provided targeted support to partner countries, including establishing a Joint Working Group with India's Ministry of Mines and assisting Uganda's Ministry of Energy and Mineral Development to develop an investment plan that links energy access with critical minerals development.

The IEA has been also driving progress in the international dialogue **on people-centred energy transitions**, connecting clean energy action to broader development goals, including poverty reduction and economic growth. In 2025, under South Africa's G20 Presidency, the IEA ran workshops on indicators for just and inclusive transitions to help governments track impacts on jobs, affordability and inclusion. High-level convening groups, including the Global Commission on People-Centred Clean Energy Transitions and the Clean Energy Labour Council, elevated these approaches in G20 and COP discussions. The IEA also produced the Indicators Handbook to help governments integrate labour, skills, and social protection into energy transition planning, ensuring that clean energy progress contributes to sustainable and equitable development outcomes.

Over time, the CETP creates a reinforcing cycle in which better data and analysis enable better decisions, IEA's global leadership feeds into national action, and clean energy transitions move faster and further. The CETP's flexible design allows the IEA to act quickly when the priorities of Member countries shift, tackling urgent and high-impact energy challenges around the world. Through a

portfolio of adaptable projects, the programme has shown its ability to scale up and pivot to emerging priorities, ensuring timely support where it is needed most.

Communicating for impact

The CETP's communications strategy aligns with the IEA's broader communications framework, leveraging all available channels, from digital platforms and media outreach to high-level engagement and in-person events. Communication and dissemination activities underpin programme implementation and help translate analysis into tangible impact on clean energy transitions in real-world contexts, serving a dual purpose. First, they respond to Member countries' priorities by showcasing concrete results, strengthening transparency and accountability, and contributing to the advancement of the mission and strategic objectives of IEA Member countries. Second, they support energy transitions in the wider IEA family, including Association countries and other emerging and developing economies by strengthening the availability and use of evidence for policy making.

Making data and analysis accessible

Throughout the year, the CETP communication activities followed a clear strategic approach to advance both objectives in a coherent and mutually reinforcing way. The programme directly supported the publication of **208 reports, models, policy briefs and data products**.

Dissemination efforts, both directly organised by the IEA and delivered at major international and regional events, amplified visibility and extended the reach of key findings. With growing demand for the Agency's expertise on clean transitions, the CETP contributed to the delivery of **355 report launches and presentations** with **over 155 000** participants.

To maximise impact and ensure relevance at country and regional level, in 2025 several outputs were translated into Portuguese, French, Spanish, Arabic, Russian and Mandarin, making key analysis and recommendations more accessible to local and regional audiences. With support from the government of Portugal, Financing Clean Energy in Africa was released in Portuguese, while Designing an Energy Statistics Roadmap was published in French and Spanish, with Arabic and Russian versions forthcoming in 2026. In Mozambique, the Energy Policy Review and the National Climate Resilience Assessment were translated into Portuguese and launched in Maputo during the Community of Portuguese Language Countries Energy Seminar. Energy Efficiency 2024 and the Energy Efficiency Policy Toolkit were translated into Mandarin to expand access for Chinese audiences, and outreach to Spanish-speaking stakeholders was reinforced through cooperation with H2LAC, a collaborative platform

promoting the development of low-emissions hydrogen and its derivatives in Latin America and the Caribbean, including a regional presentation of the Global Hydrogen Review.

Engaging audiences online

The CETP page on the IEA website serves as a central resource, providing regular updates on programme activities alongside access to programme-supported analysis, event recordings and interactive data tools. The programme's online presence has continued to expand steadily, reflecting growing visibility and engagement across digital channels. CETP content produced between 2022 and 2025 received more than **6.5 million page views** from over **4.3 million users**. The growth of these indicators remains significant, highlighting both the high-quality outputs produced by the programme and their continued relevance to a global audience. However, the rate of growth has stabilized compared with previous years, reflecting broader shifts in the communications landscape. Increasingly, content is delivered indirectly through artificial intelligence (AI) platforms rather than directly on the website, which affects traditional engagement metrics.

As most content is produced in English, the majority of readership came from English-speaking countries, reflecting the natural reach of these resources. At the same time, CETP-supported content generated strong global engagement, with readers across all continents. Early evidence suggests that the programme's expanded translation efforts are beginning to strengthen engagement in non-English-speaking regions, helping to broaden the geographical reach and relevance of key outputs. While interest was highest in IEA Member countries, emerging economies featured prominently among the top sources of traffic. India ranked third and China sixth in visits to CETP pages, while Indonesia placed 13th and Brazil 16th in page views. Significant engagement was also recorded across other countries in Latin America, Southeast Asia and Africa, highlighting the programme's broad international reach and relevance.

Digital and multimedia outreach

Another key tool driving strong audience engagement was the CETP newsletter. Throughout 2025, the IEA published the CETP newsletter on a monthly basis (except for August), providing readers with regular updates on the IEA's work on clean energy transitions, alongside original insights and in-depth analysis.

Over the year, the newsletter maintained a strong level of engagement, and by January 2026 the subscriber base stood at **260 000**. A readership survey conducted in the final quarter of 2025 confirmed the newsletter's relevance, with

respondents providing positive feedback on its content and offering suggestions for improvements, many of which will be implemented in 2026 to further enhance its value for subscribers. CETP content was also regularly featured in the IEA's biweekly Energy Mix newsletter, with more than 330 000 subscribers.

In 2025, IEA social media accounts continued to be an important lever in the dissemination of CETP analysis and events. IEA-owned social media promotions of flagship publications and commentaries, funded by the CETP, generated over 4.65 million impressions and 137 000 engagements (likes, comments, shares or link clicks) across various social media channels.

IEA videos based on CETP-funded analysis, including livestreams, webinars, podcasts and short social media videos, received over **60 000 organic views** over the course of the year.

IEA social media accounts and newsletters were also a key driver of traffic to CETP content on the IEA website. Together, they directed 109 700 users to CETP content, about 8% of total traffic.

The IEA's relaunched *Everything Energy* podcast, released biweekly since April 2025, has become a vital platform for sharing CETP analysis. To date, the IEA has published 18 episodes focused on CETP topics, ranging from energy access and technologies to investment and beyond. Collectively, these episodes have been **downloaded 87 364 times** across Spotify and Apple Podcasts.

Funding

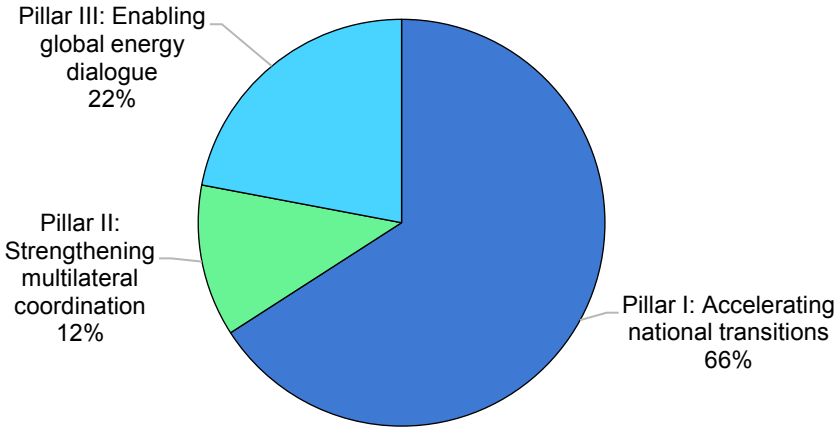
The CETP has firmly established itself as the IEA's largest programme funded through voluntary contributions (VCs) and as one of the Agency's flagship initiatives. Fully embedded in the IEA's Programme of Work and Budget, the CETP plays a central role in advancing the priorities defined by IEA Member countries. In the 2024 IEA Ministerial Communiqué, all IEA Member countries explicitly recognised the CETP's strong contribution to accelerating clean energy transitions and reinforcing energy security work across the Agency. IEA Ministers also welcomed the commitment to maintain an annual funding level of approximately EUR 20 million and expressed support for further financial reinforcement through 2030.

The CETP is made possible through the generous financial contributions of Australia, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, the European Commission, the United Nations Environment Programme, the Energy Foundation and the Sequoia Foundation.

In 2025, the IEA received 16 VCs in support of CETP activities, amounting to approximately EUR 17 million. As many VCs are earmarked for multi-year projects, a substantial share of the 2025 funding will continue to support initiatives extending beyond the current reporting period.

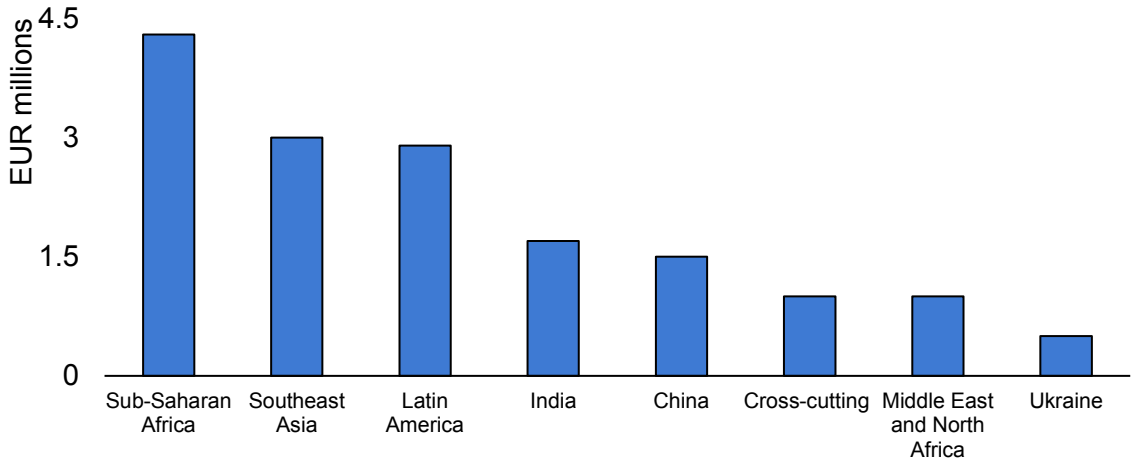
CETP expenditure increased by about 5%, rising from approximately EUR 22.5 million in 2024 to around EUR 24 million in 2025, with a corresponding expansion in programme impact made possible by the continued support of CETP funders. As noted above, most activities implemented in 2025 were supported by multi-annual funding, including the CETP VCs accepted in 2024 for a total value of EUR 37.66 million. The allocation of funding across substantive areas was closely aligned with the priorities of all IEA Member countries for the delivery of the IEA's wider Programme of Work and was guided by the strategic direction and engagement of CETP funders.

CETP expenditures by Pillar (%), 2025



Activities under Pillar I received the largest share of the funding (66%), followed by Pillar III (22%) and Pillar II (12%). Programme management and communication costs amounted to approximately 10% and are shown within the respective Pillar allocations in the figure below, as they directly contributed to the delivery and dissemination of project outputs.

CETP expenditure under Pillar I by region (EUR millions), 2025

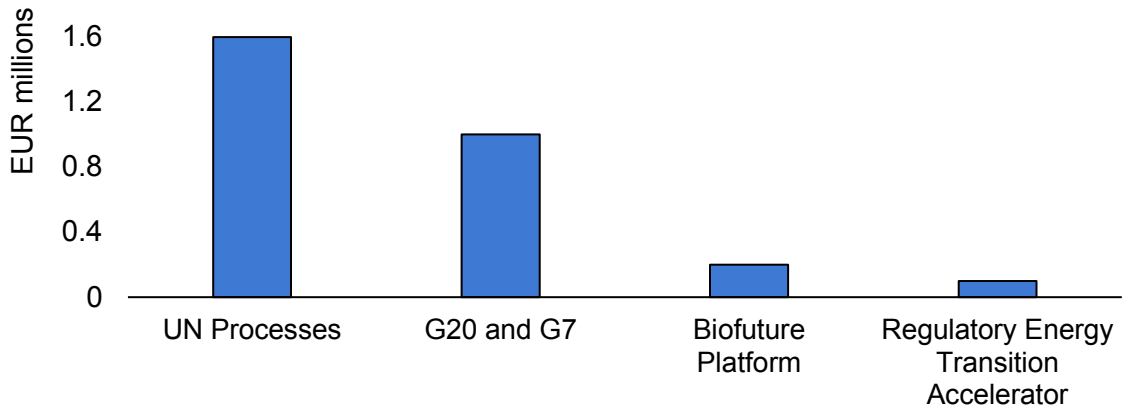


Note: Cross-cutting covers expenditure which supports outputs across multiple CETP regions. CETP expenditure on South Africa-related work is included under sub-Saharan Africa, expenditure on Indonesia-related work under Southeast Asia, and expenditure on Brazil-related work under Latin America.

In 2025, sub-Saharan Africa remained the largest regional programme under Pillar I, supporting a wide range of activities. These included regional analysis to advance access to clean cooking and guide investment towards universal electricity access; policy support through *Energy Policy Reviews* of Kenya, Mozambique and Ethiopia; delivery of the highly successful Energy Efficiency Policy Training Week in Accra; and targeted assistance on investment planning in countries such as Kenya and Uganda, particularly in support of energy transition financing and renewable energy deployment.

Expenditure under Pillar I also reflected the IEA's strong work programme in Southeast Asia, with delivery supported by the IEA Regional Cooperation Centre in Singapore. The IEA's close collaboration with India, the largest country programme in 2025, continued to deepen in the context of discussions on IEA membership and focused on critical minerals, energy efficiency and support for renewable energy planning. The IEA further strengthened its cooperation with Brazil in 2025, with the launch of the *Brazil Energy Policy Review* and support for the implementation of Brazil's National Energy Transition Plan.

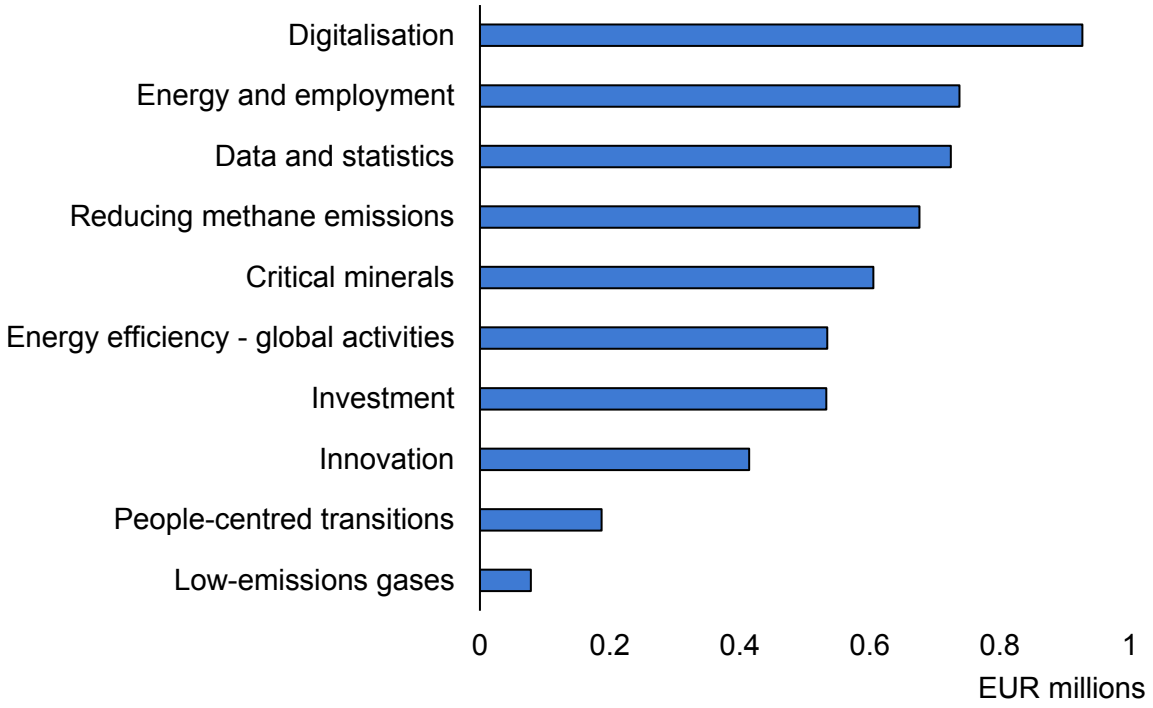
CETP expenditure under Pillar II by region (EUR millions), 2025



Note: "UN processes" includes all CETP expenditure on work that supports action through UN processes such as COP.

In 2025, the CETP enabled the IEA to strengthen multilateral coordination under Pillar II and support strong clean energy outcomes in key global forums, most notably Brazil's COP30 Presidency through several workstreams, as well as tracking nationally determined contributions and the Global Stocktake. The CETP funding supported an intensive COP dialogue to build bridges between past, current and future COP presidencies to support implementation of the COP28 energy pledges. It also supported the IEA's close collaboration with the South African Presidency of the G20. A focused set of activities was delivered to support the G7 Presidency, centred on support for emerging market and developing economies and input into G7 Climate and Energy discussions, also building bridges between analytical activities under Pillars II and III.

CETP expenditure by Pillar III workstream (EUR millions), 2025



Under Pillar III, the CETP advanced the global energy dialogue, enabling the IEA to exercise international leadership on issues critical to achieving a clean energy transition. Digitalisation of energy systems remained the largest workstream in 2025, combining technical analysis of smart power systems with direct policy advice to several partner countries. Significant resources were also allocated to work on energy and employment, reducing methane emissions, advancing critical minerals analysis and supporting energy investment planning. People-centred work and global energy efficiency activities continue to be highly important, although most of their engagement and impact is delivered through Pillar I bilateral work with partner countries. Data and statistics remained the backbone of all workstreams, ensuring evidence-based decision making, and this central role was reflected in the 2025 expenditure.

Pillar I – Accelerating national transitions

India

Highlights

- **Progress on India's IEA membership:** In 2025, India's process to join the IEA advanced positively, reflecting progressively closer collaboration with the Agency across energy policy, clean energy transitions and technical engagement.
- **Advancing energy efficiency in India**: In 2025, the IEA worked with the Bureau of Energy Efficiency and partners to accelerate efficiency across buildings, industry and transport, supporting national conferences, industrial workshops, and reports showcasing scalable solutions and guiding policies for grid-interactive buildings.
- **Building critical minerals partnerships:** The IEA and India's Ministry of Mines established a Joint Working Group on Critical Minerals in 2025, holding the first meeting virtually in April to set a framework for ongoing collaboration and contribute to India's National Critical Mineral Mission policy.
- **Supporting renewable energy planning and offshore wind**: In 2025, the IEA engaged with Indian stakeholders to advance renewable energy deployment and provide early-stage guidance for offshore wind development.
- **Strengthening resilient power systems:** The IEA signed a Memorandum of Understanding with the Coalition for Disaster Resilient Infrastructure to support renewable energy integration and the development of resilient power grids in India.
- **Capacity building for power system management:** In November 2025, the IEA hosted a three-day workshop with the World Energy Council India, bringing together over 20 senior officials from Public Sector Undertakings to share insights on managing India's rapidly evolving power system.
- **Influencing energy investment dialogue:** IEA analysis on India from the World Energy Investment 2025 report was cited by India's Minister of New and Renewable Energy at the Indian Venture and Alternate Capital Association Renewable Energy Summit in Mumbai in July 2025.
- **Advancing biofuels collaboration:** The IEA worked with India's Ministry of Petroleum and Natural Gas on liquid and gaseous biofuels, with findings presented at India Energy Week in January 2026.

Over the past decades, India has rapidly transitioned from prioritising energy access for development to emerging as a global leader in renewable energy deployment. The country has achieved remarkable economic growth in the past decade, outpacing other major economies, while also meeting key energy milestones. In 2025, India achieved 50% installed capacity from non-fossil fuel sources, ahead of its 2030 target under the Paris Agreement. The IEA's Renewables 2025 report shows that India is expected to add nearly 345 GW of renewables between 2025 and 2030, making it the world's second-largest growth market in renewables. In October 2025, the Ministry of New and Renewable Energy released a new policy direction, highlighting India's transition from rapid expansion to system integration, ensuring stable, reliable, and sustainable renewable growth. The focus is shifting from quantity to quality, looking at long-term market design to support its resilient 500 GW target. The IEA has supported India in its priority areas of critical minerals, clean energy investment and renewable energy, including offshore wind and future fuels, as well as capacity building for energy and climate officials in India's government.

High-level engagement

In 2025, the IEA held regular high-level bilateral meetings with ministers and senior officials from India's energy and energy-adjacent ministries, as well as other key stakeholders in India's energy and climate sector. These engagements underscored India's recognition of the IEA as a valued source of policy-relevant analysis and data, and included requests for IEA inputs to support ongoing discussions on priority energy topics.

In June, the IEA's Executive Director, Dr Fatih Birol, met Piyush Goyal, Minister of Commerce and Industry, to discuss critical minerals, oil, gas, solar and India's growing strength in clean energy supply chains. The meeting also highlighted the strong and growing strategic partnership between the IEA and India. In July, Dr Birol met with Gurdeep Singh, Chairman and Managing Director of India's largest power company, National Thermal Power Corporation (NTPC). The meeting allowed IEA and NTPC leaders to discuss India's evolving power sector priorities, including NTPC's long-term capacity plans, emerging nuclear strategy and key issues in financing and international cooperation. They also reviewed critical mineral supply chains, growing electricity demand from digitalisation and artificial intelligence, and strategies to enhance energy storage. Both sides highlighted opportunities for continued collaboration to support India's energy transition and system reliability.

Dr Fatih Birol, IEA Executive Director, and Piyush Goyal, India's Minister of Commerce and Industry

Dr Fatih Birol, IEA Executive Director, and Gurdeep Singh, NTPC Chairman and Managing Director

In September, Dr Birol welcomed Suman Bery, Vice Chairperson of NITI Aayog, to IEA headquarters in Paris to discuss India's energy priorities and the strong collaboration between the Agency and NITI Aayog, which is India's government think tank on energy and climate policy, among other topics.

Suman Bery, NITI Aayog Vice Chairperson, and Dr Fatih Birol, IEA Executive Director

Mary Burce Warlick, IEA Deputy Executive Director, and Santosh Kumar Sarangi, Secretary of the Ministry of New and Renewable Energy

In December, IEA Deputy Executive Director Mary Burce Warlick met with Santosh Sarangi, Secretary of the Ministry of New and Renewable Energy (MNRE), to discuss MNRE-IEA collaboration on solar and offshore wind and on the upcoming India Renewables Outlook. Secretary Sarangi outlined MNRE's priorities for 2026. Also in December, Mary Burce Warlick joined Amit Prothi, Director General of the Centre for Disaster Resilient Infrastructure, in New Delhi to sign a Memorandum of Understanding aimed at strengthening analytical support for resilient energy infrastructure and fostering technical exchanges to guide policy makers.

Amit Prothi, Director General of the Coalition for Disaster Resilient Infrastructure, and Mary Burce Warlick, IEA Deputy Executive Director, signing an MOU between the two organisations, New Delhi, India, 3 December 2025

Energy efficiency in India

In 2025, the IEA continued its close collaboration with India on advancing energy efficiency. Working with the Bureau of Energy Efficiency, the IEA supported the National Conference on Sustainable Cooling and Doubling the Rate of Energy Efficiency Improvement, held in New Delhi on 21-22 February 2025. As a knowledge partner, the IEA helped bring together key stakeholders to exchange expertise and discuss strategies to accelerate India's energy efficiency progress while addressing the country's growing cooling demand. The conference featured thematic sessions on energy efficiency improvements across buildings, appliances, industry and transport.

National Conference on Sustainable Cooling and Doubling the Rate of Energy Efficiency Improvement, held in New Delhi, India, 21-22 February 2025

Building on the previous year's work, the IEA partnered with the Bureau of Energy Efficiency to hold a workshop on "Unlocking Opportunities to Double Energy Efficiency in India's Industry" on 14 May 2025. The workshop brought together key stakeholders to identify high-impact opportunities for accelerating energy efficiency in the industrial sector, with a focus on light industry and micro,

small and medium enterprises. Discussions centred on four priority areas (electric motors, pumps, fans and compressors; process heating; process drying; and energy management), providing a strong foundation for ongoing and future energy efficiency initiatives

The IEA began work in 2025 on Efficient Grid-Interactive Buildings: Opportunities for Efficiency, Electrification and Flexibility, an analytical report assessing India's policy landscape across efficiency, decarbonisation, smartness, resilience, materials and grid interaction. Drawing on stakeholder consultations held online and in New Delhi in February, the report will evaluate India's readiness for efficient, grid-interactive buildings and will provide policy recommendations including regulations, incentives and guidance to support alignment with national climate goals. It is scheduled to be finalised in 2026.

In 2025, the IEA developed a paper on Energy Efficiency Progress in India to showcase the country's achievements and emerging opportunities. Drawing on the IEA's Energy Efficiency Progress Tracker and analysis across buildings, industry and transport, the paper highlights the latest policies and identifies remaining challenges.

Expert consultations informed case studies on successful financing of energy efficiency projects in the micro, small and medium-sized enterprise and buildings sectors. Developed with partners including the Bureau of Energy Efficiency, Energy Efficiency Services Limited, the Alliance for an Energy-Efficient Economy, the Indian Green Building Council, the Asian Development Bank and the Asian Infrastructure Investment Bank, these case studies illustrate scalable models and provide insights for strategies to double the rate of energy efficiency improvements in India and beyond.

People-centred clean energy transitions

Throughout 2025, IEA experts held consultations with Indian stakeholders, including the World Resources Institute India, the Lifestyle for the Environment programme and the Global Climate Resilience Collective, to present the people-centred transitions workstream and discuss avenues for collaboration. Additional discussions with the Self-Employed Women's Association, a national trade union centre in India for women workers of the informal economy, set the ground for integration of Indian case studies in the IEA Clean Energy Labour Council's paper on the labour dimension of clean energy transitions, published in June 2025.

The IEA also systematically ensured that the perspectives of Indian stakeholders were represented in its events and workshops on clean energy and skills development.

The IEA co-organised a workshop with the European Union in Brussels on 13-14 March 2025 on widening participation in clean energy transitions, featuring in-person participation of the Director of the Powering Livelihoods programme at India's Council on Energy, Environment and Water.

On 13-14 May, the IEA hosted the Future of Energy Skills Workshop, with 65 participants, including policy makers, industry, trade unions, educators, researchers and non-governmental organisations from around the world. The workshop featured a presentation from the Self-Employed Women's Association and in-person participation from the Tata Power Institute and the National Skills Development Corporation. Discussions included exploring the possibility of the CEO of the National Skills Development Corporation joining the IEA's Global Commission on People-Centred Clean Energy Transitions.

An online Group of 20 (G20) workshop on indicators included presentations from Swaniti Global on mapping coal transition vulnerability in Indian districts, as well as contributions from REC, an Indian public sector company that finances and promotes power projects across India, and the Power Foundation of India, an agency under the of Ministry of Power.

Several case studies from these activities were included in the Global Commission's Indicators Handbook for Just and Inclusive Energy Transitions and Blueprint for Action on Just and Inclusive Energy Transitions, as well as in the IEA's World Energy Employment Report 2025.

Renewable energy and power markets

Renewable energy planning

IEA engagement with Indian partners on renewable energy continued actively throughout the year. In October 2025, the IEA co-organised three roundtable meetings with industry associations, presenting key findings from Renewables 2025 and fostering discussions on market trends, supply chains and policy frameworks. The sessions brought together major Indian and international energy companies, including Reliance Industries, Tata Power, Vikram Solar, Siemens, ReNew, BP, ACME Solar and Avaada, along with large energy consumers, consultancies, law firms and think tanks.

Participants highlighted priority areas for accelerating renewable deployment, including electricity market reforms, stronger enforcement of state Renewable Purchase Obligations and innovative solutions, such as virtual Power Purchase Agreements. They also emphasised the growing role of storage and PV-plus-storage solutions, while hybrid auctions and declining battery costs are helping expand onshore wind and solar deployment. These exchanges strengthened

dialogue between policy makers, industry and international experts, supporting India's ongoing transition to a more resilient and sustainable energy system.

US-India Business Council roundtable with the IEA held in New Delhi, India, 29 October 2025

The IEA held bilateral meetings with key Indian energy stakeholders to discuss renewable energy planning and deployment. A technical meeting with the Central Electricity Authority (CEA) brought together engineers responsible for forecasting and renewable energy development. Discussions covered the new National Electricity Plan, under development for completion in 2027, and installed capacity scenarios for 2032 to 2037. The CEA also shared updates on energy storage deployment and the recently accelerated permitting process for Pumped Storage Hydropower, targeting 20 GW by 2030. In addition, the IEA met with Subrahmanyam Pulipaka, CEO of the National Solar Energy Federation of India, to exchange views on solar sector developments and industry perspectives.

Supporting early-stage offshore wind development

India's vast coastline and rising energy demand create strong opportunities for offshore wind to support the country's energy transition and economic development. Compared with solar PV and onshore wind, offshore wind requires more targeted policy support and sustained engagement from policy makers, particularly in the early stages of market development. While launching the first projects in a nascent market presents challenges, international experience shows that effective policy and market solutions are available.

The MNRE's revised "Strategy for the Establishment of Offshore Wind Energy Projects" aimed to enable development of the country's first projects in September 2023. In February 2024, it opened the first tender for the

development of 4 GW of projects off the coast of Tamil Nadu, followed in September 2024, with another 500 MW tender off the coast of Gujarat.

To support the MNRE in this complex process, the IEA shared international experience and delivered practical policy advice on market design, costs and infrastructure development. Drawing on lessons from countries that have successfully navigated the early stages of offshore wind deployment, the IEA provided targeted analytical support, including tailored case studies, to help inform and strengthen India's evolving approach.

On 27 February 2025 in New Delhi, the MNRE and the IEA jointly brought together Indian and international stakeholders from public and private sectors to discuss opportunities and challenges of offshore wind deployment in India. The discussion focused on design of policy support, generation costs, and supply chain and infrastructure development, including ports and transmission grids.

Further dialogue and requests for data and advice in 2025 demonstrated the continued strong engagement of Indian partners. The upcoming analysis of the Indian offshore wind market in a dedicated IEA report on India's renewable energy, to be published in 2026, will support evidence-based policy making.

Policy and analytical support for sustainable fuels

Building on the IEA's global analytical work on sustainable fuels, including hydrogen and biofuels, the Agency worked closely with Indian stakeholders to assess the techno-economic dimensions of biofuels and hydrogen and to identify synergies between them. The objective was to support India's efforts to reduce fossil fuel imports and decarbonise hard-to-abate sectors. This work also drew on the IEA's experience supporting successive G20 Presidencies, including India's in 2023, as well as its analytical and advisory contributions to sustainable fuels discussions within the G20 framework in 2025.

The project combined analytical support with direct policy engagement, including the delivery of targeted policy advice to the government of India and the dissemination of recommendations through consultations with policy makers. The collaboration contributed to concrete policy outcomes implemented in 2025, including the launch of Round 2 of the Research Development and Demonstration programme under the National Green Hydrogen Mission.

In October 2025, India's Ministry of Petroleum and Natural Gas (MoPNG) approached the IEA to request a report on liquid and gaseous biofuels in India, to be released during India Energy Week. Developed with support from the Petroleum Planning and Analysis Cell within the MoPNG, the report provides a review of India's current policies and markets and challenges for these fuels

and a forecast to 2030, as well as policy recommendations to further accelerate their deployment to 2030.

The report was finalised and presented at India Energy Week on 29 January 2026, offering timely insights into India's rapidly evolving bioenergy landscape. It will help to inform strategic policy development within India as it looks to continue to grow these technologies and markets.

Bilateral meetings between IEA and business representatives, held in New Delhi, India, December 2025

Power grids for secure electricity transition

The IEA continued to collaborate with Indian partners to support renewable energy integration and the development of resilient power grids. Meetings with the Rocky Mountain Institute India and the Council on Energy, Environment and Water explored the potential for a workstream on electricity grid transformation, an area of growing priority for India.

The IEA and the Power Foundation of India discussed developing a workstream on grids, in particular looking at the idea of grids and climate resilience.

In parallel, the IEA has engaged with the Coalition for Disaster Resilient Infrastructure, an international organisation established by the government of India, with which the IEA signed a Memorandum of Understanding in 2025 to collaborate on similar topics. Building on these discussions, and in consultation with the Ministry of Power, the project is currently under internal consideration to identify the most appropriate partner in India.

Building expertise in power systems

In November 2025, in cooperation with the World Energy Council India, the IEA hosted a three-day training workshop, bringing together IEA experts and over 20

senior officials from Public Sector Undertakings to exchange insights on managing India's rapidly evolving power system.

The workshop allowed participants to gain a deeper understanding of IEA analysis on India's energy system and its alignment with global trends. They explored the latest insights on energy sector investment, renewable and nuclear energy, and energy storage. Feedback was highly positive, with participants noting that the workshop's strategic perspective will directly support their roles in power sector operations, planning and investment decisions. This workshop also builds on our ongoing collaboration, including the upcoming peak load project, highlighting a continued effort to address the challenges of a rapidly evolving power system.

IEA-World Energy Council India Electricity Sector Planning and Policy Workshop at IEA headquarters in Paris, France, 6 November 2025

Scaling up investment

In 2025, the IEA deepened its engagement with Indian stakeholders to advance discussions on finance and investment in the clean energy transition. This work included technical exchanges with key players in the finance sector, analytical work and the virtual dissemination of findings to stakeholders such as AuctusESG (a global sustainable finance and environmental, social and governance advisory firm), NITI Aayog (a policy think tank of the government of India), ReNew Power (India's largest renewable energy developer) and others. A notable highlight was the citation of the IEA's India-focused analysis from the IEA's World Energy Investment 2025 report in a speech by India's Minister of New and Renewable Energy at the Indian Venture and Alternate Capital Association Renewable Energy Summit in Mumbai in July 2025.

IEA investment work in India culminated in a dissemination and engagement event held in New Delhi in October 2025, hosted by the National Institute of Public Finance and Policy under India's Ministry of Finance, and co-hosted by Climate Bonds Initiative India. The event convened key stakeholders from government, finance, industry and research institutions.

Discussions highlighted that India's clean energy transition depends on reducing cost-of-capital risks, with key enablers including sovereign-backed credit guarantees, foreign exchange risk mitigation, blended finance and expanded green financing channels. Participants also underscored the importance of policy coherence, robust capital markets, climate risk integration and a unified green investment strategy aligned with global market dynamics. These insights echo the key focus areas of the Agency.

