REPP

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ADVANCING NATIONAL POLICY AGENDAS THROUGH RESPONSIBLE INVESTING

An assessment of the REPP portfolio's alignment with target country climate, energy and development priorities

KEY FINDINGS

This report is based on extensive desk-based research and maps REPP's investments to date against country needs and priorities, deepening our understanding of the extent and breadth of those impacts.

REPP is:

- Making a material and valuable contribution to the climate, energy and development priorities of the countries in which it has invested.
- Raising the ambition of climate action by supporting the implementation of conditional Nationally Determined Contribution (NDC) targets.
- Contributing to the strengthening of local capacities – a crucial policy priority across the analysed countries.
- Supporting several priority renewable energy projects and national electrification programmes.
- Building a diverse portfolio of on-grid and off-grid solutions, which ensures that the programme can achieve multiple climate, energy and sustainable development goals.

By 2023, REPP-supported projects and companies are expected to:

- Be avoiding over 240,000 tonnes of greenhouse gas (GHG) emissions per year.
- Have connected 1.9 million people to electricity for the first time.
- Have created 10,000 jobs, of which 1,700 will be held by women.

COUNTRY HIGHLIGHTS

How REPP is supporting the implementation of countries' climate, energy and development policies through investment in small-scale renewable energy projects

Mali

- Supporting "carbon sink" objective through GHG mitigation
- Connecting 400,000 people to electricity will contribute to 87% energy access target
- Supporting empowerment of women

Senegal

- 4MW planned capacity will meet nearly 65% of 2030 off-grid solar capacity target
- Expected 12,000tCO_2e against 29% GHG mitigation target
- Connecting 400,000 people to electricity will contribute to 81.6% rural access by 2023 target

Sierra Leone

- Supporting flagship national mini-grid programme
- Mitigating 20,492tCO_2e will support 2050 carbon neutral goal
- Planned provision of energy access to 295,043 people supports 92% electrification by 2030 target

Liberia

- Mitigating 6,750tCO_2e will support 2050 carbon neutral target
- Promoting economic activity and job creation

Cote d'Ivoire

- Expected 12,000tCO_2e against 28% GHG mitigation target
- Supports ambitious electrification goals

Ghana

- 66.5MW planned capacity supports 1.4GW 2030 target
- Increasing investments in energy infrastructure
- Leveraging co-benefits of renewable energy

Nigeria

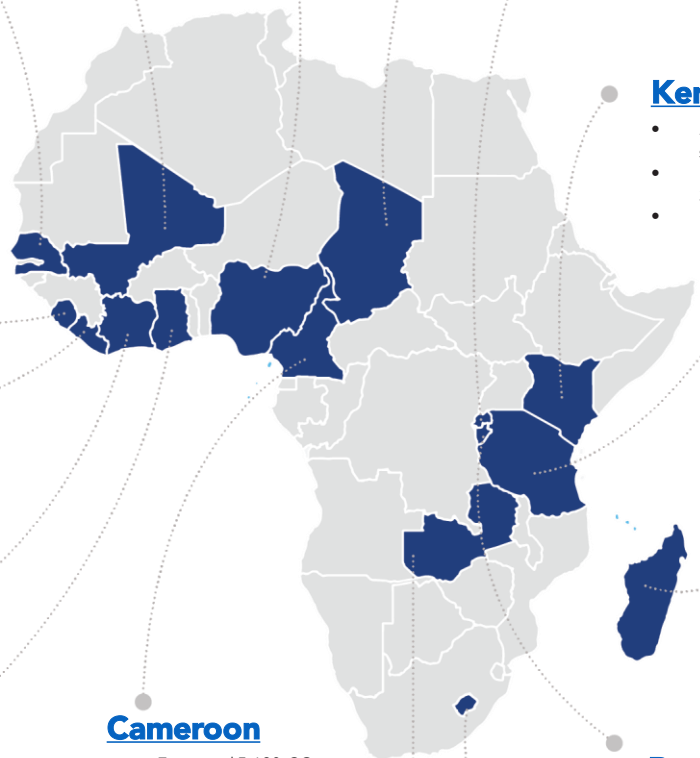
- Supporting the national electrification programme
- Planned 8.22MW will contribute to renewable capacity targets
- Promoting, economic growth and job creation

