



MINISTRY OF POWER



SREP-GHANA INVESTMENT PLAN

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Ministry of Power
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Outline of Presentation

1 Brief Country Context

2 Energy Sector Brief

3 The Renewable Energy Sector

4 Rational for Ghana SREP-IP & Investment Areas

5 Conclusion

Brief Country Context

CIF

- Total population = 25.8 million
- Population growth rate = 2.2%
- Nearly half of the population live in rural areas
- Urban population growing at a rate of 3.5%
- **Politically stable** and continues to consolidate democratic governance.
- Relatively **strong economy**; in 2013, GDP real growth rate reached to 7.9%, while the GDP per capita was USD 3,500.
- Service sector which is energy intensive accounts for 50% of GDP, agriculture 21% and industry 29% of GDP.
- Main export commodities (Gold, Bauxite, Cocoa, Crude Oil, etc)



Electricity Supply & Demand Situation

CIF

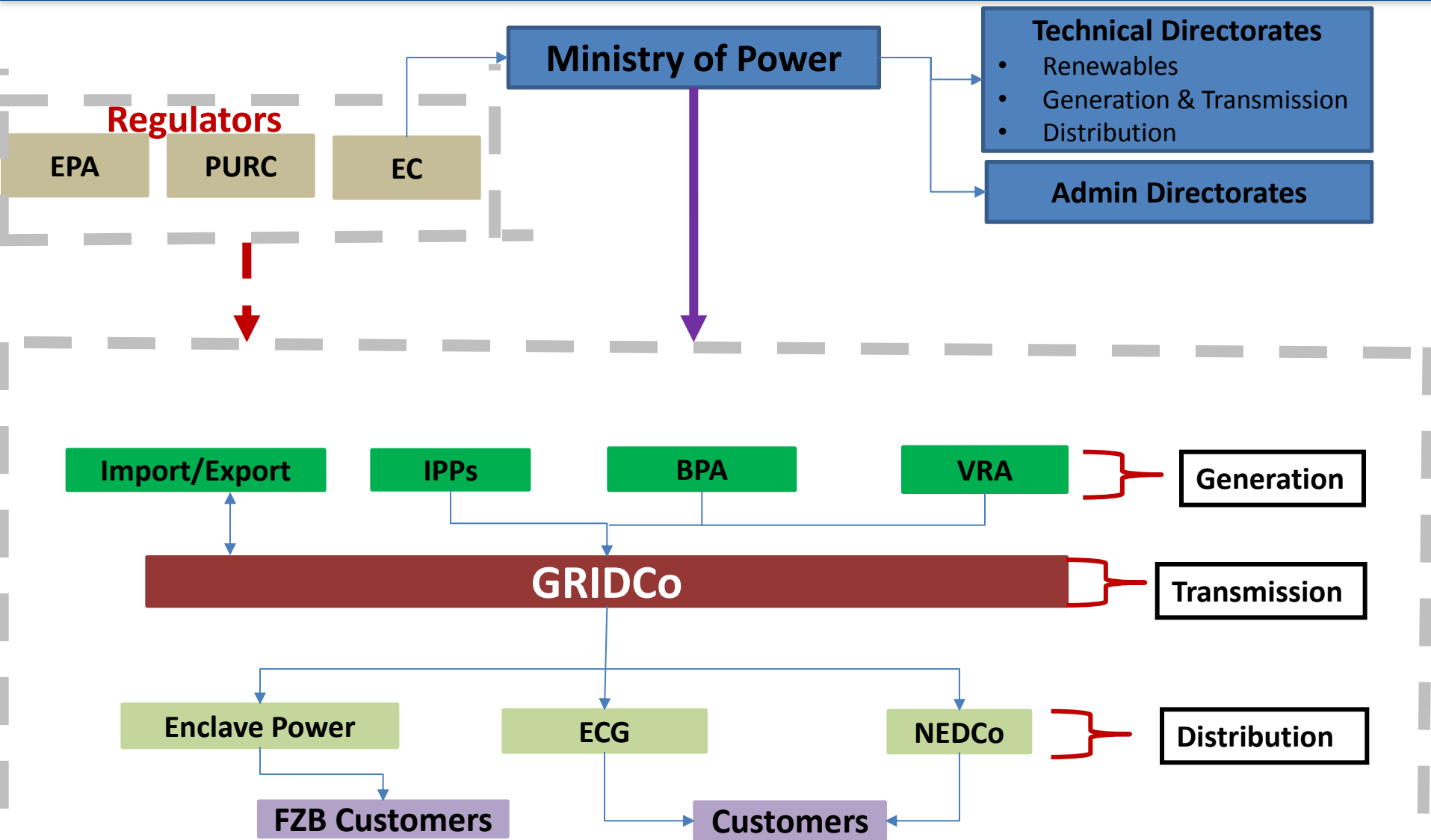
1. Installed electric generation capacity is approx. 3,000 MW (hydropower \approx 54%).
2. Development of modern RE has been much slower with only 8.2 MW installed so far.
3. Electricity demand in 2013 was 12,874GWh (**1943MWp**) and projected to reach 28,000GWh (**5,500MWp**) by 2026.
4. Recurrent droughts makes **dependence on hydro unsustainable** and moreover large hydro potential exhausted.
5. The **shift to fossil fuel thermal generation likely to impact the environment & economy adversely.**



