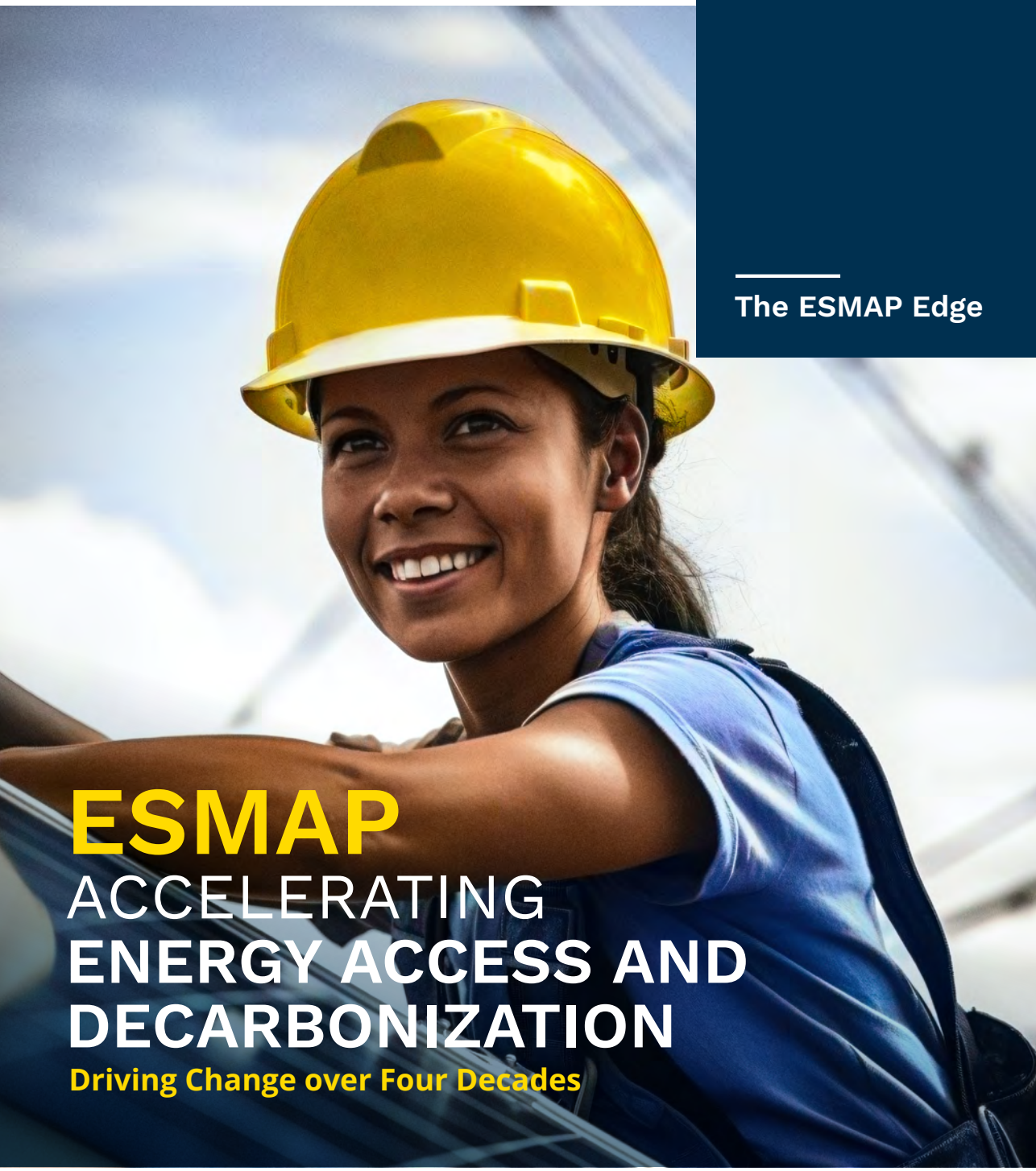
The ESMAP Edge



ESMAP
ACCELERATING ENERGY ACCESS AND DECARBONIZATION
Driving Change over Four Decades

40 ESMAP
Energy Sector Management Assistance Program

THE WORLD BANK
IBRD • IDA

Turmoil, discovery, and crises are driving change...

- Energy supply disruptions are pushing faster transitions
- Storms, wildfires, and droughts prompt urgency to act on climate change
- Lower cost renewable energy enables scaled-up adoption
- Expanding mini grids means affordable solar solutions for off-grid communities
- Digitalization enables end-to-end supply chain efficiency
- Grid-scale battery storage and green hydrogen are coming onstream
- Governments and private sector are making sustainable energy a priority

Opportunities abound...

