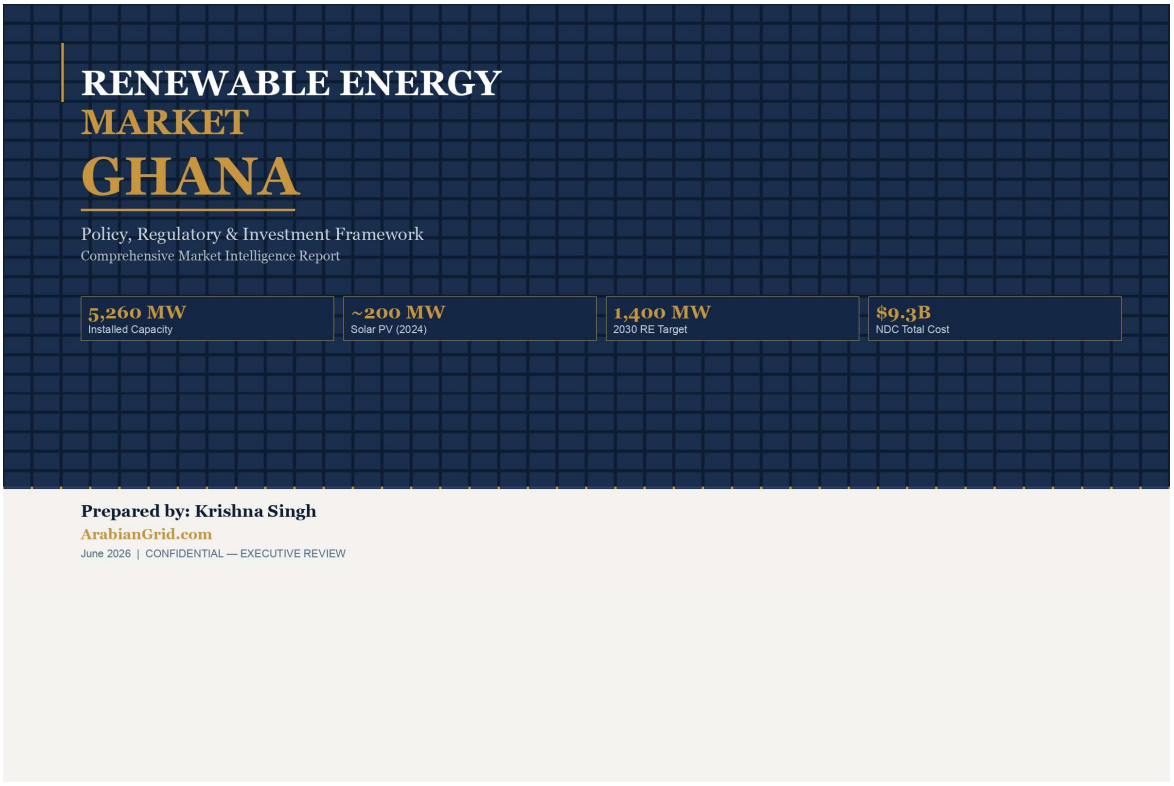
RENEWABLE ENERGY MARKET
GHANA

Comprehensive Market Intelligence Report
Policy, Regulatory & Investment Framework



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1. Renewable Energy Market Overview

Ghana's power sector stands at a pivotal inflection point. With 5,260 MW of installed generation capacity as of November 2024, the country remains heavily dependent on thermal generation (66%) and large hydro (30–33%), while non-hydro renewable energy accounts for just 1–2% of total output. However, a convergence of policy reforms, international climate finance, and private sector interest is poised to accelerate the energy transition significantly over the next five years.

The government's target of 10% non-hydro renewable energy in the national generation mix by 2030—supported by the Renewable Energy Master Plan, the Energy Transition and Investment Plan, and the newly operationalized REI & GT Fund—requires scaling from approximately 200 MW of utility-scale solar and negligible wind capacity to over 1,400 MW of total renewable installed capacity. This represents an investment opportunity exceeding USD 5.6 billion (REMP estimate) to USD 9.3 billion (full NDC cost), creating one of West Africa's most attractive RE markets for developers, IPPs, and EPC contractors.

1.1 Installed Generation Capacity

Category	Installed Capacity (MW)	Share of Total
Thermal (Gas/Diesel)	3,472	66%
Large Hydro (Akosombo, Kpong, Bui)	1,600	30–33%
Solar PV (Utility-scale)	~200	~3%
Wind	< 1 MW	<0.1%
Total Installed	5,260	100%
Dependable Capacity	4,856	—

Source: U.S. International Trade Administration (trade.gov), Aug 2025; Ghana GridCo 2025 Electricity Supply Plan

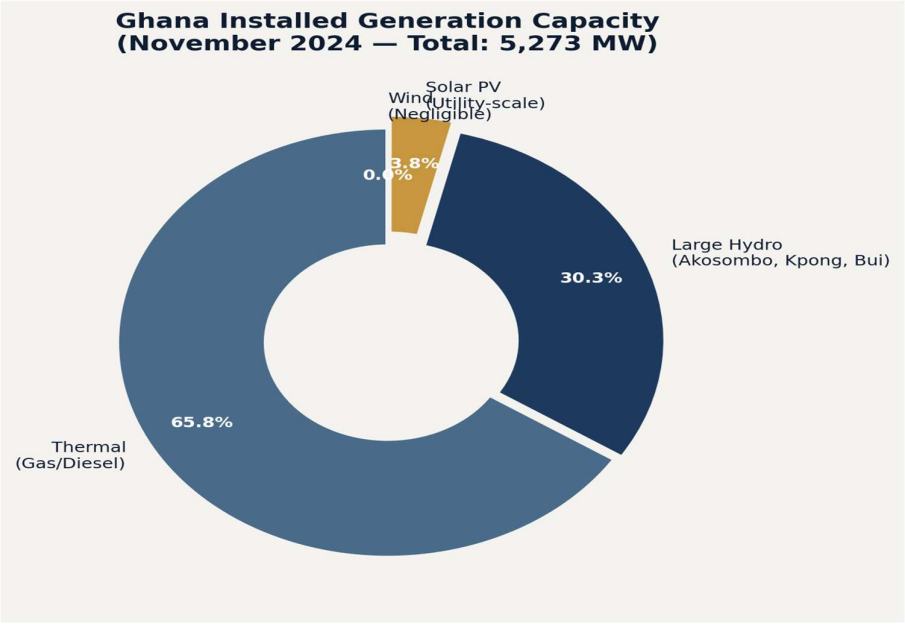

Figure 1: Ghana Installed Generation Capacity Mix (November 2024)