Policy goals for the energy sector:

- ❖ Ten percent (10%) contribution of renewable energy in the electricity generation mix by 2020;
- ❖ Minimize environmental impacts of power supply through increase use of RE and EE&EC.
- ❖ Encourage private sector participation as IPP in the Generation subsector
- ❖ Explore new generation option to diversify the fuel mix
- ❖ Universal access to electricity by 2016;
- ❖ 5,000 MW of generation capacity by 2019;

Sector Institutional Framework



RE Resource Potential & Development Status **CIF**

1. Enormous RE resources (e.g. biomass, solar, wind, W2E, S/MHP, tidal wave energy, etc.).
2. RE contributes just about 0.3% to the country's total installed capacity.
3. RE Act in place since 2011, (Act 832) for the sector.
4. Other policy instruments in place are:
 - ❖ A National Electricity Grid Code (2009) for renewable energy,
 - ❖ Renewable energy feed-in tariffs
 - ❖ Guidelines for renewable energy purchase obligation
 - ❖ Net-metering Code developed
 - ❖ Off-grid electrification and pricing policy being developed

Key RE Sector Challenges/Constrains **CIF**

1. Regulatory, contractual and tariff gaps.

- ❖ RE-FiT fixed for 10yrs (PPAs typically 20yr).
- ❖ Perceive commercial risk & affect revenues projection

2. Despite attractive RE-FiT policy, RE sector still not attracting the desired level of investments

- ❖ Weak financial standing of the main off taker (ECG),
- ❖ Limited technological capacity to handle RE installations
- ❖ Challenging financing climate; Inadequate, high cost and unsustainable financing regimes (commercial interest rates as high as 33%/yr)

3. Despite high electricity access (>70%), still a significant % of population with no access to electricity

- ❖ Remote and difficult to reach island/lakeside communities

Program Overall Objective: *Enable GoG meet its 10% RE target by 2020 as well as its universal electrification goal through the implementation of flagship renewable energy investments that would provide models for scale-up and leverage additional private and public financial resources to the country's RE sector.*

Rationale for SREP Funding

- 1. Increase investor confidence.** Strong signal to investors, development and private sector partners to provide counterpart and/or investment funding. SREP resources essential to mitigate the financial risks and leverage funds necessary for RE investment at a scale not contemplated previously.
- 2. Reduce sector challenges.** SREP resources are also necessary to ensure a coordinated approach in addressing the remaining regulatory, institutional and contractual challenges to permit the private sector to partner with the Government and/or other development partners in achieving the RE goals.
- 3. Provide necessary technical support and builds capacity.** SREP will work with its partners to attract the necessary technical expertise to undergo and/or complete necessary RE assessments to fill the current information void.