Critical minerals in India

A Joint Working Group on Critical Minerals was established between the IEA and India's Ministry of Mines (MoM) following the signing of a Memorandum of Understanding in November 2024, which set out a framework for cooperation on critical minerals. The first IEA-MoM Joint Working Group meeting was held virtually in April 2025, attended by Joint Secretary Dinesh Mahur, who is responsible for policy matters such as legislation and critical minerals, and his team. Participants discussed India's summit preparations, explored the IEA's Critical Minerals Data Explorer and Policy Tracker and reviewed the special report on traceability in mineral supply chains. The MoM welcomed the tools and highlighted their interest in learning from international best practices on traceability, recycling and stockpiling.

In 2025, the IEA presented its critical minerals work at key events, including the National Critical Minerals Processing Seminar (hosted by the MoM and the Shakti Sustainable Energy Foundation) and a stakeholder consultation on Extended Producer Responsibility for critical minerals (hosted by the MoM and the Energy and Resources Institute, an independent, not-for-profit research organisation working in energy, environment, climate change, and sustainable development).

In October, the IEA and the Asian Development Bank (ADB) met with Joint Secretary Dinesh Mahur and senior Indian officials, responsible for the implementation of the National Critical Minerals Mission, a national policy launched by India in 2025 to secure the supply of critical minerals and strengthen India's critical minerals value chains, to discuss the scope of a joint IEA-ADB-MoM report on India's role in the global critical minerals market, currently in development for a summer 2026 launch.

In December, the IEA hosted Rishabh Jain, lead of the Technology Futures programme at the Council on Energy, Environment and Water (a not-for-profit policy research institution) to explore recent analyses and potential collaboration, particularly on mobilising finance for India's mining, refining and recycling sectors.

This collaboration contributed to a key policy outcome in 2025 with the notification of the Incentive Scheme for Promotion of Critical Minerals Recycling under the National Critical Minerals Mission. The scheme allocates INR 1 500 crore (approximately EUR 145 million) to provide financial incentives for developing recycling capacity for the separation and production of critical minerals from secondary sources, including e-waste and spent lithium-ion batteries.

Data and statistics in India

India's most recent annual energy statistics and balances were published on the IEA website, with significant progress in data submission timelines, enabled by close collaboration with the Ministry of Statistics and Programme Implementation and the Ministry of Petroleum and Natural Gas. Further improvements were also made to the biofuels estimation methodology. Preliminary energy statistics for India for 2024 were included in the summer release of the IEA's World Energy Balances, with associated emission estimates released in the Greenhouse Gas Emissions from Energy data service.

End-use energy prices were published in April 2025, based on data from official online sources and a methodology defined in past years, together with the Ministry of Petroleum and Natural Gas, the Central Electricity Authority and Power Finance Corporation. Data cover oil products and electricity for transport, residential and industry. Thanks to collaboration with the Ministry of Power, end-use energy prices data and transport fuel prices are now updated monthly.

The collaboration also allowed for more direct exchanges between the data sections of Indian ministries and the IEA. Previously, submissions were only shared through the United Nations, to the Joint Organizations Data Initiative, but throughout 2025, India has submitted monthly oil and gas data directly to the IEA. Monthly oil and gas submissions to the Joint Organizations Data Initiative continue to be received on time.

In July 2025, India provided monthly oil data with a complete supply balance for the previous calendar year, enabling the IEA to calculate metrics related to India membership discussions. Additionally, India submitted data for one selected month of 2025, piloting enhanced data reporting processes. These new data submissions in 2025 reflected a positive step in energy data collaboration, strengthened by the exchanges with the Indian administration through the Data Working Group.

Indonesia

Highlights

- **Supporting Indonesia's power markets transition through PLN:** Close collaboration with Perusahaan Listrik Negara (PLN), Indonesia's state-owned utility, supported the shift toward a cleaner and more resilient power system, including capacity-building activities engaging more than 500 PLN participants.
- **Advancing Indonesia's JETP implementation:** The IEA provided intensive support to the Just Energy Transition Partnership (JETP) by leading the Technical Working Group, contributing across key working groups, and playing an instrumental role in updating the Comprehensive Investment and Policy Plan in 2025, including the integration of captive power, as well as publishing strategic outputs focused on implementation.
- **Unlocking energy storage investment:** Close collaboration with the Ministry of Energy and Mineral Resources (MEMR) supported a targeted study on financing battery energy storage systems, helping underpin PLN's plans to develop 6 GW of storage over the next decade, as set out in the Electricity Supply Business Plan 2025-2034.
- **Improving truck efficiency to cut emissions and costs:** Continued IEA support helped the MEMR advance the development of fuel economy standards for trucks, a high-impact segment responsible for around 40% of road transport energy demand.
- **Strengthening energy management with the EBTKE:** The IEA worked with MEMR's Directorate General of New, Renewable Energy, and Energy Conservation (EBTKE) to upgrade POME, Indonesia's Online Energy Management Reporting system. This underpinned the rollout of the MEMR's Regulation No. 8 of 2025 by enabling mandatory reporting by large energy users, improving data quality and usability, and supporting data sharing across ministries and local governments to strengthen supervision and implementation.
- **Strengthening regulatory frameworks for mining emissions:** At Indonesia's request, the IEA analysed legal and regulatory frameworks for GHGs from mining projects and mine waste management. The highly sensitive nature of these issues required close collaboration, reflecting the strong trust between the MEMR and the IEA, and enabled the development of impactful, internationally aligned policy recommendations.

Indonesia, one of the world's fastest growing economies, faces rapidly rising energy demand as it works toward achieving its net zero emissions target by 2060. Decarbonising the power system has become a priority, with the country's Electricity Supply Business Plan (RUPTL 2025-2034) and the Just Energy Transition Partnership setting ambitious renewable energy targets. However, significant challenges remain, including the dominance of coal in the energy mix and the need to modernise grid infrastructure. The IEA has continued to work closely with the Indonesian government and key stakeholders to support the country in addressing these challenges and advancing a clean, reliable, affordable and sustainable energy transition.

Power sector and integration of renewables

Collaboration with PLN

The IEA has been working closely with PLN, Indonesia's state-owned utility, to support the country's transition to a cleaner and more resilient power system. PLN plays a critical role in addressing these challenges. As it aims to integrate higher shares of renewable energy, strengthening its capacity to manage large volumes of variable renewable energy has become essential.

To support this objective, the IEA delivered a large-scale capacity-building workshop with more than 500 participants from PLN. The workshop focused on practical approaches to support the integration of variable renewable energy technologies, including challenges and potential to maintain system reliability, and the development of smart grids in enabling more flexible and efficient operation.

This engagement helped strengthen a shared understanding across PLN teams of the operational reforms and system upgrades needed to integrate renewables at scale while maintaining reliability.

Supporting Indonesia's Just Energy Transition Partnership

This year the IEA continued its intense and diverse support for Indonesia's Just Energy Transition Partnership, launched in 2022 at the G20 Summit, which aims to accelerate the decarbonisation of Indonesia's power system. The IEA supported the JETP Secretariat by leading the Technical Working Group, including placing a Senior Technical Advisor within the JETP Secretariat, and actively participating in the Energy Efficiency and Electrification Working Group and the policy working group, while also contributing to the workstreams. The work in 2025 essentially focused on updating the Comprehensive Investment and Policy Plan for which the leading role of the IEA was instrumental, in

particular integrating the captive power dimension, which had so far been largely outside the scope of the Just Energy Transition Partnership.

By the end of 2025, the IEA published three implementation-oriented, highly strategic outputs, including the JETP Progress Report 2025 and thematic reports on Energy Efficiency and Electrification and the Captive Power Study. These publications assist the Indonesian government in prioritising actionable next steps and reinforce the shared evidence base for JETP implementation among all stakeholders.

Financing battery energy storage systems

The IEA is working closely with the MEMR's Directorate General for Electricity (DJK), on a study on financing battery energy storage systems (BESSs) in Indonesia. The study was requested by MEMR-DJK to support PLN, Indonesia's state-owned utility, in its objective of developing 6 GW of BESS over the next decade, as articulated in its Electricity Supply Business Plan (RUPTL 2025-2034). Addressing the business and financial challenges faced by PLN, the study aims to:

- Quantify investment needs of the RUPTL's BESS pipeline.
- Identify business models and financing structures suited to the Indonesian context.
- Provide recommendations aimed at increasing the availability of private capital by creating effective procurement procedures, standardising power purchase agreement contracts and setting appropriate BESS asset remuneration while balancing affordability for PLN's consumers.

The report, expected in the second half of 2026, will be complemented by a bankability assessment tool to help investors evaluate battery energy storage system projects in emerging markets using financial, technical and regulatory criteria.

The study held its official kick-off in mid-September with the enthusiastic support of counterparts from MEMR-DJK and PLN. The IEA has also collaborated with representatives of the Energy Transition Partnership of the United Nations Office for Project Services (UNOPS-ETP), which is currently coordinating a study on BESS Integration in Indonesia, to ensure that the two studies complement one another. The IEA led the organisation of a consultative workshop, held in Jakarta on 9-10 December, to gather inputs for the report from a wide variety of stakeholders. Participation in the workshop exceeded expectations, with a total of 53 representatives attending in person and an additional 89 participants attending virtually. Participants came from a wide range of institutions, including PLN, governments, developers, financial institutions, industry and civil society. The workshop allowed participants to discuss challenges and solutions related to

Indonesia's BESS regulation, procurement, project bankability, access to public, private and concessional finance, domestic manufacturing and supply chain diversification. The IEA presented preliminary results on investment needs for the RUPTL BESS pipeline, projected financing sources and opportunities for BESS component manufacturing in Indonesia.

Project counterparts from both MEMR-DJK and PLN have expressed enthusiasm and recognition for ongoing engagement with IEA, and they noted that recommendations from the study would inform the development of energy policy related to BESS.

Consultative workshop on Financing BESS, held in Jakarta, Indonesia, 9-10 December 2025

Energy efficiency

Advancing fuel economy standards for Indonesia

In 2025, the IEA continued to support Indonesia to develop fuel economy standards for trucks, a project that began in 2023 at the country's request. In Indonesia, trucks are responsible for almost 40% of energy demand from the road transport sector and about 50% of all GHG emissions from transport. Increasing the fuel efficiency of trucks has the potential to reduce carbon emissions, improve local air quality, save significantly on the national fuel bill, deliver savings for trucking operators and help accelerate the adoption of efficient electric trucks. After the completion of data collection, in 2025, the IEA continued to collaborate closely with the MEMR. The IEA provided a comprehensive report on options for advancing the energy efficiency of trucks in Indonesia, which set out possibilities and considerations and an actionable pathway for developing national regulations. The MEMR is currently using IEA insights and analysis to progress on development of the standards.

Advancing energy efficiency policy in the textile industry in Indonesia

The textile industry represents a significant portion of the economy of Indonesia. In 2025, the IEA consulted with the MEMR to provide direct support to help advance energy efficiency policies in this key sector. After identifying the key barriers and enablers with the Ministry, the IEA began a series of consultations with industry experts. The Agency also held consultations with various organisations involved with the textiles industry in Indonesia and Southeast Asia, including the World Wildlife Fund to discuss their textiles programme and the H&M group to discuss their strategy for reducing consumption in the country. The IEA is establishing a research project to investigate new insights to inform more ambitious policies to help advance energy efficiency in this area, on which there will be progress in early 2026. This project presents a remarkable potential for replication across Southeast Asia, considering the importance of the industry in the region and the experience accumulated by the IEA in both the field and the region.

Advancing energy reporting with POME

Indonesia's efforts to strengthen the implementation of energy management regulation have been underpinned by the IEA's support to develop a high-quality data reporting system. Indonesia's Energy Management Online Reporting system, Pelaporan Online Manajmen Energi (POME), is central to these efforts. This web-based platform monitors the energy use and management activities of large energy users, enabling data-driven tracking and informed policy decisions.

The IEA has supported Indonesia to develop and enhance POME in multiple steps since 2019, including improved usability and expanded reporting functionality, in line with the expanded scope of reporting requirements established in Government Regulation No. 33 of 2023.

In 2025, the IEA collaborated with the MEMR’s Directorate General of New, Renewable Energy and Energy Conservation (EBTKE) to upgrade Indonesia’s POME system. The partnership involved the IEA providing technical support to enhance the system, advising on enhancements and participating in user testing. The IEA and the EBTKE also collaborated on exchanging energy data, strengthening the EBTKE’s data analysis capabilities, and utilising POME data to support data analysis and improve national energy balances.

In March 2025, the MEMR introduced Regulation No. 8 of 2025, requiring large energy users in the transport, building and industry sectors to implement systematic energy management, carry out energy audits, appoint certified energy managers and report their performance through the POME online system. These upgrades now enable data sharing and access across relevant ministries

to facilities implementation, and local governments can now participate in supervising and monitoring the implementation of government-owned facilities. The latest upgrade has also enhanced reporting specificity and improved the usability and usefulness of the collected data.

Critical minerals

In 2025, at the request of Indonesia, the IEA engaged with the MEMR on a bilateral project focused on analysing the legal and regulatory framework for greenhouse gas emissions from mining projects and mine waste management, with a view to providing recommendations based on international best practices.

The project involved a virtual consultation with government stakeholders from the MEMR and the Ministry of Environment to elaborate on the regulatory framework and related implementation structures. Following the consultation, the IEA finalised an internal report for the MEMR outlining the key legal and regulatory instruments in these areas, identifying barriers to implementation, highlighting international best practices, and providing recommendations for improvements.

The report notes Indonesia's progress in sustainable mining through strong environmental approvals and digital licensing. However, gaps in GHG regulation and mine waste management remain, needing better coordination, traceability and sustainability incentives to align with global best practices and support market access. These exchanges lay the groundwork for further collaboration in 2026, including a workshop with Indonesian government and industry stakeholders to present findings, discuss next steps and shape a targeted IEA bilateral support programme. Follow-up support to critical minerals in Indonesia will be one of the priorities of cooperation with the IEA.

Considering the extreme sensitivity of these questions, very few international players have managed to develop programmes on critical minerals with Indonesia. The high degree of ownership from the MEMR and the excellent cooperation that resulted from this project demonstrated the MEMR's confidence in the IEA, as well as the relevance of the CETP to support such impactful work.

Data and statistics in Indonesia

Collaboration with the MEMR remained strong and productive throughout 2025, ensuring timely data provision through regular exchanges. Indonesia's latest annual energy statistics and the 2023 energy balance were published on the IEA website. Preliminary 2024 energy statistics were featured in the summer release of the World Energy Balances, with associated emission estimates released in the Greenhouse Gas Emissions from Energy data service. Sectoral energy price data were also published, drawing on information from the MEMR's annual

report. These data cover oil products, coal, natural gas and electricity across transport, residential and industrial sectors. Toward the end of 2025, bilateral engagement intensified, paving the way for a dedicated country visit in 2026 aimed at strengthening cooperation and advancing ongoing initiatives on energy data.

Southeast Asia and Association of Southeast Asian Nations

Highlights

- **Supporting energy efficiency targets:** The IEA advice to ASEAN Member state representatives on global and regional energy efficiency trends helped inform the new energy efficiency target for the ASEAN Plan of Action for Energy Cooperation III (2026-2030).
- **Advancing renewable energy deployment in ASEAN:** The IEA strengthened market analysis through expanded Southeast Asia coverage in Renewables 2025, launched an ASEAN dashboard and published targeted policy guidance, including practical recommendations on electrifying low-temperature heat and steam, auctions, and integrating solar and wind, to support policy makers in accelerating clean power growth across the region.
- **Strengthening expertise in power market regulation:** The IEA supported training and knowledge sharing across ASEAN in 2025, including the ASEAN Energy Regulators Network and the Asia Pacific Energy Regulatory Forum workshops and the ASEAN School of Regulation, providing practical guidance on power market regulation, renewable integration and multilateral electricity trade.
- **Enhancing capacity for energy efficiency policy making:** The IEA hosted its 22nd Southeast Asia Energy Efficiency Policy Training Week in Hanoi and delivered an online workshop on Demand-Side Data and Energy Efficiency Indicators, equipping nearly 150 policy makers and practitioners from across the region with practical tools and insights for evidence-based efficiency policies.
- **Building capacity for cross-border power trade:** The IEA co-organised the 9th Singapore-IEA Regional Training Programme with the Singapore Energy Market Authority, bringing together nearly 200 participants from 20 countries to explore technical, regulatory and financial pathways for ASEAN interconnector projects and strengthen frameworks for regional power transmission.
- **Advancing people-centred clean energy transitions:** The IEA collaborated with Southeast Asian governments, trade unions and international partners to strengthen evidence for fair and affordable policies, resulting in the publication of Social Dimensions of Clean Energy Transitions in Southeast Asia and the Southeast Asia Indicators Handbook for Just and Inclusive Transitions to guide equitable policy planning.

Southeast Asia is among the fastest growing regions in the world. This growth has been largely met with fossil fuels, including coal, which still represents close to 50% of the electricity produced in the region and up to 80% in some countries. Yet, almost all countries that are part of the Association of Southeast Asian Nations (ASEAN) have put forward ambitious net zero targets. Achieving these targets will require multiple changes and processes to address the major challenges of the energy transition, including regulatory, policy, investment and technical aspects.

Through the IEA's "opening doors" policy, initiated in 2015, Indonesia, Thailand and Singapore joined the Agency as Association countries and the Agency also developed relations with other counterparts both bilaterally (the Philippines and Viet Nam) and regionally (Asian Development Bank, ASEAN).

In 2019, the IEA was named a “key strategic partner” to ASEAN in recognition of its extensive support in all aspects of Southeast Asia’s energy priorities under the ASEAN Plan of Action for Energy Cooperation, and this status has led to constant engagement and support through the years. The IEA engages closely with the ASEAN Secretariat and the ASEAN Centre for Energy, helping the chairmanship set the energy strategies and supporting their implementation. In addition, bilateral joint work programmes at country or regional level, building on extensive engagement and collaboration, are designed to support the energy priorities of key partners across the full range of CETP impact areas.

The IEA’s new Regional Cooperation Centre (RCC) in Singapore further strengthened regional and bilateral collaboration by providing a dedicated platform for engagement and implementation in the region. Most activities described below, as well as those for Indonesia, were delivered jointly by IEA experts in Paris and in the Regional Cooperation Centre in Singapore. The RCC played a key role in bringing the IEA closer to the countries and in strengthening the relationship of confidence with the region. The RCC also allowed for a maximisation of the impact of IEA’s work supported by the CETP in the region by facilitating the implementation of more projects and increasing their reach.

Beyond projects, the IEA’s increased engagement in 2025 from both Paris and Singapore, supported by the CETP, has yielded remarkable political results with the Memorandum of Understanding signed with Viet Nam, the region’s third-most-populous country, and its request to join the IEA as an Association country, as well as a ramp-up in political cooperation with the Philippines and Malaysia. This political engagement and increased visibility are also translated into increased technical cooperation foreseen in 2026.

Renewable energy deployment and power markets in Southeast Asia

Renewable Energy Progress Tracker and policy advice

The IEA strengthened its analysis of renewable electricity markets in the Association of Southeast Asian Nations in Renewables 2025 by expanding both the scope and the underlying data infrastructure. The ASEAN-focused section was significantly enhanced, including more detailed presentation of results, clearer documentation of key assumptions underpinning the 2030 renewable capacity and generation forecasts, and targeted policy recommendations. In addition, a dedicated ASEAN dashboard was launched on the Renewable Energy Progress Tracker, providing access to key renewable energy statistics, forecasts and market trends. Both the report and the dashboard were published on the IEA website on 7 October.

On 19 December, the IEA published the policy paper Accelerating Renewables Growth in ASEAN, which identifies key barriers to faster renewable power deployment and sets out practical policy solutions based on international best practice. The paper places particular emphasis on implementation, including an assessment of renewable energy auction design options tailored to ASEAN Member states. Building on this work, an online workshop planned for February 2026 will convene ASEAN policy makers and international experts to discuss the findings, share implementation experience and explore concrete approaches to addressing the identified challenges.

Variable renewables integration in power systems

In September, the IEA published Integrating Solar and Wind in Southeast Asia, with an overview of the current status and outlook for secure and efficient variable renewable energy (VRE) integration strategies in ASEAN countries. The report included a comprehensive assessment of the readiness of Southeast Asia's power sector to integrate higher shares of VRE, identifying opportunities as well as key considerations. The report also addressed Southeast Asia's natural advantages for seasonal flexibility and highlighted priority recommendations for domestic VRE integration and regional interconnection, tailored to each power system's readiness.

The report's key findings informed regional policy making through a series of targeted engagements. They were presented at the ASEAN Energy Business Forum 2025, held in Kuala Lumpur on 15 October 2025, with an opening statement from the Secretary for Energy of the Philippines, and shared at high-level regional and international events, including the 43rd ASEAN Ministers on Energy Meeting, the ASEAN Summer School of Regulation and a dialogue

series on power sector decarbonisation co-organised by the World Economic Forum and the Malaysian Ministry of Energy. In addition, a public webinar on 13 November disseminated the findings to a wider audience, supporting evidence-based policy discussions across the region.

Renewables in industry: Electrification of low-temperature heat and steam

The report Renewables for Industry: Electrification of low-temperature heat and steam, published on 23 December, includes a dedicated section on selected Southeast Asian countries that assesses the technical and economic potential for electrifying industrial heat and steam and the implications for fossil fuel use and electricity demand. The analysis draws on detailed cost comparisons of electrification pathways using captive renewables, including heat pumps, electric boilers and thermal energy storage, relative to coal- and natural gas-fired boilers. It also examines the market and policy frameworks shaping deployment and concludes with targeted, actionable recommendations, supported by practical examples, to inform effective policy design and implementation.

Capacity-building activities: Power markets and energy efficiency

Power grid: Capacity building

Building capacity in the region is essential for effective implementation of policies on power markets and renewable energy. In this context, the IEA actively contributed to multiple regional initiatives in 2025 to support knowledge sharing, training and regulatory development. In the first week of June, the IEA contributed to a training event on the role and scope of work for the ASEAN Energy Regulators Network (AERN) post-2025 under the enhanced Asia Pacific Grid Memorandum of Understanding, led by the United Nations Economic and Social Commission for Asia and the Pacific. The training took place at the AERN Annual Meeting in Kuala Lumpur on 9-11 June 2025.

In July, the IEA delivered a lecture at the ASEAN School of Regulation summer school, sharing insights on power market regulation and renewable integration. In November, the IEA co-hosted a session at the Asia Pacific Energy Regulatory Forum with the UN Economic and Social Commission for Asia and the Pacific and Suruhanjaya Tenaga Malaysia, the national Energy Commission responsible for regulating the country's electricity and gas sectors.

Throughout the year, the IEA actively engaged in AERN capacity-building workshops and associated meetings, including sessions with Dialogue Partners and international organisations to discuss cooperation projects and initiatives.

Together with the UN Economic and Social Commission for Asia and the Pacific and the Clean Energy Ministerial, the IEA provided introductory presentations on regulatory and institutional frameworks to facilitate multilateral power trade, drawing on global experiences to inform regional policy development.

Energy efficiency: Capacity building

The IEA held its Southeast Asia Energy Efficiency Policy Training Week in Hanoi from 1 to 4 December. Co-hosted by Viet Nam's Ministry of Industry and Trade, and with support from the Asian Development Bank, it marked a key milestone in the IEA's work on energy efficiency with countries across Southeast Asia, as well as in our cooperation with Viet Nam. The event was the IEA's 22nd Energy Efficiency Policy Training Week and the first time the IEA has hosted it in Viet Nam.

The IEA's Southeast Asia Energy Efficiency Policy Training Week in Hanoi, Viet Nam, 1-4 December 2025

Nearly 150 energy efficiency practitioners and policy makers from 12 countries gathered in Hanoi to share insights on how stronger efficiency measures can help meet Southeast Asia's rapidly growing energy demand. The event received overwhelmingly positive feedback from participants, who highlighted the practical value of the discussions and the opportunity to learn from regional experiences and best practices.

Group photo from the IEA's Southeast Asia Energy Efficiency Policy Training Week in Hanoi, Viet Nam, 1-4 December 2025

ASEAN Energy Efficiency and Conservation Sub-Sector Network Meetings

From 20 to 22 May, the IEA participated in a series of meetings and workshops organised for the annual ASEAN Energy Efficiency and Conservation Sub-Sector Network in Kuala Lumpur, Malaysia. IEA experts participated in two workshops presenting on international cases of building energy certification and industrial energy efficiency through digitalisation. The IEA advised ASEAN

Member state representatives, attending the meetings on the global energy efficiency doubling target and ASEAN's historical rate of energy efficiency improvements, to provide context for the impact of energy efficiency improvements and encourage them to consider this to inform the new energy efficiency target for the ASEAN Plan of Action for Energy Cooperation III (2026-2030).

Meeting of the ASEAN Energy Efficiency and Conservation Sub-Sector Network in Kuala Lumpur, Malaysia, 22 May 2025

The IEA also took part in the ASEAN Workshop on Policies for Transport System Efficiency on 3 September 2025. This online event was an opportunity to showcase global best practice and insights for capacity building on energy efficiency in the area of transport. The IEA presented various case studies from across the world to inspire ASEAN policy makers.

On 25 September, the IEA took part in the ASEAN Workshop on Promotion of High-Efficiency Vehicles, where the Energy Efficiency in Emerging Economies (E4) Programme delivered a presentation and took part in a panel discussion on Truck Fuel Economy Standards in ASEAN. It laid out the benefits of fuel economy standards by highlighting aspects such as economic benefits for consumers, reduced CO_2 emissions and pathway opportunities that already exist in ASEAN to exert influence at a regional level.

On 19 November, the IEA took part in the 65th Meeting of the Asia Pacific Economic Cooperation's Expert Group on Energy Efficiency and Conservation, where it presented the 2025 Energy Efficiency Market Report to the region with a focus on regional findings.

Singapore-IEA Training Hub

The Singapore Energy Market Authority (EMA) and the IEA co-organised the 9th edition of the Singapore-IEA Regional Training Programme on Connecting ASEAN: Technical, Regulatory and Financial Pathways for Cross-Border Power Trade, which was held in Singapore from 29 to 30 May. The one-and-a-half-day training focused on developing the necessary frameworks to facilitate cross-border power transmission in ASEAN and addressed key factors that stakeholders should consider when implementing interconnector projects.

Almost 200 participants from 20 countries joined the training session. IEA experts facilitated the training, together with the EMA. International experts were invited as speakers, and several breakout sessions were organised, generating active participant engagement.

Panellists and participants of the Singapore-IEA Regional Training Programme on Connecting ASEAN: Technical, Regulatory and Financial Pathways for Cross-Border Power Trade, Singapore. 30 May 2025

Global Hydrogen Review 2025 – Focus on Southeast Asia

In September 2025, the IEA released the Global Hydrogen Review 2025 report, an annual publication tracking the latest developments on demand, production, policy, infrastructure, trade, investments and innovation across the hydrogen value chain. The 2025 edition included a special chapter assessing the status, challenges and opportunities for Southeast Asia. In 2024, the region accounted for around 4 Mt of hydrogen demand, or 4% of the global total, concentrated mainly in chemicals and refining. Demand is highly concentrated geographically, with Indonesia, Malaysia, Singapore and Viet Nam accounting for most regional consumption, enabling targeted, high-impact interventions. The report highlights that Southeast Asia has strong potential to scale renewable hydrogen and by 2030, an upper bound of nearly 11 Mtpa of low-cost potential could be available with early momentum in project development emerging in Indonesia and Malaysia, provided near-term actions focus on renewable deployment, pilot projects, existing hydrogen uses and measures to reduce the cost of capital. The analysis was undertaken in close

collaboration with several regional governments. Part of the input was interviews with the governments of Indonesia, the Philippines, Singapore and Thailand, which also provided feedback during the peer review.

Once the report was released, dissemination efforts included a regional launch event attended by industry and the Singaporean government, dedicated online presentations with the governments of the Philippines, Singapore and Thailand, and a regional webinar attended by more than 50 hydrogen experts from the region.

Clean energy investment

In 2025, the IEA's Cost of Capital Observatory expanded its coverage of Southeast Asia, including, for the first time, data for Malaysia, the Philippines and Thailand, in addition to existing data for Indonesia and Viet Nam. Data collected through surveys and interviews with developers and financial institutions show that financing costs for solar photovoltaic (PV) projects are lowest in Malaysia and Thailand, at 6% to 8 %, while Indonesia, the Philippines and Viet Nam face slightly higher costs of 8% to 9 %. By comparison, financing costs in advanced economies typically range from 5% to 6.5 %. The higher costs in ASEAN reflect both real and perceived risks faced by investors. Overall, Southeast Asian countries remain comparable to or below the other emerging market and developing economies surveyed.

Through the regional network of the IEA Finance Industry Advisory Board, the IEA continued to engage with major public and private financial institutions in the region, with the objective of exploring practical approaches to reduce investment risks and promote clean energy deployment.

Innovative financing models for interconnectors in Southeast Asia

In 2025, the IEA conducted a study providing a comprehensive analysis of financing options for cross-border electricity infrastructure in ASEAN, offering timely insights to guide regional energy planning and investment strategies. The analysis examined financing options for cross-border electricity infrastructure among ASEAN countries, providing insights and guidance to support investment decisions and regional energy integration. The report informs regional policy makers by examining investment and financing challenges for ASEAN interconnectors, quantifying needs for the ASEAN Power Grid and exploring strategies to enhance bankability, affordability and energy security. Findings have been reviewed with public and private stakeholders, with the final draft set for publication in the first quarter of 2026.

People-centred energy transitions

The IEA has continued its work on maximising positive social impacts in clean energy transition planning in Southeast Asia. In 2025, research, analysis and engagement with key stakeholders resulted in enhanced knowledge and evidence for fair and affordable policy making and implementation on clean energy transitions in the context of Southeast Asia, with an important policy document published at the end of the year.

In 2025, engagement with Southeast Asian workers' representatives strengthened, with trade unions playing a key role in clean energy transitions. Trade unions in Southeast Asia are represented on the IEA Clean Energy Labour Council by the International Trade Union Confederation Asia Pacific and the Confederation of All Indonesian Trade Unions (KSBSI). Representatives of both institutions joined the three meetings of the IEA Labour Council in 2025, including the President of the KSBSI who attended the in-person meeting in June in Brussels during the 10th Annual Global Conference on Energy Efficiency. Additional bilateral meetings took place throughout the year.

IEA Clean Energy Labour Council meeting, Brussels, Belgium, June 2025

Engagement with Southeast Asia policy makers and key stakeholders on the topic of employment and skills continued in 2025, with five policy, labour and civil society representatives participating in the Future of Energy Skills Workshop in Paris in May. Each of these representatives provided an update from their country on employment and skills mapping, examples of on-the-ground clean energy training programmes and experiences from multi-stakeholder engagement in workforce mapping.

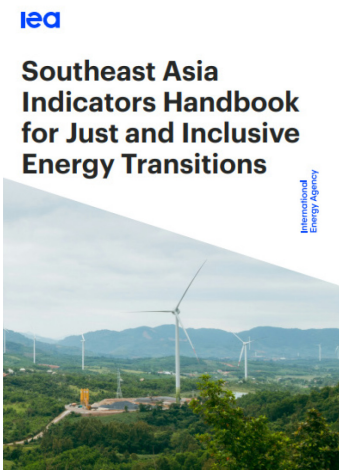
IEA Future of Energy Skills Workshop, in Paris, France, May 2025

Southeast Asian representatives also joined a series of workshops conducted in preparation of the Indicators Handbook for Just and Inclusive Energy Transitions by the IEA Global Commission on People-Centred Clean Energy Transitions. These included online workshops for labour representatives and G20 members, as well as an in-person workshop in Jakarta focused on just and inclusive energy transition indicators in Southeast Asia, attended by over 60 representatives, including policy makers, companies, trade unions, civil society and researchers. The event featured 12 expert presentations from across Southeast Asia on jobs, skills, equity, affordability, access and social inclusion, followed by breakout discussions on data gaps, barriers and opportunities for regional collaboration.

IEA Indicators for Just and Inclusive Energy Transitions Southeast Asia Workshop, in Jakarta, Indonesia, July 2025

Additional technical exchanges took place with two Indonesian ministries and key stakeholders, including the United Nations Development Programme, the International Labour Organization, the ASEAN Centre for Energy, the Just Energy Transition Partnership Indonesia and the German Agency for International Cooperation. These meetings focused on how to measure and maximise the positive social impacts of clean energy transitions in the region and provided an opportunity to learn about best practice, as well as remaining challenges that need to be addressed. Various case studies were included in the two Indicators Handbooks.

Bilateral meetings with the ASEAN Centre for Energy and the International Labour Organization Indonesia Country Office, Jakarta, Indonesia, July 2025



The IEA Southeast Asia Indicators Handbook for Just and Inclusive Transitions was published in November 2025. This document adapts the global Indicators Handbook for Southeast Asia, examining socio-economic benefits of clean energy transitions, such as new jobs, economic diversification, reduced energy poverty and improved air quality, alongside energy demand, investment, employment, access and household energy expenditure.

The Handbook includes 14 case studies from across the region on successful programmes linked to three themes: employment and skills; fair distribution, affordability and access; and social inclusion and participation. Each case study is accompanied by a list of indicators and evaluation methodologies. Designed as a technical resource, the Handbook provides guidance for governments and other stakeholders on identifying relevant indicators, as well as tools to track progress, evaluate the effectiveness of existing or planned programmes and support the design of just and inclusive energy policies. Ahead of the Southeast Asia Indicators Handbook, four online workshops engaged over 90 policy makers and labour, civil society and industry representatives to share insights on tracking clean energy transitions and contribute regional case studies.

IEA Southeast Asia Labour Online Workshop, 1 October 2025

IEA Southeast Asia Labour Policy Makers Online Workshop, 3 October 2025

The Southeast Asia Indicators Handbook was launched at a joint IEA-Tara Climate Foundation COP30 side event on fair and inclusive energy transitions in Southeast Asia. In addition, the document has been shared widely with stakeholders across the region, on social media and in regional publications, and has received positive feedback from policy makers, industry and civil society.

Energy data and statistics

The IEA has completed data collection on annual fuel statistics for the reference year 2023 and provisional energy supply data for the reference year 2024. Data for Indonesia, Singapore and Thailand were published in April 2025, thanks to the partnership with relevant government departments. Other countries' data were published in July 2025. End-use energy price data, primarily for transport fuels, as well as for other sectors and products when available, have been collected for several countries in the region. Key insights for Southeast Asia are featured in the 2025 editions of World Energy Balances, with associated emission estimates released in the Greenhouse Gas Emissions from Energy data service.

