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NATIONAL ENERGY COMPACT
FOR LIBERIA

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REPUBLIC OF LIBERIA

Preamble

The government of Liberia, recognizing the critical role of energy in fostering economic, political, and social development, has committed to ensuring universal access to modern energy services in an affordable, sustainable, and environmentally friendly manner. This commitment is enshrined in the National Energy Policy (NEP) and is aligned with the U.N. Sustainable Development Goal 7 (SDG 7). The NEP aims to leverage private capital, promote renewable energy resources, and encourage efficient electricity use, and it emphasizes regional and international cooperation in electricity trade and investments.

Liberia is a country of 5.56 million people with about a third of its population living within an 80-kilometer radius of the capital, Monrovia, while the rest is dispersed across 14,000 settlements throughout the country's 111,000 square kilometers. This makes distributed renewable energy (DRE) the cost-effective solution for many of the settlements outside Monrovia. This National Energy Compact for Liberia aims to accelerate the pace of electricity to 100,000 households per year through grid and off-grid options to achieve a national access rate of 75 percent by 2030 and to develop a national clean cooking strategy to identify the baseline and targets for increasing access to clean cooking solutions. Liberia is committed to increasing its share of renewable energy to 75 percent from the current 67 percent, while the generation base is expected to increase by 150 percent. Liberia aims to mobilize US$70 million of private capital for utility-scale solar and another US$80–100 million for DRE and clean cooking.

To achieve these ambitious targets, a time-bound and realistic action plan is included in the Compact. The action plan outlines the various reform actions to be taken across five pillars: (1) rehabilitating and expanding power generation, transmission, and distribution network infrastructure at competitive costs; (2) leveraging the benefits of increased regional integration; (3) embracing DRE and clean cooking solutions as critical elements of the access agenda; (4) incentivizing private-sector participation to unlock additional resources; and (5) ensuring financially viable utilities that prioritize energy security and provide affordable, reliable, inclusive, sustainable, and clean energy.

The development of this National Energy Compact has been enriched by multiple consultative sessions of the technical working group, feedback from the heads of entities and ministries, and engagement with development partners, the private sector, including industry associations, as well as civil society. These collaborative efforts have been instrumental in shaping the strategic direction and ensuring the alignment of objectives with the broader development goals.

Recognizing that success requires capacity-building and considerable collective efforts, the government of Liberia calls on development partners, philanthropies, the private sector, and civil society to join this transformative journey in accelerating the pace of access to energy and help in mobilizing US$1.25 billion in financing, including about US$150 million from the private sector. The government is committed to implementing the action plan included in the Compact to address the bottlenecks across the energy value chain and to help mobilize the necessary financing to provide reliable, affordable, inclusive, sustainable, and clean energy and contribute to the economic growth and development of the country and the region.

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Declaration of Commitment

The government of Liberia is committed to accelerating the pace of energy access to provide reliable, affordable, inclusive, sustainable, and clean energy to all Liberians and to catalyze economic growth, poverty reduction, and social transformation across Liberia, especially in underserved rural areas. To this end, the government aims to:

- Expand electricity access to 100,000 households per year compared with the current rate of 70,000 households per year, which would increase the national electricity access rate to at least 75 percent by 2030 from the current 32.7 percent.
- Develop a national clean cooking strategy to identify the baseline and targets for increasing access to clean cooking solutions, which would particularly benefit women and marginalized communities.
- Increase the current share of renewable energy in the generation mix to 75 percent from the current share of 67 percent while increasing the generation capacity by 150 percent.
- Create an enabling environment for private-sector participation in the energy sector to mobilize US$150 million of private investment.

To achieve these targets, we declare our resolve to take actions to address the bottlenecks across the energy value chain as outlined in the action plan included in this National Energy Compact. In particular, the government of Liberia commits to:

Rehabilitate and expand energy infrastructure at competitive costs.

- **To guide future public and private investment in electricity generation, transmission, and distribution, the revised National Energy Policy (NEP) will be adopted by March 2025 and a comprehensive, integrated least-cost power system master plan, factoring in life-cycle costs and regional resources, will be developed by June 2026**, building on the Optimization Study, the Priority Investment Plan, and the National Electrification Strategy.
- **Complete the necessary preparations to establish a solar park and launch the tender for the first utility-scale solar independent power producer (IPP) by August 2025.**
- **The government of Liberia is committed to completing the Saint Paul 2 Hydropower Plant (HPP) tender design, doing feasibility studies (including environmental and social instruments), and finalizing a credible financing plan and procurement strategy to start the bidding for key contracts by November 2026.** Recognizing the critical importance of timely completion of these renewable energy projects, a high-level steering committee headed by the Liberian vice president will meet every quarter to monitor progress and coordinate necessary actions to address bottlenecks.

Leverage benefits of increased regional integration.

- **Recognizing the crucial importance of cross-border electricity trading to optimize energy supply costs, the government of Liberia commits** to ensuring the availability of funds in order to remain current on its payment obligations on electricity imports by January 2025 and actively engage with the West Africa Power Pool (WAPP) to develop and adopt harmonized transmission pricing beginning in March 2025.

Embrace distributed renewable energy (DRE) and clean cooking solutions as critical elements of the access agenda.

- **The government recognizes the crucial importance of both intensive investment in on-grid and off-grid electrification solutions to achieve its ambitious electrification targets**. To this end, the government plans to carry out, by 2025, a multi-tier framework (MTF) survey, update its five-year electrification plan, and implement a robust monitoring system to assess progress in both on-grid and off-grid electricity access, including sex-disaggregated data on electricity connections.
- **To address the crucial challenge of clean cooking, the government will adopt a comprehensive national cooking strategy with a credible action plan** by 2026, setting clear benchmarks, targets, and investment priorities to increase access to clean cooking fuels and technologies with a focus on female-headed households.