1.2 Operating Utility-Scale Solar Plants

Project	Capacity	Developer	Commissioned
Galgu/Yendi Solar	50 MWp	BPA / First Sky Ltd	Dec 2024 / Mar 2025
Kaleo Solar (expanded)	15 MW	VRA	Apr 2024
Bui Floating Solar	~5 MW (Phase 1)	Bui Power Authority	2022 onward
Winneba (BXC Solar)	~20 MW	BXC Group	Operational
Meinergy Ghana (Gomoa Onyaadze)	20 MW	Meinergy	Earlier
Dawa Solar Park	Multi-purpose	BPA	Nov 2025

Source: Ghana News Agency (Dec 2024); BPA announcements; PVknowhow (Mar 2025); SolarQuarter (Feb 2025)

1.3 Key Players & Developers

Player	Role
Volta River Authority (VRA)	Largest state-owned generator; operates Akosombo, Kpong, Kaleo solar
Bui Power Authority (BPA)	Operates Bui Hydro (404 MW); leading solar expansion (50 MW Yendi, floating solar, 500 MW plan)
First Sky Ltd	Partnered with BPA on 50 MW Galgu/Yendi solar
NEK Umwelttechnik / Anansi Green Energy	Developing ~1,300 MW wind pipeline
BXC Group	Operates ~20 MW solar at Winneba
ECG / GRIDCo	Distribution and transmission utilities

1.4 Recent Commissioning Milestones (2024–2026)

- Dec 2024: BPA commissions 50 MWp Galgu/Yendi solar plant (Northern Region)
- Apr 2024: Kaleo Solar expansion to 15 MW inaugurated
- Nov 2025: Dawa multi-purpose solar energy project inaugurated
- 2025: Government announces 35 mini-grids + 381 solar home systems for off-grid communities
- May 2026: Government announces plan to add 200 MW solar to the national grid
- BPA plans additional 200 MW solar at Bui (250 MW solar park target announced Nov 2025)
- Wind pipeline: Anansi Green Energy / NEK Umwelttechnik developing ~1,300 MW across six wind farm projects, none yet operational

2. Renewable Energy Targets

Ghana's renewable energy targets have evolved significantly since the original 2010 target of 10% RE by 2020. That target was missed (non-hydro RE remains at just 1–2% of generation), and the current framework pushes the 10% goal to 2030, supported by more detailed implementation mechanisms.

2.1 Official National Targets

Metric	Target	Source
RE share of national energy mix	10% by 2030 (non-large-hydro)	RE Act 832; National Energy Compact 2025
RE installed capacity by 2030	1,400 MW	Ministry of Energy, May 2026
Mini-grids deployment	400 mini-grids	Five-Year Roadmap, Oct 2025
Battery energy storage	200 MW BESS by 2030	National Energy Compact, 2025
Rooftop solar systems	12,000 systems	National Energy Compact / AfDB

2.2 REMP Technology Breakdown (2030)

Technology	Base (2015, MW)	Target 2030 (MW)	Key Projects
Solar PV	~2.5	1,079.63	Bui 500 MW plan; VRA floating solar; World Bank 100 MW auction
Wind	~0.5	436	Anansi/NEK 1,300 MW pipeline
Small/Medium Hydro	—	150 (incl. 124.5 MW small hydro)	Potential sites identified
Biomass	—	~88	MSW-to-energy, biogas
Off-grid (mini-grids + SHS)	—	269	SREP 35 mini-grids
Total	42.5	1,363.63	—

Source: Ghana Renewable Energy Master Plan (REMP), Energy Commission, 2019; updated with UNDP support 2025

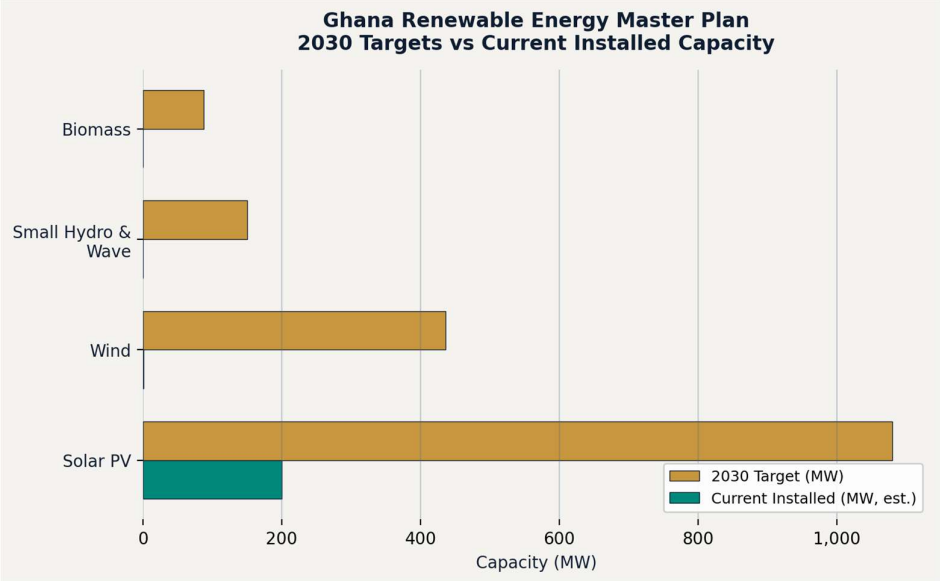

Figure 2: REMP 2030 Targets vs Current Installed Capacity

2.3 Current Baseline vs Target Gap

With approximately 150–200 MW of non-hydro RE capacity installed as of late 2024, Ghana faces a gap of over 1,100 MW to reach its 2030 REMP target of 1,363 MW. The non-hydro RE share of generation stands at just 1–2%, compared to the 10% target. This gap represents both a challenge and a significant market opportunity for developers and investors.