Cameroon

- Expected 5,190tCO_2e against 32% GHG reduction target
- Supports diversification of energy mix

Zambia

- Expected 246,852tCO_2e against 47% by 2030 reduction target
- Complementing energy mix diversification objective
- Improving energy production for sustainable growth



Chad

- Flagship renewable energy project
- 25MW planned capacity supports low-carbon development and "emerging country" vision

Rwanda

- Planned 2.25MW supports rural solar mini-grids target
- Expected 4,928tCO_2e against 38% GHG mitigation target
- Supporting productive uses of energy and rural electrification

Kenya

- 52.63MW planned capacity supports tech-specific targets
- Expected 147,182tCO_2e against 32% GHG reduction target
- Fosters productive uses of energy

Tanzania

- 50.6MW planned solar, wind, hydro capacity supporting diversification of energy mix
- Improving productive uses of energy for sustainable economic growth
- Supporting gender mainstreaming

Madagascar

- 5.7MW planned capacity will make up 85% of by 2030 solar target
- Expected 5,552tCO_2e against 14% GHG reduction target
- Supports President's heavy fuel oil hybridisation goal

Burundi

- Mubuga is a government priority project that will increase baseload generation capacity by >10%
- Expected ~17,000tCO_2e against 20% GHG reduction target

Lesotho

- Supports solar PV mini-grid targets
- Increasing private sector engagement in energy sector

ABBREVIATIONS

Abbreviations listed here are used throughout the document. Country-level policy title abbreviations are outlined under individual country analysis.

BAU	Business as usual
GHG	Greenhouse gas
GW	Gigawatt
HFO	Heavy fuel oil
IPP	Independent power producer
KPI	Key performance indicator
MW	Megawatt
NDC	Nationally Determined Contribution
QL	Qualitative
QT	Quantitative
PUE	Productive use of electricity
PV	Photovoltaic
RE	Renewable energy
REPP	Renewable Energy Performance Platform
SE4All	Sustainable Energy for All
SHS	Solar home systems
SME	Small or medium-sized enterprise
UNFCCC	United Nations Framework Convention on Climate Change

Source: PowerGen

Source: PAS Solar

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Source: PEG Africa

Source: PEG Africa

INTRODUCTION

REPP seeks to achieve transformational change, which it does in part by aligning with countries' climate, energy and sustainable development priorities and helping to inform related policy processes. This report presents the main findings of an assessment that mapped REPP's portfolio as of January 2021 against those priorities, as embodied in countries' Nationally Determined Contributions (NDCs) to the Paris Agreement, national climate policies, energy sector policies, strategies and action plans, and long-term development agendas.

The country-level analysis has two aims:

1. To deepen our understanding of the extent and breadth of REPP's current support for the implementation of its target country priorities;
2. To identify areas for improvement that will be integrated into REPP's decision-making processes to enable a better ex-ante assessment of potential future investments.

The timing of this assessment is highly relevant, since 2020 was the year by which all signatories to the Paris Agreement were required to review their national contributions with the goal of raising the ambition of the collective global action against climate change. The year also signified the beginning of what many view as the 'decade of action' for the UN's 2030 Agenda, with many countries re-evaluating their national development plans.

COVID-19 has presented a significant risk to slowing down progress. Private sector engagement and multi-stakeholder partnerships will therefore be crucial for counteracting any downward trends and ensuring a successful implementation of the global policy agendas.

As more countries submit their revised NDCs in the run up to COP26 in November 2021, there has been a clear call from national governments for private investment flows towards climate mitigation and adaptation actions, as well as for the alignment of business operations with national sustainable development priorities. REPP considers this an imperative for achieving transformational change. The analysis presented in this report is a key step in REPP's response to this call to action.

This report is structured in three sections: (1) a brief introduction to the methodology used for the assessment; (2) an overview of REPP's overall alignment with national priorities; and (3) the country-specific analysis.

Source: OnePower Lesotho (Pty) Ltd

METHODOLOGICAL APPROACH

The methodological approach developed for this assessment is based on a desk-based mapping of national- and sectoral-level policies, strategies and action plans, *to the extent that these were publicly available*.[1] Three types of documents were reviewed: NDCs and climate policies; energy sector policies, strategies and/or action plans; and national long-term development strategies.