Incentivize private-sector participation to unlock additional resources.

- **Recognizing the private sector's crucial role in mobilizing necessary resources and to incentivize its participation in the energy sector, the government of Liberia commits to developing a clear policy framework, tariff regulations and guidelines, as well as standardized bidding templates, to attract private investment.**
- **A streamlined review and approval process will be developed for private-sector-led mini-grids by September 2025.**

Create financially viable utilities that ensure energy security and provide reliable and affordable services.

- **The government is committed to making the Liberia Electricity Corporation (LEC) a financially viable utility with its revenues exceeding its costs by 2028 through a comprehensive plan** that includes measuring, among other things, reductions in generation cost through large-scale hydro and solar projects that replace expensive and imported fossil fuels; improving recoveries through pre-paid meters, including for public-sector consumers, to reduce commercial losses; diversifying the customer base by connecting mining and industrial consumers as new generation is added to the system; adopting a corporate governance framework and completing the recruitment process of full-time LEC leadership team; and implementing - multi-year cost reflective tariff-adjustment mechanism, with set targets for reduction in commercial losses, improved collection, and reduced cost of supply.
- **Ensure that all outstanding electricity dues of public-sector consumers are** settled within a reasonable time period not to exceed 18 months and that current bills are fully paid starting from January 2025.

To achieve its targets and implement the actions and commitments outlined in this National Energy Compact, the government is committed to strengthening the institutional and governance capacities of the electricity sector. The government commits to identifying the human resources and capacity-building needs across the sector to achieve its targets as well as preparing a capacity-development plan to address these gaps in the short, medium, and long term.

The government will ensure rigorous and transparent monitoring of the National Energy Compact through the National Energy Programming Unit at the Ministry of Mines and Energy (MME). Additionally, periodic quarterly review meetings will be held, jointly chaired by the ministers of finance and development planning and the MME, along with heads and senior representative of relevant entities, to review progress and address any key issues for a smooth implementation of activities. Progress toward the Compact's targets will also be reviewed and presented semi-annually to the steering committee chaired by the vice president.

Call for Partnership

The government calls on development partners, philanthropies, and the private sector to come forward to meet the following funding needs as Liberia embarks on this journey to accelerate the pace of access to affordable, reliable, inclusive, sustainable, and clean energy that will help create jobs and income opportunities for millions of Liberians as well as contribute to the economic growth and development of the country and the region.

Funding Needs from the Public and Private Sectors by 2030 (US$ million)

	Generation	Transmission and Distribution	Off-Grid	Clean Cooking	Capacity-Building	Total
Public	660	390	70	10	20	1,150
Private	60	-	70	5	5	140
Total	**720**	**390**	**140**	**15**	**25**	**1,290**

1.1
Compact Targets and Action Plan

Trajectory Target	Current Annual Pace Between 2017 and 2021	Targets by 2030
Increase Access to Electricity (%)	8% (or ~70,000 households each year)	On average, 100,000 households will be provided with electricity access each year: about 60,000 via grid, 15,000 through mini-grids, and 25,000 through off-grid/solar home systems. By 2030, around 75% of the population is expected to have access to electricity at a cumulative average rate of 17% (about two times the current rate).
Increase Access to Clean Cooking (%)	9,545 (0.8% of population)	A national clean cooking strategy/Rural Renewable Energy Agency (RREA) business plan for clean cooking to be developed by December 2025 will identify the baseline and targets.

	Current Share Renewable Energy in the Fuel Mix	Target by 2030
Increase Share of Renewable Energy	67% (on-grid)	Increase renewable energy share to at least 75%. This will be achieved by accelerating implementation of 172MW of RE projects bringing total installed capacity to 266MW, including 238MW of renewable.

	Baseline	Target by 2030
Increase Amount of Private Capital Mobilized	Negligible	US$80 million for mini- and off-grid solutions and US$70 million for utility-scale solar photovoltaic (PV) plants. Opportunities to mobilize private capital for transmission and distribution will also be explored.

Action Plan

Pillar	Indicator	Baseline Data (2024)	Target Year & Actions to Achieve Goal (including timeline)
I: Expand Generation and Network Infrastructure at Competitive Costs	Integrated least-cost power system planning adopted incorporating regional resources	No	Finalize the revisions and adopt the new NEP by March 2025. An optimization study and Priority Investment Plan (PIP) will lay out the generation plan for Liberia while the National Electrification Strategy is guiding the investment in overall access agenda. A comprehensive, integrated least-cost power system master plan factoring in life-cycle costs and regional resources will be developed by June 2026, aligning investments in generation, transmission, distribution, and mini-grids. LEC is in the process of hiring a consultant and will complete the hiring, currently at the shortlist stage, by March 2025.

			The Power System Master Plan, prepared by LEC in collaboration with RREA, will be approved by MME to guide future investments in the sector. Expedite preparation of SP2 HPP by completing the feasibility study and tender designs, including environmental and social instruments to secure financing and start the bidding process by November 2026.
	Competitive procurement policy and framework in place for private-sector investment in renewable energy	No	A steering committee headed by the vice president of Liberia has been formed to oversee development of renewable energy projects, including solar IPPs. The committee's first meeting was held on October 9, 2024, in which the MME presented institutional arrangements, the need for legal review, criteria for land selection, next steps, and timelines. Key actions are: Complete the legal review and develop a policy framework and regulations for renewable energy IPP investments by the private sector. Set up a ministerial committee chaired by the MME minister to resolve inter-ministerial issues. Set up a technical committee headed by LEC and supported by the existing Liberia Electricity Sector Strengthening and Access Project (LESSAP). Complete the land acquisition process by February 2025 to set up a solar park. The National Investment Commission will develop a public-private partnership (PPP) law, and the Liberia Electricity Regulatory Commission (LERC) will implement regulations by November 2025 to support private investments in infrastructure, including renewable energy. LEC to engage a transaction advisor and environmental & social consultants by April 2025, availing itself of the US$2 million Energy Sector Management Assistance Program (ESMAP) grant available through LESSAP Phase 2. Launch requests for proposals by September 2025 (after completing all requirements, including environment and social items), and award the first solar IPP contract by December 2025.
II: Leverage Benefits of Increased Regional Integration	Adopt and enforce harmonized transmission pricing within the respective power pools to	No	The Economic Community of West African States' Regional Electricity Regulatory Authority (ERERA) has approved the regional grid code and will soon issue the directive to formally adopt it.