- Cheaper renewables offer technology leapfrog potential
- Mini grids and off-grid solutions deliver sustainable and affordable electricity access
- Just Transitions are happening—and can be scaled up
- Onshore and offshore wind and solar maps show vast resources
- Green hydrogen gaining ground—even in low-income countries
- Big countries are stepping up investments in clean energy
- Battery storage advances enable renewable energy grids

...but the scale of challenges demands greater ambition.

- Over half a billion people without electricity
- More than 2 billion people cook on open fires
- Carbon budget will be exhausted in 9 years if 1.5°C target is to be met
- Fossil fuel subsidies persist at $5.9 trillion worldwide (6.8% of GDP in 2020), and are growing, especially in emerging markets
- Effects of climate change under a 2°C rise would reduce global economic output by 10% by 2050, with emerging-market and developing countries most severely affected
- Low growth, high interest rates, and food and fuel shortages pose dangers for low-income countries
- Sovereign and power utility debt rising as governments respond to inflation with costly subsidies
- Developing countries need financing of $2.4T/year to achieve net zero transitions consistent with development goals
- Hotter weather increases power demand to cool buildings

Together with other World Bank colleagues, ESMAP helped to deliver in developing countries over the past three years...

...**18GW of renewable energy**, equivalent to almost a third of all of Africa's installed renewable energy capacity.

...**access to electricity for 300M people**, almost as much as 90% of the US population.

...the ability to **cook without health hazards and carbon emission for 16M people**, 90% of the population of Netherlands or three times the population of Norway.

...**93 million metric tons of CO_2 emissions reductions**, as much as a quarter of Australia's CO_2 emissions in 2021.

ESMAP:
A Platform to Scale Up Action!

For 40 years, the World Bank's Energy Sector Management Assistance Program has worked with developing and emerging-market countries to solve their energy challenges. Backed by over 20 partners, including governments and foundations, ESMAP's staff of over 50 experts lead teams at the forefront of the energy transformation. ESMAP's theory of change has proven itself. It focuses on transformation from the ground up, starting with government policies, and regulatory and operational frameworks. This ensures that energy solutions are not just sustainable, but actually sustained. Set up in 1983 to help low-income countries respond to oil price increases, ESMAP now has a diversified agenda from household energy and clean cooking, to national policy reform and integration of cutting-edge clean energy technologies and solutions. ESMAP is a powerful knowledge broker, seizing opportunities to push the global effort to deliver universal access to electricity and decarbonized energy services by 2030!

Knowledge & Expertise

ESMAP is a think tank, connector, data gatherer, analyst, and innovator. It is an authoritative source for solutions to achieve universal access to energy and decarbonization of energy systems. ESMAP collects data and produces analytics to inform on cutting-edge advances based on ground experience. Its data repository includes a wide range of global information, such as wind and solar maps, geospatial data on electricity access, energy consumption patterns, policy and regulation, and institutional governance, among others. ESMAP's knowledge base ranges from detailed economic and technical assessments to policy roadmaps and "how to" guidance, clarifying key factors and strategies.

Finance Mobilization

ESMAP's expertise on raising funds turns ideas into projects. ESMAP's status, as part of the World Bank Group, enables it to leverage concessional financing that incentivizes private investment in challenging sectors and regions. ESMAP offers unique insights on sources for grants and concessional financing from climate funds. It supports the structuring of project pipelines, and often arranges blended and layered financing, along with mobilization of recipient-executed trust funds, philanthropic, and private capital.

Catalyst

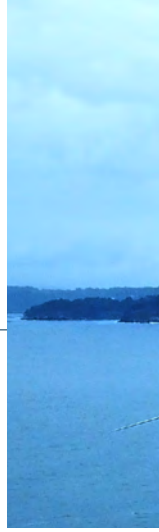
ESMAP mobilizes its experience and networks to spark change. It connects peers—public and private—across countries to test new approaches, while refining them through tailor-made pilot projects, replicating and scaling up those that work. Its studies, test projects, conferences, study tours, technical partnerships, and knowledge exchanges combine to catalyze action on integrating new energy technologies and creating markets for them.

Global Reach, Advocacy, & Partnerships

Through its integration with World Bank operations, ESMAP influences energy investments globally. Its convening power with developing-country governments, multilateral banks, private capital markets, bilateral donors, foundations, carbon-market finance institutions, national laboratories, experts in energy technology companies, consulting firms, and academia give it an ability to forge lasting partnerships.