3. Nationally Determined Contribution (NDC)

Ghana submitted its updated NDC to the UNFCCC in 2021, covering the period 2020–2030. The NDC represents the country's most comprehensive climate commitment framework, with 34 mitigation programmes and 47 adaptation measures, and a total implementation cost of USD 9.3 billion.

3.1 NDC Targets Summary

Element	Detail
Coverage period	2020–2030
Unconditional target (2020–2025)	8.5 $MtCO_2e$
Unconditional target (2020–2030)	24.6 $MtCO_2e$ (9 programmes with secured financing)
Conditional target (2020–2030)	39.4 $MtCO_2e$ (25 programmes requiring international support)
Total cumulative reduction	64 $MtCO_2e$
Total NDC implementation cost	USD 9.3 billion (USD 6.3B mitigation)
Number of mitigation programmes	34 across energy, transport, industry, waste, agriculture, forestry
Adaptation measures	47

Source: UNFCCC NDC Registry (Ghana Updated NDC, 2021); UNDP Climate Promise Ghana

3.2 RE-Specific NDC Commitments

- Increase share of RE in national energy mix to 10% by 2030
- Scale up renewable energy penetration in power generation (solar, wind, small hydro)
- Energy-efficient interventions including clean cooking solutions
- Unconditional measures: 9 programmes with partially/fully secured financing
- Conditional measures: 25 programmes requiring international climate finance

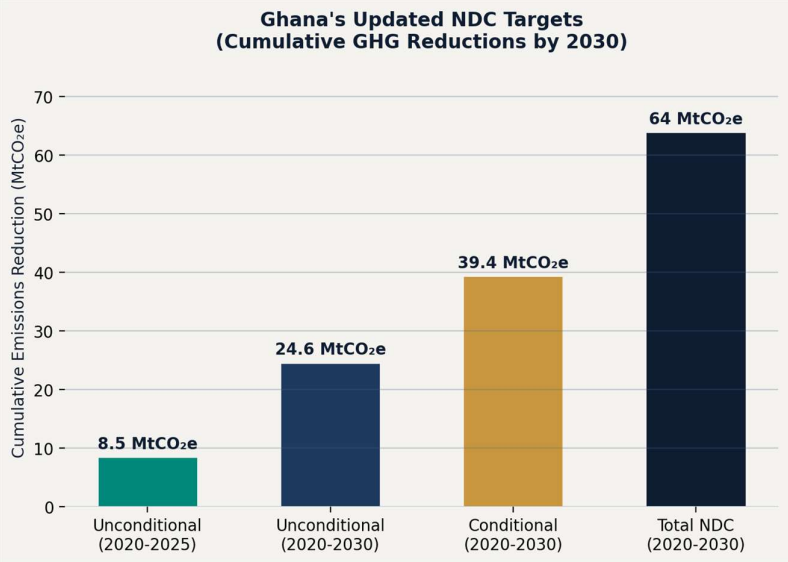

Figure 3: Ghana NDC Emissions Reduction Targets (Cumulative by 2030)

3.3 NDC 3.0 Update

Ghana initiated NDC 3.0 technical sectoral consultations in July 2025 (Aburi workshop) to prepare the next round of climate commitments. The Coordinated Programme of Economic and Social Development Policies (2025–2029) reaffirms the 24.6 $MtCO_2e$ unconditional and 39.4 $MtCO_2e$ conditional targets.

4. Renewable Energy Investment & Green Transition (REI & GT) Fund

Attribute	Detail
Full Name	Renewable Energy Investment and Green Transition Fund (REI & GT Fund / REI> Fund)
Legal Basis	Amendment to RE Act 832; Cabinet approval Mar 2025
Purpose	Mobilize capital for low-carbon infrastructure; accelerate RE investment; support green transition
Announced	March 2025 (Cabinet approval, Minister John Abdulai Jinapor)
Launched	August 28, 2025 (formal launch ceremony)
Seed Capital	GHĝ51.3 million allocated in 2025 Budget
Target Mobilization	Part of broader national goal of USD 1 billion in climate financing; USD 4.4 billion total energy sector investment by 2030
Managing Authority	Ministry of Energy and Green Transition (renamed from Ministry of Energy in 2025)
Disbursement Mechanism	Designed to fund RE project development, mini-grid deployment (35 planned 2025; 400 target by 2030), BESS, and private sector co-investment. Exact protocols still being operationalized.

Source: Ghana News Agency (Mar 2025); Modern Ghana (Mar 2025); BFT Online; GBC Ghana (Aug 2025); BudGIT Ghana 2025 Budget Analysis

The REI & GT Fund represents a significant step from policy to implementation. It serves as the domestic vehicle for channelling both public and international climate finance into RE project pipelines, complementing the AfDB-funded $27.39 million mini-grid and net-metering program. A UNDP-supported roundtable examined how the Fund can be operationalized in a way that is credible, investable, and responsive to real financing needs.

5. Renewable Energy Investment Fund (REIF)

The REIF was originally established under Section 39 of the Renewable Energy Act, 2011 (Act 832). Its mandate was to provide financial assistance for RE projects, including grants, subsidies, and loans for technology development, capacity building, and local manufacturing of RE equipment. However, despite being on the statute books since 2011, the REIF was never operationalized or funded.