	facilitate the power trade across borders		WAPP is expected to initiate the discussion on harmonized transmission pricing soon. The government of Liberia will actively participate in those discussions to facilitate power trade. The government of Liberia will ensure the timely payment of its obligations for the import of electricity through the CLSG network (Côte d'Ivoire-Liberia-Sierra Leone-Guinea).
III: Embrace DRE and Clean Cooking Solutions for Affordable Last-Mile Access	Monitoring and evaluation program adopted to track the MTF for access to electricity and clean cooking	No	An MTF survey is planned by 2025; the MTF will establish a tracking framework for different tiered services, including access on- and off-grid.
	National Electrification Strategy (NES) adopted including an updated five-year electrification plan with a clearly defined role for private sector	Yes	The 2020 NES will be updated, and a five-year electrification plan will be developed by 2026.
	National clean cooking strategy in place	No	MME in collaboration with RREA will prepare a clean cooking strategy with a particular focus on female-headed households by 2026. This will establish the baseline and targets for clean cooking.
	Policy and regulatory framework adopted for off-grid and clean cooking solutions	Yes (for solar products) No (for clean cooking)	LERC has published technical regulations for solar energy products that include ensuring conformity with applicable standards. However, the Liberian government will develop a long-term, sustainable strategy to lower the costs of solar products for poor households through a results-based financing (RBF) mechanism and access to concessional financing through local banks. MME with support from RREA will develop a policy framework for clean cooking solutions by 2026.
IV: Incentivize Private-Sector Participation to Unlock Additional Resources	Process outlined for regulatory approval of private-sector-led mini-grids (including tariff regulations)	Yes	Policy framework and regulations for mini-grid development are in place to attract private investment. LERC will issue guidelines that will streamline the process and provide clarity for investors by September 2025.
	Financial support to private-sector DRE and clean cooking operations to ensure affordability and viability	Partially	An RBF facility is in place at RREA, but it will require additional funding.
V: Ensure Financially Viable Utilities that Provide Affordable and Reliable Services	Audited annual financial statements of utilities published	No	The un-audited quarterly financial accounts are being disclosed on the LEC website along with the accounts payable and accounts receivable analyses.

		LEC will disclose its audited financial statements within six months of the financial year (FY) close; the audited financial statements for FY 2024 (ending in December 2024) will be disclosed by June 2025.
Utilities achieving at least 100 percent operational cost recovery	No, LEC incurred an operating loss of 37 percent during FY 2023 (~US$18 million, or more than one-third of its revenue)	LEC's revenue will exceed its operating costs for FY 2028 through a combination of reductions in generation costs by displacing expensive fuel oil; improving recoveries through pre-paid meters, including for public-sector consumers (excluding essential services); periodic tariff adjustments through a multi-year tariff regime to ensure a cost-reflective tariff; control over commercial losses; diversification of its consumer mix to meet the mining and industrial demand as more low-cost renewable energy is added to the system; and a reduction in technical losses. All public-sector consumers (excluding essential services) will be converted to pre-paid meters within one year, and all public-sector consumers (including essential services) will have allocations to cover their electricity bills for the next budget cycle, starting from January 2025. LEC is also in the process of filing its multi-year tariff with set targets for reductions in commercial losses, improved collection practices, and reduced costs of supply. Completion of the regulatory approval process is expected by June 2025.

Implementation Roadmap

Year	Quarter	Milestone
2024–2025	Q1 2025	Finalize the revised NEP to guide sector reforms.
	Q2 2025	Complete land acquisition for the solar park, and initiate the first utility-scale solar IPP procurement process.
	Q3 2025	Publish financial statements for LEC for FY 2024, and initiate cost-reflective tariff adjustments.
	Q4 2025	Launch a national MTF survey to assess energy access and establish a clean cooking baseline.
2026–2027	Q1 2026	Finalize the comprehensive Power System Master Plan to align investments in generation, transmission, and distribution.
	Q4 2026	Complete the feasibility study and environmental and social instruments for Saint Paul 2 HPP, and initiate the bidding process.
	Q2 2027	Commission the first phase of the 20 MW utility-scale solar project near Mount Coffee HPP.
2028–2029	Q1 2028	Achieve operational cost recovery for LEC through reduced losses and increased revenue.
	Q4 2028	Commission additional renewable energy projects, achieving 75% renewable energy in the generation mix.
	Q1 2029	Complete the rollout of clean cooking solutions for female-headed households.
2030	Q2 2030	Achieve a national electricity access rate of 75%, with 100,000 new connections annually.
	Q4 2030	Conclude implementation of the Compact, achieving all targets for renewable energy, clean cooking, and energy access.

2

Energy-Sector Overview and Challenges

2.1
Energy-Sector Overview

Liberia is a low-income country with a high vulnerability to external shocks.