In April 2025, as part of a collaboration with Asia Pacific Economic Cooperation (APEC), the IEA presented the IEA Energy Statistics Roadmap at the 36th meeting of the APEC Expert Group on Energy Data and Analysis (EGEDA). The IEA work was linked to tracking energy transitions for the broader group of participants, as the EGEDA meeting was held together with the four expert groups of APEC. About 110 participants attended the joint meeting, including representatives from the national administrations of eight Southeast Asian countries (Brunei Darussalam, Indonesia, Malaysia, Papua New Guinea, the Philippines, Singapore, Thailand and Viet Nam).

In September 2025, through its partnership with APEC, the IEA presented at the 23rd APEC Workshop on Energy Statistics: Capacity Building in Conducting Household Energy Consumption Survey. The IEA's presentation focused on the Energy End Uses and Efficiency Indicators Questionnaire. The objective of the workshop was to identify the key data need for evaluating consumption and efficiency for the residential sector across different types of economies and to propose a formal survey questionnaire designed for the region. Forty-three participants attended the workshop, including representatives from the national administrations of six Southeast Asian countries (Indonesia, Malaysia, Papua New Guinea, the Philippines, Thailand and Viet Nam).

The IEA also delivered several initiatives for capacity development in the southeast Asia region in the broader framework of the work facilitated by the IEA Regional Cooperation Centre:

- In January, the IEA presented on the energy balances methodology and quality assurance framework at a United Nations Framework Convention on Climate Change three-day online workshop for a Pacific country, with contributions for the IEA and the United Nations Statistics Division.
- In April, the IEA organised the online Thailand Energy Intensity Decomposition Workshop for Thailand's Department of Alternative Energy Development and Efficiency, presenting the energy decomposition methodology and discussing possible bilaterial work.
- In June, the IEA organised the Demand-Side Data and Energy Efficiency Indicators Workshop for Southeast Asia, where more than 100 participants explored the theory of data compilation in the buildings, industry and transport sectors. The objective of the workshop was to build capacities in Southeast Asian countries for production of accurate demand-side energy data and efficiency indicators, in accordance with international standards, to better serve national policy needs.
- In November, the IEA contributed to the workshop organised by the German Agency for International Cooperation for the energy modelling community of practice on data acquisition for energy modelling for Thailand, with a presentation on energy data requirements for modelling.

China

Highlights

- **Supporting China's renewable energy planning:** The IEA supported the development of the 15th Five-Year Plan on renewables through dedicated analysis and workshops, providing China's National Energy Administration with evidence-based inputs and recommendations on renewable electricity, heat, transport, biogases and power market integration.
- **Driving industrial heat pump adoption in China:** IEA recommendations from the Future of Heat Pumps in China report directly informed China's 2025 Heat Pump Action Plan, supporting the accelerated deployment of efficient heating technologies in industry.
- **Advancing heat pump markets:** The IEA worked with China in 2025 to develop an advanced taxonomy for monitoring heat pump adoption and performance, supporting policy, industry decisions and cross-country comparisons, with release planned in early 2026.
- **Advancing renewables in industry and bioenergy:** The IEA provided analysis and policy recommendations on electrifying low-temperature industrial heat in China and showcased the role of bioenergy in industrial decarbonisation at the 2025 Biomass Energy Innovation & Development Forum.
- **Promoting distributed energy resources in China:** The IEA launched the "Experience from Frontrunner Systems" webinar series with Agora Energy China and the Energy Foundation, sharing international best practices on integration of distributed energy resources (DER) and supporting publication of the Integrating Distributed Energy Resources in China report to guide policy and accelerate the transition to a flexible, high-DER power system.
- **Strengthening energy efficiency in buildings and light industry:** In 2025, the IEA worked with the Ministry of Housing and Urban-Rural Development and key stakeholders to guide policy, share best practices and produce Energy Efficiency in Buildings: Policy Opportunities for China with translated resources. The IEA also supported the identification of priorities and stronger measures to advance energy efficiency in light industry for the upcoming Five-Year Plan.
- **Tracking China's energy transition finance:** The IEA published a report and interactive dashboard analysing Chinese official finance for energy transitions in emerging and developing economies, highlighting recent investment trends and policy impacts.

China is the world's largest energy producer and consumer, among the largest emitters of CO_2, accounting for around a third of global emissions, and the largest investor in clean energy technologies. As a result, decarbonising its entire energy sector and ensuring a secure and sustainable clean energy transition is critical not only for China, but for the world. Building on decades of engagement with policy makers and energy experts in China, the IEA is well positioned to provide technical assistance and policy advice. The IEA acts as a bridge between its Member countries and China on energy and climate issues of common concern, sharing findings, best practices and lessons learned from across the world. Thanks to these close ties, the IEA also offers unparalleled insights to its Member countries about data, policy and technology developments in China.

2025 was a significant year for energy and climate policy in China, including the publication of China's updated nationally determined contributions and the drafting of the macro-economic 15th Five-Year Plan (2026-2030). The IEA provided timely and effective policy advice on sectoral plans for renewable energy, power markets and energy efficiency. It also examined investment in energy transitions and China's official energy finance, focusing on its role in supporting energy transitions in emerging market and developing economies.

The IEA's activities in China for 2025 were informed by numerous consultations with policy makers, experts and representatives of IEA Member countries in China to ensure that the IEA responds to questions and gaps in energy sector analysis and policy.

Engagement in renewable energy in China

Renewable energy development under China's 15th Five-Year Plan

2025 marked the final year of implementation of China's 14th Five-Year Plan, to which the IEA contributed recommendations for renewable energy that were reflected in the final policy document. Under the plan, China achieved or surpassed several key targets ahead of schedule, delivered substantial growth in renewable capacity and generation and saw notable shifts in the power mix, demonstrating strong progress toward its renewable energy deployment.

In parallel, China began preparations for its 15th Five-Year Plan to define national priorities for the period from 2026 to 2030. Central and local governments, state-owned enterprises and planning bodies have conducted consultations and policy reviews to identify key economic, climate and energy objectives, guided by China's longer-term goals of carbon peaking before 2030 and carbon neutrality before 2060. Within this framework, the Five-Year Plan on

Renewable Energy Deployment serves as a dedicated sectoral plan that translates overarching objectives into concrete targets and policy measures for renewable electricity, heat, transport and biogases. In 2025, the IEA supported the development of the 15th Five-Year Plan on renewables through dedicated analysis and workshops, providing evidence-based inputs.

The policy advice process was initiated with the preparation and sharing of a draft report outline with the National Energy Administration (NEA). The proposed structure and priority topics were discussed in detail with 15 key NEA decision makers during an online closed-door meeting. The final report was submitted to the NEA in November 2025. It opened with an assessment of China's progress towards the objectives of the 14th Five-Year Plan on Renewable Energy (2020-2025), followed by forward-looking recommendations for the next five years across renewable electricity, heat, transport and biogases. These include, for example, suggestions on renewables integration and ongoing power market reforms. The report's policy recommendations were discussed with ten NEA stakeholders during a four-hour closed-door meeting in Beijing on 9 December 2025.

Renewables for industry

Building on previous exchanges with Chinese and international stakeholders, including the China Heat Pump Association, heat pump provider Moon-Tech and the Chinese Academy of Sciences, the project gathered perspectives on the electrification of low- and medium-temperature industrial heat and steam. As a result, a dedicated chapter on the electrification of low-temperature heat and steam was included in the Renewables in Industry: Electrification of Low-Temperature Heat and Steam report. This chapter assesses China's technical and economic potential for electrifying low-temperature industrial heat, drawing on cost analyses in five industrial provinces. It compares heat pumps and electric boilers, including thermal storage, with coal- and gas-fired boilers, evaluates relevant market and policy frameworks, and concludes with actionable recommendations supported by practical examples for effective policy design.

The IEA engaged with government, industry and academic stakeholders on complementary technologies for industrial decarbonisation. This included a keynote address on the role of bioenergy in the global energy transition at the April 2025 Biomass Energy Innovation & Development Forum, hosted by China's Biomass Energy Industry Promotion Association. The presentation highlighted the development potential of bioenergy and showcased best practices and innovative scale-up strategies. The use of bioenergy in industrial decarbonisation will be explored in 2026.

Presentation of the Renewables for Industry report by IEA Senior Energy Analyst, Ilkka Hanula, at the 2025 Biomass Energy Innovation & Development Forum, Beijing, China, 10 April 2025

Integration and distribution of variable renewable energy

In March 2025, the IEA launched a webinar series, "Experience from Frontrunner Systems", focused on integration of distributed energy resources in China. Co-organised with Agora Energy China and the Energy Foundation, the series aimed to facilitate knowledge exchange and provide practical insights from international experiences.

The first webinar, held on 26 March 2025, focused on Australia's experience, showcasing its remarkable growth in rooftop solar panels and home batteries, as well as the innovative mechanisms implemented at the distribution level, and featured speakers from the Australian Energy Market Operator, the Australian Renewable Energy Agency, and AusNet, an Australian energy delivery services business.

The second webinar, held on 14 May 2025, highlighted the European experience of integration of distributed energy resources. Contributions from the European Union Agency for the Cooperation of Energy Regulators, the European Power Exchange and SolarPower Europe informed the sessions, which explored key policies, innovative business models and mechanisms for local flexibility markets to alleviate distribution grid congestion. Chinese experts shared insights on the country's specific context and challenges. Interactive discussions and Q&A sessions helped to identify lessons from international experiences and explore solutions applicable to China.

The first two webinars gathered around 100 participants, primarily Chinese power sector experts. The insights gained from these sessions offer valuable guidance for China's transition toward a future with high penetration of distributed energy resources.

The Integrating Distributed Energy Resources in China report was published in both English and Chinese at the end of September 2025. A launch event was co-organised with Energy Foundation China and Peking University in Beijing on 21 October, attracting over 100 participants in person, and viewed online by more than 60 000 people. On 23 October, the report was presented at the Suzhou International Energy Transition Forum, at the sub-forum on New Power Systems, attended by the Vice President of the State Grid Corporation of China and a Director General of the National Energy Administration. The analysis was widely shared on Chinese media and in official WeChat channels.

Launch of the Integrating Distributed Energy Resources in China report at Peking University, Beijing, China, 21 October 2025

Presentation of the Integrating Distributed Energy Resources in China report at the Suzhou International Energy Transition Forum, Suzhou, China, 23 October 2025

Energy efficiency in China

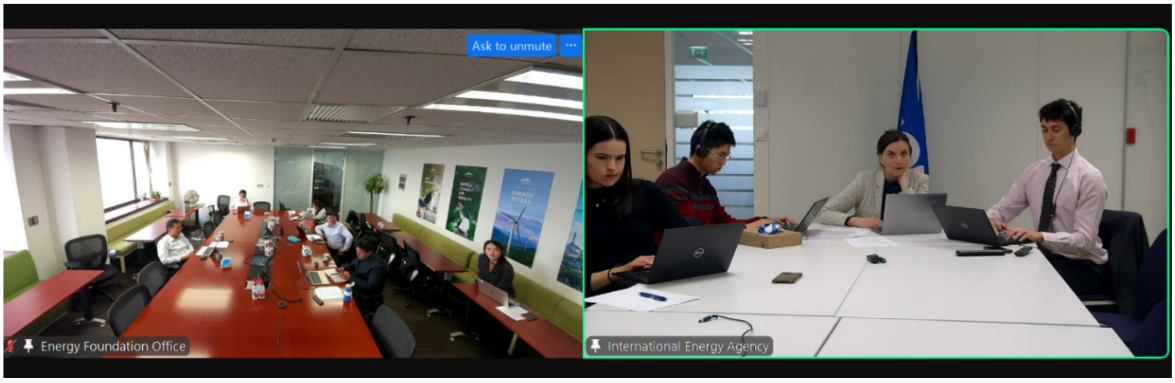
Energy efficiency in the buildings sector

In 2025, the IEA continued its collaboration to enhance energy efficiency in China's buildings sector, engaging with key national stakeholders shaping the sector, including the Ministry of Housing and Urban-Rural Development (MOHURD), the National Development and Reform Commission, the National Institute of Standardisation and the China Quality Certification Centre, among others.

In partnership with MOHURD, the IEA produced the Energy Efficiency in Buildings: Policy Opportunities for China report, scheduled for publication in March 2026, outlining priority actions to strengthen building performance and reduce emissions. Additionally, the IEA's Energy Efficiency 2024 report and the Energy Efficiency Policy Toolkit were both translated into Mandarin and published in May 2025, making key resources widely accessible to Chinese stakeholders.

The IEA held its first online workshop on building energy efficiency in China on 29 April 2025, with participants from MOHURD and Tsinghua University. The discussions focused on China's challenges in energy efficiency and lessons from European building codes. Preliminary findings from the workshop and from bilateral discussions with Chinese stakeholders were shared at the 10th Annual Global Conference on Energy Efficiency in June 2025, where MOHURD participated in a session on building efficiency.

In the second half of 2025, the IEA continued to develop policy recommendations based on consultative interviews with stakeholders in China's buildings sector, including the China Energy Service Companies Association, the China Green Building Council, the Institute of Finance and Sustainability, the Rocky Mountain Institute China, the Asian Development Bank and the Centre of Science and Technology Industrial Development, a research and policy support institution under China's MOHURD. IEA experts also delivered a speech online at the Beijing Green Development Forum in September 2025 on the role of building energy efficiency in the green transition.



Online workshop on Energy Efficiency in Buildings held on 29 April 2025

In October, IEA experts travelled to Beijing to conduct the second workshop on energy efficiency in buildings, with participants from across China. The event, on 14 October, featured presentations from the IEA on the report's preliminary policy recommendations, feedback from experts on an early draft and a presentation from the Centre of Science and Technology Industrial Development on China's upcoming Five-Year Plan priorities in the buildings sector.

The IEA presented on International Buildings Energy Efficiency Trends Globally at the Forum on Retrofitting Buildings for an Energy-Efficient, Low-Carbon Future, held in Beijing, China, 17 October 2025

The IEA also conducted an in-depth study of the financial mechanisms available for the retrofit of buildings in China, analysing the policy framework and collecting relevant case studies to highlight the progress in certain provinces. The launch of the final report is tentatively expected to take place in March 2026, coinciding with Tsinghua University's academic week.

The IEA took part in the China Council for International Cooperation on Environment and Development annual meeting, with presentations on Energy Efficiency and Inclusive Transition, Beijing, China, 16 October 2025

Energy efficiency in light industry

In 2025, the IEA advanced understanding and engagement on energy efficiency in China's industrial sector, with a particular focus on light industry. In the IEA Net Zero by 2050 Scenario, industry accounts for about one-third of China's total energy-sector CO_2 emissions, and non-energy-intensive industries represent almost 10% of industrial CO_2 emissions, highlighting the significant climate impact of energy use and efficiency improvements in these sub-sectors. Preliminary research and data analysis indicated a slowdown in energy intensity improvements during Covid-19, followed by renewed policy momentum in 2024-25, providing strong empirical support for promoting energy efficiency measures such as industrial heat electrification, heat pump installation and energy management systems.

On 28 June, the IEA held the China Energy Efficiency in Light Industry Workshop in Beijing, bringing together government, industry and academic stakeholders, with regional experts joining online. The workshop shared the IEA's preliminary analysis of China's industrial efficiency and international best practices and facilitated technical exchanges, including connecting Chinese heat pump policy makers with Australian and New Zealand practitioners. Key outcomes included identifying challenges and priorities for the upcoming Five-Year Plan, exploring financing solutions for energy efficiency upgrades, and highlighting energy efficiency as a cost-effective way to support grid responsiveness, typically costing less than half of building new generation capacity per unit of energy.

Bilateral discussions with industry leaders in China, including the state-owned China National Petroleum Corporation and the China National Offshore Oil

Corporation, explored how the energy efficiency measures they are implementing across their supply chains could be applied to light industry. Case studies were collected for analysis by the IEA to better inform downstream industries in China and other emerging economies on how to implement energy efficiency.

Scaling up heat pumps

IEA technical engagement with China has had a direct impact on the country's policies. Recommendations from The Future of Heat Pumps in China report directly influenced China's 2025 Heat Pump Action Plan, released in April 2025, which aims to drive the uptake of efficient heating technologies in industry.

Building on this progress, in 2025, the IEA's work on heat pumps centred on identifying globally recognised best practices and supporting the harmonisation of heat pump market data monitoring. Collaborating with China is particularly important given that it is the world's largest heat pump market and a key driver of global adoption and innovation. Activities began in January 2025 with a hybrid workshop, laying the foundation for developing a global heat pump taxonomy. Building on insights from this event and further research, the IEA drafted the first version of the taxonomy, which was discussed during an online plenary workshop on 26 June. A second hybrid workshop at the China Heat Pump Forum in Shandong Province on 30 July brought together around 35 in-person participants and more than 30 online attendees, including heat pump manufacturers, researchers and policy makers from major markets. The workshop examined global heat pump market trends and data collection methods to inform the development of the taxonomy.

Following earlier stakeholder consultations, a first working draft of the taxonomy was presented and discussed in an extended roundtable, which gathered feedback and explored areas where consensus remains limited, such as how to classify air-to-air heat pumps in global statistics. The IEA then developed an advanced version of the taxonomy, which was submitted for a second stakeholder consultation in December 2025. The final taxonomy is designed to support industry associations and other stakeholders to better monitor heat pump data across markets. This will support informed decision making and improved policy development and facilitate cross-country comparison. It is expected to be released in the first quarter of 2026.

Hybrid workshop on the importance of heat pump data for policy making and innovation, held at IEA headquarters in Paris, France, 23 January 2025

Accelerating sustainable energy investment in China

China has become a major actor in global energy finance, particularly for emerging and developing economies. Over the past decade, it has committed more than USD 55 billion annually to energy-related projects, with financing models that are increasingly diversified and shifting toward cleaner, more commercially driven investments. This evolution has significant implications for how energy transitions are financed and for the ability of countries to attract private capital and scale clean energy solutions. In December, the IEA published a report and interactive dashboard on China's official finance and its role in supporting energy transitions in emerging market and developing economies. The analysis combined public data from major Chinese policy banks with supplementary information from the Belt and Road Initiative platform and consultations with external partners to capture recent investment trends.

Building on the China section in the World Energy Investment 2025 report, the output provides a detailed, data-driven assessment of different modes of Chinese official financing from 2015 to 2024 and is designed to inform donors and partners on trends, instruments and evolving financing models.

A launch event in China was organised by Peking University on 9 July to present the latest global and China-specific findings from World Energy Investment 2025. Experts from Peking University highlighted the value of the analysis and data in informing policy and investment decisions and supporting China's continued progress in clean energy investment. During the mission, IEA experts also held a series of meetings with public institutions, industry associations and grid operators. These exchanges strengthened existing partnerships and established

new channels of engagement, supporting ongoing technical dialogue on China's evolving energy investment landscape.

Data and statistics

China's 2023 energy statistics and balance, along with preliminary 2024 estimates for select fossil fuel supply and electricity generation, were published in World Energy Balances, with associated emissions released in the Greenhouse Gas Emissions from Energy data service. End-use energy price data for oil, electricity and coal, sourced from the National Bureau of Statistics (NBS), Provincial Price Bureaus and estimates, were also released. The NBS provided data on energy technology R&D and demonstration, supporting the global investment analysis in the World Energy Investment 2025 report. By year end, the IEA received the 2023 data and historical datasets from 2019 onward, which will be analysed and incorporated in 2026.

In June 2025, the IEA held a series of workshops in China to improve the understanding of Chinese data, with the NBS (its provincial Centre in Jinan), the National Center for Climate Change Strategy and International Cooperation and the Ministry of Environment (with the NBS), the China Electricity Council, the School of Environment of Tsinghua University, and representatives from the Jinan Sinopec refinery statistics group. The IEA also held technical discussions on energy balances with the Deputy Commissioner of the NBS.

IEA visit to China to discuss the improvement of various energy and climate data, Beijing, 4 June 2025

In 2025, the IEA engaged in close cooperation with Tsinghua University on methodologies for estimating emissions from electricity and heat generation and on life cycle assessment of the power sector. The IEA also engaged with the National Centre for Climate Change Strategy and International Cooperation under the Ministry of Ecology and Environment.

Brazil

Highlights

- **Brazil requests IEA membership:** In 2025, Brazil officially requested to join the IEA, a milestone reflecting years of close collaboration and the country's growing role in global energy governance.
- **IEA-Brazil energy policy cooperation:** The IEA released its first comprehensive *Energy Policy Review* of Brazil in early 2025, at the government's request, marking a major milestone in the partnership and providing in-depth analysis to support policy development in Latin America's largest economy.
- **Supporting implementation of Brazil's National Energy Transition Plan:** The IEA provided technical input to revisions of the National Energy Transition Plan and conducted a policy assessment of hydrogen measure, energy efficiency in buildings, industry and transport, helping identify priority actions to strengthen Brazil's policy framework.
- **Advancing energy efficiency in Brazil:** In 2025, the IEA strengthened collaboration with Brazil's Energy Research Office and the Ministry of Mines and Energy through joint publications, high-level engagement and technical analysis. This included the Atlas of Energy Efficiency Brazil 2025 to monitor progress and inform policy, participation in global forums with senior Brazilian delegates and research on efficient appliances.
- **Supporting clean energy investment in Brazil:** In June 2025, the IEA convened its first Latin America Finance Industry Advisory Board meeting in São Paulo with Bloomberg, the Brazilian Development Bank and the Glasgow Financial Alliance for Net Zero Latin American and Caribbean Network, engaging investors on de-risking clean energy finance. This collaboration has supported two policies: the Brazil Investment Platform, providing a transparent project pipeline based on the IEA's G20 Clean Energy Investment Roadmap and Cost of Capital Observatory, and ECO Invest Brazil, a blended finance programme mobilising private capital for clean energy projects.
- **Driving progress on sustainable fuels:** The IEA worked closely with Brazil in 2025 to advance the country's leadership on sustainable fuels, contributing to the announcement of the Belém 4x Pledge, committing to quadruple production of sustainable fuels.
- **Advancing people-centred energy transitions in Brazil:** In 2025, the IEA worked with the Ministry of Mines and Energy and national stakeholders to develop indicators for just and inclusive transitions, contributing to the Global Commission's Handbook and Blueprint and highlighting Brazilian case studies.

Brazil has positioned itself as a global leader in the energy transition, underpinned by abundant renewable resources, a world-leading biofuels sector and increasingly ambitious climate and energy policies. The National Energy Transition Policy, alongside the National Energy Transition Plan and the National Energy Transition Forum, sets a clear pathway toward net zero emissions by 2050, reinforced in 2024 by landmark legislation (Low-Carbon Hydrogen Law, Brazilian Greenhouse Gas Emissions Trading System Law and Fuel of the Future Law) and the Energy Transition Acceleration Program, further boosting momentum for the energy transition. Long-term planning instruments such as the National Energy Plan and the Ten-Year Energy Expansion Plan provide strategic direction, while people-centred programmes emphasise energy access, affordability and social inclusion. Combined with Brazil's low-emissions power system, strong institutional capacity and growing focus on mobilising public and private finance, these efforts place the country in a strong position to shape the global clean energy agenda and serve as a benchmark for sustainable, inclusive growth.

Cooperation around the dual G20-COP30 presidencies in 2024-2025 has been the basis for a step change in the IEA-Brazil relationship. The IEA became the main international contributor to Brazil's leadership in multilateral climate and energy forums, as well as to its domestic policy planning and implementation, based on a continuous dialogue on energy transition policy priorities from the technical to the top level. The IEA's support to Brazil in exploiting its opportunities in the new global energy economy (low-carbon fuels, critical minerals and value chains) has a multiplier effect both in the region and globally. Over the last few years, collaboration has focused on energy scenario modelling, energy efficiency, data and statistics, energy market design, innovation, critical minerals, people-centred transitions and hydrogen. The Latin America Energy Outlook 2023 strengthened the IEA's relationship with Brazil and provided the basis for support to the design of Brazil's new National Energy Transition Plan in 2024. It also paved the way for a detailed review of Brazil's energy policies, published in 2025, which will inform further policy engagement. Reflecting the depth of this collaboration, in 2025, Brazil officially requested to join the IEA.

Brazil Energy Policy Review: A milestone in IEA-Brazil cooperation

IEA-Brazil cooperation reached a major milestone with the Energy Policy Review of Brazil. Prepared at the request of the government of Brazil, the *Energy Policy Review* represents the first comprehensive review of Brazil's energy policies by the IEA and reflects the deepening partnership between the Agency and Latin America's largest economy.

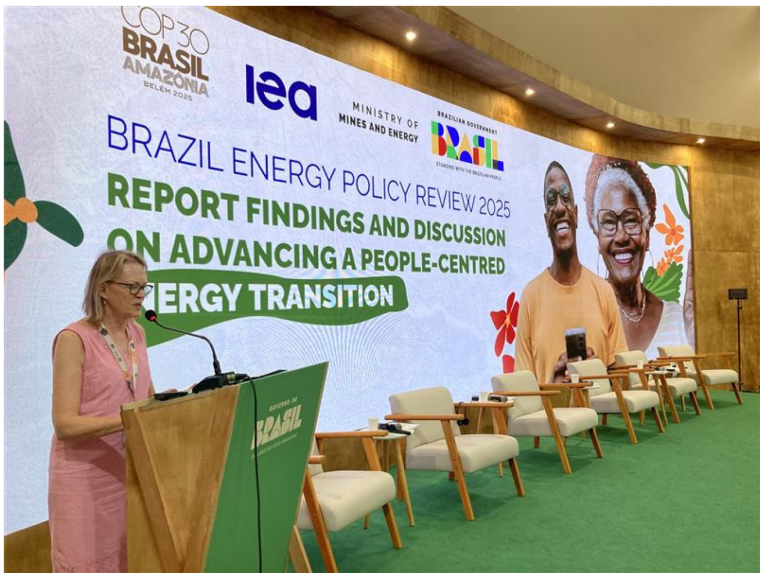
In February, a high-level IEA review team travelled to Rio de Janeiro and Brasília for an in-depth mission, engaging with the Ministry of Mines and Energy, the Energy Research Office, the Brazilian Electricity Regulatory Agency and a wide range of public and private stakeholders. Discussions focused on power system flexibility, energy jobs and skills, and on ensuring that oil and gas revenues support a fair and sustainable energy transition and other key strategic priorities. A dedicated workstream also provided recommendations to strengthen Brazil's energy statistics and data systems.

The review process combined extensive IEA analysis with peer input from IEA Member countries.

The Brazil Energy Policy Review was launched at COP30 in Belém by IEA Deputy Executive Director, Mary Burce Warlick, and Brazil's Minister of Mines and Energy, Alexandre Silveira. It recognised Brazil as a global energy leader, with one of the world's cleanest power systems, strong leadership in biofuels and ambitious climate and development goals. It also highlighted Brazil's unique opportunity to further scale low-emissions hydrogen, next-generation biofuels and modern grid infrastructure while placing people at the centre of the transition.

Launch of the Brazil Energy Policy Review *at COP30 in Belém, Brazil, 13 November 2025*

At its core, the report presents 29 policy recommendations to Brazilian authorities, reflecting best practices across electricity, clean fuels, infrastructure investment, social inclusion and governance, and providing a strategic foundation for future cooperation. Building on the recommendations, the IEA and Brazil are developing an energy data strategy for the next five years, based on the IEA's *Designing an Energy Statistics Roadmap*, and expanding collaboration on long-term energy planning, investment and policy design.



Mary Burce Warlick, IEA Deputy Executive Director, at the launch of the Brazil Energy Policy Review*, in Belém, Brazil, 13 November 2025*

Energy efficiency in Brazil

In 2025, the IEA and Brazil strengthened their collaboration on energy efficiency through high-level engagement, technical analysis and joint knowledge products. This included Brazil's active participation in major global forums such as the 20th Energy Efficiency Training Week and the IEA Energy Efficiency Roundtable, with a senior delegation from the Ministry of Mines and Energy and the Energy Research Office, joined by Sarquis José Buainain Sarquis, Brazil's Ambassador to international economic organisations in Paris.

Brazil's delegation from the Ministry of Mines and Energy and the Energy Research Office and the Ambassador of Brazil to international organisations in Paris at the 20th Energy Efficiency Training Week, Paris, France, 26 April 2025

The IEA supported Brazil's energy transition agenda by providing technical input to revisions of the National Energy Transition Plan and conducting an in-depth policy assessment of energy efficiency across the buildings, industry and

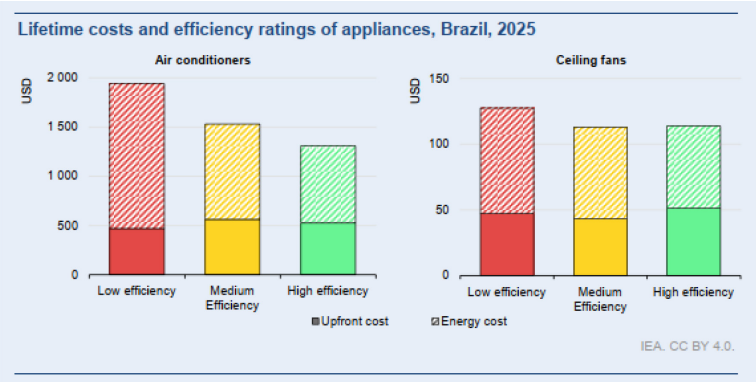
transport sectors. This work helped identify priority actions to strengthen Brazil's policy framework and accelerate efficiency gains across the economy.

Altas of Energy Efficiency

The IEA collaborated with the Energy Research Office (Empresa de Pesquisa Energética, EPE) on its Atlas of Energy Efficiency Brazil 2025. The Atlas, published in January 2026, includes a dedicated chapter on energy efficiency obligation schemes and builds on a strong track record of joint analytical work, including previous studies on iron and steel, low-income housing, and pulp and paper. The objective of the publication is both to monitor energy efficiency progress in Brazil and to promote the efficient use of electricity, reducing waste and optimising consumption. Prepared jointly by the IEA and the EPE, the publication directly informs Brazilian policy makers as they strengthen and expand programs and accelerate energy efficiency gains through adapted policies.

Advancing energy-efficient appliances in Brazil

The IEA also advanced work on efficient appliances in Brazil. Building on earlier global analysis, new market data collected in 2025 confirmed that high-efficiency air conditioners in Brazil can be delivered at prices comparable to those of less efficient models, strengthening the business case for ambitious appliance standards and smart technology deployment. This work was complemented by continued crowdsourced market data collection, reinforcing Brazil's leadership in data-driven energy efficiency policy.



Mobilising finance for energy transitions

In June 2025, the IEA convened its first-ever Latin America meeting of the Finance Industry Advisory Board, in São Paulo, marking a major milestone in engagement with the region's financial sector. Hosted by Bloomberg and co-organised with the Brazilian Development Bank and the Glasgow Financial Alliance for Net Zero Latin America and Caribbean Network, the meeting brought

together leading investors and financial institutions to discuss how to unlock private capital for clean energy transitions.

The dialogue focused on the key drivers of the high cost of capital in Latin America and practical solutions to de-risk investment and scale up clean energy finance. Participants highlighted the value of IEA analysis and scenarios in shaping investment strategies and expressed strong interest in establishing regular regional exchanges with the Agency.

The continued cooperation between the IEA and Brazil on clean energy investment, including through bilateral engagement and G20 processes, has resulted in concrete policy outcomes, supporting the development of two flagship initiatives:

- **Brazil Investment Platform:** An interministerial coordination hub for clean energy investments, led by the Brazilian Development Bank, which draws on the IEA's G20 Clean Energy Investment Roadmap and Cost of Capital Observatory to create a transparent, accountable pipeline of projects.
- **ECO Invest Brazil:** A blended finance programme designed to lower investment risks through long-term foreign exchange hedging and public-private co-financing. Its first auction has already supported clean energy projects, directly mobilising private capital for Brazil's energy transition.

People-centred energy transitions

The IEA engaged in a series of discussions with Brazilian counterparts at the Ministry of Mines and Energy (MME) under the Global Commission on People-Centred Clean Energy Transitions, which Brazil co-chairs. This work builds on the 10 Principles for Just and Inclusive Energy Transitions, which was endorsed by G20 leaders during Brazil's G20 Presidency in 2024.

In partnership with the MME, the IEA co-organised an in-person national workshop in Brazil on indicators to track just and inclusive energy transitions. The workshop brought together 20 participants from across government, including the MME, the Presidency Office, the National Secretariat for Energy Transitions and Planning, the Brazilian Electricity Regulatory Agency, the Energy Research Office and the Ministry of Foreign Affairs. This event formed part of a broader IEA stakeholder engagement process to develop the Global Commission's Indicators Handbook, which was released as a Presidency Document at a special Global Commission meeting during the G20 Energy Transition Working Group Ministerial in October in Durban, South Africa. Several Brazilian case studies were featured in both the Indicators Handbook and the Global Commission's Blueprint for Action on Just and Inclusive Energy Transitions.

In May 2025, the IEA hosted a global Future of Energy Skills Workshop with 65 external participants from government, industry, trade unions, academia and civil society. Several Brazilian stakeholders participated in person, including Mitsidi, an energy consultancy; ABEEólica, the Brazilian Association of Wind Energy and New Technologies; and EDP, one of the country's largest private companies operating in the electric sector. The workshop informed the 2025 World Energy Employment report and included several case studies from Brazil.

The IEA also co-organised a workshop with the European Union in Brussels in March 2025 on widening participation in clean energy transitions, featuring in-person participation from the Brazilian Institute for Consumer Protection.

Implementation of sustainable fuels

The IEA worked closely with Brazil to support its COP30 Presidency on sustainable fuels. Further details on this cooperation are presented in the COP30 section of this report.

The IEA convened a global workshop on sustainable fuels on 29 April, in collaboration with Brazil's COP30 Presidency, bringing together over 80 experts from government, industry, international organisations and civil society to advance international alignment on scaling up sustainable fuels. Discussions highlighted the need for a shared global level of ambition and consistent carbon accounting frameworks, as sustainable fuels – including biofuels, biogases, hydrogen and hydrogen-based fuels – play a critical role in decarbonising hard-to-abate sectors while supporting energy security and economic development. With demand projected to grow by 35% by 2030 but still falling short of long-term climate goals, participants explored challenges and solutions across transport, industry, finance and international cooperation, and provided strategic input for an upcoming IEA report to support Brazil's COP30 agenda, building on the IEA's broader work under the G20 and Global Biofuels Alliance.

IEA workshop on sustainable fuels at IEA headquarters in Paris, France, 29 April 2025

Hydrogen

In 2025, the IEA's collaboration with Brazil on low-emissions hydrogen began through inputs to Brazil's *Energy Policy Review* (EPR). The EPR recommended that Brazil scale up low-emissions hydrogen by stimulating domestic demand alongside the development of export opportunities, and by promoting hydrogen hubs to optimise infrastructure planning and reduce costs. While export markets offer significant upside potential for Brazil, the EPR emphasised that the development of a domestic market, particularly through increased low-emissions fertiliser production, will be critical to jump-starting a competitive hydrogen industry in the country.