Policy Laboratory

ESMAP analyzes energy markets, utility performance, policy and regulatory incentives, tariffs, standards, operational protocols, and rules around the world, identifying effective practices to offer countries innovative solutions that have often led to breakthroughs.



How ESMAP Works

STEP 1

DATA GATHERING

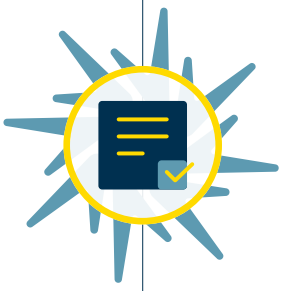
It starts with study, data-gathering, and analysis. ESMAP teams draw on existing knowledge and experience to assess the needs of specific countries, or regions within countries. They identify gaps and innovation opportunities, review existing policies, plans and programs, conduct energy modelling, and make recommendations. ESMAP also incubates new ideas, identifies innovation frontiers, and creates new facilities and partnerships—such as the Sustainable Renewables Risk Mitigation Facility or the Hydrogen for Development Partnership—based on global experience, on-the-ground practice, and emerging needs.

STEP 2

COLLABORATION

Client government and World Bank teams, with support from ESMAP, develop Strategic Country Diagnostics, Country Partnership Frameworks, and Country Climate Development Reports, which are the foundations on which strategies and plans are developed to address electricity access gaps and/or to achieve decarbonization goals. ESMAP provides resources, data, and insights to inform these core analytical products, as well as Programmatic Advisory Services and Analytics, which focus on energy access and transitions. ESMAP also provides support to the teams to structure and customize the design of new projects and programs. It then works to mobilize financing to implement them. This includes direct financing from ESMAP's own resources for pilot projects and contributions from climate funds to complement World Bank Group (IBRD, IDA, IFC, and MIGA).

STEP 3



IMPLEMENTATION

Projects and programs are implemented. Where results meet or exceed expectations, ESMAP works with World Bank operational teams to identify scale-up opportunities, as well as financing to seize them. In some cases, ESMAP has led efforts to create dedicated funds for clean cooking, cooling, renewable energy, coal transition, and energy storage, among others.

STEP 4

KNOWLEDGE SHARING

ESMAP captures the lessons of successful (and less successful) projects, to share the knowledge gained with other countries. This is done through thematic deep dives, conferences, study tours, customized learning events, and South-South knowledge exchanges, as well as through published manuals and guides on various energy challenges. Often, ESMAP staff, with direct experience leading projects to expand access and/or decarbonize in one country, oversee efforts to replicate this success in other countries.

KNOWLEDGE AND EXPERTISE

ESMAP is a think tank whose world-class experts gather and analyze data on energy access, cooking practices, renewable energy expansion, and end-use decarbonization solutions in hard-to-abate sectors including energy efficiency practices. Drawing from multiple sources, our teams develop global and country-specific data sets whose comprehensive rigor has gained the confidence of partners including governments, private investors, utility managers, and policymakers, among others.

Focused Studies Providing Guidance to Practitioners and Policymakers to Achieve Successful Energy Access and Decarbonization Interventions

ESMAP distills global experience from World Bank operations to clarify critical factors needed to advance best-practice frontiers. For example, ***Key Factors for Successful Development of Offshore Wind in Emerging Markets*** draws conclusions from ESMAP's experience and study in over 20 countries; it offers guidance to decision-makers and developers in how to marshall some of the 2,000 gigawatts of offshore wind power that will be needed to achieve net zero emissions by 2050. Other examples include ***Unlocking Clean Cooking Pathways: A Practitioner's Keys to Progress***, ***Mini Grids for Half a Billion People: Market Outlook and Handbook for Decision Makers***, and ***Wholesale Electricity Markets Design Options for Developing Countries***.

The ***Tracking SDG7: The Energy Progress Report***, produced by ESMAP with the support and collaboration of 32 partners, is the go-to source for data on global progress towards achievement of the Sustainable Development Goal on Energy (SDG7). Based on the premise "what gets measured gets done," this annual report is an authoritative source for country-by-country and worldwide status on electricity access, renewable energy, energy efficiency, and financial flows for investment in renewables.

Regulatory Indicators for Sustainable Energy (RISE) is a free, open-source diagnostic tool for governments, investors, and legal and consulting firms assessing risks of investing in energy solutions in 140 countries. Updated every two years, RISE provides detailed information via an accessible scorecard format on individual developing countries' policies, regulations, standards, and practices for electricity access, clean cooking, renewable energy, and energy efficiency.