About a third of its 5.56 million residents reside within an 80-kilometer radius of Monrovia, with the remainder dispersed across the country's 111,000 square kilometers. Following the civil wars, Liberia experienced a period of recovery, with gross domestic product (GDP) growth averaging around 7.5 percent from 2004 to 2013. However, a series of shocks—including the Ebola outbreak, declining commodity prices, and high inflation driven by rising food prices and a weakening Liberian dollar—led to economic stagnation and a decline in GDP between 2014 and 2020. The economy has shown resilience, with GDP growth rates of 4.99 percent in 2021, 4.81 percent in 2022, and 4.71 percent in 2023. Growth is expected to average around 5.6 percent during 2024–2026. Despite these positive trends, concerns about sustainable growth persist.

Despite the remarkable progress in expanding access to electricity over the past few years, Liberia still lags behind its peers.

About 32.7 percent of the population has access to electricity. Of this, 25 percent are connected to the LEC grid, while 7.7 percent rely on off-grid sources. Between 2017 and 2021, access increased at the rate of 8 percent per annum—primarily driven by the increase in access in urban areas, where more than 50 percent of the population has access to electricity, compared with less than 10 percent in rural areas. Since 2021, LEC has nearly doubled its customer base, growing from 142,947 customers in 2021 to 282,505 in 2023, expanding at a rate of approximately 70,000 new connections per year, benefiting about 350,000 additional people each year. The Rural and Renewable Energy Agency (RREA), through its various programs supported by development partners, has distributed 49,411 off-grid solar PV systems of up to 350 Wp benefiting 192,412 people. However, at this pace, only about 50 percent of the population will have access to electricity by 2030. Access to clean cooking is negligible with no established baseline, underscoring the need for a national strategy to set clear targets.

Hydropower is the main source of supply, contributing about 70 percent—but with significant seasonal variability.

The installed generation capacity is 126 MW–88 MW at Mount Coffee Hydropower Plant (MCHPP) and 38 MW at heavy fuel oil (HFO) plants, with a peak demand of 108 MW. During the dry season (starting in November), MCHPP generation declines, causing outages that intensify from January to May, when its capacity drops by more than 75 percent. This recurring situation leads to persistent supply shortages, forcing LEC to rely on costly HFO generation and increased imports from Cote D'Ivoire via the CLSG network (Côte d'Ivoire-Liberia-Sierra Leone-Guinea) to address these shortages and meet the projected 8–10 percent demand growth. Liberia's Priority Investment Plan (PIP) aims to harness indigenous renewable energy resources through public- and private-sector interventions. The PIP outlines an initiative to install 90 MW of utility-scale solar PV by 2029; a contract for the first 20 MW (near MCHPP) has been signed recently. Additionally, a 70 MW solar PV plant will be deployed in phases in the private sector. In the medium to long term, Liberia will expand its hydropower capacity through a 60 MW extension at MCHPP and through construction of the 150 MW Saint Paul 2 HPP, tapping into the Saint Paul River's total hydropower potential of 800 MW. A power system master plan is crucial to align generation, transmission, and distribution efforts while devising a clear path to expand Liberia's electricity sector.

RREA, established in 2010, is implementing the government of Liberia's rural electrification programs to overcome the urban-rural disparity.

RREA plays a crucial role in the alignment of the off-grid strategy across stakeholders, including the private sector and donor communities. RREA also provides advocacy support to off-grid regulatory frameworks, including by implementing an import-duty waiver, working with the Liberia Electricity Regulatory Commission (LERC) on the mini-grid code, and setting up an off-grid taskforce to resolve off-grid solutions. Key current initiatives include: a mini-grid and other renewable energy generation to serve over 10,000 connections in Lofa county (World Bank funded); a 9.8 MW hydropower plant and distribution network to electrify 30 rural communities in Bong and Nimba counties (African Development Bank, or AfDB, funded); construction of a distribution network and power plants to electrify three rural cities, Buchanan, Greenville, and Barclayville (EU funded). RREA is also solarizing 90

rural health facilities, installing streetlights in four rural cities, and rolling out a results-based financing (RBF) program for standalone solar systems with support from development partners. The above interventions will provide electricity to more than 200,000 people in the rural areas. RREA is well-positioned to scale up and expand these initiatives and accelerate the economic transformation of rural areas.

Private-sector participation in Liberia's energy sector, though limited, is expected to expand significantly, particularly in generation, mini-grids, and off-grid.

LERC, established under the 2015 Electricity Law, has been crucial in creating a conducive regulatory environment to attract private investments. LERC has introduced regulations for electricity licensing, micro-utility licensing, tariffs, complaints & disputes resolution, and codes for mini-grids and distribution. These are further supported by the government's policy frameworks for mini-grid development and the creation and operation of electricity distribution areas, all aimed at facilitating private-sector growth in the energy sector. The impact is evident, with four of the five distribution licensees being private entities: LIBENERGY, Jungle Energy Power (JEP), Energicity Liberia, and Totota Electric. These initiatives are expanding access in under-electrified rural areas like Gbarpolu, Nimba, Bong, and Southeastern counties, as well as powering local communities, schools, healthcare facilities, and businesses. With support from the International Finance Corporation (IFC), LEC has initiated a leasing agreement for a 16.5 MW, utility-scale solar plant combined with a 5 MWh battery energy storage system (BESS). Looking ahead, Liberia is well-positioned to capitalize on the growing influx of global investments in clean energy. With the right regulatory and legal frameworks in place to attract private investors and its renewable energy potential, the country has the potential to become a promising player in the regional energy landscape.

The country's infrastructure is still in its early stages, with limited grid connectivity and high operational costs.

As the primary utility responsible for the supply of power, the LEC has played a pivotal role, but it faces significant challenges due to inadequate funding and resources, which restricts its service area primarily to Monrovia and the surrounding area. LEC's transmission and distribution network consists of 66 kilovolt (kV) lines interconnecting four 66/22 kV substations, and a few 22 kV lines to distribute power from these substations mostly along the main roads and streets, with limited reach within the communities. This restricted coverage of the low-voltage (LV) network leaves a substantial part of the communities without access, even though the grid has technically arrived in those communities. Additionally, challenges such as high tariffs and unmet demand for connections contribute to power theft, further impeding expansion efforts.