Building on these recommendations, the IEA subsequently provided detailed feedback to Brazil's forthcoming National Energy Transition Plan, with a focus on better integrating objectives for domestic fertiliser production within the country's low-emissions hydrogen strategy and strengthening the role of domestic demand as a lever for early market development.

Energy data and statistics

The IEA's collaboration with Brazil in 2025 has been highly productive and has enabled the inclusion of high-quality Brazilian data in key IEA publications. Brazil successfully submitted all annual fuel questionnaires by the end of the first quarter. In February, a meeting was held with Empresa de Pesquisa Energética to review the data submission on coal, renewables, gas and electricity, and provide feedback. While discussions on data quality and applied methodologies are still ongoing, the progress achieved to date represents a significant step forward. Brazil's most recent annual energy statistics and balance were included in the summer release of the IEA's World Energy Balances, with associated emission estimates released in the Greenhouse Gas Emissions from Energy data service.

Brazil continued submitting end-use prices data and metadata through the fourth quarter of 2025, and a price report was submitted for the second consecutive time. The data cover transport, residential and industrial sectors. Transport fuel prices are now updated in the database on a monthly frequency. Brazil also continued its collaboration on energy end-use data gradually throughout 2025, submitting data on energy end uses and efficiency indicators from 2022 to 2024 across all sectors, as the information became available. In addition, R&D data were provided and successfully incorporated into the IEA database.

Over the year, Brazil actively participated in core IEA activities. In March 2025, five Brazilian participants attended the 30th Energy Statistics Course, as well as virtual training on energy balances, energy-related emissions and the development of end-use data and prices across energy sources and sectors.

In February, the IEA held two days of focused data discussions in the framework of the *Energy Policy Review* framed around the structure of the IEA Energy Statistics Roadmap. One of the key outcomes was the interest in developing a written energy data strategy that would drive the evolution of the Brazilian energy information system in the medium term. Collaboration on the data strategy started at the end of 2025, and the report is expected to be published in 2026.

IEA also supported the Brazilian Federal Court of Accounts in integrating the Energy Statistics Roadmap into their energy transition guide for supreme audit institutions.

Latin America

Highlights

- **2050 Energy Transition roadmaps for Chile and Colombia:** At the request of their respective governments, the IEA delivered flagship energy sector transition roadmaps for Chile and Colombia, providing clear, evidence-based pathways, policy priorities and investment signals to support a clean, secure and inclusive transition to net zero emissions by 2050.
- **Doubling appliance efficiency in Latin America:** The IEA supported governments to strengthen appliance standards and labelling, piloting the Super-Efficient Equipment Appliance Deployment Call to Action and accelerating regional alignment to unlock major energy savings by 2030.
- **Advancing low-emissions hydrogen in Latin America:** The IEA integrated hydrogen analysis into the net zero roadmaps for Chile and Colombia and supported regional uptake through targeted outreach, informing policy makers and industry on hydrogen opportunities, financing and supply chains across the region.
- **Building energy efficiency capacity in Latin America:** The IEA's 20th Energy Efficiency Policy Training Week and regional Energy Efficiency Roundtable in 2025 brought together policy makers from across Latin America to share global best practices. Building on this, the 2026 regional training week will be hosted in Mexico City, to further strengthen policy capacity in Mexico and the Caribbean.
- **Strengthening people-centred clean energy transitions in Latin America:** Senior leaders from Brazil, Chile and Colombia actively contributed to the IEA Global Commission, while regional workshops with the Latin American and Caribbean Energy Organization (OLACDE, previously OLADE)[1] engaged over 100 stakeholders to inform global guidance on just and inclusive transitions.
- **Unlocking clean energy investment in Latin America:** The IEA delivered region-wide analysis on energy investment trends, financing needs and cost of capital. It published a dedicated commentary with OLACDE and supported regional initiatives with partners such as the Inter-American Development Bank and the World Economic Forum to reduce investment risks, mobilise private capital and advance regional power market integration, including through high-level engagement on cross-border electricity markets and grid infrastructure.

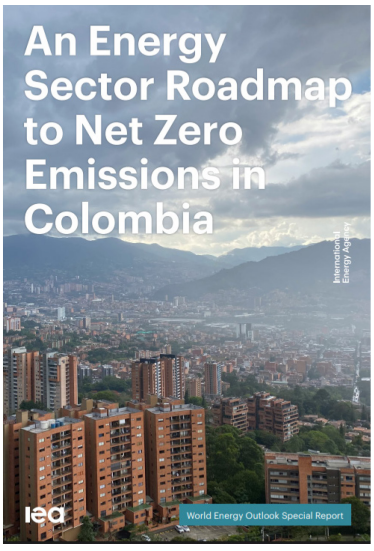
[1] In late 2025, the Latin American Energy Organization (OLADE) officially changed its name to the Latin American and Caribbean Energy Organization (OLACDE), integrating the Caribbean subregion into its name.

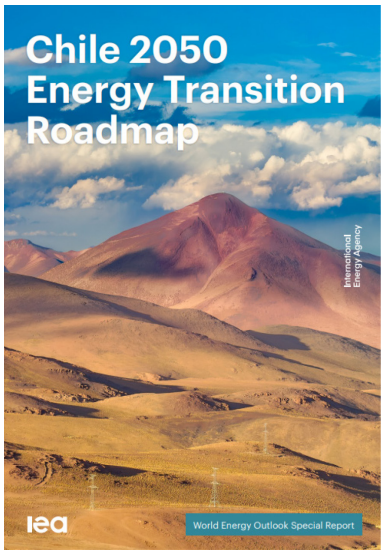
Latin America is well placed to play a strategic role in the global clean energy transition, drawing on abundant renewable resources, one of the world's cleanest electricity systems, and significant reserves of critical minerals essential for clean energy technologies. With renewables already accounting for around 60% of electricity generation, the region has a strong foundation to advance sustainable growth while contributing to global energy security, provided that enabling policies and international cooperation are sustained.

In 2025, building on the momentum generated by the Latin America Energy Outlook 2023, the CETP delivered an ambitious and policy-relevant work programme focused on supporting implementation of nationally determined contributions, advancing regional energy efficiency policies and scaling up low-emissions hydrogen, alongside other priorities aligned with national policy processes across the region.

Energy Transition Roadmaps

The IEA delivered two flagship special reports, An Energy Sector Roadmap to Net Zero Emissions in Colombia and the Chile 2050 Energy Transition Roadmap, providing clear, evidence-based pathways for achieving net zero emissions by 2050. Developed at the request of the two governments, and in close partnership with national authorities, the roadmaps outline the role of the energy sector, key policy actions and investment priorities needed to support a clean, secure and inclusive transition.





Grounded in the latest World Energy Outlook 2025 data and aligned with each country's nationally determined contributions, the reports use advanced scenario analysis tailored to national circumstances, strategic priorities and regional dynamics. They present realistic, data-driven pathways – not prescriptive blueprints – to guide policy making, investment and long-term

planning. Following Chile's national elections in December 2025, the final Chile report was published in January 2026.

An Energy Sector Roadmap to Net Zero Emissions in Colombia

The Colombia roadmap was developed through an intensive, collaborative process with the Colombian government. The IEA held eight technical sessions with public authorities to refine modelling assumptions and data, alongside three virtual multi-stakeholder workshops with industry, civil society and academia to capture perspectives on investment, power and industry transitions.

The roadmap is already shaping national policy. Its findings will inform the update of Colombia's National Energy Plan, led by the Energy and Mining Planning Unit, and will contribute to the development of the country's upcoming Nationally Determined Contributions 3.0. It also serves as a key analytical input to Colombia's Country Platform investment plan, which is coordinated by the Inter-American Development Bank (IDB), where the IEA acts as a knowledge partner.

The report was officially launched on 14 November at COP30 by the IEA Deputy Executive Director at a high-level event hosted by the IDB, attended by the Colombian Deputy Minister of Energy, the Director of the National Planning Department and senior regional leaders. The roadmap was widely recognised as a landmark contribution to Colombia's long-term energy transition strategy.

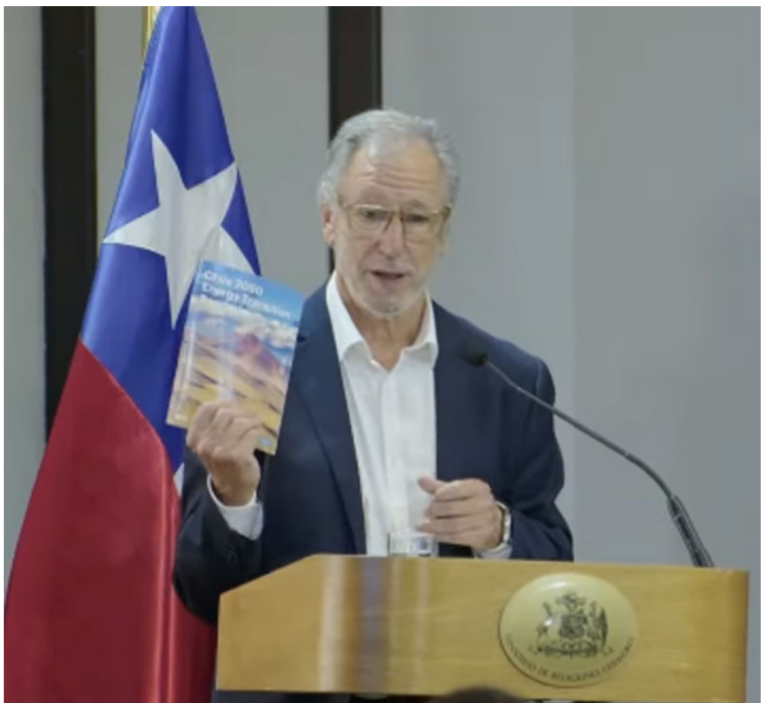
Launch of the IEA report, An Energy Sector Roadmap to Net Zero *in Santiago, Colombia, 14 November 2025*

Chile 2050 Energy Transition Roadmap

The Chile roadmap, produced by the IEA at the request of the government of Chile and in close collaboration with the Ministry of Energy, provides a comprehensive pathway for Chile to achieve its legally binding net zero

emissions target by 2050 while strengthening energy security, affordability and economic growth. Built around four key pillars – energy efficiency, power sector decarbonisation, end-use electrification and modern resilient grids – the roadmap outlines investment needs and opportunities to lower household energy costs and improve air quality, and highlights Chile's potential to leverage its renewable and critical mineral resources to move up the value chain and become a global leader in low-emissions hydrogen.

Launch of the Chile 2050 Energy Transition Roadmap *in Santiago, Chile, 14 January 2025*



H.E. Álvaro García, Vice minister for Economy and Energy, holds the Chile 2050 Energy Transition Roadmap *during the official launch of the report in Santiago, Chile, 14 January 2025*

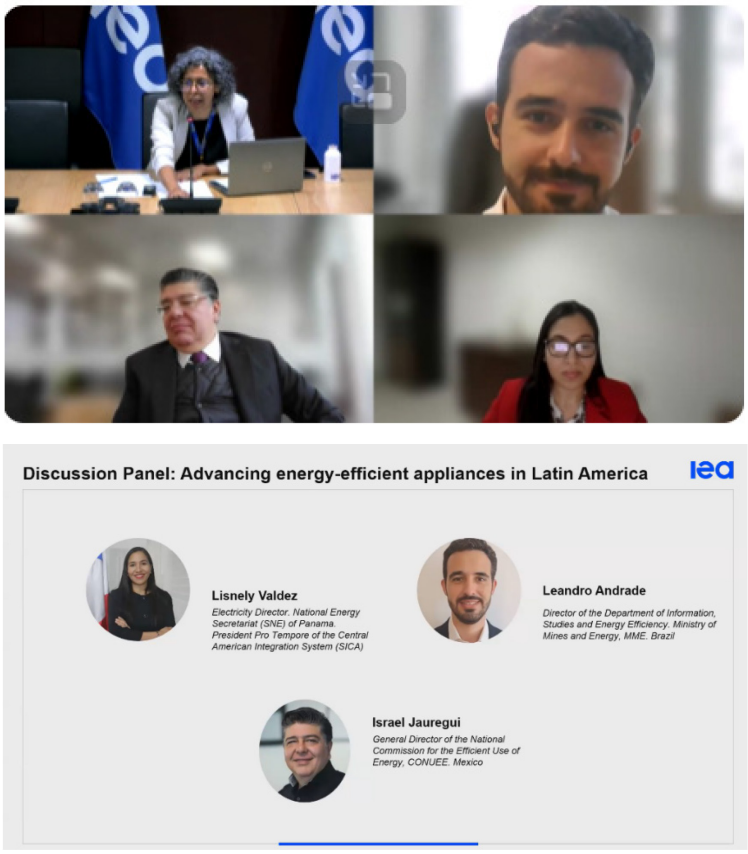
Advancing regional energy efficiency policy

Advancing efficient appliances

Global electricity demand is projected to grow by 60% by 2030, driven in part by the rapid uptake of household appliances. Energy efficiency is therefore a key lever to lower costs, strengthen energy security and reduce emissions. Well-designed policies, such as minimum energy performance standards and energy labels, can cut energy use by up to half. Latin America has been a global frontrunner, with countries like Brazil and Mexico implementing efficiency policies since the 1980s, and around two-thirds of the region now applying minimum energy performance standards and labelling schemes. Stronger implementation could deliver savings of nearly 40 TWh from appliances by 2030.

To support this momentum, the IEA and the Super-Efficient Equipment and Appliance Deployment (SEAD) Initiative launched a free online course, Appliance Energy Efficiency Policy, aimed at equipping policy makers, non-governmental organisations and businesses with practical tools to design effective policy packages. The Latin America regional launch event in October attracted 179 participants from 16 countries, with women representing 40% of attendees, and featured closing remarks from two regional partners, the Latin American Energy Organization and the Development Bank of Latin America and the Caribbean. A follow-up webinar brought together 180 participants and included a panel of government officials from Brazil, Mexico and Panama sharing national experiences.

Latin America also served as the pilot region for the SEAD Call to Action to double appliance efficiency by 2030. Following the development and publication of the SEAD Latin America Call to Action Pathway in 2024, the IEA recognised the importance of continuing to provide support to countries to align appliance standards across the region. In 2025, the IEA continued its work with the Central American Integration System (SICA), a regional body that promotes policy integration and cooperation across Central America, in its efforts to develop regional standards for appliances. This included a series of four workshops covering the design and implementation of energy efficiency policies for appliances. Government officials from SICA countries followed the online course on energy-efficient appliances policy to test the platform and the content of the course in Spanish.



Capacity building on energy efficiency

The 20th Energy Efficiency Policy Training Week in Paris was a key opportunity for capacity building on energy efficiency policy in Latin America, allowing policy makers from across the region to learn from global best practice and the experience of peers. Mexico was represented by staff from the Secretariat of Energy of Mexico, the National Commission for the Efficient Use of Energy and the National Electricity Commission. A further 11 government representatives from Argentina, Chile, the Dominican Republic, El Salvador and Panama joined the training week. The Energy Efficiency Roundtable took place on the sidelines of the IEA's 10th Annual Global Conference on Energy Efficiency Conference in Brussels in June, with participation of high-level officials from Brazil, Chile, Costa Rica, Mexico and Uruguay.

Building on this success, the IEA will co-host its 23rd Energy Efficiency Policy Training Week in 2026 in Mexico City, co-hosted with Mexico's Secretariat of Energy. This regional edition for Latin America and the Caribbean reflects the longstanding IEA-Mexico partnership on advancing energy efficiency and aims to further strengthen policy capacity across the region.

Latin American participants celebrate receiving their diplomas at the 20th Energy Efficiency Policy Training Week, in Paris, France, 7-11 April 2025

Support for implementation of nationally determined contributions

The IEA moderated a session on energy planning and nationally determined contributions at the Regional Forum of Energy Planners and the Regional Energy Planning Council of Latin America and the Caribbean, held on 5-6 June and organised by the Latin American and Caribbean Energy Organization and the United Nations Economic Commission for Latin America and the Caribbean. The session showcased IEA expertise on nationally determined contributions, energy modelling and key insights from the World Energy Outlook, while fostering an interactive dialogue on regional planning challenges and priorities.

People-centred clean energy transitions

Three key high-level stakeholders from Latin America, the Energy Ministers from Brazil, Chile and Colombia, serve on the IEA Global Commission on People-Centred Clean Energy Transitions. Their participation ensured that each ministry played an active role in the research and convening activities conducted under the Global Commission in 2025. Representatives from these three ministries attended the in-person meeting of the Global Commission in Brussels, held alongside the 10th Annual Global Conference on Energy Efficiency.

The IEA, in collaboration with the Latin American and Caribbean Energy Organization, organised a virtual regional workshop on indicators for just and inclusive energy transitions in Latin America and the Caribbean on 8 July 2025, bringing together 109 participants from governments and diverse stakeholder groups. The event supported the development of the Global Commission's Indicators Handbook to operationalise the G20 Principles for Just and Inclusive

Transitions by showcasing existing indicator frameworks and data practices from the region. Through plenary presentations of concrete examples in Brazil, Chile, Panama and Uruguay and interactive discussions, participants shared practical indicators, data collection approaches and institutional arrangements used to track people-centred clean energy transitions in the context of Latin America. Insights from the workshop will inform global guidance and future cooperation on monitoring just and inclusive energy transitions in the region. Meetings were also held with colleagues from the Ecuadorian Ministry of Mines and Energy and the Brazilian Energy Research Office to discuss their potential contributions to the Just Transitions Indicators workshop.

Eight case studies from Latin America were included in the Global Commission's final Indicators Handbook and Blueprint for Action.

Additionally, several Latin American stakeholders were engaged in activities organised as part of the people-centred programme. A professor and researcher from the Argentine National Council for Scientific and Technical Research participated in the two-day in-person IEA workshop on Widening Participation in Clean Energy, held on 13-14 March in Brussels. The Head of the Division of Participation and Social Dialogue of the Chilean Ministry of Energy participated in the two-day in-person IEA workshop on the Future of Energy Skills held on 13-14 May in Paris, and the Latin America SDG7 Youth Constituency Regional Focal Point participated in the side event on just transitions organised at the COP30 Regional Climate Foundations Pavilion in Belém, Brazil in November 2025.

Finally, the Secretariat presented the IEA's work on indicators for people-centred clean energy transitions at a meeting of the Technical Commission on Infrastructure and Energy Transitions of the Organisation of Latin American and Caribbean Supreme Audit Institutions.

Clean energy investments

Building on the Latin America chapter of the World Energy Investment Report and insights from the IEA's Cost of Capital Observatory, the IEA and the Latin American Energy Organization co-authored a joint commentary, Unlocking investment opportunities in Latin America's energy transition. The commentary highlights regional energy investment trends, future financing needs and successful renewable policies, and compares the cost of capital for clean energy projects in Brazil and Mexico with other emerging economies. It also sets out key policy recommendations to reduce investment risks and lower financing costs across the region.

To support deeper regional integration, the IEA partnered with leading institutions, including the Inter-American Development Bank (IDB) and the World

Economic Forum (WEF). In this context, the IEA contributed to the IDB-led Regional Initiative Energy Integration System of the Southern Cone Countries, which aims to establish a regional electricity market across Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay. This included two high-level in-person technical meetings in Uruguay and Argentina, where the IEA shared international best practices from markets such as the European Union and Nord Pool, and provided analysis on the regional optimisation of hydropower resources.

The IEA also supported a joint WEF-IDB initiative to promote public-private partnerships for grid infrastructure investment. Through a series of webinars, the IEA shared global evidence and best practices on mobilising private capital for power system development, with the outcomes published by the partner institutions in October.

Low-emissions hydrogen

Chile's 2050 Energy Transition Roadmap included a dedicated deep-dive chapter assessing low-emissions hydrogen opportunities in the country, while Colombia's Net Zero Roadmap covered hydrogen across several sections. Insights from Chile's roadmap, including key highlights and figures, were directly incorporated by Chile's Ministry of Energy in updating the National Green Hydrogen Strategy for 2026-2030, released in March 2026.

Outreach and dissemination activities included the in-person presentation of the Global Hydrogen Review at the opening session of the 6th Green Hydrogen Summit Chile LAC, held in Concepción on 22-23 April 2025, alongside keynote interventions by Chile's Ministry of Energy and the Vice President of Chile's Production Development Corporation (Corporación de Fomento de la Producción, CORFO), reaching an audience of nearly 1 000 participants. This was complemented by an extended technical presentation of the Global Hydrogen Review and Energy Technology Perspectives at the University of Concepción for about 200 faculty members, students and representatives from the Ministry of Energy, CORFO and the German Agency for International Cooperation. In addition, topics related to broader energy technology supply chains and opportunities for low-emissions hydrogen were presented and discussed in Madrid at a conference entitled "Where Europe and the Americas meet for energy dialogue", which brought together 100 participants from the private sector, public institutions from Latin America and other international organisations.

Online engagement with Spanish-speaking stakeholders continued through cooperation with H2LAC, a collaborative platform promoting the development of low-emissions hydrogen and its derivatives in Latin America and the Caribbean, including a dedicated regional presentation of the Global Hydrogen Review and

an ad hoc session on hydrogen project finance. Two country-focused presentations were organised for Colombia, one in collaboration with H2Colombia, a company dedicated to dissemination, promotion, design, development and commercialisation of hydrogen technologies, and one with the National Association of Entrepreneurs of Colombia, with around 100 participants. Data and analytical inputs related to Latin America were also provided to the United Nations Economic Commission for Latin America and the Caribbean and informed its special publication on low-emissions hydrogen in Latin America and the Caribbean, which was released in December 2025.

Amalia Pizarro, IEA Energy Technology Analyst, presenting at the 6th Green Hydrogen Summit Chile LAC, Concepción, Chile, 22 April 2025

Presentation at Madrid Energy Conference, "Where Europe and the Americas meet for energy dialogue", Madrid, Spain, 7 May 2025

Data and statistics in Latin America

The IEA's strong cooperation with Latin American countries drove meaningful advancements in the quality and scope of energy data collection and reporting. In particular, the annual energy balances for the reference year 2023 for Chile, Colombia, Costa Rica and Mexico were published in April, based on questionnaires submitted by the national governments, while 2023 data from Argentina and Brazil were also released in April, in a simpler format. Energy data

for 25 countries were included in the summer release of the IEA's World Energy Balances, with associated emission estimates released in the Greenhouse Gas Emissions from Energy data service.

End-use energy prices data for transport, residential and industry were collected from official sources and incorporated in the IEA database. Data were received directly for Argentina and Ecuador.

As part of the IEA accession process, IEA energy data experts conducted two missions to Colombia, in July and October, to discuss data work, focusing on short-term statistics. Notably, significant progress was made with Colombia on oil and electricity data, which are now shared monthly.

In January, the IEA participated in an online workshop organised in collaboration with the United Nations Framework Convention on Climate Change for another Latin American country to support the ministry in charge of energy in developing capacity to compile energy data for climate reporting.

Finally, the IEA maintained ongoing discussions with the Latin American and Caribbean Energy Organization throughout the year, further reinforcing collaborative efforts to improve energy data reporting and management in the region, particularly on monthly data and prices information.

Africa

Highlights

- **Supporting Kenya's energy policy and clean energy goals:** In April 2025, the IEA launched the *Kenya 2024 Energy Policy Review*, providing evidence-based recommendations on electricity access, clean cooking and renewable energy development. The review informed Kenya's draft National Energy Policy 2025-2034 and reinforced the country's role as a regional leader in energy and climate action.
- **First-ever *Energy Policy Review* for Mozambique:** In 2025, the IEA delivered the *Energy Policy Review* at the request of the government of Mozambique, providing a strategic roadmap to expand energy access, attract investment and support sustainable economic development. The review and the National Climate Resilience Assessment were launched in Maputo, strengthening evidence-based planning for the country's energy transition.
- **Launching Ethiopia's *Energy Policy Review*:** In April 2025, the IEA began developing Ethiopia's first *Energy Policy Review*, working closely with the Ministry of Water and Energy to provide tailored recommendations and support strategic planning for the country's energy sector.
- **Strengthening energy efficiency capacity across Africa:** In October 2025, the IEA co-hosted its largest-ever Energy Efficiency Policy Training Week in Accra, with Ghana's Ministry of Energy and Green Transition, the African Development Bank and the African Union.
- **Advancing universal access to clean cooking:** In July 2025, the IEA published Universal Access to Clean Cooking in Africa: Progress Update and Roadmap to Implementation, tracking how USD 2.2 billion in pledges and policy commitments by 12 African governments are translating into action. With USD 470 million already disbursed and strengthened national policies, the report provides guidance for investors and governments to accelerate access to clean cooking by 2030.
- **Driving global clean cooking policy under South Africa's G20 Presidency:** The IEA led the development of the Clean Cooking Infrastructure Investment Action Plan with South Africa's Department of Electricity and Energy and its Energy and Water Sector Education Training Authority, resulting in the Voluntary Infrastructure Investment Action Plan. Both documents were formally endorsed by G20 Energy Ministers and Leaders in 2025, a major milestone in closing the global clean cooking access gap.
- **Guiding investment for universal electricity access in Africa:** The IEA's *Financing Electricity Access in Africa* report provides evidence to inform policy

and investment decisions, helping governments and financiers target resources effectively to achieve universal access and ensure affordable energy services.

- **Supporting investment in Uganda's power grid:** At the request of the government of Uganda, the IEA developed an investment plan and user-friendly tool to guide transmission line expansion and support energy access, economic growth and critical minerals development.
- **Supporting Kenya's clean cooking transition:** At the request of the government of Kenya, the IEA is developing an investment plan for the Kenya National Cooking Transition Strategy, providing guidance on technology pathways, affordability, subsidy design and financing needs.
- **Supporting methane policy and regional exchange in Africa:** The IEA worked with Nigeria's Ministry of Petroleum Resources and the African Energy Commission to convene a Regional Roundtable and bilateral workshops, providing national methane estimates, abatement options and regulatory guidance to Nigeria and regional partners, strengthening emissions management and broader energy policy collaboration.

Africa is set to become home to one-fifth of the world's population by 2030 and to play an increasingly important role in the global energy ecosystem. However, the continent faces a wide and diverse range of energy challenges, including access deficits, security of electricity supply, infrastructure reliability and low efficiency standards. Boosting access to secure and sustainable energy in Africa remains essential. More than 600 million people on the continent currently live without access to electricity, and nearly 1 billion lack access to clean cooking supplies. Supporting these ambitions will require a step change in financing, including from the international community and the private sector. In recent years, the IEA has significantly and successfully increased its engagement with Africa, providing analysis on the issues most relevant to the continent's countries, such as clean cooking and financing clean energy transitions, creating global momentum through high-level events held on the continent and close interaction and direct support in development of their energy policies. In 2025, CETP activities built on these engagements to provide more tailored policy advice and take the engagement even further.

Sub-Saharan Africa

Collaboration on energy policy across Africa

Energy Policy Review of Kenya

In April 2025, the IEA launched its Kenya 2024 Energy Policy Review, which showed the country's continued strides toward universal electricity access, clean cooking solutions and renewable energy development.

The report was launched in Nairobi by Kenya's Minister of Energy and Petroleum J. Opiyo Wandayi and IEA Deputy Executive Director Mary Burce Warlick at an event attended by around 100 stakeholders from government, the private sector, non-governmental organisations, academia and financial institutions. In her keynote address, the Deputy Executive Director highlighted Kenya's remarkable progress towards its energy goals, as well as its role as a regional leader on energy development and climate action and a growing hub for start-ups.

Kenya is already a clean energy champion in sub-Saharan Africa. Low-emissions technologies serve as the cornerstone of the country's electricity mix, with geothermal, hydro, wind and solar sources accounting for nearly 90% of power generation in 2023. The *Energy Policy Review* offers recommendations on how Kenya can further harness its abundant renewable energy sources, strong institutions and skilled workforce to achieve its energy objectives.

Minister Wandayi noted that: "The collaboration with the IEA came at a particularly important moment for Kenya, as we have been undertaking a comprehensive review of our own National Energy Policy. The IEA's report offers timely insights that have helped inform our own policy decisions." Notably, the clean cooking recommendations in Kenya's draft National Energy Policy 2025-2034 align with those outlined in the *Energy Policy Review*.

Following the report launch, the IEA hosted a roundtable on the role of innovation in achieving Kenya's energy targets. This was structured around a presentation of the IEA Clean Energy Innovation Policies in Emerging and Developing Economies report, to which the Kenya Climate Innovation Center contributed a chapter. Nearly 50 participants discussed Kenya's position as a regional leader in research and development, emphasising Nairobi's growing influence on Africa's tech revolution and as a centre for clean energy progress.

From left to right, Syrine El Abed, IEA Africa Programme Manager; Alex Wachira, Principal Secretary, Ministry of Energy and Petroleum; the Honourable J. Opiyo Wandayi, Minister of Energy and Petroleum; Mary Burce Warlick, IEA Deputy Executive Director; and Eng. Isaac Kiva, Secretary for Reviewable Energy, Nairobi, Kenya, 14 April 2025

Mozambique Energy Policy Review

In 2025, the IEA delivered its first-ever Energy Policy Review of Mozambique, marking a major milestone in the country's energy transition and a strong example of demand-driven international cooperation. Requested by the government of Mozambique, the review provides a strategic roadmap to expand energy access, unlock investment and support sustainable economic development.

Developed through extensive in-country consultations with government institutions, utilities, the private sector, financiers, academia and civil society, the *Energy Policy Review* reflects national priorities and realities. Its recommendations were warmly welcomed by senior officials as practical, actionable and closely aligned with Mozambique's Energy Transition Strategy.

Despite political uncertainty following the 2024 elections, the IEA maintained close engagement with national counterparts, ensuring that the review stayed on track. The report was officially launched in October 2025 in Maputo during the Community of Portuguese Language Countries Energy Seminar, reaching a high-level regional audience. Translated into Portuguese, it was widely shared and discussed, generating national and international media coverage.

Early impact is already visible. National stakeholders have requested further IEA support, including power sector modelling, and the Ministry of Energy has expressed interest in signing a Memorandum of Understanding to deepen cooperation. The review is also directly informing the IEA's wider work on energy access and clean cooking in Africa, feeding into preparations for the 2026 Summit on Clean Cooking Access.

Rita Madeira (second from left), Africa Programme Manager of the IEA's Global Energy Relations Directorate, presents the report's findings to the Ministry of Energy and Mineral Resources of Mozambique and key energy agencies, Maputo, Mozambique, 20 October 2025

Energy Policy Review of Ethiopia

In April 2025, the IEA took the initial steps towards developing the *Energy Policy Review* through a collaborative effort with the government of Ethiopia. A scoping mission was conducted on 15 April, during which the IEA met with the Ministry of Water and Energy, which expressed strong interest in both the substance of the review and the peer-review process. The Ministry welcomed the involvement of peers from IEA Member and partner countries and followed up with a formal letter requesting the support from the IEA to develop the review.

The main review mission took place from 1 to 5 December 2025 in Addis Ababa, bringing together IEA experts and peers from the Danish Energy Agency, the French Development Agency and the Kenyan Energy and Petroleum Regulatory Authority. The mission featured three days of in-depth consultations, one day with government stakeholders (around 30 representatives from ministries, utilities and public institutions), and two days with non-government stakeholders, including development partners, financial institutions, private sector actors, civil society and academia. A dedicated session also engaged IEA Member-country embassies, including Italy, the United Kingdom, the United States and the European Union.

Discussions focused on key strategic themes, including renewables and the power sector, electricity and clean cooking access, electric mobility, climate and environment, and financing and investment. The mission concluded with a presentation of preliminary findings to senior officials at the Ministry of Water and Energy, followed by an extensive Q&A session. The assessment was very positively received, with the Ministry expressing strong appreciation for the IEA's

analytical support and data contributions, and confirming its interest in continued collaboration beyond the *Energy Policy Review*. The final report is scheduled for publication in the third quarter of 2026.

Energy Policy Review *peer review team during the visit to Addis Ababa, Ethiopia, December 2025*

Climate resilience for energy transition in sub-Saharan Africa

The National Climate Resilience Assessment for Mozambique was launched in person in a dedicated session during the 5th Energy Seminar of the Community of Portuguese Language Countries on 20 October in Maputo. The report has been translated into Portuguese, and 50 copies were printed for the launch event. The report is part of the IEA series of National Climate Resilience Assessments, which provides a standardised evaluation of the current and future risks to a country's energy system while identifying measures to enhance resilience to climate impacts and other risks of disruption. Mozambique's assessment identifies tropical storms, cyclones and floods as key risks to national energy infrastructure. With climate change, storms are projected to intensify, as are the risks of seasonal droughts and floods, posing a threat to the reliable operation of hydropower generation and the secure operation of the country's coal mines. In addition, the National Climate Resilience Assessments for Kenya and South Africa are in preparation, with the release planned for the first half of 2026. The exposure model and main findings from published National Climate Resilience Assessments were presented in person on 11 October at the World Bank's Workshop on Climate Resilience of Hydropower in Africa.

Participants of the 5th Energy Seminar of the Community of Portuguese Language Countries, Maputo, Mozambique, 20 October 2025

Energy efficiency

In October 2025, the IEA held its 21st Energy Efficiency Policy Training Week in Accra, Ghana, co-hosted with Ghana's Ministry of Energy and Green Transition and supported by the African Development Bank Group and the African Union Energy Commission. It was the largest edition to date, bringing together over 230 energy efficiency professionals from nearly 20 African countries. The event strengthened national and regional capacity, enabling participants to share experiences and learn from IEA experts how energy efficiency can support Africa's energy security, affordability and economic growth.

The training week was opened by Ghana's Minister of Energy and Green Transition, John Abdulai Jinapor, who highlighted its value for accelerating policy action across the continent and publicly thanked the IEA and its partners for supporting Africa's sustainable energy transition. Opening remarks were also delivered by the African Development Bank, underlining its continued commitment to regional cooperation and financing for energy efficiency.

The programme included the launch of the IEA's Financing Electricity Access in Africa report, presentations on universal access to clean cooking and high-level discussions on affordability and access. Five parallel training courses covered appliances and equipment, buildings, transport, industry, and monitoring and evaluation, combining policy frameworks with practical exercises. Participant feedback was overwhelmingly positive, with a 97% satisfaction rate and nearly 1 000 applications – a 30% increase from 2024 – demonstrating strong and growing demand for IEA capacity building across Africa.

The training week also deepened collaboration with regional partners. The United Nations Industrial Development Organization convened its Energy Efficiency for Sustainable Livelihoods in Africa Steering Committee alongside the event, enabling regional energy centres to participate directly. This strengthened cooperation with

the IEA, including future joint work on harmonising minimum energy performance standards for electric motors and expanded regional training activities.