The **Multi-Tier Energy Access Tracking Framework** (MTF) uses country-level data to identify what prevents or limits households' access to and use of electricity. These data are essential to effective planning to expand access. In 2022, ESMAP's MTF team conducted surveys in Bangladesh, Pakistan, Papua New Guinea, Rwanda, and South Sudan. Their assessments will be used to ensure that newly served customers get electricity that fully meets their needs, as well being safe, reliable, and affordable.

The **Global Electricity Regulatory Index** (GERI), a complementary compendium to RISE, developed in collaboration with the African Development Bank (AfDB), collects data from more than 100 developing countries to help identify gaps in their regulatory frameworks and benchmark their performance against their global peers.

FINANCE MOBILIZATION

ESMAP unit has within it an Energy Climate Finance Team that works in close collaboration with Climate Investment Funds, the Global Environment Facility, the Canada Facility, the Green Climate Fund, and others. ESMAP teams bring technical experience in structuring innovative delivery solutions that blend World Bank lending and concessional lending from the Bank's International Development Association with concessional climate finance from global, as well as bilateral providers. In addition, ESMAP programs also secure private capital and grant financing, including contributions from philanthropic foundations.

Risk Mitigation

ESMAP's pioneering work with 30 developing countries to develop renewable energy targets and bankable projects has ignited widespread interest. ESMAP's pilot effort, Energizing Renewables, or EnRen, evolved as demand grew with successful rooftop solar projects in Vietnam and the Maldives. Now renamed the Sustainable Renewables Risk Mitigation Facility (SRMI), it is supported by $440 million from the Green Climate Fund ($280 from SRMI-1 window and $160 from SRMI-Resilience), blended with World Bank financing, worth a targeted $2.5 billion, to leverage another $5.8 billion in private investment. A total of 16 countries are on board in both SRMI facilities, 10 of which are in Sub-Saharan Africa. The program is expected to connect 12.2 million people to electricity drawn from renewable sources backed up by battery storage.

Cooling

A climate change nightmare scenario of intense and frequent heatwaves has surfaced in many already hot-weather countries, where over half the world's population will live by 2030. Hence, the importance of cooling technologies and cold chains for food production, storage and transport, health care, and vaccine distribution, as well as for homes and workplaces. ESMAP's Efficient and Clean Cooling Program mobilized concessional climate finance of $157 million from the Green Climate Fund to co-finance World Bank project lending of $723 million to support policy reforms and direct investments, enabling adoption of modern cooling techniques and technologies.

Clean Cooking

Gender-based inequities persist throughout the energy sector, but they are especially pernicious—and deadly—in cooking. About 2.4 billion people rely on wood, charcoal, coal, dung, and kerosene to cook. Families, especially women and children, are exposed to toxic smoke, killing up to 4 million people each year. The same smoke pollutes the air and sends carbon into the atmosphere. In 2019, ESMAP launched a $500-million Clean Cooling Fund, with the goal of leveraging another $2 billion in investments in the sector. Rwanda was among the first countries to implement the model: ESMAP provided a grant to develop the Energy Access Quality Improvement Project, launched in 2020. It will deliver clean cooking solutions to half a million households by leveraging $30 million in public and private sector investment. Similar projects are planned for five other African countries, as well as Myanmar. Already, ESMAP-initiated technical support and financing have prompted new policies and complementary financing to bring clean cooking solutions to 61.5 million people.

Just Transitions from Coal

The ESMAP team played an integral role in developing the climate finance and investment package required to convert South Africa's old, unprofitable Komati coal power plant into a site for renewable energy and battery storage. The Komati project is financed jointly by a $439.5 million World Bank loan, a $47.5 million concessional loan from Canada's Clean Energy and Forest Climate Facility, and a $10 million grant from ESMAP, made possible by the United Kingdom's $3 million contribution and $7 million from the Global Energy Alliance for People and Planet. ESMAP also supported the preparation of the Climate Investment Fund's Accelerating Coal Transition (ACT) program, and its investment plan in South Africa, approved in October 2022.