Within the last two years, LEC made significant improvements to reduce the commercial losses.

By the end of 2022, commercial losses stood at 41.3 percent, but this figure dropped to 31.4 percent in 2023, and further decreased to 27.5 percent by October 2024. This represents a total reduction of 33.4 percent in commercial losses from 2022 to October 2024. This significant improvement was achieved through a combination of strategic initiatives, including the formation of the Anti-Power Task Force, the implementation of robust metering, the regularization of illegal consumers, regular onsite meter audits, enhanced monitoring of large customers, and the strengthening of the meter maintenance team for quicker response times.

As the central authority for energy-sector governance, the MME is committed to advancing Liberia's electrification goals, fostering collaboration between public and private stakeholders, building on current successes, and attracting further investments to improve energy access and drive economic development in the coming years.

2.2

Current Status and Challenges

PILLAR I
EXPAND GENERATION AND NETWORK INFRASTRUCTURE AT COMPETITIVE COSTS

The seasonal variability of MCHPP and rapidly increasing demand underscore the imperative for additional power-generation capacity. Moreover, the high cost of generation from HFO-based plants is driving up the cost of supply, which at present is the highest in the region. This also hinders the LEC's ability to achieve operational cost recovery. The addition of low-cost indigenous renewable energy as envisioned under PIP through competitive bidding will help address these issues.

In addition to PIP for generation sources, a transmission pipeline document (2014) and the National Electrification Strategy (NES) examine least-cost solutions to expand access. However, a comprehensive power system master plan based on the latest data and updated plans is required to align future investments in generation, transmission, and distribution.

Liberia has recently awarded a contract for its first utility-scale 20 MW solar PV project, expected to be commissioned by October 2025. Negotiations are also ongoing for the leasing of a containerized solar PV project + BESS (SCATEC Release Project), supported by IFC, to further expand renewable energy capacity. The success of these projects will help lay a solid foundation for the accelerated development of renewable energy projects in Liberia to provide low-cost dry-season power. The government is working with relevant stakeholders to identify gaps and to develop legal frameworks, regulations, standard templates, and relevant documents, including environmental and social instruments, to fast-track another 70 MW + BESS through the private sector. In addition, at the solar IPP workshop held on October 7, 2024, with the private sector, land was identified as a key constraint. A joint committee with representatives from the Land Authority, MME, and LEC has been tasked with assessing and identifying new sites and acquiring the land for a solar park. The solar park with basic facilities, access, and connectivity to the grid will help attract private investment. These initiatives will create a conducive environment for investment, attract private-sector capital, and establish a clear path for the smooth execution of future IPP projects, driving sustainable energy development. See Pillar 3 of this section for further details on engaging the private sector to set up solar PV plants.

Liberia is gradually building its capacity to develop and implement projects, starting from the rehabilitation of MCHPP in 2018 after it became dysfunctional in 1990 and after it was damaged during a period of civil unrest. MCHPP is now going ahead with an extension of about 60 MW of hydro capacity, which is expected to undergo bidding in the next fiscal year. This will boost LEC's implementation and revenue capacity further, allowing it to effectively develop its next greenfield hydropower asset of about 150–200 MW, Saint Paul 2 HPP, upstream of MCHPP. The development of these resources is essential to meeting the nation's access targets, to providing reliable and affordable electricity to the people of Liberia, and to supporting economic development.

In tandem, investment in transmission and distribution will be required to evacuate and disperse this power. Currently, consultants are being engaged to develop a power system master plan to direct these investments.

Regulations for distribution networks are available to help expand medium- and low-voltage customer connections, but the role of the private sector in this space needs to be enhanced. There is one local private-sector distribution company, Jungle Power, which is responsible for distribution in Nimba County, however, no additional privatized distribution companies have emerged so far.

The challenges of seasonal variability in power generation and the rising costs from HFO-based plants require urgent investment in low-cost renewable energy solutions. By implementing the PIP for generation, establishing a comprehensive power system master plan, and fostering a clear regulatory framework, Liberia can attract both public- and private-sector investments and ensure a sustainable, affordable power supply to meet growing demand.

PILLAR II
LEVERAGE BENEFITS OF INCREASED REGIONAL INTEGRATION

Liberia has been benefiting from CLSG electricity network interconnection as an importer of electricity—primarily to meet its dry-season demand but also to fill the gap during the rainy season. Though in the past, Liberia has also benefited from exporting excess electricity during the rainy season, this capacity has diminished due to increased access, growing domestic consumption, and stagnant supply. The country now faces challenges in maintaining a stable supply year-round and, in the short

to medium term, remains dependent on energy imports through CLSG. However, of the 27 MW of capacity Liberia receives from the CLSG line, only half is currently available due to supply constraints in Cote D'Ivoire. Exploring the option of importing electricity from Ghana through the CLSG network could help Liberia fill the gap and still utilize the available network.

Moreover, connecting power-generating assets to the CLSG network will give Liberia an option to export excess supply; this may also help reduce the cost for solar IPP by mitigating the off-take risk to some extent.

In parallel, investments in downstream infrastructure are needed to carry and disperse the power, as discussed in Pillar 1. Ensuring a financially viable sector, as outlined in Pillar 5, is also crucial for Liberia to meet its payment obligations.

Currently, import prices and transmission wheeling charges to the Transco CLSG are negotiated, but the move toward harmonized pricing being initiated by ERERA is critical for the regional electricity market to thrive.