The list of documents used in this analysis is not exhaustive but aims to capture the key and most up-to-date policies in the targeted fields. Where specific priorities and targets were not consistent across policy documents, the most recently developed targets and priority measures were generally used as a reference for assessing alignment with national priorities.

The overview of key policies has been split into three categories: climate targets, energy sector priorities and development vision. These categories are loosely defined and often the information can be attributed to more than one category; in particular, renewable energy (RE) development targets are often sourced from the NDC but listed under the energy sector priorities category. The categories were introduced for the purpose of making the information more accessible.

The analysis focused on a set of qualitative (QL) and quantitative (QT) indicators[2], in line with REPP's key performance indicators (KPIs) and broader monitoring data.

These include:

- Greenhouse gas abatement target (QT)
- RE technology preferences (QL) and generation capacity targets (QT)
- Energy access approach (QL) and targets relating to number of people with access to electricity / RE (QT)
- The role of (renewable) energy in national long-term development plans (QL)
- Priority energy sector co-benefits (QL)

Beyond the core list of indicators, any country-specific priorities related to energy sector development were also noted and used for building the country policy landscape profiles. The evaluation of the alignment of a specific REPP investment with national needs, priorities and targets was based on the information collected through REPP's portfolio impact management systems and broader engagement with investees. Not all data was available on a country-specific basis for REPP investees with operations across multiple countries. In these cases, the overall figure was divided by the number of countries of operation to arrive at an individual country measurement.

For any future policy alignment assessments, we will seek to further strengthen the robustness of the methodology and improve REPP's data collection in line with the findings of this study.

[1] The mapping is largely based on the initial NDCs submitted to the UNFCCC during the period of 2015-2017. At the time of the analysis only four of the assessed countries (Kenya, Rwanda, Senegal and Zambia) had submitted their updated NDCs.
[2] While it is possible to quantify some of the listed qualitative indicators, it was not possible to do so as part of this assessment, largely due to the lack of defined measurement indicators in the majority of analysed policy documents.

REPP'S ALIGNMENT WITH NATIONAL PRIORITIES

The country-specific analysis shows that the REPP portfolio is well aligned with national climate, energy and development priorities of its target countries. REPP contributes directly to the implementation of the Paris Agreement – at both global and country levels – through its support for RE projects that result in avoided greenhouse gas (GHG) emissions and increased access to clean electricity, which are key to the mitigation priorities in most of the analysed NDCs.

Given that for developing countries to meet their mitigation targets it is often conditional on them accessing international climate finance and knowledge transfer, it can be said that REPP investments increase the ambition of climate action in these countries. REPP also contributes to the strengthening of local capacities – a crucial policy priority across the analysed countries – by supporting partnerships between international and local project developers, as well as local staff at operational and, in many cases, management levels.

Priority investment projects that make their way into national policy documents and sector development strategies tend to focus on large-scale energy generation. Hence, for a programme like REPP, which invests in small-scale grid-connected projects, it is difficult to use these project lists as a basis for investment decision-making. Nevertheless, REPP is currently supporting several governments' flagship projects, including the Mubuga solar PV project in Burundi and the Djermaya solar PV project in Chad. REPP's recent investment in the Malile project in Madagascar, which focuses on the hybridisation of operating heavy fuel oil (HFO) plants with new solar capacity, supports the implementation of the country's new presidential Emergence Initiative.

REPP's off-grid investees are contributing to the achievement of host countries' national electrification targets, thus supporting the implementation of rural electrification strategies, national energy policies and

Source: Rift Valley Energy Group

Source: PEG Africa

NDCs (where off-grid focused targets are included). Most of REPP's mini-grid investees are supporting flagship national electrification programmes (e.g., GVE and PowerGen in Nigeria, Moyamba and PowerGen in Sierra Leone).

Climate action priorities of the analysed countries have a strong focus on adaptation measures, particularly strengthening climate resilience. However, specific targets and actions for improving climate resilience are often not well defined. Where more detailed information is available, for the energy sector, priorities can include the "diversification of the energy mix through the increase of RE capacity", "improving climate resilience of energy infrastructure" or "expanding economic opportunities for the population".