CATALYST

ESMAP leverages its knowledge and proximity to project design and finance to be a catalyst, igniting transformation. ESMAP teams convene experts who share their experience with energy sector decision-makers in developing countries. This encourages country policy and planning officials to integrate new technologies and apply innovative policy incentives and regulations. ESMAP enables energy leaders from one country or region to visit their counterparts in another area, learning—and often adopting—new approaches, tools, and practices. Our global network of energy insiders, built over 40 years and reinforced by its integration into World Bank teams in over 100 countries, makes ESMAP a supercharged expert group with force-multiplier impact. With its donors and clients shaping the context, ESMAP has fostered integrated multi-country power pools, helped introduce energy storage technologies, and scaled up solar, onshore, and offshore wind implementation, as well as off-grid and mini grid solar use. It has jump-started countries' plans to reform costly subsidies and effect transitions away from coal. There is magic and power in action, and ESMAP catalyzes that action.

Electricity Market Integration

People in some regions of Africa, Latin America, East Asia and the Pacific, and the Middle East and North Africa struggle with limited access to electricity because their countries' electricity markets are too small. Think Mali, Chad, and Burkina Faso. Or El Salvador and Honduras. Alone, they don't have enough electricity customers for an optimal-sized power plant, so they struggle with inefficient plants, spotty grid connections, and substandard service, with frequent blackouts and brownouts. Utilities in such countries—and there are dozens of them—are often hobbled by debt and kept afloat only by wasteful subsidies that drain scarce state resources. A solution to break this dead-end cycle is the development of regional markets, and ESMAP is showing the way. In 2021, ESMAP set up the Electricity Markets, Grid Connectivity, and Regional Trade (MARCOT) program. Through grants to 16 regions, including West, East, and Southern Africa, governments gained access to expert advice on electricity markets. MARCOT's assessments and guidance on pricing, removal of subsidies, and rigorous application of regulation has changed minds. Critically, ESMAP advised many to couple

their electricity markets with neighboring countries. In Africa, for example, it has led to the creation of regional power pools, expanding the electricity markets and stimulating investment in infrastructure to serve those expanded markets.

Offshore Wind

ESMAP's 2021 study, ***Key Factors for Successful Development of Offshore Wind in Emerging Markets***, is now being adapted to user-friendly, digital e-learning modules on the World Bank's Open Learning Campus. ESMAP has also developed, with the International Finance Corporation (IFC), an Offshore Wind Development Program to invest seed capital that attracts private sector support for offshore wind farms. This effort, developed in collaboration with the Global Wind Energy Council, has financed grants to produce offshore wind maps for Azerbaijan, Colombia, India, the Philippines, Sri Lanka, and Türkiye. Work for Brazil and South Africa will start this year. Already, the Philippines' government has awarded private windfarm developers 42 sites to realize their potential capacity of 31 gigawatts.

"Our global network of energy insiders, built over 40 years and reinforced by its integration into World Bank teams in over 100 countries, makes ESMAP a supercharged expert group with force-multiplier impact."

Transitions from Coal

ESMAP's program, Supporting Coal Regions in Transition, supports developing-country governments as they begin transitions away from coal through coal mine closure and coal plant repurposing. It facilitates knowledge exchange, roadmaps for transition, and designs pathways to preserve and grow human capital by structuring comprehensive social protection packages to protect families impacted by the transition. It also develops training and job transition initiatives. South Africa is among the first countries to benefit from ESMAP's technical assistance on coal plant decommissioning. In this case, ESMAP's advisory activities included technical, economic, and environmental assessments; a socioeconomic baseline for the plants and their surroundings; and designing reskilling programs for staff at Eskom, the utility, and other affected workers. This preparatory work culminated in November 2022 with World Bank approval of a $497 million investment to decommission and repurpose the Komati coal-fired power plant.

"There is magic and power in action, and ESMAP catalyzes that action."

Mini Grids for Half a Billion

Mini grids have emerged as a game-changing breakthrough vehicle to deliver low or zero-carbon electricity to almost half a billion people by 2030, about half the world's currently unserved population. ESMAP is seizing this opportunity through its Global Facility for Mini Grids, now supporting 40 mini grid initiatives in 31 countries. ESMAP's technical assistance, project preparation studies, guidance on service standards, cost benchmarking, financial modelling, and matching suppliers and financiers with mini grid developers is at the forefront of transformation. As the estimated mini grid installation investment cost to connect 490 million new customers by 2030 has been halved to $98 billion from $190 billion in 2018, adoption is scaling up fast. The pace of deployment of mini grids has tripled since 2018, with 48 million people now served by 21,000 mini grids worldwide. This is good news for low-income communities in which electricity access has been most elusive, notably in Sub-Saharan Africa. The ESMAP team has supported design and delivery of three of the region's largest mini grid programs: the Access to Distributed Electricity and Lighting in Ethiopia Project, with 600 mini grids; the Nigeria Electrification Project, with 850 mini grids; and the Kenya Off-Grid Solar Access Project, with more than 130 mini grids. Similar projects are being planned for the Democratic Republic of Congo, Haiti, and Niger. ESMAP experts have also distilled global experience in this emerging field in ***Mini Grids for Half a Billion People: Market Outlook and Handbook for Decision Makers***, a cutting-edge handbook for policymakers and developers, and the World Bank's most comprehensive and authoritative publication on mini grids to date.