The participants and IEA staff during the Energy Efficiency Policy Training Week in Accra, Ghana, 20-23 October 2025

From left to right: Eyerusalem Fasika, Country Manager at the African Development Bank; Hon.John Abdulai Jinapor, Minister of Energy and Green Transition of Ghana; and Melanie Slade, Senior Programme Manager, Energy Efficiency in Emerging Economies, Accra, Ghana, 22 October, 2025

From left to right: Sander Maebe, Energy Analyst, IEA; Nickson Bukachi Ongeri, Senior Policy Officer, African Energy Commission; Paula Edze, National Coordinator for Sustainable Energy for All, Energy Commission of Ghana; Mawefemo Modjinou, Principal Programme Officer Energy Efficiency, Economic Community of West African States Centre for Renewable Energy and Energy Efficiency; Mame Tabuah Ankoh, Senior Energy and Infrastructure Specialist, The World Bank; and Ashanti Mbanga, Project Manager, South African National Energy Development Institute, Accra, Ghana, 23 October, 2025

From left to right: Readlay Makaliki, Lead Technical Expert, Southern African Development Community Centre for Renewable Energy and Energy Efficiency; Tabitha Olang, Manager, Monitoring, Evaluation and Learning, Global Alliance for People and the Planet; Catherine Achuliwor, Senior Officer, Energy Commission of Ghana; Ashanti Mbanga, Project Manager, South African National Energy Development Institute; and Charles Michaelis, Independent Expert in Monitoring and Evaluation, Accra, Ghana, 22 October, 2025

Strengthening partnerships in Ghana and across Africa

The Accra Training Week provided a platform to further strengthen IEA engagement with Ghana. The Agency subsequently hosted a study tour of 25 Ghanaian policy makers and agreed a joint workplan with the Energy

Commission of Ghana for 2026, focusing on e-mobility, buildings, appliances and productive uses of energy.

In 2025, the IEA also formally joined the African Energy Efficiency Alliance as its official knowledge partner, supporting the Alliance with data, analysis, policy guidance and capacity building. As part of this role, the IEA supported the first African Energy Efficiency Conference in Addis Ababa in December, co-organised a pre-conference training on bioclimatic buildings and contributed to high-level ministerial discussions. Through these engagements, the IEA is helping to strengthen policy coordination, build institutional capacity and scale up energy efficiency action across the continent.

Brian Motherway (second from left), Head of the IEA's Office of Energy Efficiency and Inclusive Transitions, in the opening panel of the African Energy Efficiency Conference, Addis Ababa, Ethiopia,10 December 2025

Partners of the African Energy Efficiency Alliance during the Africa Energy Efficiency Conference, Addis Ababa, Ethiopia, 12 December 2025

Collaboration on energy efficiency with South Africa

In 2025, the IEA further strengthened its close collaboration with South Africa on energy efficiency throughout the country's G20 Presidency, supporting efforts to elevate energy efficiency as a core pillar of Africa's clean energy transition.

As part of this engagement, the IEA was invited by South Africa to join the African Energy Efficiency Facility. Launched under the G20 Energy Legacy Programme, the Facility aims to unlock a new pipeline of bankable energy efficiency projects across Africa by addressing key technical and financing barriers and translating policy ambition into concrete, investable action.

Variable renewable energy integration in Kenya

In 2025, the IEA advanced its work on variable renewable energy integration in Kenya through a workshop, a forthcoming white paper and targeted bilateral engagement, supporting the country's transition towards a more flexible, reliable and renewable power system.

The Variable Renewable Energy Integration Workshop was held in Nairobi on 22 October in collaboration with Kenya's Ministry of Energy, bringing together around 50 senior representatives from across the power sector, including government agencies, the regulator, utilities, private developers, industry associations and development partners.

Discussions highlighted the major opportunities offered by open access, the need to strengthen system operations and stability as wind and solar expand, and the importance of clear, forward-looking regulation to underpin Kenya's ten-year pathway towards a liberalised electricity market. Participants also emphasised the importance of regulatory predictability to sustain investment confidence and effective sector coordination during this critical transition period.

Insights from the workshop combined with IEA analysis and international best practice are being consolidated into a white paper to be published in first quarter of 2026.

Advancing universal access to clean cooking

The IEA has carried forward the momentum from the landmark 2024 Summit on Clean Cooking in Africa, co-hosted by the governments of Norway and Tanzania and the African Development Bank Group, by continuing to elevate the profile of clean cooking. Throughout 2025, the IEA continued to track progress on clean cooking access and infrastructure deployment, providing governments with data-driven advice on how to achieve universal access, and providing investors, clean cooking companies and African governments with opportunities to connect and facilitate deals.

Progress update on universal access to clean cooking

In July 2025 the IEA launched a new report, Universal Access to Clean Cooking in Africa: Progress update and roadmap to implementation, to provide insights into how investors and African governments can take advantage of the momentum from the summit to achieve universal access to clean cooking through informed policy reforms, investment decisions and further collaboration with the IEA. The report also tracks how the USD 2.2 billion in financial pledges and the policy commitments made by 12 African governments are translating into action. Since the summit, USD 470 million have been disbursed, which is above the annual average required to ensure that the financing commitments are fully delivered by 2030. At the same time, many countries have strengthened their clean cooking policy frameworks, including announcing and implementing new policies.

At the report launch event, Dr Fatih Birol, IEA Executive Director, and Laura Cozzi, IEA Director of Sustainability, Technologies and Outlooks, were joined by Lerato Mataboge, African Union Commissioner for Infrastructure and Energy, and Jacqueline Kawishe, Special Representative of the President of Tanzania for Clean Cooking.

Looking ahead, the IEA announced a second Clean Cooking Summit to be held in Nairobi in 2026, building on the success of the first summit in Paris in 2024. The second summit will be co-chaired by President William Ruto of Kenya, Prime Minister Jonas Gahr Støre of Norway, United States Secretary of Energy Chris Wright and IEA Executive Director Dr Fatih Birol.

In December 2025, the IEA welcomed a high-level Kenyan delegation from the Ministry of Energy and Petroleum to its Paris headquarters to begin discussions and preparations for the summit. During this time, IEA Executive Director Dr Fatih Birol held a video call with Kenya's Cabinet Secretary for Energy and Petroleum, Opiyo Wandayi, to discuss preparations for the upcoming IEA Ministerial and the second IEA Summit on Clean Cooking in Africa. Two days of meetings were also organised with different IEA teams to discuss the programme of work for the coming period.

Video call between (left screen) Opyio Wandayi, Kenya's Minister of Energy and Petroleum, and high-level representatives of the Ministry and (right screen) Dr Fatih Birol, IEA Executive Director, with the Kenyan delegates and the IEA team, December 2025

Also in December, the IEA launched a series of technical workshops aimed at tackling one of the sector's biggest challenges, scaling up financing. The first workshop was held alongside the African Energy Efficiency Conference in Addis Ababa in December 2025, bringing together clean cooking companies, donors and African governments. Further workshops are planned in 2026, including one aligned with the Ministerial meeting, providing African governments with a dedicated platform to present national programmes, connect directly with financiers and donors, and accelerate deal-making.

Collaboration with South Africa's G20 Presidency on clean cooking

The IEA was also the lead partner for the South Africa G20. At the G20 leaders' Summit in Johannesburg on 22-23 November, leaders formally endorsed the Voluntary Infrastructure Investment Action Plan. This marks a major milestone in global efforts to close the clean cooking access gap. At the G20 Energy Transition Working Group in October, the Action Plan received consensus endorsement from the G20 Energy Ministers, making it the only outcome to be unanimously endorsed by the G20 Ministers. To underpin this outcome, the IEA worked in collaboration with South Africa's Department of Electricity and Energy and its Energy and Water Sector Education Training Authority to develop the Clean Cooking Infrastructure Investment Action Plan.

Financing clean energy transitions in Africa

Collaboration with Kenya and Uganda

Mobilising greater investment in energy infrastructure remains one of Africa's most pressing challenges. Despite accounting for around one-fifth of the global population, the continent attracts just 3% of global energy investment. To meet

energy-related development goals, annual energy investment must more than double to more than USD 200 billion by 2030.

The IEA continues to provide practical guidance to help close this gap. Its Financing Clean Energy in Africa report (2023) offers key insights on boosting private investment and aligning different sources of capital with sectoral needs. In 2025, with support from the Portuguese government, the IEA released a Portuguese translation of the report to expand its reach, particularly across Portuguese-speaking countries in Africa. The launch event in April 2025, featuring IEA Deputy Executive Director Mary Burce Warlick alongside senior representatives from Portugal's Ministry of Energy and Environment and the African Development Bank Group, highlighted the IEA's commitment to making its analysis accessible to diverse audiences.

Uganda investment plan for the Grid Development Plan

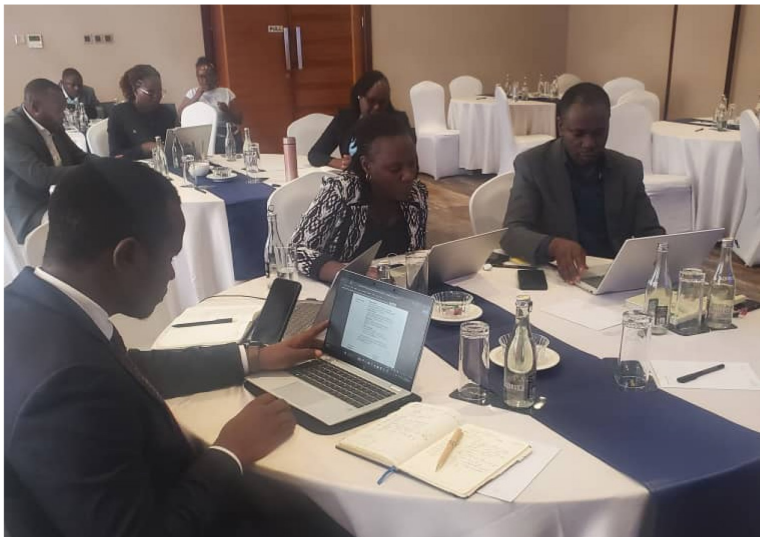
Uganda's Ministry of Energy and Mineral Development and the Uganda Investment Authority requested IEA support to develop an investment plan to prioritise investments for extending and strengthening transmission lines under Uganda's Grid Development Plan. The IEA developed a report and an easy-to-use tool to guide decision making on economic sectors, energy access and critical minerals development.

In October 2025, the IEA conducted a mission to Uganda, holding workshops and bilateral meetings to align the modelling approach with government and stakeholder priorities. Participants included representatives from the Ministry of Energy and Mineral Development, the Uganda Electricity Transmission Company, the Energy Regulatory Authority, the National Mining Company, and development partners such as the World Bank, the African Development Bank, the EU Delegation, the French Development Agency, the UK Foreign, Commonwealth and Development Office and the Netherlands Embassy.

Kenya investment plan for the National Cooking Transition Strategy

In Kenya, the Ministry of Energy and Petroleum asked the IEA to develop an investment plan for the Kenya National Cooking Transition Strategy. The forthcoming report will provide modelling and guidance on technology pathways (including bioethanol and liquified petroleum gas), affordability, consumer costs, subsidy design and financing needs. In October 2025, the IEA met with senior Kenyan officials to confirm strategic alignment and next steps, with publication targeted for the second quarter of 2026.

Workshop with the members of the Ministry of Energy and Mineral Development, Kampala, Uganda, October 2025



Technical training with representatives of the Ministry of Energy and Mineral Development, Kampala, Uganda, October 2025

In February 2025, the IEA published a commentary on how high financing costs are constraining clean energy investment in Kenya and Senegal, showing that despite strong investor interest and ambitious renewable targets, the cost of capital for projects in both countries remains significantly higher than in advanced economies. The analysis finds that utility-scale solar projects face financing costs of 8.5% to 9%, compared with 4.7% in Europe and 6.4% in North America, largely due to country-level risks, regulatory uncertainty and concerns about the financial health of state-owned utilities. The commentary highlights the critical role of concessional finance, risk guarantees and regulatory reforms in lowering capital costs and unlocking greater private investment for clean energy.

Investment guide for access and grids

The IEA's Financing Electricity Access in Africa report, published in October 2025, presents the first comprehensive tracking of public and private investment flows into electricity access across sub-Saharan Africa. It finds that achieving universal access within the next decade requires USD 150 billion, with around 40% needing to come from concessional finance. An additional USD 2 billion per year is required to ensure that basic energy services remain affordable.

The report was developed with contributions from KTH Royal Institute of Technology in Sweden, TSE Junior Etudes (the student-run consultancy of the Toulouse School of Economics), Sustainable Energy for All, Climate Policy Initiative and the Global Platform for Action. It was launched in Accra, Ghana, alongside the Energy Efficiency Policy Training Week, followed by a public webinar in November 2025. The launch, opened by IEA Deputy Executive Director Mary Burce Warlick, featured strong engagement from policy makers and practitioners. The report reached wide audiences through the Everything Energy podcast, with over 1 400 downloads in the first 48 hours, a media interview on the Mongabay news platform, as well as coverage across news outlets in Africa such as ESI Africa, The Vault News and Sun-Connect.

Launch of the Financing Electricity Access in Africa *report, Accra, Ghana, October 2025*

People-centred work

Sub-Saharan Africa played a central role in the IEA Global Commission on People-Centred Clean Energy Transitions in 2025. Six high-level African leaders sit on the Commission, including the Nigerian Minister of Labour, the South African Minister of Energy, the Mayor of Freetown and the President of the Congress of South African Trade Unions (COSATU), alongside the Global Focal

Point of the SDG7 Youth Constituency and the Director of the International Network on Gender and Sustainable Energy.

South Africa's Minister of Electricity and Energy, Dr Kgosientsho D. Ramokgopa, opened the IEA Global Commission meeting as part of the official G20 Energy Transition Working Group Ministerial Meeting held in Durban, South Africa in September. COSATU attended on behalf of the labour movement, highlighting the importance of tracking quality jobs and workforce development as core elements of a just energy transition.

Members of the IEA Global Commission on People-Centred Clean Energy Transitions at the meeting in Durban, South Africa, October 2025

This strong representation ensured that African perspectives were fully embedded in the Commission's research, analysis and convening activities throughout the year. Several of these leaders, including Nigerian Labour Minister Nkeiruka Onyejeocha, participated in the in-person Global Commission meeting held in Brussels during the 10th Global Conference on Energy Efficiency.

Zingiswa Losi, President of COSATU, IEA Labour Council meeting, Brussels, Belgium, June 2025

To support regional implementation, the IEA Secretariat and South Africa's Council for Scientific and Industrial Research co-hosted a virtual regional workshop in May on indicators for just and inclusive energy transitions, bringing together 65 participants from governments and stakeholder organisations across the continent. The workshop showcased African data practices and informed the Global Commission's Indicators Handbook, helping to operationalise the G20 Principles for Just and Inclusive Transitions through practical regional examples.

Sub-Saharan Africa featured prominently in the Global Commission's final Indicators Handbook and Blueprint for Action, with 16 African case studies. These included South Africa's skills mapping for renewable energy value chains and initiatives to empower women in clean energy in Kenya, Nigeria, Senegal and Tanzania. The Indicators Handbook includes examples from sub-Saharan Africa and input from African trade unions on tracking quality jobs and workforce development, as well as Kenya's Gender Mainstreaming National Energy Policy and Senegal's Foyré Rewbé programme, which aims to empower women economically in last-mile communities throughout Senegal as leaders, entrepreneurs and workers in the clean energy sector. African trade unions participated in the IEA Labour Employment Survey 2025 which fed into the IEA World Energy Employment 2025 report. The report included survey input on decent work and just energy transition requirements.

African stakeholders were also actively engaged in the IEA's broader people-centred programme, including participation in workshops in Brussels and Paris on widening participation in the clean energy sector and the future of energy skills. African trade unions, notably the African Regional Organisation of the International Trade Union Confederation, COSATU and the Nigerian Labour Congress, played a particularly strong role, contributing to the IEA Labour

Council meetings, co-chairing the Council, which took place on the sidelines of the 10th Annual Conference on Energy Efficiency.

The IEA also deepened dialogue with South African labour institutions by presenting its work on just energy transitions and G20 engagement at COSATU's Climate Change Commission in Johannesburg in April, and at a national trade union meeting coordinated by the National Economic Development and Labour Council in May.

The IEA also delivered a presentation on the Agency's work and the Global Commission to the United Nations Framework Convention on Climate Change (UNFCCC) Just Transition work programme during Africa Climate Week, held in Ethiopia in September, and moderated three discussions on just transition. In Ethiopia, the IEA also participated in the Energy Transition and Access session at the UNFCCC Implementation Forum and the Anglophone Nationally Determined Contributions clinic.

Methane emissions: Tracking and capacity building

The IEA strengthened its engagement on methane in Africa in 2025 through flagship analysis, regional convening and targeted regulatory support. The Global Methane Tracker 2025 was released in May. The accompanying Methane Tracker Data Explorer features detailed estimates for methane emissions and abatement potential at the regional and national level for fossil fuel producing countries in Africa, along with in-depth policy analysis for some of the major producers, including Algeria and Nigeria.

Building on this analytical foundation, the IEA partnered with the Nigerian Ministry of Petroleum Resources and the African Energy Commission to convene a Regional Roundtable on Turning Methane Pledges into Action in Abuja on 24-25 November. Hosted by the Nigerian Ministry of Petroleum Resources, the event featured opening remarks by the Honourable Ekperikpe Ekpo, State Minister of Petroleum Resources (Gas), and was attended by over 100 stakeholders, including international organisations, industry representatives and government officials from eight other countries in the region: Cameroon, Côte d'Ivoire, Gabon, Ghana, Mauritania, Mozambique, Senegal and Uganda. The participating countries represented a range of perspectives from both established and emerging producers at various stages of methane-related regulatory development. Nigeria and Ghana, which have both developed guidelines for their oil and gas sectors, shared experiences and lessons learned from the regulatory development process, along with insights into ongoing implementation efforts. Côte d'Ivoire, Mozambique and Senegal described current initiatives to measure and regulate emissions. Several countries expressed interest in drawing on international best practices to establish

methane provisions to enhance operational efficiency, increase revenues and improve eligibility for green finance opportunities. Nigeria expressed a strong interest in strengthening its partnership with the IEA and working together on a range of critical energy-related topics, from methane emissions management to clean cooking, energy data and energy efficiency.

Throughout the year, the IEA engaged in bilateral meetings with several regulators in the region, including two workshops organised by the Natural Resource Governance Initiative for Senegal and Nigeria. For each group of country stakeholders, the IEA presented national estimates for methane emissions and abatement opportunities, along with opportunities to strengthen the regulatory framework. In September, the methane team met with the Tanzanian Petroleum Upstream Regulatory Authority to provide an overview of IEA country estimates and discuss plans for establishing a methane reduction target.

Participants and IEA staff during the Regional Roundtable on Turning Methane Pledges into Action*, Abuja, Nigeria, 24-25 November 2025*

Data and statistics

Data collection for annual fuel statistics progressed successfully, leading to the publication of energy balances for Kenya and Senegal in the April release of World Energy Balances, followed by the July 2025 release covering all other countries on the continent. The IEA also published detailed data for Burkina Faso, Chad, Mali and Mauritania. As in previous years, end-use energy prices data primarily for transport and for residential and industry, when available, were collected from official sources and incorporated into the IEA database for 36 countries. Data were received directly for Botswana, Cabo Verde and Malawi. The associated emission estimates for these countries were published in August 2025 in the Greenhouse Gas Emissions from Energy data service.

Throughout the year, the IEA also strengthened energy data collection and capacity building across Africa:

In January, the IEA and the United Nations Statistics Division contributed to a three-day online workshop for a West African country organised by the UNFCCC and presented on the IEA Energy Statistics Roadmap.

In June, the IEA, in partnership with the Southern African Development Community (SADC) and the African Energy Commission (AFREC), held a Joint Regional Workshop in Zambia to strengthen national energy information systems for 15 SADC Member states. The workshop convened 33 data experts from energy ministries, statistical offices and energy agencies, aiming to improve the production, management and sharing of energy statistics. Participants assessed existing systems and developed strategies for improvement using the IEA's Energy Statistics Roadmap, enhancing regional capacity for reliable, timely and harmonised energy data.

The IEA, SADC and AFREC Joint Regional Workshop to Strengthen National Energy Information Systems for SADC Member states, Lusaka, Zambia, 23-27 June 2025

In June, the IEA co-hosted a webinar with AFREC focused on liquid petroleum gas data collection. The event attracted approximately 200 participants from across Africa, with active contributions from several countries. Following the strong engagement and positive feedback, the IEA was invited to continue the webinar series on other relevant energy data topics.

In October, the IEA and AFREC organised a webinar, Securing Africa's Energy Future: Building Robust Energy Security Data Systems, on how African countries can strengthen energy security data systems, showcasing data collection tools and examples of short-term energy security indicators which can be developed for the region. The webinar, with around 120 participants from energy ministries, regulators, central banks and academia, helped build a shared understanding of the meaning of "energy security data" in the African context.

In September, the IEA organised a workshop for Kenya and Senegal on driving energy efficiency through digitalised energy systems, including sessions on the role of data in evidence-based policy making and on end-use data and efficiency indicators.

IEA workshop for Kenya and Senegal on Driving energy efficiency through digitalised energy systems for inclusive clean energy transitions *at IEA headquarters in Paris, France, 24 September 2025*

In 2025, the IEA worked closely with South African partners to strengthen the collection and reporting of energy statistics, with a strong emphasis on supporting national institutions. Data collection for the annual fuel questionnaires went smoothly, with South Africa's energy balance for the reference year 2023 published in the World Energy Balances online data service in April. Transport end-use energy prices data were submitted by the country and incorporated in the IEA database.

In 2025, the UNFCCC, in collaboration with the IEA and the United Nations Statistics Division, initiated targeted work to strengthen South Africa's energy data and information systems. In February, IEA experts travelled to Pretoria for the Workshop on Quality Assurance of the National Energy Information Management System and Energy Statistics, providing recommendations to improve national energy data for climate policy. Building on prior online engagement, the IEA also held bilateral discussions with the Department of Mineral Resources and Energy to enhance fuel statistics and balances. In March

and April, the IEA participated in a follow-up workshop on quality assurance, contributing to sessions on demand data, methodologies and energy indicators.

IEA and UNFCCC Workshop, National Energy Information System of South Africa, Pretoria, South Africa, 11-14 February 2025

Middle East and North Africa

Highlights

- **Strengthening power system resilience and clean energy transitions in MENA:** The IEA 2025 report, *The Future of Electricity in the Middle East and North Africa*, provided evidence-based pathways for reliable, resilient and low-carbon power systems across the region.
- **Advancing methane policy in MENA:** In 2025, the IEA worked with Algeria, Egypt, Iraq and Libya to provide guidance on methane measurement, abatement technologies and regulatory approaches, helping producer countries reduce emissions while improving efficiency and energy security. In Algeria, a detailed programme was developed with the United Nations Environment Programme, the European Commission, the German Agency for International Cooperation and national authorities, including Sonatrach (Algeria's national oil company), to support methane monitoring, mitigation and capacity building in 2026-2027.
- **Strengthening Algeria's energy resilience to climate extremes**: The IEA's National Climate Resilience Assessment for Algeria, published with input from the Ministry of Energy and Mining, provides guidance to integrate climate risk into energy systems planning, infrastructure design and grid management.
- ***Energy Policy Review* of Morocco:** The IEA continued preparations for Morocco's third *Energy Policy Review*, scheduled for 2026, providing a comprehensive assessment of national energy policies and delivering practical recommendations to support a sustainable energy transition and strengthen long-term energy security.
- **Strengthening Morocco's renewable energy framework:** The IEA worked with Morocco's Ministry of Energy Transition and Sustainable Development on renewable energy policy, including technical guidance on Energy Attribute Certificates to enhance transparency and policy implementation.
- **Building energy data capacity:** The IEA supported capacity building on energy and industrial data through a regional SDG 9 webinar in partnership with international organisations, and provided in-person technical assistance to Morocco on energy balance data, offering strategic guidance on data collection, validation and processing to strengthen the country's energy information system.

The Middle East and North Africa (MENA) region remains a cornerstone of global energy markets, supplying around of one-third of global oil production and one-fifth of global natural gas production. The region is also witnessing fast growth in nuclear energy deployment, while renewable energy sources, notably solar PV, are also showing strong growth. However, rising populations and urbanisation, rising temperatures and economic growth are fuelling energy

demand in the electricity sector, putting pressure on MENA energy systems. Furthermore, ongoing conflicts continue to affect parts of the region, posing risks to global energy security, given the Middle East and North Africa's role as a key energy producer and host to critical energy trade chokepoints.

Regional engagement

All of the technical activities in the Middle East and North Africa were underpinned by high-level engagement with energy leaders and key stakeholders across the region, ensuring strong support, coordination, and alignment with regional priorities. The IEA continued its high-level engagement with energy leaders from the Middle East and North Africa, notably through interactions with IEA Association countries Egypt and Morocco, whose ministers attended the Summit on the Future of Energy Security in London in April. In addition, the IEA Executive Director met with the Secretary-General of the International Energy Forum, reaffirming the IEA's support for global energy dialogue, particularly with producer economies. The Executive Director also met at the IEA in Paris with representatives of the Arab Energy Club, a platform that brings together current and former energy leaders from across the Arab region.

Understanding the future of electricity systems

The power sector in the Middle East and North Africa region faces distinct vulnerabilities due to extreme heat and scarcity of water. With demand rising rapidly, driven by population growth, urbanisation and increasing temperatures, reliable and resilient power systems are essential to meet cooling and water desalination needs. While oil and gas wealth has fuelled economic development in several countries, others have experienced sharp declines in electricity demand due to conflict and economic hardship. Clean energy offers a pathway to revitalise regional economies by providing dependable electricity and enabling both energy-importing and energy-producing countries to benefit from clean energy value chains, as outlined in our report The Future of Electricity in the Middle East and North Africa.

Access to domestically produced energy enhances energy security and reliability, and countries across the region have set ambitious targets, including Saudi Arabia's goal of generating 50% of its electricity from renewables by 2030. Oman has begun decarbonising heavy industry, such as shipping, and several countries are positioning themselves within clean energy supply chains. Although not currently major producers of critical minerals, Algeria, Iran, Oman and Saudi Arabia are accelerating exploration for resources like lithium, zinc and copper. Morocco, meanwhile, has emerged as a hub for electric vehicle manufacturing.

To support the report's development, the IEA convened a one-day regional technical workshop in Muscat, Oman, bringing together around 40 representatives from 11 governments and energy companies based in IEA Member countries. The IEA Secretariat also participated in Kuwait Sustainable Energy Week in May, presenting preliminary findings across two regional energy transition panels.

Participants of the technical workshop in Muscat, Oman, 6 May 2025

Following the publication, the IEA organised a livestreamed webinar to present the findings and engaged key IEA committees and groups, including the CETP Funders Meeting, the Standing Group on Global Energy Dialogue, the Standing Group on Oil Markets and the Energy Business Council. IEA experts also met with senior officials in Association countries Egypt and Morocco and briefed interested IEA Member country diplomatic missions in the region.

Methane abatement

In 2025, the IEA continued its engagement with countries across the Middle East and North Africa on energy-related methane emissions, a critical issue for both climate mitigation and energy security. For producer economies in the region, reducing methane emissions offers one of the most cost-effective opportunities to lower GHG emissions while increasing the efficiency, reliability and market value of oil and gas production.

Discussions with Algeria, Egypt, Iraq and Libya focused on the scale of methane emissions in the region and on practical abatement solutions directly applicable to national circumstances, including improved measurement, leak detection and repair, and the deployment of proven technologies across upstream operations.

Engagement with Algeria continued in partnership with the United Nations Environment Programme, the European Commission and the German Agency for International Cooperation. A detailed programme of work has been developed for implementation in 2026-2027 in close cooperation with relevant

Algerian authorities, including the national oil company, Sonatrach, to support methane monitoring, mitigation and capacity building.

Climate resilience in Algeria

Algeria's energy system is increasingly vulnerable to climate extremes, including heatwaves, droughts, wildfires and floods. Temperatures are rising faster than the global average, driving higher electricity demand, especially for cooling, and reducing the capacity of gas-fired power plants. By mid-century, most gas plants could face prolonged periods above 35°C, increasing the risk of outages.

The National Climate Resilience Assessment for Algeria, published on 3 July with input from the Ministry of Energy and Mining and other key agencies, evaluates current and future risks to the country's energy system. It identifies flash floods, drought-driven wildfires and heatwaves as major threats. Rising temperatures could reduce gas-fired power plant capacity and strain the electrical grid, increasing the risk of outages during peak demand, especially from higher cooling needs. The report highlights urgent opportunities to strengthen energy resilience and protect Algeria's electricity security in a warming climate.

The report emphasises the urgent need for proactive climate resilience measures, including integrating risk assessments into energy planning and strengthening infrastructure to protect Algeria's electricity security, energy sector and communities in a rapidly warming climate.

Energy Policy Review of Morocco

The IEA and Morocco signed their new Joint Work Programme on the sidelines of COP29 in Baku in November 2024. Following up on this renewed joint commitment, from 11 to 13 February 2025, the IEA's experts visited Rabat to present analysis on renewable energy to the Ministry of Energy Transition and Sustainable Development. The mission aimed to strengthen collaboration between Morocco and the IEA and to build support for future joint work. Meetings with key stakeholders, including the Moroccan Agency for Solar Energy, the National Agency for the Regulation of Electricity, the German Agency for International Cooperation, the French Development Agency, the European Union Delegation and the Danish Embassy, helped identify priorities and opportunities for joint initiatives to advance Morocco's renewable energy agenda.

The visit marked the beginning of preparations for the IEA's *Energy Policy Review* of Morocco, the third conducted for Morocco since 2014, which is scheduled for publication in 2026. The review will provide a comprehensive assessment of Morocco's energy policies and deliver practical recommendations

to support the country's sustainable energy transition and strengthen long-term energy security. Furthermore, the Ministry of Energy Transition and Sustainable Development, which had sent a senior participant to an IEA Emergency Response Exercise in late 2024, made a request for the IEA to conduct an Energy Security Review, to be delivered in 2026.

Strengthening Morocco's renewable energy policies

Following the adoption of the decree introducing Energy Attribute Certificates (EACs) in Morocco, the Ministry of Energy Transition and Sustainable Development has highlighted the implementation of EACs as a key policy priority for collaboration with the IEA. EACs in Morocco are official certificates that verify that electricity has been generated from renewable sources, supporting transparency, green energy markets and policy implementation. An initial exchange on 9 April 2025 provided an opportunity to explore this topic in depth. During the discussion, ensuring the international recognition and acceptance of EACs was identified as a central challenge, underscoring the importance of targeted policy support and engagement to strengthen Morocco's renewable energy framework.

In response, the IEA provided targeted analysis and continued technical exchanges with the Ministry of Energy Transition and Sustainable Development. A technical meeting on 2 December examined the main challenges to the international recognition of EACs, including the implications of the Carbon Border Adjustment Mechanism and the role of private sustainability initiatives such as RE100. Following the meeting, the IEA shared further tailored analysis with the Ministry in mid-December, summarising key insights and illustrative examples to provide practical guidance for policy decisions and support the advancement of Morocco's renewable energy framework.

Enabling Oman's hydrogen transition

The IEA continued its long-term cooperation with Oman on hydrogen. In December 2025, the IEA participated in the Green Hydrogen Summit Oman. This summit brings together hundreds of stakeholders of the hydrogen sector in Oman along with international companies and leaders. Over the four editions already held, it has built an extraordinary platform for collaboration to progress in the advancement of the hydrogen sector in Oman. This year, the IEA contribution included a presentation of the key findings of the Global Hydrogen Review 2025, providing a global perspective on a panel about Oman's hydrogen vision. The IEA's presentation was very well received and helped inform subsequent discussions within the government of Oman on hydrogen policy and strategic development.

People-centred transitions in the Middle East and North Africa

In 2025, the IEA continued to strengthen cooperation with different energy and labour ministries and key stakeholders in the areas of skills and jobs, affordability, gender equality and inclusion of marginalised communities within clean energy transitions.

The IEA hosted the Future of Energy Skills Workshop, with 65 external participants, including policy makers, industry, trade unions, educators, researchers and non-governmental organisations from around the world. The workshop featured the participation of representatives from Econometric Research Limited, based in the MENA region, and the Institute for Essential Services Reform.

This workshop fed into the IEA World Energy Employment 2025 report, which includes detailed analysis on employment and skills. Energy companies, energy workers and their trade unions and educators based in the MENA region completed IEA Employment Surveys, with results included in the final report, in addition to quantitative analysis. A range of case studies from the MENA region were included in the report, including studies on education and training programmes and initiatives to attract young people and vulnerable people to the energy sector.

The IEA also presented its work on human capital and just energy transitions, including in the MENA region, at the International Forum on Energy for Sustainable Development, chaired by United Nations Economic and Social Commission for Western Asia in October 2025.

International Forum on Energy for Sustainable Development, Skopje, North Macedonia, October 2025

Data collection and capacity development

The IEA continues to collect comprehensive energy data across the MENA region. For the 2025 edition of World Energy Statistics and Balances, data for 18 countries were published, with associated emissions released in the Greenhouse Gas Emissions from Energy data service. End-use energy price data, primarily for transport and, when available, for residential and industrial sectors, were collected from official sources and incorporated into the IEA database. Algeria and Bahrain provided data directly.

In December, the IEA partnered with the Statistical, Economic and Social Research and Training Centre for Islamic Countries, the United Nations Industrial Development Organization, the International Telecommunication Union and the Statistical Center for the Gulf Cooperation Council to organise a webinar on Measuring Progress on SDG 9: Strengthening Statistical Capacities for Inclusive and Sustainable Industrialization.

Also in December, the IEA, in collaboration with the UNFCCC, provided targeted in-person technical assistance on energy balance data to Morocco. The three-day workshop brought together representatives from the Ministry of Energy Transition and Sustainable Development, the national energy regulator, the utility, the national oil company and other stakeholders. It produced strategic recommendations to strengthen Morocco's energy information system, with the IEA offering technical and strategic guidance on data collection, validation and processing for energy and climate purposes.