5.1 REIF vs REI & GT Fund: Key Distinctions

Attribute	REIF (Act 832, Sec. 39)	REI & GT Fund (2025)
Legal Basis	RE Act 832, Section 39	Amendment/restructuring under RE Amendment Act; Cabinet approval Mar 2025
Status	Never operationalized (2011–2025)	Approved for operationalization; launched Aug 2025
Mandate	RE development, utilization, sustainability	Broader: RE investment + green transition financing
Capitalization	Never funded	Seed capital: GHB̂51.3M (2025 Budget)
Managing Authority	Energy Commission (designated, never activated)	Ministry of Energy and Green Transition

In practice, there is no separate operational REIF distinct from the REI & GT Fund as of 2025–2026. The dormant REIF has been effectively subsumed and transformed into the broader, rebranded REI & GT Fund under the renamed Ministry of Energy and Green Transition.

6. Renewable Energy Act (Act 832, 2011)

The Renewable Energy Act, 2011 (Act 832) is Ghana's foundational legislation for the promotion and regulation of renewable energy. It was significantly amended by the Renewable Energy (Amendment) Act, 2020 (Act 1045), which replaced the feed-in tariff mechanism with competitive procurement.

6.1 Key Provisions of Act 832

Feed-in Tariff (FIT) Scheme (Original, Sections 20–28)

- Established a guaranteed feed-in tariff mechanism obligating distribution utilities and bulk consumers to purchase RE electricity at rates approved by PURC
- Renewable Energy Purchase Obligation (REPO): Every distribution utility required to purchase a specified percentage of total electricity from renewable sources
- PURC mandated to set FIT rates for RE technologies, providing price certainty and revenue predictability for investors

Licensing Requirements (Sections 11–19)

- Energy Commission empowered to authorize, certify, and license all RE generation, transmission, and distribution
- License categories: Wholesale Electricity Supply Licence, Retail Electricity Supply Licence, Extension Licence
- Small-scale self-generation from RE sources exempted from full licensing requirements

Net Metering (Added by Act 1045, 2020)

- Section 30A establishes net-metering for encouraging self-generation "not for income generation"
- Net Metering Sub-Code originally published in 2015, allowing consumers to feed excess power back to the grid
- Credit mechanisms designed for kWh-based (active energy) accounting only

Incentives and Tax Exemptions

- Duty and VAT exemptions on RE equipment and machinery
- All solar panels imported into Ghana exempt from duties and VAT
- Tax rebates for manufacturing/assembling firms in the RE sector

6.2 Key Changes Under Act 1045 (2020 Amendment)

Aspect	Act 832 (Original, 2011)	Act 1045 (Amendment, 2020)
Pricing Mechanism	Guaranteed feed-in tariff (FIT)	Competitive procurement scheme (auctions/tenders)
Purchase Obligation	REPO at pre-set FIT rates	Purchase obligation retained but via competitive bidding
Net Metering	Sub-Code 2015 (informal)	Formally codified; Section 30A "not for income generation"
FIT Rate Setting	PURC sets guaranteed rates	PURC determines prices through competitive procurement
Policy Intent	Attract early RE investment with price certainty	Reduce cost burden on utilities; fiscal sustainability

Source: GhaLII (Act 832 consolidated as amended through Act 1045); PURC website; Ndowuona Legal (2021); ICLG Renewable Energy Laws Ghana 2025

7. National Energy Policy

7.1 Original Policy (2010)

Ghana's first National Energy Policy was approved by Cabinet on 16 March 2010, developed in response to the country's emerging oil and gas sector following the 2007 Jubilee Field discovery. It was structured around six key policy areas:

- Power — Generation, transmission, and distribution
- Petroleum (Upstream) — Oil and gas exploration and production
- Petroleum (Downstream) — Refining, distribution, and marketing
- Renewable Energy — Promoting RE deployment and integration
- Woodfuels and Biomass — Sustainable biomass management
- Energy Efficiency and Conservation — Demand-side management

7.2 Updated National Energy Policy (2021)

The revised 2021 policy (approved March 2023) adds dedicated chapters on Waste-to-Energy Management, Energy Efficiency, and Energy Transition. It proposes establishing a National Renewable Energy Authority and targets 10% non-hydro RE penetration by 2030.

7.3 Institutional Arrangements

Institution	Role
Ministry of Energy & Green Transition	Policy making; coordination; implementation; supervision of sector institutions
Energy Commission	Technical regulator; authorizes, certifies, licenses all RE; develops REMP
PURC	Economic regulator; sets tariffs; determines competitive procurement prices
Bui Power Authority (BPA)	Operates Bui Hydro (404 MW); mandated for RE expansion including solar
Volta River Authority (VRA)	Operates Akosombo (1,020 MW) and Kpong (160 MW); diversifying into solar
GRIDCo	Owns and operates the national transmission system; grid integration and dispatch

Source: Ministry of Energy 2010 NEP; Ministry of Energy 2021 NEP; IEA Policy Database; energyrights.info

8. Renewable Energy Master Plan (REMP)

The Ghana Renewable Energy Master Plan (REMP), published in February 2019 by the Energy Commission with support from UNDP and the China-Ghana South-South Cooperation programme, is the country's most detailed technology-level investment roadmap for renewable energy deployment through 2030.

8.1 Objective

Increase the proportion of renewable energy in the national energy generation mix from 42.5 MW in 2015 to 1,363.63 MW by 2030 (1,094.63 MW grid-connected + 269 MW off-grid), while reducing dependence on biomass for thermal energy applications and providing an investment-focused framework for economic growth and climate change mitigation.