SREP Ghana Program Design

CIF

SREP GHANA PROGRAM

Investment Projects co-financed by SREP

PROJECT

1

Renewable energy mini-grids and stand-alone solar PV systems

Executed by: MoP and AfDB

Funded by:

- SREP: USD 17.5 million
- AfDB: USD 27 million
- DPs: USD 12 million
- GOG: USD 8 million
- Beneficiaries & private sector: USD 18.5 million

PROJECT

2

Solar PV based net-metering with storage

Executed by: Energy Commission and AfDB

Funded by:

- SREP: USD 12.5 million
- AfDB: USD 15 million
- DPs: USD 12 million
- GOG: USD 8 million
- Beneficiaries & private sector: USD 45.5 million

PROJECT

3

Utility-scale solar PV/wind power generation

Executed by: private sponsors and IFC/AfDB

Funded by:

- SREP: USD 10 million
- IFC: USD 10 million
- AfDB: USD 10 million
- Beneficiaries & private sector: USD 20 million

PROJECT

4

Technical assistance to scale-up renewable energy

Executed by: Energy Commission and AfDB

Funded by:

- SEFA: USD 1.5 million
- DPs: USD 2.5 million

SREP Investment Projects

Project 1: RE mini-grids and stand-alone solar PV systems

Encourage sustainable public and private financing for scaling-up RE-mini-grids & stand-alone PV systems to achieve universal access, with a special focus on gender (female-headed households and SMEs).

Expected results

1. Estimated 55 renewable mini-grids
2. GoG in collaboration with private sector invested in 33,000 stand-alone solar PV systems for households,
3. About 1,350 schools, 500 health centres and 400 communities electrified.



SREP Investment Projects

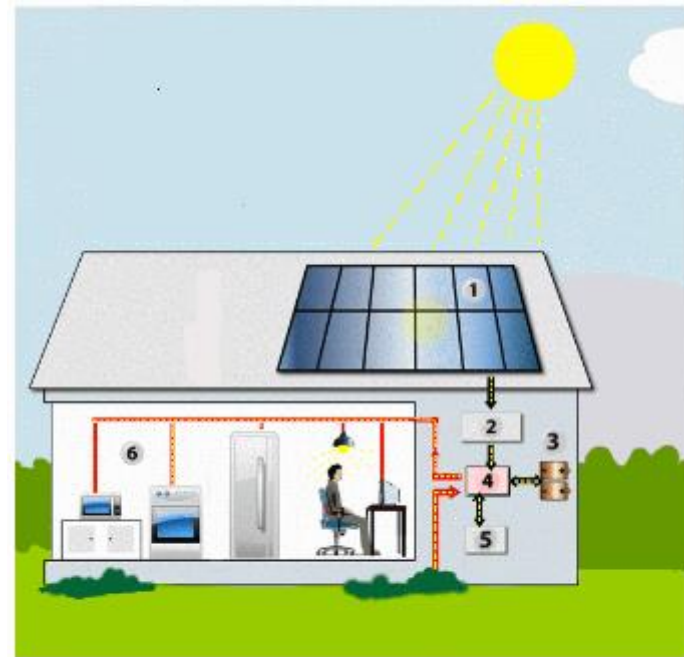
CIF

Project 2: SPV based net metering with battery storage

Objective: Develop a comprehensive net metering program, deploy at least 15,000 units of roof-mounted solar PV systems to reduce the economic cost of power on SMEs and households and contribute 25-30MW RE to power mix.

Expected results

1. 15,000 grid connected solar PV systems equipped with storage capacity to meet desirable loads installed.
2. Credit recovery facility and financing instruments developed.
3. Decentralized and standard contract application process established
4. Impact of large distribution generation on distribution networks conducted.
5. Certification regime for service providers established and relevant capacities built.



1. Solar Modules
2. Charge Controller
3. Batteries
4. Solar UPS Controller
5. Inverter
6. Appliances

SREP Investment Projects

CIF

Project 3: Utility-scale solar PV/wind power generation

Objective: Assist Government overcome key challenges that prevent the growth and expansion of the utility-scale solar PV and wind market in Ghana by catalyzing the first project-financed utility-scale renewable energy plants, demonstrating the Ghanaian RE sector potential to financiers and helping attract further investment in the future.

Specific Targets

1. This project is expected to leverage additional sources of co-financing from the private sector and from the AfDB private sector window.
2. IFC (the World Bank Group's International Finance Corporation) will be the lead MDB for the implementation.