IEA and UNFCCC Workshop I, Quality Assurance of the National Energy Information Management System and Energy Statistics of Morocco, Rabat, Morocco, 15-17 December 2025

Ukraine

Highlights

- **Energy-efficient reconstruction in Ukraine:** The IEA supported the government of Ukraine and national stakeholders in advancing building reconstruction and renovation with a focus on energy efficiency, digitalisation, job creation and alignment with net zero emissions. The IEA also published a commentary, *Rebuilding better and faster – why energy efficiency is key for Ukraine*, to highlight the benefits of efficient building upgrades.
- **Advancing Ukraine's power sector:** In 2025, the IEA supported implementation of key policies from its *Empowering Ukraine Through a Decentralised Electricity System* report through workshops on distributed energy, storage, system operators and grid flexibility, helping advance national energy transition priorities and strengthen electricity security.
- **Expanding renewable energy in Ukraine:** The IEA published *Policy Options to Accelerate Distributed Solar PV in Ukraine*, providing tailored pathways to scale up solar deployment while balancing speed, government support and system integration. The report was launched online in December 2025 with participation from Ukraine's Deputy Minister of Energy and national experts.

As Ukraine entered the fourth year following Russia's full-scale invasion, ensuring reliable access to heat and electricity for citizens has remained a critical priority. Despite significant progress in rebuilding and strengthening energy system resilience in spring and summer, the situation is fragile, with heightened risks of major disruptions as attacks grow in scale and sophistication. Ukraine continues to balance urgent short-term energy security needs with efforts to maintain uninterrupted heat and power supply nationwide. At the same time, Ukraine has set out an ambitious long-term vision through its 2050 Energy Strategy and 2030 National Energy and Climate Plan, focused on European integration and decarbonisation. Investing in decentralised energy resources alongside rebuilding damaged infrastructure will support progress towards a net zero future while keeping energy security at the core of the country's strategy.

In 2025, the IEA expanded its support to new areas that represent Ukraine's key short- and medium-term priorities for the energy sector as it faces myriad complex challenges during the ongoing war. This growing engagement was also set out in the IEA-Ukraine Collaboration Programme for 2025 to 2028.

Energy efficiency

Ukraine's building stock has faced unprecedented challenges since Russia's full-scale invasion in 2022, with extensive destruction of critical infrastructure and the displacement of millions of people. Amid the devastation, the priority is not simply to replace buildings as they once were, but to rebuild in ways that improve people's daily lives and strengthen communities. Putting energy efficiency at the heart of Ukraine's recovery ensures homes that are warmer, safer, and more affordable for families, while also creating jobs, boosting the economy and strengthening energy security. The IEA works to support the government of Ukraine and key national stakeholders in advancing the reconstruction and renovation of buildings during and after the war, with a strong focus on energy efficiency, job creation and alignment with net zero emissions by 2050. As a result, Ukraine's buildings will be more resilient, comfortable and affordable and will align with the country's climate and energy security goals as part of its long-term recovery.

In 2025, in response to a request from the Ministry of Infrastructure, the IEA continued to work on a project to deliver a set of policy recommendations for a coherent package to strengthen energy efficiency and digitalisation in buildings, drawing on international best practices. The project provided technical inputs to support the update of minimum energy efficiency requirements for buildings scheduled for 2025.

In addition to direct engagement, in October the IEA published an analytical commentary, Rebuilding better and faster – why energy efficiency is key for Ukraine, based on modelling to show how upgrading building envelopes and heating systems offers significant benefits

Distributed energy resources

Following publication of the report Empowering Ukraine Through a Decentralised Electricity System, in 2025, the IEA supported Ukraine in implementation of the most urgent policies identified in the roadmap through targeted analysis and technical workshops. From 10 to 12 June in Copenhagen, two workshops were co-hosted with the Danish Energy Agency. The first focused on barriers to increased deployment of distributed energy resources in Ukraine, addressing both operational and regulatory challenges, and the second, held under the EU4Energy programme, was dedicated to energy storage.

Participants of the workshop on electricity systems in Ukraine, Copenhagen, Denmark, 10 June 2025

In October, the IEA held a hybrid workshop in Kyiv on the role of distribution system operators, which was followed in November by an EU4Energy workshop, co-hosted with the Energy Community Secretariat, on flexibility and active consumers. Both workshops were strongly endorsed by Ukrainian stakeholders and directly responded to priorities identified by national counterparts, helping advance policy discussions and practical next steps.

Workshop on the role of distribution system operators, Kyiv, Ukraine, October 2025

In parallel, the team maintained close working-level exchanges with Ukrainian and European partners and contributed to international forums on interconnections, import capacities and power sector resilience, reinforcing policy alignment and supporting Ukraine's efforts to strengthen electricity system security.

Distributed solar PV

Ukraine has significant potential to expand renewable energy, which can play a critical role in diversifying energy supply and strengthening resilience. As part of its work on distributed energy resources, the IEA developed and published the Policy Options to Accelerate Distributed Solar PV in Ukraine report.

The report reviews Ukraine's current policy and market context and sets out three pathways to accelerate the deployment of distributed solar photovoltaics. These range from a fast-track approach relying on strong public support to drive rapid uptake, to incremental enhancements of existing incentives and a longer-term, system-friendly model focused on real-time self-consumption and targeted support. Together, the options illustrate different ways to balance deployment speed with levels of government intervention.

The report was officially launched at an online event on 4 December. The event brought together a strong group of speakers and experts who shared insights on Ukraine's distributed solar potential, including Ukraine's Deputy Minister of Energy, Roman Andarak.

Data and statistics

In 2025, Ukraine's statistical office was unable to submit its latest annual fuel statistics due to the ongoing impact of the Russian invasion. The IEA addressed this by using alternative data sources and developing new estimation methods, to ensure the continued publication of comprehensive energy and emissions statistics. The 2023 fuel statistics were estimated by the IEA, and the 2023 energy balance was released in April with input from national experts and non-governmental organisations. Preliminary 2024 estimates of select fossil fuel supply flows were published in July, and the associated emissions were released in August 2025.

Despite the challenging circumstances, Ukraine successfully submitted energy end-use and efficiency indicators in February 2025, including selected national activity data up to the 2023 reference year. The IEA published end-use prices for transport fuels based on the State Statistical Service of Ukraine, and residential and industrial electricity and natural gas prices based on data from Eurostat and the Ukraine Ministry of Finance.

In 2025, Ukrainian statisticians engaged in multiple IEA activities thanks to synergies between the CETP and the EU4Energy initiative. In March, they joined an online workshop on the role of energy data in climate tracking, and in October, they participated in the 30th Energy Statistics Course, with dedicated language support from EU4Energy. During the final EU4Energy Phase II workshop in Riga, the IEA held bilateral meetings to understand Ukraine's

priorities on energy data and plan future support. In November, the IEA presented the new version of the annual fuel questionnaires to Ukrainian statisticians and introduced the virtual platform for data collection and query exchanges. In December, a bilateral meeting was held to discuss data revisions as well as forthcoming energy balances and end-use data. These initiatives enhanced Ukraine's ability to produce accurate energy balances, end-use data and emissions estimates, while allowing the IEA to access more reliable data despite the immense pressures faced by the country.

Pillar II – Multilateral coordination

Highlights

- Three COP30-IEA High-Level Energy Transition Dialogues were held, in Brussels, Addis Ababa and New York, hosted jointly by the IEA and Brazil's COP30 Presidency, with support from the UNFCCC Secretariat and the UN SG Climate Action Team.
- Brazil pledged to quadruple production of sustainable fuels (Belém 4x Pledge), based on the IEA report Delivering Sustainable Fuels: Pathways to 2035.
- The G20 Energy Ministers endorsed the Voluntary Infrastructure Investment Action Plan in Durban in October, building on the Clean Cooking Infrastructure Investment Action Plan co-developed by the IEA, South Africa's Department of Electricity and Energy and its Energy and Water Sector Education Training Authority, with contributions from African stakeholders.
- The Indicators Handbook for Just and Inclusive Energy Transitions was released as an official G20 Document at a meeting of the Global Commission, on the margins of the G20 Energy Transition Ministerial Meeting in Durban in October 2025.
- The Group of 7 (G7) Critical Minerals Action Plan, endorsed by Leaders at the Kananaskis Summit in June 2025, was shaped by IEA input.
- The Baku to Belém Roadmap to USD 1.3 trillion, a joint effort of COP29 and COP30 Presidencies, shaping global efforts to mobilise public and private finance for energy access and clean energy transitions, was informed by IEA expertise.
- IEA supported the development of the Biofuture Platform 2025 Action Plan, which provides leading analysis on biomass supply, carbon accounting, biochemicals and biomaterials, and priorities for international policy coordination.
- The first-ever high-level Regulatory Energy Transition Accelerator Forum was held at the Clean Energy Ministerial in Busan, Korea in August 2025.
- Renewable energy targets in new nationally determined contributions were tracked and integrated into the flagship Renewables 2025 report, providing global assessment alignment with the COP28 pledge to triple renewable capacity by 2030.

Support for Brazil's COP30 Presidency

In 2025, the IEA provided comprehensive convening and analytical support to Brazil's COP30 Presidency, as a strategic advisor on the COP30 energy agenda.

A key feature of the IEA's mobilisation and convening were the joint IEA-COP30 Presidency **High-Level Energy Transition Dialogues,** co-chaired by COP30 President Ambassador André Correa do Lago and IEA Executive Director Dr Fatih Birol, building on previous editions that helped shape the UAE Consensus at COP28 and the energy outcomes of COP29. Organised in collaboration with the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat and the UN Secretary-General's Climate Action Team, the Dialogues convened senior decision makers to inform energy priorities for COP30 and beyond. Three dialogues were held in 2025, directly shaping Brazilian President Luiz Inácio Lula da Silva's energy-focused leader's-level discussion on energy at the Belém Climate Summit in November.

Building consensus on key energy actions through dialogue and mobilisation: IEA High-Level Energy Transition Dialogues

The IEA launched the 2025 High-Level Dialogue series in Brussels on 11 June, hosted by the European Commission and President Ursula von der Leyen, with a keynote speech from Teresa Ribera, the European Commission's Executive Vice President for a Clean, Just and Competitive Transition. The meeting brought together more than 50 high-level participants from across Africa, Asia, Europe, the Middle East and North and South America, with a focus on accelerating the implementation of existing COP energy commitments. The IEA and the COP30 Presidency co-hosted a second High-Level Dialogue in Addis Ababa on 8 September, as part of the Second Africa Climate Summit. Nearly 50 African energy leaders discussed regional priorities for COP30, with a focus on mobilising finance, expanding electricity and clean cooking access, and reducing cost of capital and investment risks. The third High-Level Dialogue was held during the UN General Assembly and formed part of the UN Secretary-General's "solutions dialogues" for accelerating clean energy transitions, feeding directly into the UN Secretary-General's Special High-Level Event on Climate Action. This dialogue focused on sustainable fuels and the COP28 commitment to transition away from fossil fuels in a just, orderly and equitable manner. The outcomes of the three 2025 High-Level Energy Transition Dialogues informed the energy session chaired by President Lula at the Belém Climate Summit on grids and storage, sustainable fuels and clean cooking. The session brought together around 40 participants, including 20 Heads of State and Government

and the United Nations Secretary-General. The IEA was the only international energy organisation in attendance, underscoring its central role in supporting the COP30 energy agenda.

Opening High-Level Dialogue, Brussels, Belgium, 11 June 2025

COP30 Climate Action Agenda

The IEA worked closely with the COP30 Presidency on advancing priority outcomes. One of the key achievements was the outcome on sustainable fuels. By organising a workshop on creating demand for action on sustainable liquid and gaseous fuels in April 2025, the IEA laid the groundwork for Brazil's Belém 4x Pledge to quadruple sustainable liquid and gaseous fuels by 2035. The pledge was underpinned by the IEA's flagship report, Delivering Sustainable Fuels: Pathways to 2035, published in October 2025, which set out pathways, policy priorities and investment needs to scale deployment worldwide. The Agency's analytical support was formally recognised at the launch of the pledge and, at Brazil's request, the IEA has taken on the role of tracking progress against the pledge.

On **investment and finance**, IEA analysis fed directly into the Baku to Belém Roadmap to USD 1.3 trillion, including recommendations on the quality of finance and mechanisms to scale up clean energy investment as part of the New Collective Quantified Goal (NCQG). Throughout the year, the IEA worked closely with the UNFCCC Secretariat and the COP30 Presidency to support implementation of Brazil's G20 Clean Energy Investment Roadmap, including engagement with the Independent High-Level Expert Group on Climate Finance. The IEA also presented findings from its World Energy Investment 2025 report to the UNFCCC Standing Committee on Finance, contributing to discussions on NCQG tracking.

Beyond individual workstreams, the IEA worked closely with the Brazilian COP30 Presidency in support of their efforts to develop and engage stakeholders around a more structured **Climate Action Agenda** to help

accelerate implementation of the Paris Agreement and the Global Stocktake (GST) commitments in the timeframe to the next Global Stocktake (GST, 2028). In 2025, a new governance structure for the Climate Action Agenda was launched, organised around six thematic pillars aligned with the GST.

Within this framework, the IEA was a key partner under the Energy, Industry and Transport pillar and participated as a member of the Secretariat for two priority areas.

Specifically, the IEA served on the Secretariat of **Activation Group 1**, focused on tripling renewable energy capacity and doubling energy efficiency, and **Activation Group 3**, focused on ensuring universal access to energy, contributing analysis, coordination support and technical expertise to advance these priorities under the COP30 Climate Action Agenda.

The IEA provided analysis and strategic advice to support the development of Plans to Accelerate Solutions for these Activation Groups, proposing benchmarks and policy priorities for accelerated action on priority areas, such as electricity grid expansion and resilience, universal access to clean cooking, methane abatement, sustainable fuels and the delivery of just and inclusive energy transitions. For example, on **grids and storage,** the IEA proposed targets to scale global energy storage capacity to 3 000 GW by 2035 and increase annual grid investment to USD 1 trillion and key policy priorities towards these goals, building on the COP29 pledge to reach 1 500 GW of storage capacity and expand or upgrade more than 25 million km of electricity grids by 2030. On **methane**, the IEA provided analysis and advice to accelerate implementation of existing commitments and ensure that agreed 2030 methane reduction targets are met.

COP30 Summit

The IEA played a prominent role at COP30 in Belém, which took place from 10 to 21 November. IEA representatives intervened in more than 100 events across the summit, including ministerial-level meetings, high-level dialogues and official side events. The Agency organised and contributed to a wide range of flagship events, including the launch of the IEA's Brazil 2025 Energy Policy Review and the Colombia Net Zero Roadmap, high-level discussions of the Global Commission on People-Centred Clean Energy Transitions and in the context of the Climate Action Agenda, and a joint IEA-UNFCCC event on financing the implementation of Global Stocktake energy goals. Additional sessions led by the IEA focused on financing electricity access in Africa, carbon pricing and Article 6, as well as events hosted at IEA Member country pavilions.

IEA Executive Director Dr Fatih Birol with UN Secretary-General António Guterres at the COP30, Belém, Brazil, November 2025
(Photo credits: 2026 UN Climate Change)

Belém Climate Summit in Brazil, 7 November 2025
(Photo credits: 2026 UN Climate Change)

Supporting the implementation of nationally determined contributions

In 2025, the IEA created a cross-agency effort to boost the support offered to countries as they define energy ambition and implementation action under the new round of updated nationally determined contributions (NDCs) under the Paris Agreement. This support covers a range of analytical, capacity-building, engagement and tracking activities at the national, regional and global level. Those delivered at the global level are set out below.

Tracking NDCs and the Global Stocktake

The IEA assessed the contribution of the energy sector to the updated NDCs and new and revised long-term net zero targets, with results made publicly available through the Climate Pledges Explorer. This analysis informed a preliminary assessment of the implications of NDCs on energy sector emissions in the 2025 World Energy Outlook and fed into the analysis of the UN Secretary-General's Climate Action Team ahead of the Climate Summit in September 2025 and received special acknowledgement at the Summit.[2]

The IEA also tracked renewable energy targets included in NDCs submitted since December 2024. By the February 2025 deadline, 23 of 195 Parties had submitted updated NDCs, increasing to 41 submissions by the end of the third quarter of 2025. The Agency assessed 2030 renewable capacity targets in these NDCs and reviewed national policy updates in selected countries to identify changes in renewable ambition relative to the policy landscape in 2024. This analysis fed directly into the Renewables 2025 market report, including an updated assessment of national and international renewable energy ambitions for 2030. The report highlighted recent policy developments in major markets and assessed the extent to which updated NDCs reflected commitments related to the COP28 pledge to triple global renewable energy capacity by 2030.

The IEA advanced work on its Energy Efficiency Progress Tracker, providing the most up-to-date and comprehensive view of progress towards the global goal to double the rate of energy efficiency improvements by 2030. This work provides easily comparable country and regional trends and is a key resource to support national target setting, providing a transparent analytical basis to assess how energy efficiency commitments are reflected in NDCs and supporting policy frameworks. The tracker was updated twice in 2025, with a new industrial module added in June and the latest data released in November showing an uptick in progress in global and regional energy intensity for 2025. This uptick, after years of slower average improvement, was driven primarily by India and China, contributing to significantly slower growth in energy demand and emissions for the year.

These progress trackers inform an overall view in the central IEA tracking tool as part of the first Global Stocktake, as the IEA, in collaboration with the UNFCCC Secretariat, is tracking progress towards the energy objectives established at COP28.

The IEA worked with key partners, such as the UNFCCC, the NDC Partnership and the United Nations Development Programme (UNDP) in global and regional

[2] See in particular paragraphs 14 and 15.

forums, such as the Latin American and Caribbean Energy Organization in the context of the new NDC implementation programme.

Highlights included the UNFCCC June Climate Meetings in Bonn, where the IEA co-hosted a side event on Accelerating NDC implementation through the GST Energy Goals. The session dealt with the importance of translating global energy goals into ambitious national targets to deliver COP28 outcomes and build momentum ahead of COP30. Discussions also explored how policy action and technological innovation can help catalyse clean energy investment. A follow-up, formal side event was held with the UNFCCC at COP30 and the 20th Global Conference of Children and Youth for Climate Change (COY20).

Beyond global forums, the IEA contributed to the UNFCCC NDC work programme through participation in a series of strategic regional and thematic events. These included an IEA-UNDP co-organised session at the NDC Partnership Conference in Berlin in June, an IEA-moderated session in the NDC Clinic co-organised by the UNFCCC and the NDC Partnership in the framework of the Regional Latin America and Caribbean Climate Week in Panama, a dedicated workshop on NDCs under the Latin American Energy Organization-UN Economic Commission for Latin America and the Caribbean Summit in Rio de Janeiro, and additional side events organised in collaboration with NDC-related initiatives, supporting peer exchange and capacity building on NDC design and implementation.

NDC 3.0 Clinic session during the Latin America and Caribbean Climate Week 2025, Panama City, Panama, May 2025

As a central pillar of the IEA's youth engagement, the IEA participated for the second time as a knowledge partner to the COY20. In this role, the Agency organised and chaired two dedicated sessions on youth as drivers of just energy transitions and access to clean energy, and on next-generation NDCs, focusing on youth agency from design to delivery.

Strengthening data and transparency

The IEA provided targeted data to inform the UNFCCC's efforts in monitoring GHG emissions and removals for Annex I countries. This included facilitating the comparison between IEA data and the data submitted to the UNFCCC. These data formed the foundation for expert reviews during the UNFCCC's GHG inventory review process. Additionally, the IEA contributed to ad hoc data requests for nationally determined contributions assessment reports and participated in country-specific assessments through joint workshops with the UNFCCC.

Throughout the year, the IEA delivered capacity-development activities in collaboration with the UNFCCC. These included contributions to in-person and online workshops in five countries. The IEA collaborated with the UNFCCC to strengthen energy data for climate reporting through multiple workshops and reviews. In Morocco, it co-hosted a workshop in Rabat and contributed to the quality assurance of the national energy information system. In South Africa, the IEA supported a national workshop, provided recommendations on integrating energy data into GHG inventories and climate policies, held bilateral meetings on improving energy balances and joined a multi-session workshop on demand data and energy indicators. The Agency also contributed to online workshops for a Pacific country and a West African country to address urgent capacity-building needs, presenting IEA energy balances and the statistics roadmap. Additionally, it participated in an online workshop for a Latin American country to help build capacity for compiling energy data for climate reporting. More details on selected events are provided in the relevant sections under Pillar I. These collaborative efforts reinforced the IEA's commitment to supporting countries in improving their energy data management systems and building the capacity necessary for effective climate action.

IEA as custodian for Sustainable Development Goals energy data

In parallel with its support to NDC development and implementation, the IEA continued to play its pivotal role as a custodian agency for energy-related Sustainable Development Goal (SDG) indicators, contributing to global climate action through robust data to increase transparency and accountability.

In collaboration with the United Nations Statistics Division (UNSD), the IEA produced the official indicator datasets for SDG targets 7.2 and 7.3, while partnering with the United Nations Industrial Development Organization to develop the dataset for target 9.4. Comprehensive regional datasets were also prepared for the UN Regional Commissions, ensuring robust and inclusive data coverage. The main UNSD data repository, including IEA data, is available on the UN website.

The IEA's contributions extended to co-developing storyline documents with its UN partners detailing progress toward these SDGs, which were incorporated into major publications such as The Sustainable Development Goals Report 2025 and the UN Secretary-General's report on Progress towards the Sustainable Development Goals, an official input to the annual UN High-level Political Forum. According to the United Nations, the English-language versions of the Sustainable Development Goals Reports garnered more than 1.4 million web page views, with a total user count of almost 1 million by 2024.

Beyond reporting, the IEA reviewed the methodology and progress assessments for targets 7.2 and 7.3 in the UN SDG Progress Chart 2025 and updated related data on its Energy Statistics Data Browser. The IEA also participated in UN meetings with other reporting agencies to evaluate data quality and enhance the submission process for future reporting cycles, reaffirming its commitment to providing high-quality, actionable data for global energy transitions.

Additionally, the IEA has also collaborated on the annual Tracking SDG 7: The Energy Progress Report, the global reference for information on progress toward the achievement of SDG 7 of the UN 2030 Agenda for Sustainable Development. The report is produced annually by the five custodian agencies responsible for tracking progress toward the goal: the IEA, the International Renewable Energy Agency, the United Nations Statistics Division, the World Bank and the World Health Organization. Based on the report, the IEA also released an article, Energy access improving, but international financial support still needed to boost progress and address disparities, warning that current efforts are not enough to achieve SDG 7 on time.

The IEA also reviewed SDG-related sections for indicators 7.2.1, 7.3.1 and 9.4.1 in drafts of the UN Secretary-General's report on Progress towards the Sustainable Development Goals and The Sustainable Development Goals Report 2025, including reviews of the UN progress assessments for these indicators. These reports were released in May and July 2025 in preparation for the UN High-Level Political Forum on Sustainable Development.

The Agency also contributed to capacity building and outreach, presenting joint IEA-UNSD work on SDG energy indicators at several events throughout the year. In March, through synergies with the EU4Energy programme, statisticians from Eastern European and Caucasian countries participated in an online workshop, "The Role of Energy Data in Climate Tracking". The session focused on how reliable energy data supports SDG achievement, including methodologies for estimating energy-related GHG emissions and tracking indicators linked to energy and climate goals (SDG 7 and SDG 13).

Later in December, the IEA partnered with the United Nations Industrial Development Organization, the Statistical, Economic and Social Research and

Training Centre for Islamic Countries, the International Telecommunication Union and the Statistical Center for the Gulf Cooperation Council to organise a webinar on “Measuring Progress on SDG 9: Strengthening Statistical Capacities for Inclusive and Sustainable Industrialization.” This initiative aimed to enhance national statistical systems, enabling countries to accelerate progress toward SDG targets through improved data collection and reporting.

G20

In 2025, the IEA served as a knowledge partner of the South Africa G20 Presidency, actively supporting the Sherpa and Finance Tracks, as well as the cross-cutting Taskforce 1 on Inclusive Economic Growth, Industrialization, Employment and Reduced Inequality. The IEA’s contributions ranged from targeted briefings, presentations, analytical framing and in-depth analyses to high-profile events and strategic advice. By building on the outcomes of Brazil’s 2024 G20 Presidency, the IEA helped carry forward momentum on energy security and transitions, ensuring continuity and impact across presidencies.

The IEA’s engagement with South Africa for its G20 Presidency has supported a renewed and strengthened partnership, which is reflected in the two-year Joint Work Programme, which was signed by IEA Executive Director Dr Fatih Birol and South Africa’s Minister of Electricity and Energy, Dr Kgosientsho Ramokgopa, in June 2025. The IEA worked with around 20 institutions in South Africa in the context of the G20 Presidency. The IEA’s support was widely recognised and welcomed across the government of South Africa and the private sector. All partners in South Africa expressed gratitude for the IEA’s support, with Minister Ramokgopa praising IEA support in a joint news release with the IEA Executive Director and through forewords in the IEA-led reports on clean cooking, regional power system interconnectivity and just transitions, thanking the IEA for its leadership in these areas.

South Africa's Minister of Electricity and Energy, Dr Kgosientsho Ramokgopa, with IEA Executive Director Dr Fatih Birol, Davos, Switzerland, 22 January 2025

Advancing global energy collaboration

The IEA's core involvement focused on deepening and broadening the energy conversation in the G20 Energy Transitions Working Group (ETWG). The Agency collaborated with South Africa's Department of Electricity and Energy and the ETWG Secretariat, led by the South African National Energy Development Institute, to provide analysis, policy advice and convening support under a formal partnership agreement. As knowledge partner of the ETWG, the IEA contributed significantly across its three priority areas: 1) Energy Security, Affordability and Reliable Access; 2) Just, Affordable and Inclusive Energy Transitions; and 3) African Interconnectivity and Energy Pools.

IEA Deputy Executive Director Mary Burce Warlick participating in the Durban G20 Energy Transition Ministerial, Durban, South Africa, 20 October 2025

Overview of key analysis in support of South Africa's G20 Presidency

Supporting energy security, affordability and reliable access

The IEA played a leading role in translating global analysis on energy security and energy access into practical policy advice and negotiated outcomes. Building on the outcomes of the Future of Energy Security Summit, the IEA supported the Electric Power Research Institute in the development of the Voluntary Energy Security Toolkit Presidency Document. The toolkit's value was commended in the G20 Leaders Declaration.

At the second ETWG meeting in Cape Town on April 30, the IEA provided policy guidance on energy efficiency and co-hosted an energy efficiency side event with a focus on doubling efficiency through improved financing and sectoral policies. The IEA also participated as a panellist at an energy efficiency financing side event at the third ETWG meeting in Sun City on 30 July.

The IEA collaborated with many partners across the global energy governance, including with the International Atomic Energy Agency. This included participation in events on financing nuclear energy at the second ETWG meeting in Cape Town on 30 April, as well as engagement in the Nuclear Energy Ministerial Conference held during the Energy Transitions Ministerial Meeting in Durban on 9 October.

In parallel, the IEA provided policy guidance on financing energy access, drawing from key findings of its Financing Electricity Access in Africa report. This input helped inform the Presidency Document on Affordability Framework, working towards a Global Energy Poverty Compact. The IEA also participated in an Eskom-led side event on a Decentralised Energy Access Roadmap at the fourth ETWG meeting in Durban on 10 October.

Universal access to clean cooking

Building on its close cooperation on clean cooking under Brazil's 2024 G20 Presidency, the IEA played a central role in advancing global momentum on universal access to clean cooking and supporting South Africa's G20 Presidency to translate commitments into concrete action in 2025.

A major milestone was reached on 21 November 2025, when the IEA, South Africa's Department of Electricity and Energy and partners unveiled a new plan to strengthen clean cooking infrastructure and accelerate access across sub-Saharan Africa. The announcement took place alongside the G20 Social Summit and G20 Leaders' Summit in Gauteng, where delegates placed renewed emphasis on Africa's development priorities, with energy access and clean cooking identified as key issues on the agenda.

Earlier in the year, the G20 Energy Ministers meeting in Durban in October formally endorsed the plan, signalling strong political backing for accelerated action. The plan sets out practical solutions that actors can take to mobilise additional finance, improve existing clean cooking policies and enhance local capability. Addressing these areas will help expand access to affordable and modern cooking fuels across sub-Saharan Africa, where nearly 1 billion people still lack clean cooking options.

This landmark outcome was underpinned by the Clean Cooking Infrastructure Investment Action Plan, co-developed by the IEA, South Africa's Department of Electricity and Energy and its Energy and Water Sector Education Training Authority, with contributions from African governments, industry and international organisations.

"Clean cooking is not just an energy issue but a human rights issue. The G20 issued a historic agreement, 'Closing the Clean Cooking Gap', which I see as the key legacy of South Africa's G20 Energy Transitions Working Group. This outcome builds on our Presidency document, 'Clean Cooking Infrastructure Investment Action Plan', developed by the International Energy Agency and South Africa's Energy & Water Sector Education Training Authority. The report outlines the most important concrete actions that all partners can take to advance clean cooking, drawing on input from industry experts, intergovernmental organisations, and other countries."

Dr Kgosientsho Ramokgopa
Minister of Electricity and Energy, Republic of South Africa

Critical minerals and stepping up the value chain

In 2025, the IEA worked closely with the G20 South African Presidency and African partners to advance a shared ambition: ensuring that African countries capture a greater proportion of the economic, industrial and employment benefits of the global clean energy transition. This collaboration placed value chains, industrial development and clean energy manufacturing firmly on the G20 agenda, reinforcing Africa's role not only as a resource supplier, but also as an emerging hub for clean energy industries.

The IEA also provided input to the G20 Critical Minerals Framework, helping shape principles aimed at increasing investment in mineral development, enhancing beneficiation at source and promoting responsible mining and mineral development.

The IEA supported discussions on how stepping up the value chain can deliver tangible development gains, including job creation, economic diversification, expanded energy access and long-term resilience. G20 discussions highlighted the opportunity to address persistent barriers, such as access to affordable finance, to unlock further investment and growth. This work was informed by the IEA report Stepping up the value chain in Africa: Minerals, materials and manufacturing, which explores practical pathways for African countries to move from raw material supply to higher-value activities, such as processing, manufacturing and clean energy technology production, highlighting the policies and investments needed to unlock jobs, growth and long-term development benefits.

The work featured prominently at a side event at the fourth meeting of the Energy Transitions Working Group on 8 October, which was organised by the IEA in cooperation with South Africa's Department of Electricity and Energy, the

South African National Energy Development Institute and the Council for Scientific and Industrial Research.

IEA Energy Innovation Forum Event at the margins of the Durban G20 Energy Transition Ministerial, Durban, South Africa, October 2025

The side event, entitled “Energy Technology Innovation: Stepping Up the Value Chain for Long-Term Economic Growth”, attracted around 100 industry representatives and policy makers. High-level speakers from government, industry CEOs and investors participated, including the Department of Science and Innovation, BMW, Zero Carbon Charge, Hive Energy, Green Scooters, the University of Cape Town, Africa Climate Ventures and the United Nations Industrial Development Organization.

The findings were also disseminated at the COP30, a Working Party on Critical Minerals meeting on 8 October, a Coal Industry Advisory Board meeting on 16 October and the IEA Experts Group on R&D Priority-Setting and Evaluation workshop on Building Resilient and Robust Clean Energy Supply Chains, in Petten, the Netherlands, on 27-28 November.

In collaboration with the United Nations Industrial Development Organization, Sustainable Energy for All and the Council for Scientific and Industrial Research, the IEA supported the drafting and refinement of the Presidency Document on High-Level Voluntary Principles for Sustainable Industrialization Hubs, including low-to-zero emission hydrogen and ammonia.

Sustainable fuels

Throughout 2025, the IEA supported the discussions on sustainable fuels within the G20 agenda, working closely with the Presidency and the ETWG members.

In April, the IEA invited the G20 Presidency to participate in its workshop on sustainable fuels, providing an opportunity to explore how policy signals can unlock markets and accelerate deployment. This momentum continued in June, when the IEA contributed to discussions at the third ETWG meeting in Sun City,

presenting on the role of sustainable fuels in the energy transition and highlighting how they can advance multiple policy objectives, including energy security, emissions reductions and economic development.

The IEA provided hands-on analytical support to strengthen Presidency outputs. In September, the Agency peer reviewed and supported the further development of a paper on sustainable fuels prepared by the Council for Scientific and Industrial Research, helping ensure the analysis was robust and policy-relevant ahead of the fourth ETWG meeting. At the fourth ETWG meeting, in Durban in October, the IEA delivered a keynote presentation on the sustainable fuels roadmap which attracted around 50 participants.

In parallel, the IEA contributed directly to Presidency-led outputs. The Agency provided input to the Presidency Document led by the South African National Energy Development Institute, Sustainable Fuels: E-fuels for Water-Stressed Regions, helping shape perspectives on how sustainable fuels can support development while addressing resource constraints. This work was complemented by IEA participation in dedicated sustainable fuels side events at both the third ETWG meeting in Sun City on 30 July 2025 and the fourth ETWG meeting in Durban on 8 October, further reinforcing the IEA's role as a trusted partner in advancing this agenda.

African interconnectivity and energy pools

The IEA supported efforts to strengthen regional power system interconnectivity across Africa. In partnership with the African Development Bank, African regulators and power pools, the IEA's expertise supported efforts to harmonise regulatory frameworks, enable cross-border electricity trade and advance the African Single Electricity Market.

The Agency facilitated the exchange of best practices of regional interconnectivity and co-organised three virtual consultations, as well as one in-person workshop at the third ETWG meeting in Sun City on 30 July. These engagements informed the development of the **G20 Booklet on Best Practices on Regional Power System Interconnectivity**, which outlines actionable regulatory and policy solutions for accelerating interconnection, planning and implementation. Minister Ramokgopa recognised this contribution by expressing his "sincere appreciation to the International Energy Agency and the African Development Bank for their leadership."

The IEA also supported the African Development Bank in the development of the Presidency Document on **High-Level Policy Principles for Advancing Regional Power Integration and Trade**. The principles outline actionable recommendations to align policy and regulatory frameworks for efficient regional electricity trade.

Supporting just and inclusive energy transitions

In the context of just and inclusive energy transitions, the IEA supported the G20 Presidency by providing analytical work and helping to organise a series of workshops. These activities aimed to translate analysis and tools into practical action by facilitating knowledge exchange and implementation at country level.

A G20 workshop on Indicators for Just and Inclusive Energy Transitions brought together G20 members and partner countries to turn high-level principles into practical tools for action. The workshop, held on 30 July in Sun City, invited participants to share the indicators they have developed or adapted to reflect the G20 Principles for Just and Inclusive Transitions, showcasing how countries and institutions are measuring progress on people-centred energy transitions.