GLOBAL REACH, ADVOCACY, AND PARTNERSHIPS

ESMAP's sustained presence and track record make it a trusted leader. Its guidance is sought by energy sector practitioners and decision-makers at all levels, from those installing wind, solar farms, and mini grids, to energy ministers at the UN High-Level Dialogue on Energy. By its unique attributes—knowledge, access to finance, and catalytic role—ESMAP is at the hub of the global conversation on energy solutions. It has fostered long-term engagements with energy leaders in multiple countries. These relationships allow ESMAP to build partnerships among governments, utilities, investors—both institutional and private—and experts in energy management and technology. ESMAP is continually building new networks, sustained by the flow of expertise and financing spread across them. Its direct connection to World Bank operations ensures that its experience-driven advice is widely disseminated. Its adherence to World Bank Group protocols and standards delivers disciplined reporting and accountability, inspiring confidence among clients, donors, and investors that agreements will be met.

Energy Storage Partnership

The Energy Storage Partnership (ESP) enables national laboratories, research institutions, development agencies, and philanthropies to share technology and training to develop new energy storage solutions in developing countries. The partnership delivered project plans for low-income countries—Bangladesh, Burkina Faso, Chad, Liberia, Maldives, Sierra Leone, and Togo, —hitherto dependent on expensive diesel and fuel oil, to shift to solar power and storage. As ESP's initiator, ESMAP leveraged this knowledge partnership to tap financing from the World Bank's concessional loan window, the International Development Association (IDA) and Climate Investment Funds. In 2018, the World Bank Group launched the Accelerating Battery Storage for Development Program, with $1 billion earmarked for projects in low-income countries. In addition, ESMAP's advance work prompted the Climate Investment Funds to direct $725 million in private and public concessional financing that will deliver total battery storage capacity of 640 megawatts.

Hydrogen for Development

Steel mills and cement and fertilizer plants consume huge amounts of energy. This complicates their transition to clean energy; indeed, GHGs in the industrial sector are notoriously hard to abate. Green hydrogen has emerged as a potential solution. ESMAP launched a Hydrogen for Development partnership at COP27, involving 16 government agencies and private companies. Building on ESMAP's Energy Storage Partnership, as well as its Green Hydrogen Support Program which financed, among others, India's effort to identify and plan hydrogen development opportunities, ESMAP is well-positioned to shape this new partnership. Experience gained in developing assessments and roadmaps to produce, utilize, and export green hydrogen in Chile, Costa Rica, Mauritania, Morocco, and Namibia, is guiding ESMAP's action in this emerging field. The Hydrogen for Development Partnership is a platform for knowledge sharing, capacity building, and financing, offering developing countries the tools they need to gain access to the growing hydrogen economy.

Realizing India's Clean Energy Ambition

India, at present the world's third-largest contributor to greenhouse gas (GHG) emissions, has committed to a threefold increase in renewable energy capacity from 150 gigawatts to 500 gigawatts by 2030. This requires an investment of roughly $500 billion. The bold clean energy expansion, announced at COP26, is complemented by a strategy to cut one billion tons of emissions from India's existing trajectory. These pledges underscore the collaborative spirit that has fueled the diverse clean energy and access partnership between India and ESMAP since 2010. Notable ESMAP studies include ***Barriers for Solar Power Development in India*** *(2010) and* ***Unleashing the Potential of Renewable Energy*** *in India (2011). In 2015, ESMAP helped establish the Partial Risk-Sharing Facility for Energy Efficiency. Subsequently, in 2017, a $648-million World Bank loan was granted for grid-connected rooftop solar projects in industrial and commercial sectors. In 2022, an additional $165-million loan was approved to extend rooftop solar to residential buildings. Moreover, ESMAP has supported India's endeavors to widen access to and transition towards clean energy through various studies and projects focused on scaling up battery storage systems, solar parks, and coal mine closures.*