Complementary TA funded by SEFA CIF

Project 4: Technical assistance to scale-up RE:

Objective:

1. Assist stakeholders overcome key technical, financial, regulatory and institutional challenges impeding the scaling-up of renewable energy investments in the country
2. Overcome barrier that constrain the successful implementation of the flagship renewable energy projects financed under this program.

Specific Targets

- Transaction support facility to reduce cost.
- Tariff methodology for ancillary services in RE
- Support creation of Renewable Energy Authority.
- Support creation of "one-stop shop" solution to fast track RE transactions , etc.



SREP Program Financing Plan

CIF

Funding Sources and Uses

1. Estimated cost of SREP-Ghana IP is USD 230 million
2. CIF/SREP contribution of USD 40 million.
3. The financing plan detailing sources and uses of funds is shown below:

PROJECT	SREP	GoG	AfDB*	IFC	DPs	PI&B**	Total
RE mini-grids and stand-alone solar PV systems	17.5	8.0	27.0	0.0	12.0	18.5	83.0
Solar PV based net metering with battery storage	12.5	8.0	15.0	0.0	12.0	45.5	93.0
Utility-scale solar PV/wind power generation	10.0	0.0	10.0	10.0	0.0	20.0	50.0
Technical assistance to scale-up RE	0.0	0.0	1.5	0.0	2.5	0.0	4.0
TOTAL	40.0	16.0	53.5	10.0	26.5	84.0	230.0