Held virtually as part of the official ETWG3 side-event programme, the workshop provided a global platform for exchange, learning and addressing common challenges. Participants presented concrete examples of how indicators are being used to track progress, explained how data is collected and integrated into policy making, and highlighted the institutional arrangements that support effective data gathering. The workshop was attended by 63 participants from major international organisations, including C40 Cities, the Food and Agriculture Organization, the Global Green Growth Institute, the International Atomic Energy Agency, the University of Chinese Academy of Social Sciences, Swaniti Global, the International Energy Forum, the International Labour Organization, the International Renewable Energy Agency, the Organization of the Petroleum Exporting Countries, Sustainable Energy for All and the World Resources Institute. This workshop, one of seven dedicated workshops organised on the topic, directly contributed to the development of the IEA's Indicators Handbook for Just and Inclusive Energy Transitions. The Handbook was officially launched on 9 October 2025 in Durban, South Africa, at a meeting of the Global Commission on People-Centred Clean Energy Transitions, held as part of the official programme of the G20 Energy Transitions Ministerial Meeting. As an official document of South Africa's G20 Presidency, the Indicators Handbook was developed by the Global Commission in collaboration with the G20 Presidency Secretariat and local partners. Designed as a practical resource, it provides governments and stakeholders with clear guidance on selecting relevant indicators as a first step toward tracking policy design and implementation in line with the G20 Principles. By offering tools to monitor progress, assess the effectiveness of programmes and inform policy design, the handbook helps ensure that energy transitions are not only faster, but also fairer and more inclusive.

Meeting of the Global Commission on People-Centred Clean Energy Transitions, held as part of the official programme of the G20 Energy Transitions Ministerial Meeting, Durban, South Africa, 9 October 2025

In support of South Africa women's month in August, the IEA organised a Women's Breakfast event at the third ETWG meeting on 1 August 2025. With more than 100 participants, the event celebrated a decade of progress on women's empowerment within the G20's Energy Transitions Working Group and highlighted experiences and opportunities for women's leadership in energy transitions.

From left to right: Curtis Jenken, IEA Multilateral Policy Officer; Syrine El Abed, IEA Africa Programme Manager; Samantha Graham-Maré, Deputy Minister of Electricity and Energy; and Nic Botha, the Deputy Minister's Chief of Staff, participating in the Women's Breakfast event, in Sun City, South Africa, 1 August 2025

G7

In 2025, as Canada held the Presidency of the Group of Seven during the group's 50th anniversary year, the IEA played an important role in shaping G7 action on energy security and energy innovation. The IEA produced a wide range of analysis and recommendations that directly informed decisions taken by G7 Leaders and Energy Ministers. The G7 Energy and Environment Ministers explicitly welcomed the IEA's constructive role in providing data and analysis to inform work on energy systems, artificial intelligence and critical minerals.

A flagship initiative was the IEA's contribution to the G7 Critical Minerals Action Plan, endorsed by Leaders at the Kananaskis Summit in June 2025. The Action Plan, which emphasised mobilising capital and investing in partnerships with emerging and developing economies, was endorsed by all G7 Leaders, as well as invited countries, including India. The Action Plan also tasked G7 Energy Ministers to develop a Roadmap to Promote Standards-based Markets for Critical Minerals to differentiate fair and market-oriented critical mineral supply chains from those dominated by non-market policies and practices. The roadmap includes an explicit mention of the IEA as a forum to enhance the responsibility and transparency of supply chains. The

roadmap was endorsed at the G7 Ministerial in Toronto on 31 October, during which the IEA Executive Director was invited to participate in a session focusing on critical minerals. The roadmap was endorsed by all G7 members, as well as partner countries, including Ukraine.

Working closely with Natural Resources Canada, the IEA also supported G7 efforts related to Ukraine, culminating in the endorsement by Energy Ministers of the Statement of Ukraine's Energy Security.

Building on the Hiroshima G7 Summit's mandate to support energy innovation in emerging market and developing economies, in partnership with Natural Resources Canada, the IEA co-hosted the second edition of the Energy Innovation Forum in Toronto on 29 October, ahead of the G7 Energy Ministerial. The Forum brought together policy makers, innovators, investors, researchers and other energy sector stakeholders from almost 30 countries, including around 40 energy start-ups, creating a unique platform to connect ideas, capital and policy action. The event's objective was to translate innovation ambition into near-term opportunities, reinforcing the G7's leadership on clean energy technologies.

The impact of this engagement was recognised at the highest level. Following the conclusion of the G7 Ministerial, Canada's Minister of Energy formally thanked the IEA, highlighting that its involvement was instrumental in the success of G7 2025 and essential to ensuring the G7's continued global leadership.

G7 Energy and Environment Ministers' Meeting, in Toronto, Canada, 30-31 October 2025 (Photo credits: Government of Canada)

Biofuture Platform

The Biofuture Platform is a country-led, multi-stakeholder initiative under the Clean Energy Ministerial that works to advance a sustainable, inclusive and resilient bioeconomy. It promotes best practices, investment, policy coordination and international cooperation to scale the use of sustainable biomass. The Platform is led by five core countries (Brazil, Canada, India, the Netherlands and the United States) and brings together 25 members, including 13 from CETP partner countries and regions. The IEA serves as the Platform's Facilitator, providing coordination and analytical support in a role similar to a secretariat.

International collaboration and advocacy

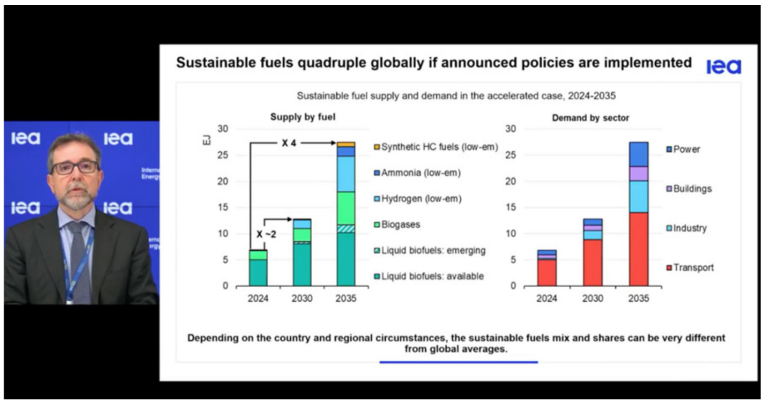
In 2025, a central contribution was the IEA's support to the development of the Biofuture Platform's 2025 Action Plan. The Action Plan brings together leading analysis on biomass supply, carbon accounting, biochemicals and biomaterials, as well as priorities for international policy coordination and engagement.

The IEA also helped coordinate transition of the Platform's Chair from the United States to Italy, ensuring a smooth handover and continued leadership. At the same time, the IEA supported the selection of two new Vice-Chairs, Brazil and the Netherlands.

Beyond strategic planning and governance, the IEA supported work under the Platform by co-organising a side event on creating demand for sustainable biofuels at the Clean Energy Ministerial in Korea. The IEA delivered a presentation and helped moderate the panel discussion, bringing together more than 40 participants from governments, industry and international organisations. The event focused on key challenges and solutions in creating demand for sustainable biofuels, building upon the IEA's April workshop on creating demand for all sustainable fuels.

Tae-Yoon Kim, IEA Head of Critical Minerals Division, presenting on sustainable biofuels at the Clean Energy Ministerial event "Creating Demand for Sustainable Biofuels", in Busan, Korea, 25 August 2025

In addition, the IEA presented the main findings of the Delivering Sustainable Fuels report at the Clean Energy Ministerial event during COP 30 Business Week in São Paolo in November. The presentation outlined the report's main messages and policy priorities. The analysis finds that current and proposed policies, if fully implemented, could nearly double the use of sustainable fuels by 2030 and quadruple it by 2035. Achieving this growth will require coordinated action to remove market barriers and unlock investment. The event included participants from several Clean Energy Ministerial initiatives, industry and other international initiatives.



Paolo Frankl, Head of the IEA Renewable Energy Division, presenting the key findings of the Delivering Sustainable Fuels *report in Sao Paolo, Brazil, 8 November 2025*

Regulatory Energy Transition Accelerator

The Regulatory Energy Transition Accelerator (RETA) is a global network of more than 60 energy regulators dedicated to supporting the decarbonisation of energy systems. RETA provides both regulatory thought leadership and targeted technical assistance, delivered through strategic partnerships with a group of delivery partners, including the IEA, the World Bank, the International Renewable Energy Agency, the Rocky Mountain Institute, the Regulatory Assistance Project and others.

Since its launch in 2021, RETA has tripled in size, expanding from 20 to over 60 regulators across advanced, emerging and developing economies. Eight CETP signatories are now part of the network, alongside regulators from key transition regions such as Africa, Latin America and Southeast Asia. As host of the RETA Secretariat and a core delivery partner, the IEA plays a central leadership role, shaping strategy, convening peers and ensuring that regulatory solutions are practical, inclusive and globally relevant.

RETA plays an important role in bringing regulatory perspectives into discussions at global energy and climate forums. In 2025, the IEA helped drive momentum for the Clean Energy Ministerial Campaign on Empowering Energy Regulators for Accelerated Decarbonisation. This effort culminated in the first-

ever high-level Regulatory Forum at the Clean Energy Ministerial (CEM), where senior regulators joined global institutions to share regulatory perspectives. The forum was referenced in the official CEM16 Announcements and Outcomes document. To support this engagement, the Regulatory Assistance Project published a policy brief entitled Pathways for empowering regulators to advance decarbonisation, outlining practical approaches to strengthening regulatory capacity and impact.

CEM16 Regulatory Forum, in Busan, Korea, 25 August 2025

Beyond the Clean Energy Ministerial, the IEA worked closely with the G7 Presidency to ensure that regulatory perspectives shaped discussions on grids. The IEA delivered presentations on grid infrastructure expansion and bottlenecks to building future transmission grids, drawing on IEA and RETA analysis. In parallel, the IEA and the RETA team contributed to the G20 South African Presidency's Booklet of Best Practices on Regional Interconnectivity. At New York Climate Week, RETA delivery partners, the Rocky Mountain Institute and the Regulatory Assistance Project, participated in a roundtable hosted by the World Business Council for Sustainable Development, alongside regulators, system operators and private sector stakeholders.

Beyond global advocacy, RETA delivers tangible, practical support. In 2025, the IEA published the Building the Future Transmission Grid report, developed under RETA's workplan with direct input from regulators. The report was launched at a joint IEA-RETA event that attracted more than 120 participants. In addition, Energy Innovation, a RETA delivery partner, published Regulating Hydrogen: A Primer For Energy Regulators, which was presented during a dedicated webinar on 25 June with 70 participants.

RETA's technical assistance activities included a range of targeted engagements. In Malawi, RETA contributed to a high-level Climate Parliament event on clean cooking, helping place regulatory solutions at the centre of

national and regional discussions. As part of this event, RETA's delivery partner Modern Energy Cooking Services led a dedicated session on regulatory approaches to clean cooking, bringing together African energy regulators and key international stakeholders, including Brazil's Electricity Regulatory Agency, to exchange experiences and lessons learned.

RETA also responded directly to needs identified within its own network. A targeted technical assistance activity, implemented by its delivery partner, the Regulatory Assistance Project, addressed a specific regulatory challenge faced by members. The work culminated in a lessons-learned report and a webinar attended by more than 60 participants.

In addition, RETA hosted a peer-to-peer learning workshop together with the United Nations Environment Programme's Climate Technology Centre and Network on regulatory frameworks to reduce SF6 gas emissions, one of the most potent GHGs in the world.

On 5-6 June, the IEA hosted the RETA Roundtable 2025, bringing together senior regulators, partners and funders for strategic dialogue and peer exchange. The roundtable not only showcased progress, but also shaped RETA's forward-looking workplan, ensuring continued relevance and impact.

RETA Roundtable at IEA headquarters in Paris, France, 5 June 2025

Pillar III – Enabling global energy dialogue

Highlights

- The 10th Annual Global Conference on Energy Efficiency, held in Brussels in June, brought together over 650 participants from nearly 100 countries and resulted in a Ministerial Outcome Statement endorsed by almost 50 governments and 65 companies.
- The second Energy Innovation Forum was hosted on the margins of the G7 Energy and Environment Ministerial in Toronto in October 2025.
- The IEA and the Foundation for Interoperability in Digital Economy launched the Digital Energy Grid: A Vision for a Unified Energy Infrastructure report in February 2025, setting out a strategic framework for interoperable digital systems to connect energy actors and transactions.
- The Global Critical Minerals Outlook 2025 expanded coverage of strategic energy minerals and informed global debates on diversification, resilience and security, alongside new tools such as the Critical Minerals Data Explorer and Policy Tracker.
- The World Energy Investment 2025 report marked its 10th edition, tracking USD 3.3 trillion in global energy investment and highlighting persistent financing gaps in emerging and developing economies.
- The Global Methane Tracker 2025 revealed that energy-related methane emissions are around 80% higher than reported to the UNFCCC and showed that 70% of fossil fuel methane emissions could be eliminated with existing technologies.
- The World Energy Employment 2025 report expanded coverage to new job categories and occupations, supported by data from over 700 organisations, and informed global debates on skills and workforce transitions.
- The IEA advanced its work on people-centred clean energy transitions through its Global Commission, Labour Council and Gender Advisory Council, convening over 200 stakeholders across four continents and shaping discussions at the G20 and COP30.

Energy efficiency: Global activities

The 10th Annual Global Conference on Energy Efficiency

The IEA's 10th Annual Global Conference on Energy Efficiency, co-hosted by Dr Fatih Birol, IEA Executive Director, and Dan Jørgensen, European Commissioner for Energy and Housing, was held in Brussels on 12-13 June 2025, in partnership with the Energy Efficiency Movement. The event brought together over 650 attendees from almost 100 countries to drive action on energy efficiency, with the aim of boosting energy security and affordability and enhancing industrial competitiveness.

Across two days of high-level panels, roundtable discussions, bilateral meetings and workshops, participants shared views on topics ranging from "investment, competitiveness and jobs" to "energy efficiency affordable homes and workplaces" and "future-proofing appliance policy". A special in-person address from His Majesty Letsie III, King of Lesotho, reminded participants of the need for people-centred solutions for clean energy transition objectives. In addition to this, further people-centred meetings took place, such as the IEA Labour Council and the Global Commission on People-Centred Clean Energy Transitions.

The 10th edition of the IEA's landmark event came at a pivotal moment. At COP28, governments agreed to double the rate of global energy efficiency improvements by 2030. Achieving this goal is critical if the international community is to bring about the secure, affordable clean energy system that can meet our shared climate goals. But progress must accelerate rapidly if the goal is to be met.

The event provided a focal point to global discussions on advancing energy efficiency in line with these goals. During a ministerial roundtable, representatives of almost 50 governments, including 36 ministers, agreed a Ministerial Outcome Statement, reaffirming their commitment to achieving the doubling goal and highlighting key actions that they could take towards it. A separate CEO roundtable, where leaders of 65 major international companies gathered, led to the publication of the Brussels CEO Four-Point Action Plan, as well as additional commitments from 18 major manufacturers.

10th Annual Global Conference on Energy Efficiency, Brussels, Belgium, 12-13 June 2025

Energy efficiency capacity building

Since 2015, the IEA's Energy Efficiency Policy Training Weeks have equipped more than 3 000 government officials from over 125 countries with the tools and knowledge to implement effective energy efficiency policies, measures that help consumers lower energy bills, help countries enhance energy security and overall help reduce emissions globally.

From 7 to 11 April 2025, a global edition of this flagship training took place, marking the 20th edition of Energy Efficiency Policy Training Week in Paris. Throughout the week, nearly 200 policy makers and experts from over 80 countries joined the growing community of energy efficiency practitioners, learning from leading experts on international best practice and innovations in energy efficiency policy. The programme followed the same format as the Latin America Energy Efficiency Policy Training Week, with five parallel courses on key areas for energy efficiency measures: buildings, appliances, industry, transport and evaluation methods. The training week began with an opening high-level discussion led by IEA Executive Director Dr Fatih Birol, with senior representatives from governments, including ambassadors from Brazil, Ghana, Kenya, Mexico, Switzerland and Thailand. Sessions covered key energy efficiency solutions to ensure affordability, create jobs and bolster skills. "The IEA has long championed energy efficiency as the 'first fuel', as it is not only the most secure energy resource, but also among the most cost-effective measures to cut energy bills and reduce greenhouse gas emissions," Dr Birol said.

To mark the 20th edition of the training week, the IEA reached out to training-week alumni to gain insights into how this experience helped to advance energy efficiency policy in their countries or helped them to advance in their careers. The survey responses were very insightful, with many accounts of national and subnational policy changes and implementation reported to have been directly influenced by the training weeks. In addition to this, alumni shared that the knowledge and experience gained during their training week helped them to advance in their careers, with many now holding senior leadership positions within national governments. In addition to the survey, the IEA conducted desk research into the number of policies on energy efficiency in countries following their participation in a training week and found that, since the first training week, over **1 000 energy efficiency policies** have been implemented in participating countries.

20th Energy Efficiency Policy Training Week, Paris, France, 7-11 April 2025

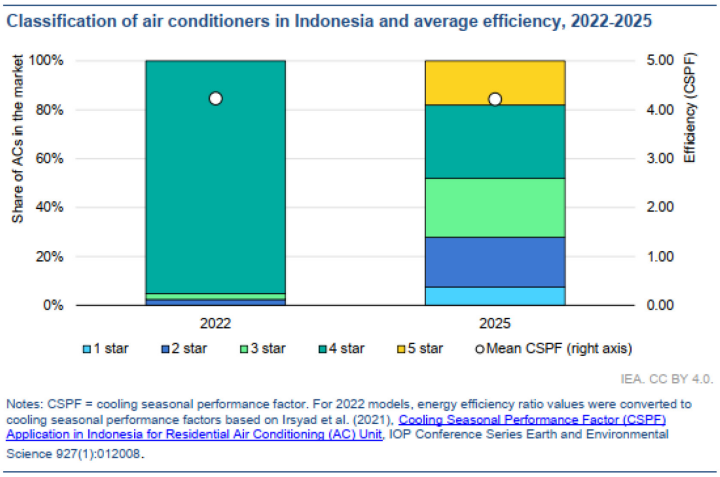
Participants at the 20th Energy Efficiency Policy Training Week, Paris, France, 7-11 April 2025

Energy Efficiency Policy Toolkit 2025

To accelerate action on energy efficiency, the IEA developed an Energy Efficiency Policy Toolkit that integrates the Policy Package for Energy Efficiency, with concrete examples for each end-use sector. The objective is to support governments in designing and implementing effective energy efficiency measures by combining policies across three core pillars: regulation, information, and incentives. The toolkit shares strategic principles to guide policy makers to enhance and expand their energy efficiency policies and programmes. Building on this foundation, the Energy Efficiency Policy Toolkit 2025, updated on the occasion of the 10th Annual Global Conference on Energy Efficiency in Brussels, has evolved into an interactive, online tool. This updated version enhances usability and policy impact by incorporating more than 50 case studies that cover both advanced and emerging economies and offer practical insights into the successful implementation of energy efficiency policies across diverse national and sectoral contexts.

Super-Efficient Equipment and Appliance Deployment Initiative

Energy efficiency in appliances, particularly in rapidly growing end uses such as air conditioning, is a critical and underexploited lever for managing energy demand, emissions and system costs. Analysis in the IEA's Energy Efficiency 2025 report shows that policy design and implementation details strongly influence whether appliance policies translate into real market change. For example, the report highlights how, in Indonesia, early air conditioner labelling led to most models clustering in the top efficiency class, limiting its impact on average market performance. Subsequent reclassification of labels and the introduction of more stringent minimum energy performance standards helped restore product differentiation and strengthen market signals.



Notes: CSPF = cooling seasonal performance factor. For 2022 models, energy efficiency ratio values were converted to cooling seasonal performance factors based on Irsyad et al. (2021), Cooling Seasonal Performance Factor (CSPF) Application in Indonesia for Residential Air Conditioning (AC) Unit, IOP Conference Series Earth and Environmental Science 927(1):012008.

IEA analysis underscores why sustained, evidence-based work on appliance efficiency is essential to deliver scalable, cost-effective energy and climate benefits in fast-growing cooling markets.

The Super-Efficient Equipment and Appliance Deployment (SEAD) initiative, supported in part by the IEA's Clean Energy Transitions Programme, plays a critical role in accelerating the global transition to energy-efficient appliances by transforming markets at scale. By promoting the adoption of super-efficient technologies, SEAD helps countries reduce energy demand, lower GHG emissions and cut energy costs for households, businesses and governments. The initiative also supports energy security and grid resilience, particularly in rapidly growing economies where appliance use is rising quickly. Through coordinated policy support, technical assistance and market engagement, SEAD ensures that energy efficiency delivers measurable climate, economic and development benefits.

As part of its strategic efforts to mainstream energy efficiency within the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) and Clean Energy Ministerial processes, and to strengthen ministerial-level recognition of the role of efficient appliances and equipment in decarbonisation, SEAD convened and contributed to a series of high-level events in 2025:

- **A Vision for Deploying Smart Cooling Technology**, April 2025, Seoul, at the Clean Energy Ministerial Senior Officials Meeting, focusing on policy pathways for accelerating deployment of smart and efficient cooling solutions.
- **Flexibility for Power Systems: How Appliances and Equipment Can Deliver Demand Response**, August 2025, Busan, at the Clean Energy Ministerial, highlighting the contribution of efficient appliances and equipment to demand-side flexibility and grid resilience.
- **Clean and Efficient Energy Solutions: Efficient Cooling and Ventilation for Comfort and Decarbonisation**, November 2025, Belém, at an International Electrotechnical Commission event during COP30, emphasising standards-based approaches to efficient cooling and ventilation.
- **Efficient Cooling and Ventilation for Comfort and Decarbonisation**, November 2025, Belém, at a United Nations Environment Programme United for Efficiency event during COP30, reinforcing alignment with global efficiency initiatives and multilateral partners.

Building on momentum from high-level engagement, SEAD advanced practitioner-level collaboration to support data-driven policy development. Together with the IEA's Digital Demand-Driven Electricity Networks Initiative and the Efficient, Demand Flexible Networked Appliances platform, SEAD co-

organised a series of technical webinars on data centre electricity use and the role of energy consumption data in policy and system planning.

SEAD also convened a webinar on product registries and data collection, which generated strong peer-to-peer learning and prompted requests for a follow-up session focused on how the analysis of products registered can inform the decision-making process for future policies. In addition, SEAD facilitated a targeted working meeting among members from Europe, Australia and China to address methodological challenges in comparing fuels and technologies on a single energy label.

Complementing these activities, SEAD continued its collection of crowdsourced market data in Brazil, Indonesia, South Africa, and Viet Nam, with analysis and expanded data collection planned for 2026 in Malaysia, Mexico, the Philippines and Thailand.

Critical minerals

Critical minerals have risen rapidly up the policy agenda as a cornerstone of energy and economic security. These minerals are not only crucial for technologies that enable energy transitions, but also play a vital role in high-tech industries, aerospace, defence, artificial intelligence (AI) data centres, semiconductors and advanced manufacturing, making them central not only to energy security, but also to broader national and economic security. At the 2024 IEA Ministerial Meeting, Member governments endorsed the IEA's Voluntary Critical Minerals Programme, recognising the importance of critical minerals for clean energy transitions and mandating the IEA to strengthen market analysis, improve data transparency and support more resilient and sustainable supply chains through tools such as country reviews and voluntary stockpiling. Activities in 2025 built on these mandates to support governments with evidence-based insights to advance secure and sustainable critical minerals supply chains for clean energy transitions.

Market analysis and outlook

The IEA published the Global Critical Minerals Outlook 2025 in May. This annual report has become the go-to global publication for the status and outlook for the global critical minerals market. It provides comprehensive updates on the outlook for key critical minerals and recent market developments. The 2025 edition expands the scope of analysis significantly to cover a broad suite of energy-related strategic minerals. The report also includes topical deep dives on policy mechanisms for diversified mineral supplies, supply chain issues for emerging battery technologies, and opportunities for supply-side technology innovation (mining, refining and recycling), as well as a broader view on supply chain risks

for energy-related strategic minerals. This analysis also features prominently in other key publications, such as the World Energy Outlook 2025 and World Energy Investment 2025.

The IEA also contributed a section on local value addition to the Stepping Up the Value Chain in Africa report, produced as an input to G20 discussions (see the G20 chapter above). The section outlines policy instruments supporting domestic mineral processing and beneficiation across African countries, including fiscal incentives, local content requirements and infrastructure development strategies.

Two commentaries on critical minerals security were published during the year. The first, released in February, examined security risks arising from growing geopolitical tensions. The second, published in October, analysed major announced export controls on rare earths and battery materials. Together, they provided key briefings for countries on critical market developments and emerging risks. In addition, the IEA's Critical Minerals Policy Tracker was expanded in 2025 to include over 500 policy entries across 45 countries. The Critical Minerals Data Explorer has also been enhanced to integrate both demand and supply data, to reinforce its role as the global reference point for critical minerals market information

Strengthening the IEA's expertise in critical minerals security

As critical minerals play a growing role in the energy security landscape, diversifying their supply chains and increasing emergency preparedness have become essential to ensure that countries can mitigate the effects of supply shocks and maintain robust energy security strategies.

To address this, the IEA undertook multiple activities 2025 to support preparedness and diversification efforts, including activities on stockpiling, emergency response procedures, a table-top exercise (TTX) and a diversification workshop. Following the first TTX in 2024, the 2025 edition of the TTX was held on 21 November for magnet rare earth elements. With the overall aim to enhance emergency preparedness, the exercise provided a platform to exchange knowledge, test emergency response frameworks and strengthen international cooperation.

The first diversification workshop for rare earths was also held on 21 November, alongside the TTX. The workshop was designed to help countries identify opportunities to diversify rare earth supply chains, explore strategic partnerships to accelerate project development, examine policy tools (e.g. equity investment, price floor and take-or-pay) to reduce investment risks, and discuss pathways for innovation, recycling and broader ecosystem development.

Also, two Stockpiling Workshops were organised in June (virtual) and September (hybrid), exploring strategic aspects such as material portfolios, operating and governance models, release mechanisms and costs.

Table-Top Exercise (TTX) and Diversification Workshop at IEA headquarters in Paris, France, 21 November 2025

Finally, an event on Critical Minerals Security was held with the IEA Summit on the Future of Energy Security, in London in April 2025. The summit included UK Prime Minister Keir Starmer and European Commission President Ursula von der Leyen and decision makers from 60 governments and over 50 major energy companies, alongside international institutions and civil society organisations. Participants included directors-general from governments of countries that produce and consume critical minerals (including most IEA Member countries plus Brazil, Chile, Indonesia and Peru), executives from mining industries, finance institutions and civil society. Overall, more than 100 high-level participants explored the challenges posed by the concentration of extraction and processing activities, as well as the economic opportunities that critical minerals development presents for producing countries. However, it was underscored that these economies must ensure that the benefits extend to local communities through skills training, job creation and environmental protection.

Sustainable and responsible critical mineral supply chains

In late February 2025, the IEA published The Role of Traceability in Critical Mineral Supply Chains report, jointly with the OECD Centre for Responsible Business Conduct, alongside an update to the Critical Minerals Policy Tracker, with more than 15 new traceability-related policies. The report outlines how integrating mineral traceability into risk-based due diligence can mitigate environmental, social and governance risks and strengthen supply chains.

Effective systems require balanced design, data quality, adaptability and collaboration among companies, governments and civil society. An eight-step roadmap guides trust-building, incentives and stakeholder engagement to ensure alignment with global supply chain realities.

The report was presented at numerous events, including Mining Indaba in Cape Town, South Africa; the Prospectors & Developers Association of Canada conference in Toronto, Canada; the OECD Forum on Responsible Mineral Supply Chains; and the Asian Development Bank Sustainable Trade Forum. The IEA also began follow-up work with the OECD to launch a joint industry survey on traceability in mineral supply chains. The survey aims to gather insights from upstream and downstream stakeholders on traceability practices, challenges and opportunities and will inform future OECD and IEA work on responsible sourcing and traceability.

To support the Global Critical Minerals Outlook 2025, the IEA expanded and deepened the analysis of sustainability performance tracking of mining companies to include additional companies and metrics and released an update to the Critical Minerals Policy Tracker, with policies from the previous 12 months and additional countries. The IEA also developed a white paper for the G7 Canada Presidency on standards-based market access for critical minerals, outlining pathways for mutual recognition of sustainability standards and discussing implementation, including regulatory alignment and market incentives.

In addition, the IEA began a bilateral project in support of Indonesia's Ministry of Energy and Mineral Resources (MEMR) focused on providing technical assistance and recommendations on improvements to the legal and regulatory system relating to GHG emissions from mining projects and mine waste. The project involved a virtual consultation workshop with government stakeholders from both the MEMR and the Ministry of the Environment.

Following the consultation, the IEA finalised an internal white paper for the MEMR outlining the key legal and regulatory instruments, identifying obstacles and barriers to implementation, highlighting international best practices and providing recommendations for improvements. The white paper will serve as the basis for future work in 2026, including a workshop with Indonesian government stakeholders to present the findings, discuss next steps and plan further structured support on these topics.

Digitalisation of energy systems

In 2025 the IEA’s Digital Demand-Driven Electricity Networks (3DEN) Initiative continued to play a central role in supporting countries to navigate the rapid

transformation of electricity systems, by advancing analysis and policy dialogue on demand-side flexibility, digitalisation and decentralisation. By bridging technical insight with policy-relevant guidance, 3DEN helps decision makers unlock system efficiencies to reduce costs, improve deliverability and enhance system resilience.

In 2025, the IEA continued to lead technical support and strategic guidance across various platforms, coordinating implementation, facilitating high-level dialogue and strengthening international knowledge exchange within the 3DEN Initiative. The first half of 2025 saw the completion of four pilot projects, the launch of Phase II with the Italian Ministry of the Environment and Energy Security and the United Nations Environment Programme, and increased stakeholder engagement on regulatory innovation and system planning. Successful pilot projects in Brazil, Colombia, India and Morocco concluded, with 93 new Phase II proposals received and 43 passing the initial screening.

On 19 November 2025, the IEA co-hosted an official COP 30 side event together with the Italian Ministry of the Environment and Energy Security in Belém, Brazil, together with the United Nations Environment Programme and delegates from industry, non-governmental organisations and experts. The session provided a public platform to announce Phase II and the selection of 14 projects to be implemented across Africa and Brazil. The event reinforced the programme's focus on delivery and the application of digital tools to improve system performance, service outcomes and demand-side participation.

Policy guidance and analysis

A key milestone in the first half of the year was the publication of the Digital Energy Grid: A Vision for a Unified Energy Infrastructure report, launched in partnership with the Foundation for Interoperability in Digital Economy, in February 2025. The report offered a conceptual and strategic framework for integrating energy actors and transactions through interoperable digital systems.

Policy guidance activities focused on shaping analytical frameworks, defining flexibility metrics, aligning modelling approaches and strengthening the evidence base for forthcoming policy briefs and country case studies. This work was underpinned by sustained technical and policy engagement with governments, system operators and analytical partners, ensuring that 3DEN outputs are grounded in real-world system data, reflect national priorities and directly inform policy-relevant conclusions. Its activities included:

- **Country-level engagement:** The 3DEN Initiative led policy and analytical dialogue with partners including Indonesia's Institute for Essential Services Reform, South Africa's Department of Electricity and Energy and Thailand's Department of Alternative Energy Development and Efficiency, as well as

several key power sector institutions in Thailand. These country-level engagements helped to understand the role of demand-side flexibility within each country context, as well as to identify and refine priority research questions and the technical and policy considerations that need to be accounted for to address them. Outputs informed both the broader narrative on flexibility in emerging markets and advanced ongoing analysis to ensure that results will support national policy and contribute to internationally comparable guidance on demand-side flexibility.

- **Policy insights:** The 3DEN Initiative has helped to strengthen the visibility of digital and demand-side flexibility solutions in delivering affordable, reliable and low-carbon energy systems, as well as providing analysis to deepen the underlying evidence base on the important role that these technologies have to play. This has been embedded across a broad range of IEA analysis, including providing a three-page spotlight on the role of digitalisation and demand-side flexibility in expanding electricity access in Africa as part of the IEA's milestone Special Report on Financing Electricity Access in Africa, released in October 2025. Similarly, the IEA's December Policy Brief, The Value of Demand Flexibility, and commentary on the potential for district heating to provide system flexibility services further underline how the 3DEN Initiative is amplifying the importance of digital and demand-side solutions to delivering affordable, reliable and low-carbon energy systems.
- **Ongoing analysis:** In addition to these published outputs, substantial analytical groundwork was undertaken to support ongoing and future deliverables under Phase II of the 3DEN Initiative. This included preparatory modelling discussions with national stakeholders in Ireland, Indonesia, South Africa and Thailand; scoping work to define research questions and data requirements for country case studies; and the initiation of data procurement activities to strengthen analysis of demand-side assets and digitalisation. This analysis will inform a policy brief that will follow The Value of Demand Flexibility in 2026, a companion publication which will examine demand flexibility of potential set across different time horizons. Engagement with external partners, including Guidehouse, supported the development of datasets that will improve both 3DEN-specific analysis and the accuracy of the IEA's World Energy Model.

Policy guidance was also delivered through sustained engagement with international platforms and institutions. Contributions to discussions within the International Smart Grid Action Network and the Green Powered Future Mission initiative and bilateral exchanges with organisations such as the OECD Development Cooperation Directorate ensured that analytical insights from the 3DEN Initiative informed wider policy debates on grid investment, tariff design and system flexibility. Requests from international partners for further policy briefs and aligned analytical work during 2026 reflected growing demand for the 3DEN Initiative's analytical frameworks and policy-relevant evidence base.

Knowledge dissemination, capacity building and policy dialogue

The 3DEN Initiative helped to disseminate impacts and report findings by hosting several key events.

These included a February launch event for the milestone Digital Energy Grid report, in collaboration with the Foundation for Interoperability in Digital Economy, with high-level participation from Dr Fatih Birol, IEA Executive Director; Brian Motherway, Head of the IEA Office of Energy Efficiency and Inclusive Transitions; and Nandan Nilekani and Dr Pramod Varma, co-founders of the Foundation for Interoperability in Digital Economy (FIDE). The report, officially launched by Sujith Nair, CEO of FIDE, highlighted the potential of the Digital Energy Grid to unify energy transactions, assets and actors within a digital framework.

In March, the IEA also hosted the 29th International Smart Grid Action Network (ISGAN) Executive Committee. ISGAN acts as a key platform for analysis and insights gained under the 3DEN Initiative to collaborate and support the planning and implementation of smart distributed grids with outputs from the group, including casebooks, analytical tools and structured knowledge sharing.