Uganda's Solar Transformation

ESMAP's success in brokering complex partnerships to spread off-grid solar power across Bangladesh and Ethiopia, was adapted for Uganda, where a three-phase Electricity for Rural Transformation project has raised household access from 10 to 48 percent in just eight years. When the country's energy planners found that grid expansions failed to keep pace with growing population and demand, they sought ESMAP's guidance. Applying lessons drawn from its Lighting Africa and Lighting Global programs, both innovative sparkplugs for off-grid solar solutions, ESMAP's team worked with in-country partners and external backers to craft a lasting solution. It helped the government set up a financial intermediary, the Uganda Energy Credit Capitalization Company, to extend loans via local commercial banks to private solar kit supply and maintenance companies. This enabled them to bring their products to unserved households, which found in the solar kits an affordable, leapfrog alternative to waiting interminably for a grid connection. Larger scale solar kits are also being delivered by private companies under service contracts to over 800 schools and health centers in rural Uganda. The program is supported by a $520-million IDA credit, complemented by $118 million in Clean Technology Fund and private financing. It's a model with a big role to play elsewhere: Off-grid solar is emerging as a cost-effective way to accelerate access to electricity.

Multi-Tier Framework for Energy Access

ESMAP's Multi-Tier Framework for Energy Access has proven a critical starting point in helping countries bridge electricity access gaps. Surveys conducted by ESMAP-led teams have led to geo-spatial maps of electricity access in multiple countries, which have resulted in national strategies and plans for expanding access. In Bangladesh, Cambodia, Ethiopia, Pakistan, Papua New Guinea, Rwanda, South Sudan, and Uganda, among others, these national plans, which are data-driven, accurate, and comprehensive, have proven fiscally sound, attracting financing from the International Development Association, as well as bilateral donors. The data collected are guiding large-scale efforts in 21 countries overall to close gaps in reliable, affordable access to electricity, and to launch national electricity expansion plans where needed. It has been among the key drivers in bringing electricity to the previously unserved homes of more than 300 million people worldwide in recent years.

POLICY LABORATORY

ESMAP's robust analytical work, driven by data and analysis, along with its pilot-test projects, mitigate risk and demonstrate that scaled-up investment is not only possible, but highly attractive.

Energy Subsidy Reform Facility

Energy subsidies sustain excessive consumption of fossil fuels that harm the local environment and global climate. Universal price subsidies for fossil fuels often tend to benefit better-off households, while also putting pressure on fiscal balances, and diverting resources from human development, growth-oriented, and pro-poor public spending. Many governments spend more on energy subsidies than social assistance. In the wake of the 2022 energy crisis, global energy subsidies were estimated at over $1 trillion in 2022, resulting in significant fiscal pressures. Experience has shown that well-targeted measures are more effective in meeting the needs of the poorest and most vulnerable, often at lower cost. The Energy Subsidy Reform Facility supports developing country governments in designing energy subsidy reform initiatives. Since 2013, it has provided technical assistance grants totaling over $25 million. These grants are complemented by global knowledge sharing, collaboration, and advocacy. In response to the energy crisis, the Facility ramped up technical support to World Bank teams and governments by monitoring cross-country developments, advising on policy dialogue, highlighting risks and insights from experience, and scaling up funding in all regions to respond to increased demand for technical support on managing crisis impacts.

Off-Grid Solar

A powerful example of ESMAP's role as a policy laboratory is its pioneering effort over a decade ago to promote off-grid solar power to deliver electricity access to unserved households, especially in rural areas. Through its Lighting Africa program launched with a pilot project in Kenya in 2009, ESMAP sought to promote the use of household solar kits. At its outset, many dismissed this as idealistic and impractical, opting to rely on established practice, however slow and expensive, of extending the grid. ESMAP persevered, building up a knowledge base, and partnering with the International Finance Corporation (IFC) and the Global Off-Grid Lighting Association. Together, they developed Lighting

Global, which supported pilot projects to test models of financing, leasing, sales, and service contracts for off-grid solar in multiple settings. As solar PV costs dropped, it became evident that off-grid was the most practical route to closing the electricity access gap. A global off-grid solar market worth over $2 billion has emerged, along with consensus that off-grid solar is the most cost-effective, feasible solution to electrify 55% of currently unconnected households in the next five years. ESMAP, by its early investments in testing off-grid solar solutions in low-income African settings, has been at the forefront of rural electrification worldwide, helping to develop a market that has delivered electricity to over 400 million people in less than a decade. With 80% of those still without electricity living in rural areas, ESMAP's strategy—backed by its donors—offers a proven way forward.