PILLAR III
EMBRACE DRE AND CLEAN COOKING SOLUTIONS FOR AFFORDABLE LAST-MILE ACCESS

In 2020, the government adopted the NES with support from the World Bank. According to the NES, grid expansion and densification will be the least-cost option to reach 70 percent of households, while the remaining 30 percent could be served by mini-grids and standalone solar systems, including three large-capacity mini-grids (5 percent of the households), smaller-size community mini-grids each serving between 99 and 337 households with an average of 140 consumers (6 percent of the households), and standalone solar systems (for the remaining 19 percent). The maximum number of targeted connections will need to come from the off-grid side given the limited time before 2030 and its cost-effectiveness. The NES is being updated and transferred to a digital platform to monitor energy access. This will be complemented by a Rural Master Plan, which builds out a business plan for RREA's implementation strategy in Liberia.

Policy Framework: An MTF survey was conducted and published in 2020 for Liberia. The MTF is to be updated and tracked by the government for both grid and off-grid connections.

Private-Sector Participation: Several private off-grid companies are active in Liberia, but none have reached significant scale. Lack of working capital and rural households' limited incomes are key barriers to scaling private-sector participation. There are two RBF facilities, funded by Beyond the Grid Fund for Africa, the World Bank, and Energising Development (EnDev) poised to scale up private-sector participation. RBF facilities for off-grid or mini-grid usage will need significantly more funding than what has been provided so far.

PILLAR IV
INCENTIVIZE PRIVATE-SECTOR PARTICIPATION TO UNLOCK ADDITIONAL RESOURCES

The energy sector needs investments of about US$1.5 billion in generation, grid expansion, mini-grids, and off-grid solutions, which will require both public and private funds.

Weak macroeconomic conditions as well as the poor creditworthiness of the off-taker (LEC) are the biggest challenges to attracting private capital. Credit-enhancement instruments, such as World Bank Group–backed guarantees, that were implemented successfully in similar challenging environments will be considered in order to facilitate debt and equity investments. In addition, the country lacks the legal and regulatory framework to guide the structuring of public-private partnership (PPP) projects. Private investors face increased risks without access to reliable data and information, which can deter investment and hinder efforts to modernize infrastructure or expand services. Clear, accessible financial information can help build trust and facilitate stronger PPPs.

Given the above constraints, there is very limited participation from the private sector. Liberia can change this by offering streamlined procedures built on the principles of transparency and predictability that are critical to attracting investments, especially in PPPs or other modalities.

Innovative solutions, to lower the risk, such as revenue-sharing models, connection to CLSG, long-term power purchase agreements with guarantees, or other credit-enhancement instruments to facilitate debt and equity investment could pave the way for private investment in new generation capacity.

A transaction advisory service is available under LESSAP Phase 2 to support the development of the first utility-scale solar IPP with BESS.

PILLAR V
ENSURE FINANCIALLY VIABLE UTILITIES THAT PROVIDE AFFORDABLE AND RELIABLE SERVICES

Over the past few years, LEC has made significant strides in improving its operational and commercial performance. Commercial losses have been reduced substantially, from about 47.7 percent in 2021 to about 31.4 percent in 2023, with a further reduction to 27.4 percent as of July 2024. Simultaneously, LEC has nearly doubled its customer base, growing from 142,947 in 2021 to 282,505 in 2023, making considerable progress toward universal electricity access and increased revenue.

A crucial step in achieving universal electricity access is ensuring that LEC becomes a financially viable entity that can undertake investments and be a creditworthy off-taker for planned private-sector generation projects. During FY 2023, LEC incurred an operating loss of about US$18 million (i.e., more than one-third of its revenue), equivalent to approximately 37 percent of revenue. The financial viability of LEC is compromised by the accumulation of arrears due to unpaid electricity consumption by public institutions, theft of electricity, the high cost of generation, and non-cost-reflective tariffs that all affect LEC's ability to operate effectively, meet its payment obligations (particularly for electricity imports), and expand its services to meet the unmet demand as well as the 8–10 percent expected growth. A financial model to analyze various factors was deployed to prepare a cost-recovery strategy. LEC is also in the process of filing its multi-year tariff with set targets to reduce commercial losses, improve collection, and reduce the cost of supply.

Risk Register and Mitigation Strategies

Category	Risk	Mitigation
Financial Risks	Insufficient mobilization of US$1.25 billion required, especially US$150 million from private-sector investments.	Develop policies and incentives to attract private investments, use guarantees and concessional financing, and engage international financial institutions.
	Inability of LEC to achieve financial viability due to persistent technical and commercial losses.	Implement cost-reflective tariffs, prioritize revenue recovery, and scale up metering programs to reduce losses.
Technical Risks	Delays in implementing renewable energy projects, including Saint Paul 2 HPP, due to procurement or land acquisition challenges.	Establish a high-level steering committee to expedite approvals and secure project sites early through the Land Authority and the MME.
	Seasonal variability in hydropower generation leading to supply shortages.	Accelerate solar PV installations and explore regional energy imports from Ghana and Cote d'Ivoire to stabilize supply.
Institutional Risks	Coordination challenges among ministries, agencies, and the private sector in project implementation.	Strengthen the National Energy Programming Unit to ensure inter-agency coordination and periodic review of progress.
	Regulatory framework delays for renewable energy and distributed solutions.	Expedite development of policies and frameworks through LERC.
Environmental and Social Risks	Delays in environmental and social-impact assessments for major projects.	Engage experienced consultants early, and ensure compliance with national and international environmental standards.
	Resistance from local communities during land acquisition for energy projects.	Conduct extensive stakeholder engagement, and establish community benefit-sharing programs.