REPP is implicitly contributing to improving climate resilience by maintaining a diverse portfolio and supporting projects and companies operating in nascent RE markets, which contributes to the diversification of the energy mix in those countries. Furthermore, REPP's substantive investment into distributed RE solutions and, in some cases, the sensitisation of local communities on the use of alternative clean energy sources for climate-resilient agriculture (through mini-grid projects) is improving the climate resilience of the energy systems and populations. REPP's approach towards improving climate resilience through its investments will be further strengthened as additional guidance becomes available through future revisions of energy and climate policies in its countries of operation.

Most of the analysed countries place a strong focus on the co-benefits of climate and energy sector actions. National policy makers often do not consider access to electricity and the development of RE capacity as an end goal, but rather an enabler for socio-economic development and the transformation of countries' economies from low- to middle-income. Beyond the economic benefits, gender mainstreaming and the inclusion of youth, minorities and vulnerable communities are listed as important cross-cutting priorities. Yet the balance between the installed RE capacity or GHG emission abatement and broader development impacts is often difficult to achieve. This is partly due to the limited experience of mainstreaming adaptation and broader sustainable development priorities into energy sector development.

In this regard, REPP's diverse portfolio of on-grid and off-grid solutions, ensures that the programme is able to achieve multiple goals. REPP's strong focus on gender mainstreaming across its operations, for example, is well aligned with many of the analysed NDCs and/or national policy documents, where gender equity is identified as a key cross-cutting issue.

Source: Voltalia

Source: OnePower Lesotho (Pty) Ltd

COUNTRY ANALYSIS

Icon key

CLIMATE TARGETS

ENERGY SECTOR PRIORITIES

DEVELOPMENT VISION

BURUNDI

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
Mpanda*	Run-of-river hydro	Grid-connected	10.2	6,213	USD 1 million development loan
Mubuga	Solar PV	Grid-connected	8.67	2,072	Development and construction finance (amount undisclosed)
Virunga Power	Run-of-river hydro	Grid-connected	15.7	8,961	USD 2.5 million convertible loan at corporate level
TOTAL			**34.57**	**17,246**	

* Project contracted, but conditions precedent not fully met at time of writing.

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- REPP investees are expected to contribute to ~17,000tCO_2e avoided per year, supporting Burundi's conditional NDC (2018) mitigation target of 20% GHG emission reduction by 2030 and raising the ambition of its climate commitments.
- REPP's support for private investment in renewable energies also aligns with the priorities of the National Strategy and Action Plan on Climate Change (NSAPCC [2012]), and by supporting two different technologies is in line with the vision of the Electricity Generation and Distribution Master Plan (Master Plan [2018]), which encourages the diversification of the energy mix.

- Mpanda and Virunga Power's run-of-river hydro projects are expected to bring 25.9MW of additional capacity, contributing to the 2040 national target of 238MW as laid out in the Master Plan.
- Once operational, Mubuga will add 8.67MW of solar power capacity. The project is Burundi's first solar independent power producer (IPP) and will act as a reference case for the sector that is expected to grow significantly over the coming years.

- Investments in Mpanda and Mubuga strongly support the country's development vision, with both projects identified as priority initiatives in the National Development Plan 2018-2027 (NDP [2018]), as well as supporting the National Strategy and Action Plan on Climate Change (2012), which encourages private investment in renewable energies.
- Virunga Power has recently designed and adopted a gender action plan, which mainstreams gender across the company's operations – in line with the vision of the NDP.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Burundi's NDC outlines an unconditional commitment to reduce GHG emissions by 3%, which would be increased to 20% with financial, technical and technological support from the international community. The NDC's vision is to promote climate-resilient development. Priority mitigation-oriented programmes in the energy sector focus on the development of hydro projects and the expansion of decentralised rural electrification solutions using solar PV systems. The NDC stresses the importance of technical and technology transfer, including in relation to the development of RE and the use of RE-based solutions for agricultural and livestock production activities (drainage, conservation, drying and cold chain).

The estimated costs of NDC implementation stand at approx. USD 1.46 billion for mitigation measures and USD 3.7 million for adaptation. NSAPCC encourages private investment in renewable energies.

Several policies have a strong focus on the potential for hydropower development in the country (e.g. NSAPCC; NDP). However, the associated climate risks are also acknowledged. The Master Plan encourages the diversification of energy sources.[3] and envisions a strong role for solar power, with the overall capacity expected to reach 204MW by 2040, representing 27% of the total estimated installed capacity. This would be close to the total hydro capacity at 238MW in 2040.