8.2 Technology Targets (2030)

- Utility-scale Solar PV: 1,079.63 MW
- Wind: 436 MW
- Small/Medium Hydro: 150 MW (incl. 124.5 MW small hydro)
- Biomass (MSW-to-energy, biogas): ~88 MW
- Mini-grids & Solar Home Systems: ~0.5 MW (off-grid portion)

8.3 Implementation Timeline

- Cycle 1: 2019–2021 (transition phase)
- Cycle 2: 2022–2025 (scaling phase)
- Cycle 3: 2026–2030 (full deployment phase)

8.4 Investment Requirements

Total REMP investment requirement: USD 5.6 billion over 2019–2030, with >80% expected from the private sector. Annual investment requirement: approximately USD 460 million per year. Land requirement: approximately 1.1 million acres.

8.5 REMP Update (2025)

A revised REMP is being finalized as of 2025 with UNDP support, reflecting new trends in technology costs, the REI & GT Fund, and updated deployment targets. The update was launched through a UNDP-supported roundtable in October 2025.

Source: Energy Commission REMP (energycom.gov.gh); UNDP Ghana (May 2019); FAO/FAOLEX; DLA Piper Africa

9. National Energy Transition Framework (NETF 2022–2070)

Launched by President Nana Akufo-Addo and presented at COP27 (Egypt, 2022), Ghana's National Energy Transition Framework sets out a 50-year pathway to net-zero emissions by 2070 while ensuring socio-economic growth and leveraging Ghana's natural resource endowment.

9.1 Key Objectives

- Identify viable pathways for carbon neutrality within a secure and efficient energy sector
- Balance existing efforts with new initiatives to increase renewable energy penetration
- Convert thermal plants to natural gas as a transition fuel
- Integrate nuclear power into the energy mix (starting ~2030s)
- Achieve decarbonization, energy access, and security of supply

9.2 Seven Priority Action Areas

#	Priority Area	Key Measures
1	Power Generation	Scale up RE (solar, wind, small hydro); transition thermal to gas; integrate nuclear
2	Transport	Promote EVs and low-carbon transport fuels
3	Clean Cooking	Transition from biomass/charcoal to LPG, electricity, improved cookstoves
4	Oil & Gas	Optimize upstream with emissions reduction technology
5	Industry	Promote energy efficiency and fuel switching
6	AFOLU	Reduce deforestation; promote climate-smart agriculture
7	Green Minerals / Just Transition	Develop lithium, graphite, cobalt, manganese for clean energy supply chains

9.3 Phase-Out Timelines

Coal: Ghana has no operational coal plants. Natural gas will play a significant role as a transition fuel. Electricity generation aims for zero emissions by 2070 after peaking at 37.5 $MtCO_2$. The framework envisages progressive conversion of thermal plants from LCO/diesel to natural gas, then eventual replacement with renewables, storage, and nuclear.

9.4 Integration with RE Targets

- 10% variable RE integration in national grid by 2030
- 20% variable RE integration by 2070
- Nuclear energy positioned as baseload replacement for thermal (1,000 MW plant planned; sites identified at Nsuban and Obotan)
- Aligned with REMP target of 1,363 MW RE by 2030

9.5 Just Transition Provisions

The NETF includes specific provisions for workers in the informal biomass/charcoal economy, oil and gas sector retraining, mining community benefit-sharing from green minerals, and gender/inclusion

equity. Ghana intends to leverage its green mineral resources (lithium, cobalt, manganese, graphite, bauxite/aluminium) for value addition rather than raw material export.

Source: Ministry of Energy NETF Abridged Version; IEA Policy Database; Wikipedia (Ghana NETF); GNA News Agency (May 2024); MDPI Energies (2025)

10. National Clean Energy Programme (NCEP)

The National Clean Energy Access Programme (NCEP) is Ghana's flagship carbon market programme under Article 6.2 of the Paris Agreement. It is designed to contribute to Ghana's conditional NDC targets by increasing access to clean energy technologies while generating internationally transferred carbon credits.

Attribute	Detail
Full Name	National Clean Energy Access Programme (NCEP)
Legal Basis	Article 6.2, Paris Agreement; Ghana-Switzerland MoU (28 Feb 2020)
Carbon Credit Target	2.2 $MtCO_2e$ as ITMOs to Switzerland
Beneficiary Target	Up to 5 million households
Implementing Agency	Ghana EPA — Carbon Market Office (CMO)
International Partner	KliK Foundation (Switzerland) — carbon credit purchaser
Design Doc Developer	Econoler
UNDP Support	Climate Promise initiative focusing on NCEP
Pipeline	35 activities as of Ghana BUR4 (Mar 2024)

10.1 Key Activities

- **ATEC:** 100% data-auditable electric smart stove ITMOs with direct carbon payments to households
- **EcoLinks:** Ghana Clean Cooking Initiative (Ashanti and Central Regions)
- **Solar PV systems:** Distribution programmes under carbon market framework
- **Rice AWD projects:** Alternate Wetting and Drying for cultivation emissions reduction

10.2 Regulatory Framework

NCEP operates under Ghana's Framework on International Carbon Markets and Non-Market Approaches (published December 2022), which created the Automatic Additional Technology List and governance mechanisms for Article 6 activities. It directly implements Ghana's conditional NDC targets and complements the ETIP and NETF.

Source: UNEP Copenhagen Climate Centre (Article 6 Pipeline, 2023); UNDP Ghana Press Release (2020); Ghana EPA Carbon Market Office; Ghana BUR4 (UNFCCC, 2024)

11. National Energy Strategy

Ghana's national energy strategy comprises several interlocking policy documents:

11.1 Strategic Pillars

- **National Energy Policy (2021 revision):** Achieve universal access to electricity; diversify the energy mix with RE and nuclear; provide RE incentives; integrate nuclear into generation.
- **NETF (2022–2070):** Net-zero by 2070 with 7 priority action areas (see Section 9).
- **ETIP (2023):** USD 550 billion investment plan; net-zero by 2060; 4 main decarbonization technologies covering >90% of targeted abatement (see Section 14).