FIDE Co-founder Nandan Nilekani and Dr Fatih Birol, Executive Director of the IEA, launch the Digital Energy Grid at IEA headquarters in Paris, France, 12 February 2025

Dr Fatih Birol, Executive Director of the IEA, addresses delegates at the launch of the Digital Energy Grid at IEA headquarters in Paris, France, 12 February 2025

These high-level events were complimented by senior bilateral exchanges involving Italian leadership and IEA management at the United Nations General Assembly and during COP-related activities. These events reaffirmed political support for the 3DEN Initiative and helped to inform its future direction. Engagement with major international partners, including China's National Energy Administration and the OECD Development Cooperation Directorate, positioned the Initiative within wider global discussions on power system reform, grid investment, tariff design and digitalisation.

IEA representatives also participated in international knowledge-sharing forums, including the Institute of Electrical and Electronics Engineers/OECD side event on "The Hidden Costs of AI" (12 February), the Green Powered Futures Mission workshop hosted by Japan's Ministry of Economy, Trade and Industry (18-19 February), and a closed-door session on energy modelling for data centres with the Efficient, Demand Flexible Networked Appliances Technology Collaboration Programme (26 May). These engagements informed IEA work on the intersection of digital infrastructure and energy systems. Building on this broader institutional engagement, 3DEN also contributed to high-level knowledge-sharing events, including a session at EU Sustainability Week and two sessions at the 10th IEA Global Conference on Energy Efficiency in Brussels, strengthening the visibility and reach of 3DEN's work across international platforms.

Energy technology and innovation

The State of Energy Innovation

The first edition of a new IEA report, The State of Energy Innovation, was launched on 2 April 2025. The report is a first-of-its-kind compilation of energy technology innovation indicators and trend analyses, made possible by CETP funding for global energy innovation analysis since the establishment of the programme. Notably, the report covers global trends in public energy R&D spending, energy technology demonstration projects, start-up activity, and patenting and policy developments, all of which depend on underlying data architecture that has been enhanced and expanded through various CETP projects.

The report's main messages focused on the important role of productive energy innovation ecosystems for a range of key energy policy and economic goals, as well as the risks of a recent slowdown in energy innovation funding and changes in the global landscape, such as the rise of China as a major player in energy technology development. This report strengthens the global evidence and data available across the clean energy technologies, identifying areas where greater policy focus could help to improve the delivery of clean energy targets and ambitions.

IEA Energy Innovation Forum 2025

Energy innovation will shape the future energy system and is key to accelerating progress for clean energy goals. In October, with the government of Canada, and in support of Canada's 2025 G7 Presidency, the IEA co-hosted the second IEA Energy Innovation Forum in Toronto. The Forum brought together more than 200 experts from corporate R&D, finance, start-ups and the public sector to support the research, development and deployment of clean energy technologies. Canada's Minister of Energy and Natural Resources and Minister of Environment and Climate Change both participated. The event began with a presentation by Timur Gül, IEA's Chief Energy Technology Officer, of the IEA report, The State of Energy Innovation. This was followed by roundtable discussions on the brightest spots of technology progress over the past year, as well as near-term risks and priority focus areas. Breakout sessions explored AI for energy innovation, battery mineral resilience and carbon dioxide removal technologies, following the focus of The State of Energy Innovation.

The event had a dedicated session on the role of energy technology innovation for development and for securing energy needs in situations with pressing energy challenges, including Ukraine, as well as emerging and developing economies. In her video intervention, Svitlana Grynchuk, Ukraine's Minister of

Energy, discussed how energy innovation is fundamental to the country's energy system and economic recovery strategies. She highlighted the technical skills needed for implementation of Ukraine's largest-ever battery energy storage system. The presentation by Professor Madhavi Srinivasan, from Nanyang Technological University, described the differences in energy needs and challenges in Southeast Asia compared with other regions. He presented examples of R&D projects for powering microgrids on an island in Southeast Asia, noting the importance of strengthening energy grids, which are often overlooked in emerging economies. Finally, Diana Maranga from Octavia Carbon, a Kenyan start-up, discussed the challenges of developing innovative energy technologies in a country without a legacy of innovation institutions and strong international research networks. She outlined the importance of paying attention to local contexts and the need to design projects around local realities, as well as the continued role for international partnerships to support innovation.

Global EV Outlook 2025

The IEA's Global EV Outlook 2025 report was published along with an expanded data explorer covering an increased number of emerging economies. Additionally, the Global EV Policy Explorer was updated and expanded to include an increasing number of policies and strategies related to electric vehicles (EVs) in emerging markets and developing economies.

The report provided an overview of the latest trends in EV deployment, manufacturing, batteries and charging infrastructure. In 2024, more than 20% of new cars sold worldwide were electric, and EV sales in some emerging and developing economies are booming. For example, in Latin America, sales values and penetration rates doubled in many countries, including Brazil, where electric car sales doubled compared to 2023. In Southeast Asia, electric car sales grew by nearly 50% to represent 9% of all car sales in the region in 2024, with Thailand and Viet Nam having notably higher sales. Government support and affordability measures, such as tax and import incentives in Brazil and Indonesia, drove strong EV growth. The report notes uncertainties including changing policies, economic risks and low oil prices, and emphasises that realising potential requires timely infrastructure investment.

Findings on the increasing affordability of electric cars in emerging markets informed analysis in flagship publications, including the World Energy Outlook 2025 and the 2025 Energy Technology Perspectives Special Report on the car industry.

The authors presented the findings in two livestreamed technical webinars, with recordings on YouTube viewed hundreds of times. Around 20 additional presentations were delivered to government stakeholders, including the Dutch

and Swedish governments, and at workshops and conferences such as the Electric Vehicle Symposium. By the end of 2025, the report web pages had attracted over 250 000 users, with total views reaching 670 000. The report's findings received positive coverage from major media outlets, including Global China Daily, Global Times China and Reuters.

Heat pumps

Heat pump uptake is growing globally as a high-efficiency heating solution, but fragmented data reporting limits cross-market comparability. Improving the consistency and coverage of heat pump data would provide policy makers and researchers with stronger evidence to design effective policies and accelerate adoption.

To advance common definitions and classifications for heat pump technologies, the IEA hosted three workshops in 2025, bringing together nearly 150 participants from industry, government, and academia to discuss heat pump data challenges, policy relevance and the development of a common taxonomy. Participants highlighted the need for harmonised definitions and consistent reporting to enable meaningful international comparisons and stronger policy support. In parallel, the IEA launched two stakeholder consultations to inform the development of a common heat pump taxonomy and will continue to lead international coordination on heat pump data, supported by the Heat Pump Coordination Group, established in 2024 under the IEA's Committee on Energy Research and Technology.

Private and public sector investment

A key challenge that remains is mobilising greater investment in energy infrastructure. Despite accounting for two-thirds of the global population, emerging markets and developing economies (EMDEs) other than China attract just over 15% of global energy investments. The geography of energy investment is shifting in ways that will have long-term implications. China is the largest global energy investor by a wide margin, and its share of global clean energy investment has risen from a quarter ten years ago to almost one-third today. Spending patterns remain very uneven, with many developing economies, especially in Africa, struggling to mobilise capital for energy infrastructure.

World Energy Investment Report

2025 marked the 10th edition of the IEA's flagship World Energy Investment Report. It provides a global benchmark for governments, investors and industry for tracking capital flows into the energy sector and examining how investors are

assessing risks and opportunities across all areas of fuel and electricity supply, critical minerals, efficiency, research and development, and energy finance.

This edition of the report included updated analysis of international public finance, with the latest data from development finance institutions and new analysis on the role of multilateral climate funds and the role of export credit agencies in financing the clean energy transition. The regional analysis, first introduced in World Energy Investment 2024, covers ten countries and regions, of which seven cover EMDEs. The report was widely disseminated among industry, financial institutions and other stakeholders at events organised by the Institute of International Finance, the Spanish Energy Club, Danske Bank, BNP Paribas, Cambridge Associates, Jefferies, London Climate Week and the 4th Finance for Development Conference in Sevilla, Spain.

Financing clean energy transitions in EMDEs

The IEA published the third edition of the Cost of Capital data in July 2025, with an updated dashboard and commentary summarising the latest findings from the more recent data. While global investment in the energy sector reached USD 3.3 trillion in 2025, only about 25% reached emerging and developing economies other than China. This highlights the need to address the real and perceived risks faced by investors. In many of these countries, data on financing costs is scarce, so greater transparency could build investor confidence. The IEA's Cost of Capital Observatory helps fill this gap with a dashboard that provides free data on capital costs for energy projects, along with tools and analysis to help governments identify and quantify risks ranging from regulatory and political uncertainties to broader bankability concerns.

Based on the analysis and data, the IEA delivered clean energy finance training for members of the International Development Finance Club, which is made up of national development banks. The training was co-organised with the Frankfurt School of Finance and Management, the International Development Finance Club and the French Development Agency. At the request of several participants, a series of training webinars on financing grids and on hydrogen was also provided.

Transition finance

One of the IEA's key analyses informing COP30 discussions was the Scaling Up Transition Finance report, which provides practical guidance to drive investment in the clean energy transition. Achieving the climate and sustainability goals set out at COP requires significant emissions reductions from emissions-intensive sectors, companies and countries. Yet, many

impactful measures struggle to attract adequate funding or green financing. This is where transition finance plays a role.

It can help emissions-intensive activities shift toward sustainable practices aligned with long-term climate and development goals. While current flows remain modest, estimates suggest that USD 400-500 billion per year could be mobilised over the next decade, complementing green finance and targeting sectors and regions where emissions are hardest to reduce. The report covers the current landscape of transition finance, including deep dives into three sectors that offer particularly strong potential: cement and steel, critical minerals, and natural gas. The report stresses that to ensure meaningful results, financial flows from advanced economies to emerging and developing economies need to expand, and cooperation between governments, financiers and the private sector is essential to overcome barriers and reduce the risk of "financial carbon leakage".

The role of carbon credits in financing clean energy technologies

Transition credits could play a role in accelerating the early retirement of old coal-fired power plants and their replacement with clean energy. However, the implications on energy security for the countries are still unexplored. To provide an analytical lens to this problem, the IEA participated as a knowledge partner in several bilateral and multilateral engagements with the Transition Credits Coalition, led by the Monetary Authority of Singapore, with support from industry partners, as well as the Kinetic Coalition.

Experts from IEA headquarters in Paris and the Singapore Regional Cooperation Centre provided technical support at Singapore's request, guiding the initiative's next steps. This included exchanges with the Rocky Mountain Institute, contributions to the COP30 report, and responses to consultations by the Monetary Authority of Singapore and the Rocky Mountain Institute. Through these interactions, the Transition Credits Coalition identified system-wide barriers and solutions for using energy transition credits, including robust crediting approaches, risk mitigation mechanisms and measures to strengthen buyer confidence.

The IEA also was invited to participate and provided input on transitions credits at the Rockefeller Foundation workshop on "Coal to Clean" in April 2025. The Agency also co-organised the 25th annual workshop on GHG emissions trading with the International Emissions Trading Association and the Electric Power Research Institute, with eight panel sessions held on 2, 3 and 4 December 2025. Always a widely anticipated date in the global carbon trading calendar, this invitation-only workshop brought together over 160 senior government officials,

corporate executives, and researchers from non-governmental organisations and academia to discuss the latest updates and prospects for GHG emissions trading around the world.

Reducing methane emissions

Methane emissions currently account for around 30% of the global temperature increase since the Industrial Revolution, and one-third of methane emissions from human activity come from the fossil fuel sector. These emissions come from several sources, including the oil, gas and coal supply chains, abandoned mines and facilities, the incomplete combustion of gas in flares, and burning biomass for cooking. Significantly cutting methane emissions could prevent a 0.1°C rise in average global temperature and have a profound impact on achieving climate sustainability goals.

The IEA's Global Methane Tracker 2025 report and the accompanying interactive Methane Tracker Data Explorer provide the latest available estimates on global methane emissions. The Global Methane Tracker has been updated annually for the past six years and is globally recognised as the most authoritative and comprehensive source of emissions from fossil fuel operations. In the 2025 update, the IEA added several new features, including in-depth profiles of several new countries, country-level historical emissions data, an interactive tool to explore international methane initiatives, and estimates of emissions from abandoned fossil fuel facilities. Using satellite data, the report finds that energy-related methane emissions are in aggregate about 80% higher than the total reported by countries to the UNFCCC. Current methane reduction pledges cover 80% of global oil and gas production, and the report finds that around 70% of fossil fuel methane emissions could be eliminated using existing, often low-cost technologies. It also highlights that incomplete combustion of traditional biomass for cooking and heating in developing economies is a major methane source, and that universal access to clean cooking would improve health outcomes while reducing overall GHG emissions.

In November 2025, working with the UN Environment Programme's International Methane Emissions Observatory and the Environmental Defense Fund, the IEA released Pledges to Progress 2025, the first assessment of the world's largest oil and gas companies under the accountability framework designed and published jointly by the three institutions in 2024.

In November 2025, the IEA released a report on Advancing Methane Emissions Reductions by National Oil Companies, highlighting how national oil companies can adopt best practices from peers to implement methane management strategies tailored to their circumstances. At COP30, a number of countries released a statement on "Drastically Reducing Methane Emissions in the Global

Fossil Fuel Sector", with support from the European Commission, the IEA and the Latin American Energy Organization. The quantitative elements of the statement were based on findings from the IEA.

Building capacity to regulate methane emissions

Under its Global Methane Engagement Programme, the IEA advanced regulatory development work with Iraq and Kazakhstan, in addition to providing support on policy design and implementation to other countries.

As a strategic partner in Climate and Clean Air Coalition's Fossil Fuel Regulatory Programme, the IEA offered technical and legal expertise to support the development of regulations on methane emissions from oil and gas operations for Kazakhstan. Together with the Ministry of Ecology and the Clean Air Task Force, the IEA co-hosted two regulatory workshops (in January and July) in Astana to facilitate engagement with national stakeholders and provide technical training. The regulatory package, which includes guidelines for leak detection and repair, equipment standards, measurement, monitoring, reporting and verification, and satellite detection, will be deliberated in Parliament in early 2026.

To support Iraq, the IEA partnered with the International Methane Emissions Observatory to develop an emergency response plan to notifications from its Methane Alert and Response System, which will be implemented by Iraq's Ministry of Oil and Ministry of Environment and the country's national oil companies in the second half of 2026. The IEA also provided ad hoc regulatory support in the form of a review of draft methane legislation and presentations of the regulatory roadmap and toolkit to several countries, including Brazil, China, Nigeria, Senegal, Tanzania and Viet Nam.

The IEA continued its series of Regional Roundtables for Turning Methane Pledges into Action with two events in 2025.

In July, the IEA, the Latin American Energy Organization and the Peruvian Ministry of Energy and Mines co-hosted the Second Regional Summit on Methane in Latin America and the Caribbean, in Lima, Peru. The event was attended by over 250 stakeholders from international organisations, industry, and civil society, and government representatives from 22 countries in the region. As part of this summit, the IEA convened a closed-door session to build regulatory capacity on methane for government and national oil company representatives from 16 countries, including major producers like Argentina, Brazil, Colombia, Ecuador and Mexico.

In November, the IEA partnered with the African Energy Commission to convene a regional roundtable in Abuja, Nigeria, that was hosted by the Nigerian Ministry

of Petroleum Resources. This brought together 100 stakeholders, including government officials from Cameroon, Côte d'Ivoire, Gabon, Ghana, Mauritania, Mozambique, Senegal and Uganda.

The next regional roundtable is tentatively planned to take place in Cairo, alongside the Egypes conference, in March 2026 and will focus on the Middle East and North African region.

First Regulatory Convening for Methane Regulations in Astana, Kazakhstan, January 2025

EU Methane Import Standard Workshop in Brussels, Belgium, May 2025

IEA-Latin American Energy Organization Latam Methane Summit, in Lima, Peru, 23-24 July 2025

Low-emissions gases

Low-emissions gases like biomethane, hydrogen and e-methane could play an important part by shaping the future gas sector. To accelerate their deployment, industry, infrastructure and regulation need to adapt for efficient integration. Creating systems that use multiple gases will present a need to overcome network integration challenges and improve supply flexibility.

The IEA continued to closely monitor the development of low-emissions gases, including through the dedicated sections of the Quarterly Gas Report and timely updates in each of the quarterly Gas Reports. The deployment of low-emissions gases is expected to continue at a strong pace over the medium term, and in the IEA's outlook, the supply of low-emissions gases is expected to increase by two-and-half times by 2030. Despite this growth, the impact of low-emissions gases on the global gas balance is set to remain limited through 2030. They are expected to account for less than 1% of global gaseous fuels supply at the end of this decade.

To facilitate dialogue between emerging producers and consumers, the IEA held the Low-Emissions Gases Day in February 2025, bringing together nearly 150 government representatives and private stakeholders. Participants discussed the evolving policy frameworks supporting development of low-emissions gases, developments in emerging and mature markets for biogas and biomethane, recent developments in low-emissions hydrogen and emerging trade in low-emissions gases. Trade was a particular focus, and the event included a presentation by Tokyo Gas, providing an update on e-methane trade projects, and another by representatives from Ukraine, which started exporting biomethane to the European Union in early February.

At the invitation of the President of Brazil's Biogas Association, IEA experts participated in Brazil's 12th Biogas Forum, held in São Paulo on 2-3 September and organised by Brazil's Biogas Association in cooperation with the Ministry of Mines and Energy, as well as Petrobras.

People-centred clean energy transitions

Ensuring that energy transitions ultimately benefit people is the key to their success. Through its people-centred programme, the IEA works to identify the impacts of energy policy on people's everyday lives and how policies can be designed, implemented and tracked to deliver tangible economic and social gains for populations, which can lead to overall improvements in their quality of life. This work focuses on themes that are top of mind for governments around the world, including jobs and skills, energy affordability, and meaningful stakeholder engagement and participation.

In 2025, the programme continued to develop its analytical workstream and strengthen its network, enabling the convening of over 200 policy makers, researchers, and industry, labour and civil society stakeholders across four continents in nine technical workshops and stakeholder consultations. This included meeting in-person and online with key institutional partners, such as the International Labour Organisation, to develop and harmonise data collaboration, as well as delivering external presentations and engaging with stakeholders involved in the just transition projects. These included: the German Agency for International Cooperation's Innovation Regions for a Just Energy Transition initiative; the UNFCCC 17th Research Dialogue; the Building and Wood Workers' International meetings (365 trade unions representing 12 million members across 117 countries); the 14th International Forum on Energy for Sustainable Development, organised by the five United Nations Regional Commissions; and the SDG7 Action Forum during New York Climate Week.

The IEA also delivered a number of presentations in events organised by youth organisations, including the SDG7 Youth Constituency and Renew Watts (Nigeria), and it welcomed various student groups for presentations on the Agency's work, including the Yale Climate Fellows, the Warsaw School of Economics and the University of Strathmore (Kenya).

Many of the programme's outputs were channelled through its key high-level convening groups, the Global Commission on People-Centred Clean Energy Transitions, the Clean Energy Labour Council and the Gender Advisory Council. Those convenings served as vehicles to raise the profile of the work and make a tangible contribution on this topic in multilateral forums, including the G20 and COP. At COP 30, the IEA organised five side events, including two high-level convenings at the UK and Brazilian pavilions, and intervened in five side events

with partners. At these events, the IEA focused on relevant topics, such as employment and skills, health, generating benefits for local communities, energy transitions in different country contexts, and measuring and monitoring progress.

Global Commission on People-Centred Clean Energy Transitions

The IEA hosted a meeting of the Global Commission on People-Centred Clean Energy Transitions as part of the official G20 Energy Transitions Ministerial meeting in Durban. Opened by the South African Energy Minister and chaired by the Department of Economic Development, the meeting brought together EU and African Union Energy Commissioners, as well as ministers and vice-ministers from Denmark, Germany, Norway, Singapore, Spain and the United Kingdom.

The IEA Global Commission on People-Centred Clean Energy Transitions met in person in Brussels in June 2025 as part of the 10th Global Conference on Energy Efficiency. The meeting marked the launch of the Blueprint for Action on Just and Inclusive Energy Transitions, developed with Commission members.

IEA Clean Energy Labour Council

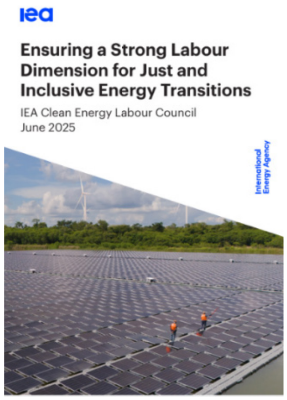
The IEA Labour Council welcomed two new important members in 2025, industriAll European Trade Union and IndustriAll Global Union, as the European and International sectoral representatives. This has increased IEA outreach with energy workers across the globe and input into IEA's work from energy workers and their representatives.

The IEA Labour Council met three times in 2025. The first meeting, which took place online on 21 March, included presentations and discussions on the IEA Electricity 2025 report and IEA's new initiative on artificial intelligence. The meeting also provided an opportunity to identify priorities for Labour Council members for the year ahead and prepare for the next in-person meeting of the Labour Council in June.

The second Labour Council meeting took place on 13 June 2025 on the sidelines of the 10th Global Conference on Energy Efficiency. Representatives from various countries and the COP30 Presidency attended the meeting, which focused on clean energy transitions and multilateral engagement. Updates were shared by the COP30 Presidency, the Congress of South African Trade Unions, a key South African G20 stakeholder and the IEA. Special guests, including Nigeria's Minister of State for Labour and Employment and the European Commission's Deputy Director General for Employment, Social Affairs and Inclusion shared insights on shaping policies for just clean energy transitions and

highlighted relevant current and future initiatives. Labour Council members also explored key themes from the first-ever IEA Labour Council paper, released at the 10th Annual Global Conference on Energy Efficiency.

IEA Labour Council meeting, Brussels, Belgium, 13 June 2025



The Ensuring a Strong Labour Dimension for Just and Inclusive Energy Transitions paper highlights the critical role of labour in making energy transitions fair, inclusive and people-centred. The central role of energy workers is stressed, as are the importance of investing in decent jobs in the clean energy sector and a multi-stakeholder approach to planning and implementing energy transitions. The paper highlights social dialogue as an important tool to manage energy transitions fairly and calls for adequate social protection to provide a safety net for impacted workers.

The IEA Labour Council further shared these policy considerations with international policy makers at the G20 and COP30 Presidencies. The document was also shared with international affiliates of Labour Council members, as well as online and on social media.

The third IEA Labour Council meeting, held online on 16 December, was opened by the IEA's Executive Director. Members discussed the World Energy Outlook 2025 and World Energy Employment Report 2025, sharing insights on employment trends, skills shortages and the central role of energy workers – 76 million globally in 2025. The meeting also reflected on 2025 G20 activities and COP30, highlighting IEA engagement with Labour Council members and their affiliates at both forums.

Online IEA Labour Council meeting to discuss the IEA World Energy Outlook 2025 and the World Energy Employment 2025 Report, 16 December 2025

Beyond official Labour Council meetings, the IEA strengthened bilateral engagement with members, who participated in a range of activities, including as high-level panellists at the 10th Annual Global Conference on Energy Efficiency, the opening panel of the IEA Future of Energy Skills workshop, and various in-person and online workshops on indicators for just energy transitions.

In addition, the Labour Council was instrumental in helping share the IEA Labour Employment Survey, which fed into the IEA World Energy Employment 2025 report. In 2025, a survey of energy workers and their representatives, conducted for the first time, received 213 responses, covering 65 countries.

Judith Kirton-Darling (centre), General Secretary of industriAll European Trade Union, at the 10th Annual Global Conference on Energy Efficiency, in Brussels, Belgium, June 2025

Diana Junquera Curiel, IndustriAll Global Union, at the IEA's Future of Energy Skills Workshop in Paris, France, May 2025

The people-centred team was also asked to attend various international trade union events in 2025 to present the IEA's work on employment, skills and just energy transitions. This provided an opportunity to further distribute the IEA's work in these areas, collect useful data sources and case studies for forthcoming reports, and further develop relationships with IEA Labour Council members and the wider labour movement representing energy workers.

Energy and employment modelling

World Energy Employment report

The World Energy Employment (WEE) 2025 report, published on 5 December, expands the IEA's employment model to include new energy job categories and extends the timeframe to 2015-2035, up from 2019-2030. The analysis is supported by an expanded Energy Employment Survey, which received responses from over 700 companies, educators and trade unions, compared with 200 in the previous edition. For the first time, the report provides detailed occupation-level estimates, offering insights into skills requirements, workforce demographics and education trends. Two special chapters focus on the Future of Energy Skills and were complemented by the IEA Future of Energy Skills Workshop on 13-14 May 2025, which brought together over 60 stakeholders from industry, education, labour and policy.

Findings from WEE 2024 and early results from WEE 2025 were also presented at 16 events in 2025, including two COP30 side events, UNFCCC Climate Week, the UN International Forum on Sustainable Development and the IEA Clean Energy Labour Council. The presentations generated strong demand for discussion among policy makers, industry stakeholders, labour representatives

and other audiences, highlighting the broad relevance of the reports' findings. The report also received strong interest from major press outlets.

Geospatial analysis

Geospatial analysis is at the forefront of empirical research, as it provides detailed, location-specific insights, enabling the IEA to connect physical, economic and social factors in ways that aggregate data cannot. Over 4 700 unique datasets have been collated into a central directory on the IEA's server, significantly streamlining the integration of geospatial data across a wide range of IEA analyses, including work on climate resilience, investment and access. As the repository is now routinely used in analytical workflows, new datasets continue to be added, and metadata is regularly updated to ensure quality and usability.

This sustained effort to centralise key geospatial datasets has further enhanced analytical efficiency and has played a prominent role in recent publications, including Chapters 1 and 5 of World Energy Outlook 2025 and the Colombia Net Zero Roadmap.

Monitoring global clean energy policy progress

The IEA further developed its policy collection and methodology in 2025 to feed into the forthcoming State of Energy Policy 2026 (to be published in the first quarter of 2026). One priority focus this year has been to develop the long-term vision of energy security policies globally, from emergency measures against oil and natural gas disruptions, to new, emerging risks like cybersecurity, supply chains and climate resilience.

New workstreams also include the development of a new tracking of government energy spending data, from initial budgets to actual disbursements, at programme level and for all energy sectors. The team also extensively developed a new methodology to assess the past and future policy impacts, notably of energy efficiency standards. This work contributed to a commentary, Are governments better positioned to respond to energy security risks today than in the past?, published in July 2025 and in the World Energy Outlook 2025 report.

Data and statistics

Developing skills and systems for data-driven energy policy

Energy Statistics Roadmap translations

In 2025, the IEA published French and Spanish translations of Designing an Energy Statistics Roadmap: A Guide to Strengthening National Capacities for Tracking Energy Transitions, and it is finalising the Arabic and Russian versions, which are expected to be released in 2026. The guidebook, launched in 2025, is designed to help governments in emerging markets and developing economies enhance their data strategies and strengthen efforts to track energy transitions.

Accompanied by a Microsoft Excel-based tool, the guidebook serves not only as a framework for assessing national energy systems, but also as a practical resource for strategic action planning. It enables countries to evaluate the current status of their energy systems and develop tailored action plans based on identified priority areas.

Data capacity development

To advance data capacity development, the IEA has taken a coordinated approach to training and technical assistance. Building on the Energy Statistics Roadmap, the Agency, often in collaboration with international partners, delivered numerous in-person workshops across regions and countries, complemented by online webinars. These efforts were supported by partnerships with the United Nations (including the United Nations Statistics Division and the UNFCCC), its regional commissions (such as the Economic and Social Commission for Western Africa) and regional organisations like the African Energy Commission.

One notable example was the joint workshop with the UNFCCC in Rabat, Morocco. In December 2025, the IEA contributed as an energy statistics expert to a three-day Workshop on Quality Assurance of the National Energy Information Management System and Energy Statistics of Morocco. This mission reflects the deepening collaboration between the IEA and the UNFCCC on energy data for climate purposes, and Morocco remains an important partner in these efforts.

Toolkit for modelling energy end-use consumption

In 2025, the IEA developed a draft toolkit designed to model end-use energy data from raw, commonly available data sources. The toolkit covers four sectors:

industry, residential, services, and transport. For ease of use in various national contexts, the toolkit consists of an Excel file for entering input data and calculating end-use data, using default or customised assumptions, and a Word document providing guidelines that explain the assumptions and offer instructions for using the tool. The IEA will further refine the materials and test different components in collaboration with volunteering countries.

Measuring energy affordability

In 2025, the IEA launched a scoping study on measuring energy affordability, aiming to strengthen understanding of how affordability can be assessed across different contexts. The study is now being finalised, with a report expected in 2026 that will serve as a reference point for countries seeking guidance on energy affordability metrics and methodologies. This effort marks an important step toward developing consistent, evidence-based approaches to monitor and address affordability challenges in the energy sector and enhance the deliverability of clean energy targets and ambitions in a low-cost manner.

Energy expenditures

In 2025, the internal Energy Expenditure database was migrated to a new data system and updated with the latest energy prices. Additionally, expenditure data were converted and coupled with other indicators, enabling more robust and consistent analyses. Additional indicators included computing expenditure in constant prices, as well as pairing expenditure with income data. Results from this enhanced database were published in an internal report and have supported several flagship IEA publications, including the Energy Efficiency Market Report. External release of a pilot database is planned for 2026.

Additional indicators on energy security and critical minerals

Significant progress was achieved in developing energy security indicators. A detailed questionnaire assessing data systems for critical minerals was finalised to pilot with different countries in the coming months. Data system assessment questions were also incorporated into critical mineral review questionnaires. Further work included initiating collaboration with Eurostat to integrate generation capacity information into the monthly electricity questionnaire, enabling earlier collection of annual capacity modification data for use in power security indicators.

Policy data for empirical analysis

This workstream delivers outputs that aim to bridge the gap between innovative data approaches and the urgent needs of policy makers navigating energy transitions, including:

- **Patent data, providing insights into emerging clean energy technologies and innovation trends:** In 2025, the IEA updated the Energy Technology Patents Data Explorer by leveraging data pipelines that transform PATSTAT (a database of 300 million patents) into indicators that track how patents are being filed in the energy sector.
- **Open job postings, highlighting workforce developments and skill gaps in the clean energy sector:** The IEA has continued work on developing an innovative Open Job Posting database, featuring vacancies in selected clean energy sectors to analyse trends in the evolving energy job market. Results from this database were published in an internal report and have supported several flagship publications, including the Energy Efficiency Market Report and the World Energy Employment Report.
- **Enhancements to the hydrogen project database using AI, improving data accessibility and analytical capabilities:** The IEA released the application using artificial intelligence to enhance its hydrogen project database by leveraging text analytics from emails and websites. The project converts text data into database fields with currently approximately 85% accuracy. The primary output, expected to be launched in 2026, is an internal application capable of transforming text related to hydrogen projects into database entries within seconds. This work is viewed as a proof-of-concept work to use artificial intelligence to enhance desk research.
- These tools provide policy makers with actionable, evidence-based tools to tackle challenges such as fostering technological innovation, ensuring energy system reliability, building a skilled workforce and strengthening public support for clean energy policies.

Real-time, leading and spatially granular indicators in several areas

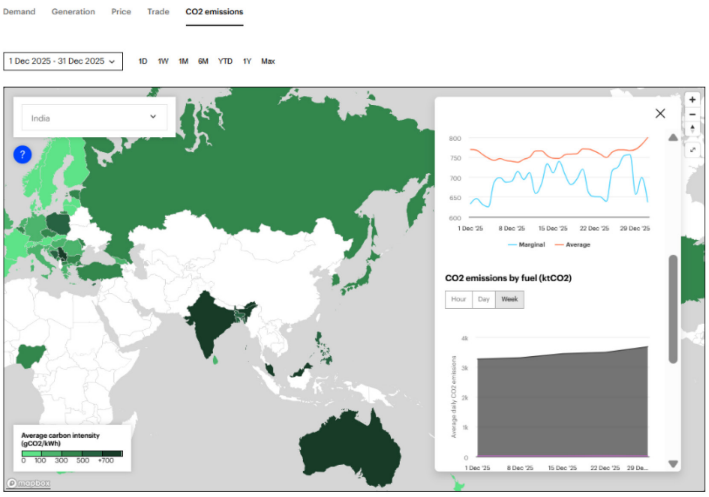
In 2025, the IEA delivered significant improvements to its real-time electricity database and the public-facing Real-Time Electricity Tracker. The tracker can now compare average CO_2 emission factors to marginal CO_2 emission factors, based on the average CO_2 intensity of the marginal electricity mix at every hour. Both metrics can be viewed at hourly, daily and weekly levels.

The Real-Time Electricity Tracker provides real-time data on electricity demand, generation, trade and spot prices for more than 60 countries, with daily and hourly resolution at both country and regional levels. The data have already informed key IEA publications, such as the Electricity Market Report and the

Clean Energy Market Monitor. Users can also explore the narratives behind the numbers through interactive features accompanying the data.

To better understand demand dynamics, the IEA has developed a model that isolates the temperature-related component of real-time electricity demand. Running daily, the model enables near-instant tracking of temperature-corrected demand as soon as electricity data are ingested. These insights were used in the Energy Efficiency 2025 report.

To further enrich the IEA's datasets with high-frequency, real-time information, the IEA has also developed a project that extracts data from open-source flight databases and converts them into estimates of fuel consumption and CO_2 emissions. The associated data pipelines operate continuously (24/7) and are carefully orchestrated to minimise the burden on data provider.



Real-Time Electricity Tracker

Acknowledgements

The IEA gratefully acknowledges the support provided to the CETP in 2025 by Australia, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom and the European Commission, acting on behalf of the European Union. Their continued trust and collaboration form the foundation for the programme's success.

The IEA also sincerely thanks the CETP partner countries for their engagement and shared commitment to advancing clean energy transitions. Their dedication, insights and continued collaboration are instrumental in building a more sustainable and resilient energy future.

The CETP Core Team extends its gratitude to Dr Fatih Birol (IEA Executive Director), Mary Burce Warlick (Deputy Executive Director) and Dan Dorner (Head of Strategic Initiatives Office) for their strategic oversight in the implementation of the programme over the past year. Our sincere thanks also go to the other members of the IEA leadership and to all the members of their teams for the excellent guidance and management of various aspects of the programme.

The CETP Annual Report 2025 was led by Magdalena Sanocka and supported by Kristína Lopatková and the wider CETP team in the Strategic Initiatives Office. It has been made possible by the contributions of colleagues across the IEA. We would like to thank all of them for their outstanding implementation of the programme activities and for their contribution to this report.

We are grateful to our colleagues in IEA Corporate Services, and particularly those who form part of the CETP Core Team for their invaluable support throughout the year.

A special thank you to Susan Copeland for her expert editing.

We also wish to express our appreciation to the IEA Communications and Digital Office for their help in producing this report.

For any questions about the CETP or this report, please contact cetp@iea.org.

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Typeset in France by IEA - March 2026
Cover design: IEA
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