The NDP outlines support for public-private partnerships and includes a list of priority projects. The Master Plan outlines the objective of 30% electrification by 2030. The NSAPCC supports the development of mini-grids (hydro, wind and solar PV).

Clean energy infrastructure development and increased energy production capacity underline the implementation of Burundi's vision for a transition toward a green economy (Vision [2011]). The principal objective is access to reliable and competitively priced sources of energy for industrial, artisanal and mining activities. The NDC supports the use of RE in agriculture and livestock production.

The Vision and the NDP also target the inclusion of gender, youth and vulnerable groups to be mainstreamed across all programmes.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2018) • National Climate Change Policy (2012) • National Strategy and Action Plan on Climate Change 2012-2025 (2012) • National Adaptation Programme of Action (2007)	• Letter on the National Energy Policy (2011) • Electricity Generation and Distribution Master Plan (2018)	• Vision Burundi 2025 (2011) • National Development Plan 2018- 2027 (2018)

[3] Estimations and targets outlined in the Master Plan have been used as a reference point in the absence of other publicly available up-to-date policy documents.

CAMEROON

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
upOwa	SHS	Off-grid	5,190	1.73	USD 1.57 million equity; USD 0.61 million subordinated (convertible) loan
TOTAL			5,190	1.73	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- Through its investment in upOwa, REPP will contribute to an estimated 5,190 tonnes of mitigated GHG emissions per year, supporting the implementation of Cameroon's conditional NDC (2018) target to reduce emissions by 32%. This contribution is expected to grow in 2021 with the signing of two other projects in REPP's advanced pipeline.
- REPP contributes to the diversification of the national energy mix and the increased resilience to climate change – a priority outlined in the country's first NDC and the National Climate Change Adaptation Plan (NCCAP [2015]).

- Through its operations, upOwa is expected to add 1.73MW of RE capacity, contributing towards the ambitious NDC goal of increasing generation capacity four-fold to 6GW by 2035.
- upOwa's fast-growing service is expected to deliver first-time access to clean electricity to 173,000 people by 2023, directly supporting RE's important role in achieving universal access in the country, as outlined in the Rural Electrification Master Plan (Master Plan [2016]). upOwa is also currently the only company implementing pay-as-you-go for SHS at scale in Cameroon.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Cameroon's NDC sets out a conditional mitigation target of 32% (33MtCO_2e) reduction in GHG emissions compared to a business-as-usual (BAU) reference scenario for the target year 2035. The energy sector is key to both mitigation and adaptation objectives. The NDC outlines the need to diversify energy supply, in line with the NCCAP, which aims to reduce the climate change vulnerability of energy infrastructure, including through the decentralisation of the transmission system.

Cameroon has committed to increasing generation capacity to 6GW, including through the development of RE. RE should constitute 25% of the overall energy mix by 2035, excluding large hydro (NDC [2016]). The NDC and NCCAP promote the development of solar, wind and biogas.

The Master Plan outlines four programmes to provide access to electricity in rural areas. It targets electrification in 660 localities through various approaches, including the extension of interconnected grids, rehabilitation and construction of isolated diesel and mini-hydro plants, the use of stand-alone solar technologies and regional grid integration.

Vision 2035 (2009) considers the development of energy infrastructure as an enabler for poverty reduction (with a goal to reduce poverty to below 10%). It recognises the need for significant investments in the energy sector to develop RE potential and achieve universal access to energy. The NCCAP aims to find opportunities to strengthen national competitiveness within the climate change context.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2016) • National Climate Change Adaptation Plan (2015)	• The Rural Electrification Master Plan (2016)	• Vision 2035 (2009)

CHAD

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
Djermaya	Solar PV with single-axis trackers	Grid-connected	25	39,858	USD 430,000 development loan
TOTAL			**25**	**39,858**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- Once operational, the Djermaya grid-connected solar PV project is expected to avoid 39,680tCO_2e per year, contributing to Chad's NDC (2017) conditional target of a 71% GHG reduction by 2030.

- Djermaya is one of the Government's priority projects for the period of 2021-2022, supporting the implementation of the target of 20% RE in the energy mix by 2030, as set out in the Letter on the Energy Policy (2018).
- Djermaya is a public-private partnership that will have a strong demonstration effect for RE market development.