11.2 Demand Projections & Generation Expansion

Ghana's Integrated Power System Master Plan (IPSMP) develops a resilient generation capacity expansion plan meeting electricity demand forecast at least cost. The Energy Commission publishes annual Energy Outlook reports. With an electricity access rate of ~84–86% (one of the highest in sub-Saharan Africa), Ghana targets universal access by 2030 under Mission 300.

11.3 Nuclear Energy

Ghana plans a 1,000 MW nuclear power plant with two sites identified: Nsuban (Western Region) and Obotan (Central Region), under the Nuclear Power Ghana (NPG) organization. Nuclear is positioned as a baseload replacement for thermal under the NETF.

Source: Ministry of Energy, NEP 2021; Oxford Business Group (2024); IEA Ghana Energy Outlook

12. Energy Sector Strategy and Development Plan (ESSDP)

Published in February 2010, the ESSDP served as the implementation pathway for the original National Energy Policy. While now superseded by newer frameworks (NETF, ETIP, REMP, NEP 2021), the ESSDP established foundational targets that remain relevant.

Attribute	Detail
Published	February 2010, Ministry of Energy
RE Target	10% RE in energy mix by 2020 (not achieved; pushed to 2030)
LPG Access Target	Increase from 6% (2010) to 50% by 2015 (not met)
Key Strategies	Private sector participation in electricity distribution; rural electrification acceleration; biofuels promotion
Institutional Reforms	Separation of generation/transmission/distribution; strengthening PURC; opening distribution to private operators
Current Status	Largely superseded by NETF (2022), ETIP (2023), REMP (2019), NEP (2021 revision)

12.1 Mission 300 National Energy Compact

The ESSDP's modern successor in terms of institutional reform is Ghana's National Energy Compact under Mission 300, presented at the Africa Energy Summit in Dar es Salaam (January 2025). Ghana committed to scaling RE, enhancing electricity access, attracting private investment, and implementing sector reforms. A review workshop was held in Accra in May 2026.

Source: Ministry of Energy ESSDP (Feb 2010); PURC archival; STEER Centre (2022); World Bank Mission 300

13. Sustainable Energy for All (SEforAll)

Ghana's SEforALL Action Agenda was developed through a rigorous consultative process in 2012, building on a Rapid Assessment and Gap Analysis (RAGA). It aligns with the global SEforALL initiative targeting universal energy access, renewable energy scale-up, and energy efficiency improvements by 2030.

13.1 Key Targets (by 2030)

Target Area	SEforALL Goal	Current Status
Electricity access (national)	100%	~84–86% (2024 est.)
Renewable energy share	Increase significantly	<5% non-hydro RE share of generation
Energy efficiency	Double the rate of improvement	Ongoing; significant gaps remain
Clean cooking access	Universal access	Significant gap: ~12.9M people at high risk

13.2 Key Data Points

- Electricity access: ~84–86% national rate, with significant urban-rural disparities
- Clean cooking: ~12.9 million people at high risk due to lack of sustainable cooling and clean cooking access (SEforALL)
- RE share (excl. large hydro): <5% of generation mix, well short of the 10% target
- Lead national institution: Energy Commission of Ghana
- Regional coordination: ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE)

13.3 Linkage to RE Deployment

SEforALL directly aligns with the REMP, the National Rooftop Solar Programme (Capital Subsidy scheme by Energy Commission), and off-grid electrification initiatives. SEforALL supported Ghana in developing the ETIP launched in September 2023. The 2025 National Energy Compact under Mission 300 reinforces SEforALL objectives with specific targets for universal electricity access by 2030.

Source: SEforALL Africa Hub; SEforALL Chilling Prospects/Country Brief: Ghana; UNDP Ghana; World Bank Mission 300 (2025)

14. Ghana Energy Transition and Investment Plan (ETIP)

Launched on 21 September 2023 during the UN General Assembly in New York, the ETIP is Ghana's most ambitious investment-facing energy transition framework. Developed with support from SEforALL and Bloomberg Philanthropies, it seeks to attract USD 550 billion in capital investments to achieve net-zero emissions by 2060.

14.1 ETIP Overview

Attribute	Detail
Launched	21 September 2023 (UNGA, New York)
Prepared by	Government of Ghana (Ministry of Energy) with SEforALL & Bloomberg Philanthropies
Objective	Net-zero CO_2 emissions by 2060; universal energy access; ~400,000 jobs
Total Investment	USD 550 billion by 2060
Majority Funding	Private sector capital + de-risking instruments
Sectors Covered	Power generation, Transport, Clean cooking, Industry, Oil & gas (transition)

14.2 Sectoral Transition Measures

Sector	Key Measures	Investment Focus
Power	Scale-up RE; phase out high-carbon thermal; grid modernization; BESS	~44% of total (~$240B implied)
Transport	EV adoption; public transport electrification; fuel efficiency	~46% (~$253B implied)
Clean Cooking	Transition from biomass/charcoal to LPG, electric, biogas	Significant allocation in household energy
Industry	Energy efficiency; fuel switching; low-carbon technologies	Remaining allocation
Oil & Gas	Managed decline; gas as transition fuel; methane reduction	Enabling framework

Source: SEforALL (2023); Government of Ghana COP28 statements (Dec 2023); SYND Ghana Youth Engagement Report (Mar 2025)

14.3 Key Implementing Partners

- **SEforALL:** Technical lead; ETIP development & launch partner
- **World Bank:** Policy support; Mission 300 energy compact; sector reform
- **AfDB:** Co-financing (SREP); grid investment; institutional strengthening
- **IFC:** C&I solar market development; private sector mobilization
- **CIF:** USD 40M SREP allocation; concessional finance anchor

14.4 Key Projects Under ETIP Umbrella

- 100 MW solar auction (World Bank-backed, in preparation as of 2025)

- SREP Mini-Grid & Net-Metering (AfDB/CIF/SECO, $69.88M)
- Bui Solar Expansion (500 MW plan by BPA)
- VRA 50 MW floating solar at Kpong (EOI stage, 2024)
- Net metering framework: 12,000+ smart meters deployment

15. Scaling-up Renewable Energy Program (SREP)

The SREP-Ghana programme, funded through the Climate Investment Funds (CIF) and implemented by the AfDB, is the country's flagship concessional finance mechanism for renewable energy deployment. The original USD 40 million CIF allocation has leveraged total project financing of USD 69.88 million.