* Including the AfDB private sector window and the SEFA Trust Fund

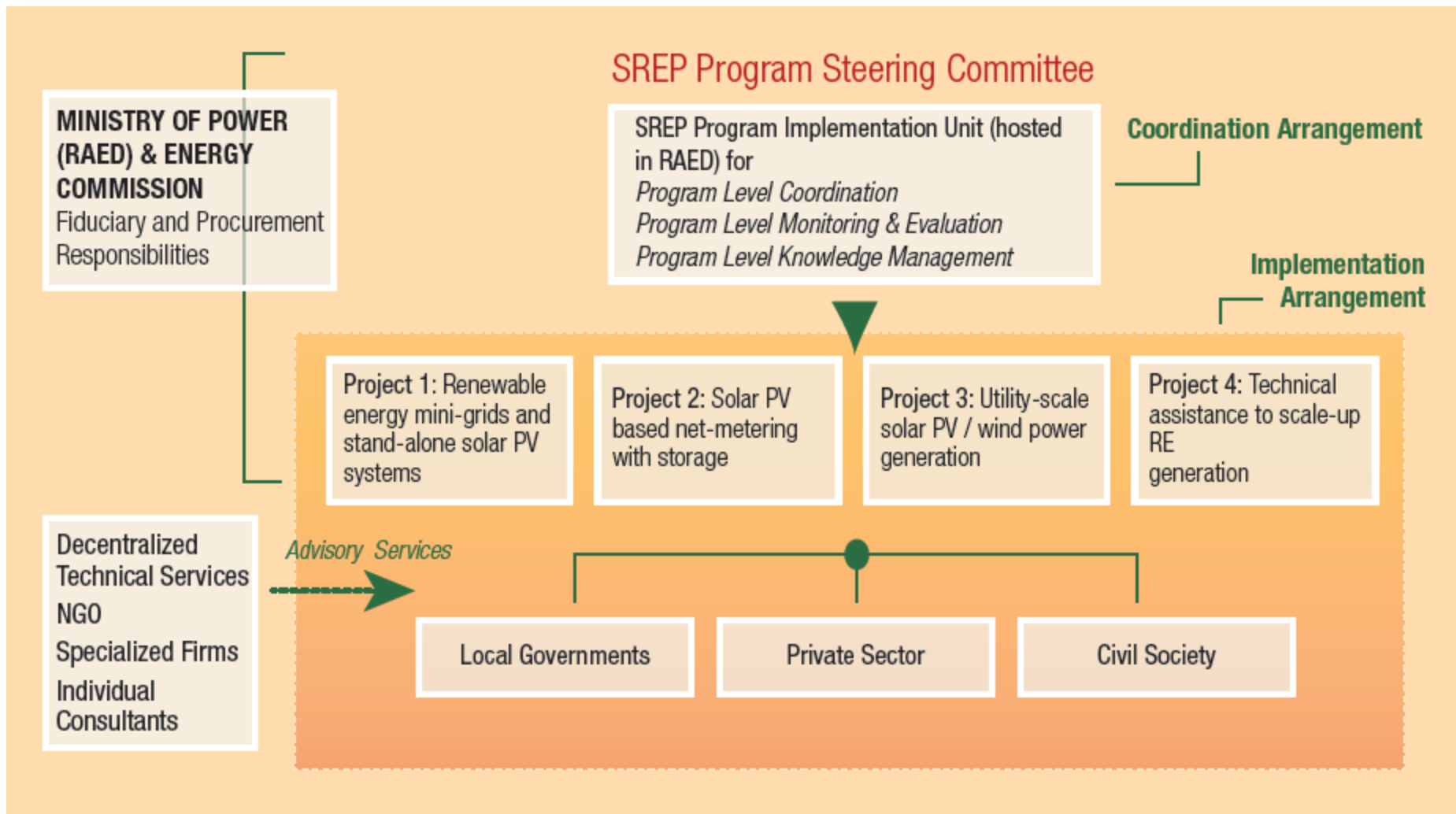
** Private investors & beneficiaries

SREP Program Results Framework



Result	Indicator	Baseline	Targets by 2020	Means of Verification
SREP Transformative Impacts				
Support low-carbon development pathways by reducing energy poverty and/or increasing energy security	National measure of energy poverty	MEPI ^a = 0.62 (2008, access rate of 56.1%) Electricity used in 2014: 12000 GWh	MEPI ^a = 0.1 (access rate of 90%) Electricity used: 4.1 kWh per capita	Country-based reporting using household survey data
	Electricity output from renewables in GWh per year	GWh per year.^b	115.6 GWh per year	Utilities and MoP
	Increased annual public and private investments (\$) in targeted subsector(s) per country	n/a	USD 230 million	National M&E
SREP Program Outcomes				
Increased supply of renewable energy	Increased annual electricity output (GWh) as a result of SREP interventions	Wind/Solar electricity output: 3.9 GWh	Wind/Solar electricity output: 39.36 GWh per year	SREP Projects' M&E systems
		Off-grid: 18.0 GWh per year	Off-grid: 36.76 GWh per year	
		Solar PV Net-Metering: 2.4 GWh per year	Solar PV Net-Metering: 39.42 GWh per year	
Increased access to modern energy services	Increased number of women, men, businesses and community services benefitting from improved access to electricity as a result of SREP interventions	0.05 (in million)	Wind/Solar electricity Project: ~ 0.0626 million	SREP Projects' M&E systems
			Off-grid Program: ~ 0.5 million Solar PV Net-Metering Project: ~ 0.0949 million	
New and additional resources for renewable energy projects	Leverage factor: USD financing from other sources compared to SREP funding	USD 40 million	Additional financing leveraged from the SREP initial resources: USD 190 million	SREP Projects' M&E systems
Avoided GHG emissions	Avoided GHG emissions (tons CO₂e per GWh) as a result of SREP	n/a	76,664 tons CO₂e per year once SREP projects are	SREP Projects' M&E systems

Program Implementation Arrangements



- Ghana has an opportunity to propel its future socioeconomic development following a low-carbon pathway.
- GoG is committed to leveraging SREP resources to help achieve its development goals of universal access to modern energy services and 10% share of renewables in the country's energy mix.
- This requires understanding Ghana's renewable energy potential and creating an enabling environment for scaling-up renewable energy.
- SREP support will help the country achieve these goals.

WS
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a Commission (NMC) to
landscape effectively.
Kabral Blay-Amihere,
sing to deepen democracy

Govt prioritises renewable energy

By Lawrence Markwei

JOHAN Jinapor, Deputy Minister of Power, has said the government has prioritised renewable energy towards the achievement of the 2020 national goals.

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To smagbeve@yahoo.com

Dear Mr Mahu,

EU funding and financial instruments can co-finance your investments or research in renewable energy projects! "EU Funding for Energy 2015" is *the* forum to get up-to-date with advanced financial aspects of EU partnerships for energy in Africa, Asia & Europe.

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