- The project is expected to increase the country's RE capacity in line with its low-carbon development plans outlined in Vision 2030 (2017) and the National Development Plan 2017-2021 (NDP [2017]).
- It will also help alleviate poverty and foster economic activity by providing power to the grid at a lower cost than fossil fuel-fired generation, thus contributing to Chad's path towards becoming an emerging country by 2030.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Chad's NDC sets out the country's commitment to reducing its emissions by 18.2% by 2030, with the possibility of increasing this target to 71% if international support is made available. The target would be achieved by, among other things, increasing RE capacity. RE is also expected to play an important role in improving the wellbeing of the population through agricultural production using hydropower, solar and wind.

The total cost of NDC implementation is estimated at USD 21.2 billion, of which USD 17.9 billion would be for the achievement of the conditional objectives. Envisioned mitigation measures are expected to cost USD 7.1 billion (USD 6.5 billion for conditional commitments).

The Emergency Plan for Access to Electricity (Emergency Plan [2020]) sets the target of 1,056MW of new capacity to be installed by 2023, including through the deployment of RE, which would facilitate the diversification of the energy mix. The Letter on the Energy Policy sets out a target of 20% RE in the energy mix by 2030.

Other policy targets include the development of 5MW generation capacity in each regional capital and 1MW in each county capital by 2022. The NDC sets the target of increasing solar-based electricity production to 200GWh/year and wind energy to up to 50GWh/year by 2030, as well as developing a cross-country power grid connecting key cities and strengthening Chad's environmental risk management. The Letter on the Energy Policy envisions strong private sector engagement, enabled by the 2019 Energy Act which liberalised the power sector.

The Letter and the Emergency Plan set out a target of increasing the national electrification rate to 38% by 2023 and 53% by 2030. The National Plan for Investment in the Rural Sector (2016) focuses on increasing energy access and promoting the use of solar and biomass in rural areas, with particular attention devoted to the electrification of the so-called 'secondary centres'.

Low-carbon development will underline the country's path towards becoming an emerging country by 2030 (NDC; NDP; Vision 2030). The key challenge lies in shifting away from over-reliance on oil revenue to a more diversified economic model with sustainable utilisation of resources and clean energy.

Sustainable energy development is among the priority measures outlined in Chad's Vision 2030. The development of energy infrastructure is expected to contribute to energy self-sufficiency and creating a diversified and competitive economy. Expanding access to RE resources is expected to increase the uptake of productive uses and strengthen regional economic development, thus improving the quality of life of the Chadian people.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2017) • National Adaptation Programme of Action for Climate Change (2009)	• Letter on the Energy Policy (2018)[4] • Emergency Plan for Access to Electricity (2020)[5]	• Vision 2030: The Chad We Want (2017) • National Development Plan 2017-2021 (2017) • National Plan for Investment in the Rural Sector 2016-2022 (2016)

[4] The document was not available online. Analysis in this paper is based on secondary resources.

[5] The document was not available online. Analysis in this paper is based on secondary resources.

COTE D'IVOIRE

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
PEG Africa[6]	SHS	Off-grid	4	12,000	USD 1.1 million equity; USD 2 million subordinated (convertible) loan and USD 600,000 COVID-19 working capital loan at corporate level
TOTAL			**4**	**12,000**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- PEG's operations in Cote d'Ivoire will lead to the estimated mitigation of 12,000 tonnes of GHG per year, thus contributing to the NDC (2016) target to reduce emissions by 28% by 2030.

- PEG aims to deliver first-time access to clean electricity to 400,000 people, directly contributing towards the implementation of Cote d'Ivoire's ambitious national target of 100% electrification, as set out in the National Renewable Energy Action Plan 2016-2020/2030 (NREAP [2016]) (although the policy prioritises grid extension).

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Cote d'Ivoire's NDC outlines a commitment to reduce the country's GHG emissions by 28% by 2030 compared to the BAU scenario in 2030 and improve the country's resilience to climate change. Energy is the largest emitting sector. Successful implementation of NDC commitments would lead to the sector's emissions reduction of 7.8% - from 11.89MtCO_2e to 9.22MtCO_2e in 2030.

[6] The reported capacity and emission figures are a rough estimate based on the total (MW; tCO_2e avoided) divided by the number of countries of operation. REPP currently monitors country-specific data only for operational units / sales.