ANNEX I
ONGOING AND COMMITTED PROJECTS

Development Partner	Project Name	Timeline	Project Description	Funding (including private sector)	Contribution to Compact Targets			
					Access to Electricity	Access to Clean Cooking	Renewable Energy Installed	Pillars
World Bank	Liberia Electricity Sector Strengthening and Access Project (LESSAP)	2021–2030	A 10-year Multiphase Programmatic Approach to increase access to electricity and improve the operational efficiency of LEC. Phases 1 and 2 are under implementation and Phase 3 is expected to commence in 2026.	US$200 million (including ESMAP: US$7.5 million and PHRD: $US2.7 million)	1.250 million people (~250,000 connections)	-	70 MW (solar PV) from the private sector	Pillar 1: Reinforcement of Grid Infrastructure and Distribution Network Pillar 3: Monitoring and Evaluation Program to Track Energy Access and RBF to Bridge the Affordability Gap for Solar Home Systems Pillar 4: Private Capital Mobilization for Grid-Connected Solar PV Project Pillar 5: LEC's Operational Cost Recovery
"	Regional Emergency Solar Project Intervention (RESPITE) + Additional Finance	2023 – 2027	Liberia component of this regional project to strengthen regional integration aims to increase grid-connected renewable energy capacity, support the preparation of new renewable energy projects and establish	US$96 million			Solar: 20 MWp, Hydro: 64 MW	Pillar 1: Competitive Procurement Policy for Generation Technologies Adopted Pillar 2: Advancing WAPP Priority Projects

Development Partner	Project Name	Timeline	Project Description	Funding (including private sector)	Contribution to Compact Targets			
					Access to Electricity	Access to Clean Cooking	Renewable Energy Installed	Pillars
			the River Basin Authority					Pillar 4: Private Capital Mobilized
"	Liberia Renewable Energy Access Project (LIRENAP)	2016–2025	Decentralized electrification in Lofa County, technical assistance to strengthen RREA and regulations, and market development of solar home systems	US$27 million	150,000 people (30,000 connections)			Pillar1: Reinforcement of Distribution Networks
AfDB	REEL Project	2027	Infrastructure investments (generation capacity, distribution network, substation, and cross-border transmission line)	UAC 24.4 million	60,000 people with improved electricity access; 37,880 with new connections			Pillar 1: Reinforcing Grid Infrastructure
AfDB and EU	LEEAP	2019–2024	Transmission line, substations, and distribution network	UAC 31.4 million	30,700 connections			Pillar 1: Reinforcing Grid Infrastructure
"	CLSG-RE	2022–2025	Distribution network along the CLSG line in Nimba, Bong, Rivercess, and Grand Bassa counties	UAC 17.9 million	24,000 connections			Pillar 1: Reinforcing Grid Infrastructure
Sweden	Beyond the Grid Fund Africa	2019–2030	RBF for DRE solutions	US$10 million	400,000 people			Pillar 3: Results-Based Financing to Bridge Affordability Gap for Off-Grid Development of Mini-Grids
Sweden	Renewable Energy and Climate Adaptation Technologies	2017–2026	Provision of grants to renewable energy businesses,	US$5 million	30,000 households		0.3 MW	Pillar 3: Results-Based Financing to Bridge Affordability

Development Partner	Project Name	Timeline	Project Description	Funding (including private sector)	Contribution to Compact Targets			
					Access to Electricity	Access to Clean Cooking	Renewable Energy Installed	Pillars
	(REACT) Sub-Saharan Africa (SSA) Programme		and access to clean fuels and cook stoves					Gap for Solar Home Systems Pillar 4: Private Capital Mobilized
EU	Construction of the Mini-Hydro Power Plant in Greenville including the rehabilitation of the feeder road	2024–2027	Construction of hydropower plant in Sinoe County; construction of 2 MW HPP and 33 kV transmission network in Greenville	10.8 million euros	12,057 connections			Pillar 1: Reinforcing Grid Infrastructure
EU	Implementation of a Solar PV Plant in Greenville	2024–2028	Construction of 850 KW solar PV plant	2.6 million euros	5,249 connections		850 KW solar	Pillar 1: Reinforcing Grid Infrastructure
EU	Supervision of works in Buchanan, Greenville, and Barclayville	2024–2027	Supervisory service for all southeastern projects	3.2 million euros	Supervisory services			Pillar 1: Reinforcing Grid Infrastructure
EU	Construction of the distribution network in Greenville Lot 2 and Buchanan	2024–2027	Transmission line, substations, and distribution network	6.5 million euros 6.5 million euros	5,249 connections 12,057 connections			Pillar 1: Reinforcing Grid Infrastructure
EU	Implementation of a solar PV power plant in Greenville	2024–2027	Construction of 850 KWp solar PV plant	2 million euros	1,200 connections		200 KWp solar	Pillar 1: Reinforcing Grid Infrastructure
EU	Technical assistance to RREA	2024–2026	Technical assistance	1 million euros	N/A			Pillar 1: Reinforcing Grid Infrastructure `
GIZ	Energising Development (EnDev)	2023–2025	Energy access for vulnerable communities, including electricity and cleaner cooking for households, social	6.9 million euros	40,000 connections (solar home systems) 303	24,000 connections 100 schools	N/A	Pillar 3: RBF to Bridge Affordability Gap for Off-Grid and LNOB Customers

Development Partner	Project Name	Timeline	Project Description	Funding (including private sector)	Contribution to Compact Targets			
					Access to Electricity	Access to Clean Cooking	Renewable Energy Installed	Pillars
			institutions, and medium- and small-sized enterprises		health facilities	10 medium- and small-sized enterprises		Pillar 3: Electrification of Last-Mile Health Facilities Pillar 3: Cleaner Cooking Energy for Households and Schools Pillar 4: Financial Support to Private-Sector DRE and Clean Cooking Operators to Ensure Affordability and Viability Pillar 4: Capacity-Building for Producers of Improved Cookstoves
USAID	MCHPP Retrofit of Units 2, 3, and 4	2023–2024	Installation of surge protection and fire-detection equipment needed to stabilize generation capacity and extend life	US$850,000				Pillar 1: Prolong the Life of Generation Assets at MCHPP
USAID	Empower West Africa	2024–2029	Increase equitable access to affordable, reliable, and clean energy in 18 West African countries through collaboration between the	US$73 million regional (Liberia included)				Pillar 1: Introduce Digital Tools Like Smart Power Meters and AI-Based Data Analytics, E-Mobility Solutions, and Capacity-Building Programs for