15.1 Programme Overview

Attribute	Detail
CIF/SREP Allocation	USD 40 million
Total Project Financing (signed 2022)	USD 69.88 million
AfDB Contribution	USD 28.49 million
CIF/SREP	USD 40 million
Swiss SECO	USD 1.39 million
Agreement Signed	25 May 2022
Officially Launched	20 December 2022
Implementing Agency	Ministry of Energy / Energy Commission; AfDB as MIE

15.2 Project Components

Component	Description	Financing
1: Mini-Grid & SHS	35 renewable mini-grids + 1,450 SHS for island/lakeside communities; 750 SMEs, 400 schools, 200 health centers	CIF/SREP + AfDB
2: Net-Metered Solar PV	12,000 rooftop PV systems; 67.5 MW installed capacity; 111,361 MWh/yr expected output	AfDB loan + GoG
3: Project Management	PIU operations; monitoring; technical assistance; RE market development	CIF grant

15.3 Expected Outcomes

- 13.5% renewable energy contribution to national energy mix (excluding large hydro)
- 2,865 jobs during construction (30% targeted to women and youth)
- 84,255 people with improved energy access
- Reduced CO_2 emissions through displacement of diesel generation in off-grid communities

15.4 Implementation Status

Construction of 35 mini-grids and 1,450 SHS commenced in Bono East and Oti regions as of June 2025. Procurement bids for mini-grid installation were opened in September 2023 (PV Magazine). An AfDB Implementation Progress Report was published in June 2024. The GCA partnered with AfDB for climate-resilient asset implementation guidance (Aug–Dec 2022 consultancy).

Source: AfDB SREP Appraisal Report; CIF Ghana Country Page (2025); PV Magazine (Sep 2023); Ghana Ministry of Energy (Jun 2025)

16. Market Outlook & Investment Analysis

16.1 RE Investment Trends (2020–2025)

Ghana added 94 MW of solar capacity in 2024, making it the third-largest solar market in Africa for that year (AFSIA Africa Solar Outlook 2026). The solar market is estimated at 0.22 GW in 2025, projected to reach 1.48 GW by 2031 (Mordor Intelligence, Jan 2026).

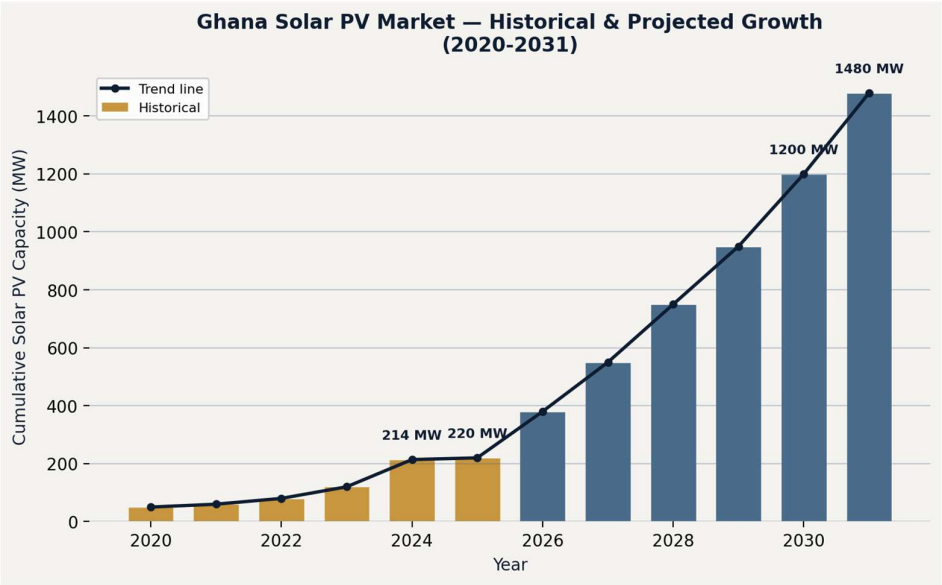

Figure 4: Ghana Solar PV Market — Historical & Projected Growth (2020–2031)

16.2 Major Project Pipeline

Project	Capacity	Developer	Status
Bui Solar (Land-based)	45 MW + 50 MW Galgu	BPA	Operational; part of 500 MW plan
Bui Floating Solar	5 MW operational; 65 MW medium-term	BPA	Expansion planned
VRA 50MW Floating Solar (Kpong)	50 MW	VRA	EOI stage (2024)
VRA 20MW Solar (Oti Region)	20 MW	VRA	Land acquired (Jul 2024)
100 MW Solar Auction	100 MW	GoG/World Bank	In preparation
BXC Solar (Onyadze)	20 MW	BXC Group	Operational since 2018
SREP Mini-Grids	35 mini-grids	GoG/AfDB/CIF	Under implementation
Net-Metering (SREP)	12,000 rooftop PV	GoG/AfDB/SECO	Rollout 2023–
Anansi/NEK Wind Pipeline	~1,300 MW	NEK Umwelttechnik	Development/permitting

16.3 Grid Integration Challenges

Challenge	Details
Financial crisis	Energy sector debt: USD 1.2–1.5B owed to IPPs (Oct 2024); ECG payment rate ~48% to IPPs
Transmission losses	~25% combined technical + commercial losses; weak grids with low fault levels
Curtailment risk	Variable RE curtailment expected as penetration grows; 284 GWh expected from Bui in 2025
IPP contract disputes	Government reviewing all IPP contracts (ongoing since 2025)
Transmission bottlenecks	Limited interconnection between generation hub (south) and demand centers

16.4 C&I Solar Market

The IFC distributed solar market assessment (2021) identified Ghana as one of the highest-potential C&I solar markets in West Africa. The addressable C&I solar market is estimated at 200–400 MW. C&I solar PPAs offer 10–15 year terms at costs below grid tariffs (IFC). Key adopters include mining companies, manufacturing firms, and cold-chain operators in the Accra/Tema corridor. Net-metering framework is expanding with 12,000+ smart meters, and a net-metering app was launched in December 2025.