Utilities for Energy Transition

The rapid growth of scalable and affordable renewable energy has coincided with emergence of cost-effective digital technologies. This means that electricity grids can integrate solar, wind, and other net zero or low carbon energy sources. But utilities, regulators, and energy decision-makers seeking to combine these technologies must understand and master them, so as to deploy them effectively. ESMAP's Utilities for Energy Transition provides grants to support pilot programs in which technical assistance is delivered to countries adopting digitized smart-grid technologies with advanced metering. It also tests innovative business models. For example, ESMAP has helped Kenya Light and Power mobilize data on customers' energy usage to identify those who would benefit from credit financing to buy household appliances such as refrigerators, thereby taking full advantage of their electricity access, improving their quality of life, and strengthening the utility's economic viability.

Gender and Energy

Achieving SDG7 is ESMAP's focus, but our mandate includes a parallel commitment to achieve SDG5 on gender equality. Women currently occupy fewer than a third of jobs in the energy sector worldwide and, too often, gender considerations are not properly integrated into energy projects and operations. That's why ESMAP has developed a global program, applying to all regions, on gender and energy. Consistent with its methodology elsewhere, ESMAP has developed an online **Women's Employment in Energy Sector Utilities Toolkit**, a free resource to help utilities integrate gender equity in their operations. The toolkit, also used by World Bank staff in designing and implementing energy lending operations, outlines practices and strategies to remove barriers to women's participation in energy projects, and more broadly, in science, technology, engineering and mathematics (STEM) careers. ESMAP's strategy also addresses the need for equality in women's access as consumers of energy services, to ensure equality in women's ability to have productive livelihoods, as well as access to modern energy services such as clean cooking.

ESMAP Delivers Results

Accelerating Decarbonization...

Renewables

- 18 GW capacity added under World Bank projects
- $21.8 billion leveraged for renewables, including $14.1 billion from private sources
- 6.5 GW capacity added to battery energy storage systems under World Bank projects

Reducing Greenhouse Gases

- 93 tons of emissions avoided under World Bank projects
- 49 World Bank projects that reduce or avoid GHGs
- $2.2 billion mobilized to cut emissions, of which $80 million from private sources

Accelerating Access...

Electricity

- 300 million people gained first-ever access, of which 175 million via mini-grid or off-grid
- 311 public facilities electrified
- $10 billion mobilized to expand access, of which $3 billion from private sources

Clean Cooking

- 16 million gain first-ever access to clean cooking via World Bank projects
- $400 million mobilized for clean cooking

Our Donors

ESMAP owes its success as a driver of change to its donors and partners, whose support includes not just financing but also the experience and knowledge they bring to the energy conversation. Each partner, in turn, benefits from a seat at the ESMAP Consultative Group table, an opportunity to share best practices, to learn from, and influence others. ESMAP offers its partners and donors a mechanism to pool resources for innovation, planning and analytics. This allows for consolidated action to generate robust, data-driven plans, projects, and portfolios, in which donors can invest with confidence and visibility. These are reinforced by built-in results measurement provisions, ensuring accountability and evidence of impact to investors. ESMAP is grateful to its donors and partners for 40 years of fruitful collaboration; thanks to them, ESMAP remains a leader in accelerating access to electricity and decarbonizing energy services worldwide.

Federal Ministry
Republic of Austria
Finance

Federal Ministry
for Economic Cooperation
and Development

GOBIERNO DE ESPAÑA
MINISTERIO DE ASUNTOS ECONÓMICOS Y TRANSFORMACIÓN DIGITAL

ITALIAN AGENCY
FOR DEVELOPMENT
COOPERATION

Federal Ministry
for Economic Affairs
and Climate Action

IKI INTERNATIONAL CLIMATE INITIATIVE

Sida

Global Affairs Canada
Affaires mondiales Canada

Norad

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Agency for Development and Cooperation SDC

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Secretariat for Economics Affairs SECO

climateworks
FOUNDATION

財務省
Ministry of Finance, JAPAN

Ministry of Environment and Energy Security
Department of Energy and Climate

Global Energy Alliance
for People and Planet

LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Environnement, du Climat
et du Développement durable

MINISTRY OF FOREIGN AFFAIRS
OF DENMARK

Foreign, Commonwealth
& Development Office

European
Commission

Ministry of Foreign Affairs of the
Netherlands

Department for
Energy Security
& Net Zero

Ministry for Foreign Affairs of Finland

Government of Iceland

AFD
AGENCE FRANÇAISE
DE DÉVELOPPEMENT

The
Rockefeller
Foundation

THE WORLD BANK
IBRD • IDA

ESMAP
Energy Sector Management Assistance Program

The World Bank
1818 H Street, NW
Washington DC 20433 USA