Development Partner	Project Name	Timeline	Project Description	Funding (including private sector)	Contribution to Compact Targets			
					Access to Electricity	Access to Clean Cooking	Renewable Energy Installed	Pillars
			public and private sectors					Renewable Energy Careers
Rockefeller Foundation/GEAP P	M300 Technical assistance	March 1, 2025–September 30, 2026	Development of LEC Network Planning Manual	US$800,000	~112,273 connections			Pillar 1: Reinforcement of Grid Infrastructure and Distribution Network

ANNEX II
METRIC OF KEY INDICATORS

Pillars	Metrics /Indicators	Data (latest available)
Pillar 1: Expand Generation and T&D Networks	• **Generation capacity installed/available** (MWs) • % thermal, % renewable (including BESS)	• 126 MW installed (74% available) Max during dry season: 40 MW • Thermal: 30%; Hydro: 70%
	• **Energy produced annually** (MWhs) – Total • % thermal, % renewable (including VRE/BESS) • Average annual growth rate (%) (of last three years) • Average cost per kWh – thermal, renewable	• 936,950 MWh • Thermal: 33%; Hydro: 67% • 14.64% • Thermal: 0.25 US$/kWh Hydro: 0.06 US$/kWh
	• Energy imported annually (MWhs) – Total • Average annual growth rate (%) (of last three years) • Average cost per kWh (US$)	• 139,819.58 • 2% • US$0.16 per kWh
	• **Energy exported annually** (MWhs) – Total	• 15,282
	• **Transmission network** (HV, MV) – Total: length (KM); voltage (KV): transfer capacity (MW/MVA)	• HV (total length = 386.02 km, voltage= 66 kV, TC = 66 MW) • MV (total length = 345 km, voltage= 33 kV, TC = 15 MW) • MV (total length = 667.33 km, voltage= 22 kV, TC = 11.1 MW)
	• **Distribution network** (LV) – Total: length (KM); voltage (KV): transfer capacity (MW/MVA)	• LV (total length = 1,889 km, voltage= 0.4/0.23 kV, TC = 0.19 MW)

	• **Access to energy** (electricity and clean cooking)			• 33% electricity access
	• Number of new on-grid connections (by customer type)			• 312,622
		2022	2023	2024
	Households	194,066	276,199	304,166
	Industries	7	11	17
	Commercial	5,368	6,295	8,439
Pillar 2: Regional Integration	• **Transmission Interconnectors** (HV) – Total: length (KM); voltage (KV): transfer capacity (MW/MVA)			• HV (Total length = 530 km, voltage= 225 kV, TC = 243 MW)
	• Energy traded in bilateral power purchase agreements/MOU			• 154,480,034.37 kWh • US$22,838,794.79
	• Energy traded in power pool			• 284,386,554.85 kWh • US$34,898,740.44
	• Transmission wheeling charges (USD per kWh)			• US$0.02
	• Payables – arrears/receivables (USD)			• US$74,299,398 (payable arrears) • US$52,040,420 (receivable arrears)
Pillar 3: DRE/Clean Cooking	• Number of new mini-grid connections (cumulative)			• 2,344
	• Number of Tier 1–2 SHS (2018 to date)			• 49,441
	• Number of clean cooking connections/appliances			• 9,545 (0.8% of population)
Pillar 4: Private-Sector Participation	• Total investment required to meet 2030 Energy Compact goals/targets – public/private (information can be sourced from finance) • Total investment available as of 2024 – public/private • Investment gap to be mobilized each year up to 2030 – public/private (based on government priorities and sequencing) (domestic and international)			• US$1.5 billion (US$250 million is available and the gap is US$1.25 billion
	• Total (private) investment needs by 2030 (USD, percentage) split by grid, mini-grid, off-grid, and clean cooking; spilt by generation, transmission, distribution, and access (domestic and international)			• US$150 million is expected to be mobilized through private funding for DRE and solar IPPs; in addition, private financing options for T&D will be explored during Compact implementation
Pillar 5: Sector Reforms and Sustainable Utilities	• Utility financial profitability (per audited accounts) – net income/loss (US$ amount and US$/kWh) for Discos, Transcos, Gencos			• -5,000,000 • Unaudited • Unbounded
	• (Regulator) Tariff policy, average end-user tariffs (per kWh)			• US$0.23
	• Total subsidy amount (USD); path/timelines to full-cost reflectivity (estimate)			• 0

	• Aggregate technical commercial & collection losses: • Number of metered customers • Number of prepayment meters	• 45.4% • 312,622 • 312,002
	• Level of debt – payables to government, IPPs, other vendors	US$31,420,982 (payable to government) US$42,878,415 (other vendors) US$16,996,419 (receivable from government)
	• Load shedding (e.g., average number of hours per day and/or estimated lost MWhs per annum)	5 hours or 132,330.28 MWh loss from load shedding
Additional - Cross-Cutting for consideration	• Capacity-building requirements (US$) (at all levels)	US$25 million
	• Alignment of power-sector least-cost expansion plans to country, long-term strategies and NDCs /Paris Agreement – yes/no	Yes
	• Household affordability (i.e., % level of household disposable income available to be spent on energy services and/or % of households receiving energy subsidies)	13.5% constituting 57,660 households
	• Jobs: e.g., track the number of jobs created for youth and women	Data not available

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