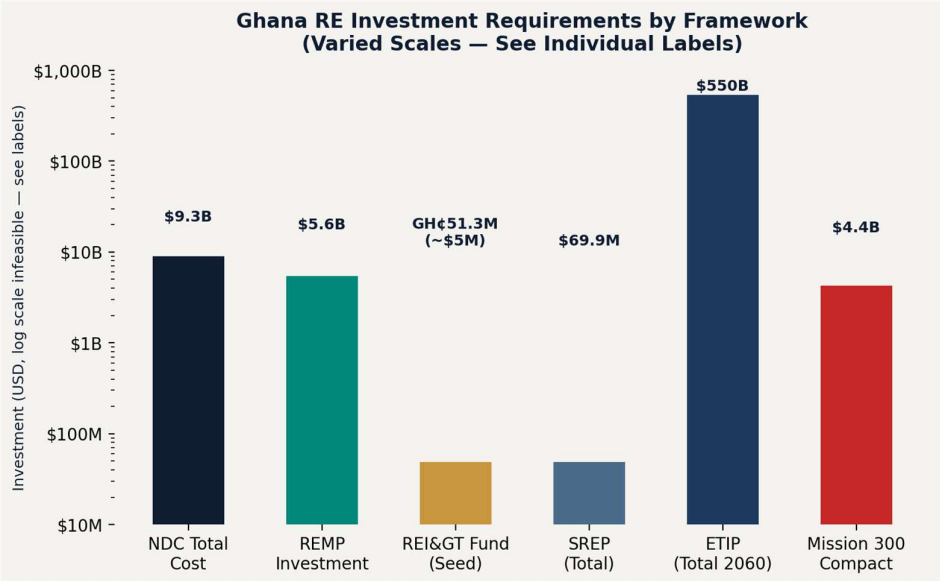

Figure 6: Ghana RE Investment Requirements by Framework

17. Policy & Investment Framework Timeline

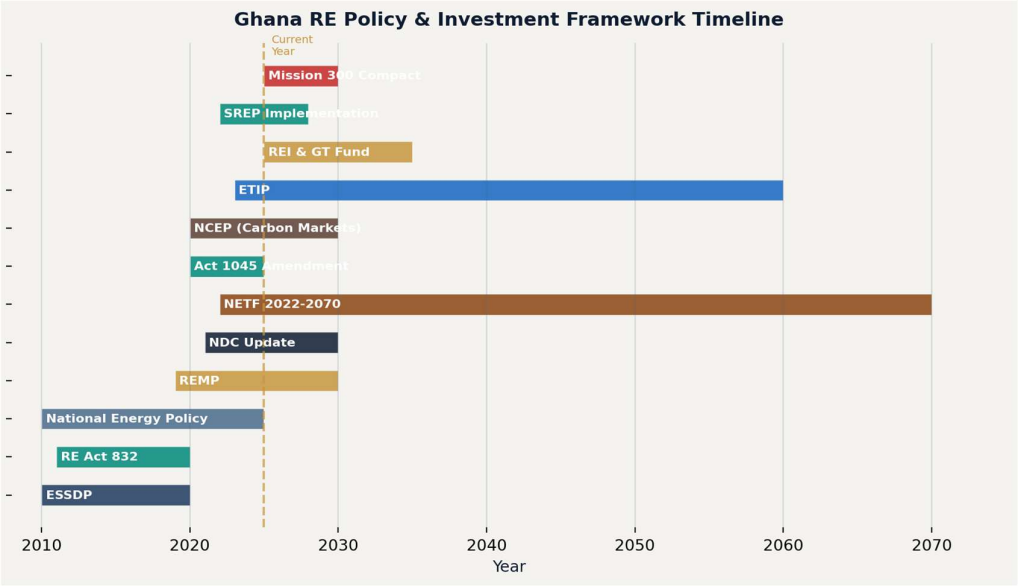

Figure 5: Ghana RE Policy & Investment Framework Timeline

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Sources & References

Key sources include: U.S. International Trade Administration (trade.gov, Aug 2025); Ghana GridCo 2025 Electricity Supply Plan; Energy Commission of Ghana; UNFCCC NDC Registry; UNDP Climate Promise Ghana; Ghana EPA Carbon Market Office; Ministry of Energy & Green Transition; AfDB SREP Appraisal Report; CIF/SREP Ghana Country Page; SEforALL (2023); AFSIA Africa Solar Outlook 2026; Mordor Intelligence (Jan 2026); IFC Ghana Distributed Solar Market Assessment (2021); Bui Power Authority AGM Report (Aug 2025); IMF Ghana 5th Review (Dec 2025); GhaLII (Act 832 consolidated); PURC; PV Magazine (Sep 2023); Ghana News Agency (Dec 2024, Mar 2025); Modern Ghana; BFT Online; GBC Ghana; BudGIT Ghana 2025 Budget Analysis; ScienceDirect; MDPI Energies (2025); Oxford Business Group (2024); DLA Piper Africa; Ndowuona Legal (2021); Climate Policy Lab, Tufts (Mar 2025); SYND Ghana Youth Engagement Report (Mar 2025); Ecofin Agency (Oct 2025).