The NDC focuses on improving energy access at an affordable price and increasing the share of RE in the energy mix to 42% by 2030 (26% large hydro, 16% other RE). The country aims to expand research of RE technologies and remove key barriers to RE investments. Priority technologies include hydro, solar PV (including promotion of solar kits, solar water pumps, etc.), biomass and waste-to-energy. The NREAP includes a target of 424MW grid- connected solar PV capacity and 485MW of bioenergy capacity by 2030. National policies place a strong focus on improving energy efficiency.

The NREAP had set an ambitious national target of a 100% electrification by 2020. The policy clearly prioritises grid extension – only 3% of the population were to be served by off-grid systems by 2020, declining to 2% by 2030), with existing isolated mini-grids gradually being connected to the main distribution network.

The NDC has a strong focus on co-benefits of mitigation action, including improvement to life quality, job creation, economic development and reduction of social conflict. The national long-term development vision – Cote d'Ivoire 2040 – supports the use of RE as a basis for industrial development.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2016)	• National Renewable Energy Action Plan 2016 - 2020/2030 (2016) • Cote d'Ivoire SE4All Action Agenda 2015 - 2002/2030 (2016) • The Electricity Production and Transmission Master Plan 2015-2030 (2015)[7] • National Rural Electrification Programme (2013)	• National Development Opportunity Study: Cote d'Ivoire 2040

[7] Plan Directeur Production et Transport d'Energie Electrique 2015-2030.

GHANA

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
Gaia Energy	On-shore wind	Grid-connected	50	73,715	USD 450,000 development loan
PEG Africa[8]	SHS	Off-grid	4	12,000	USD 1.1 million equity; USD 2 million subordinated (convertible) loan and USD 600,000 COVID-19 working capital loan at corporate level
Ghana Catholic Churches	Rooftop PV	Grid-connected	12.5	27,375	USD 290,000 technical assistance loan
TOTAL			**66.5**	**113,090**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- REPP is helping Ghana avoid 113,090tCO_2e per year, thus contributing to the (conditional) NDC (2016) target of a 30% GHG emission reduction by 2030.

- REPP's diverse portfolio of utility-scale, mini-grid and SHS projects in Ghana is well aligned with the energy sector development vision outlined in the Renewable Energy Master Plan (REMP [2019]) and the Agenda for Jobs – a medium-term national development policy framework 2018-2021 (Agenda for Jobs [2017]).
- Jointly, REPP investees are expected to deliver 66.5MW of new RE capacity, contributing towards the REMP target of 1,363MW by 2030.
- The Agogo wind farm project is expected to contribute 50MW of wind capacity, contributing significantly to the REMP target of 325MWp of utility wind capacity by 2030.
- Ghana Catholic Churches and PEG are expected to add 12.5MW and 4MW of new solar capacity, respectively, contributing to the REMP targets of 200MWp of distributed solar and 20MWp of standalone solar.

- REPP's investments in the energy infrastructure are in line with the goals of the Long-Term National Development Plan 2018-2057 (Long-term NDP [2018]).
- PEG is also starting to offer solar-powered water pumps to smallholder farmers, which contributes to the Government's vision of leveraging the benefits of RE to support advancement in agricultural development (REMP, Agenda for Jobs).

[8] The reported capacity and emission figures are a rough estimate based on the total (MW; tCO e avoided) divided by the number of countries of operation. REPP currently monitors country-specific data only for operational units / sales.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Ghana's NDC commits to reducing national GHG emissions by 15% by 2030 (approx. 11MtCO_2e), which could be extended by an additional 30% with international support (leading to an overall reduction of 33MtCO_2e). The energy sector is seen as a priority area for achieving the GHG abatement target, with one of the key objectives being the scaling up of RE penetration by 10% by 2030. This should be achieved through a set of priority programmes focusing on a diverse range of technological solutions, from small to medium-sized grid-connected hydro, solar and wind projects, to solar mini-grids and SHS for lighting in urban and selected non-electrified rural households. An estimated USD 22.6 billion will be required for the implementation of priority programmes, of which USD 16.3 billion is expected to come from international support.

RE development is listed as a priority in key sector policies and strategies – the National Energy Policy (NEP [2010]) and REMP) – and broader development strategies, such as the Agenda for Jobs. The REMP sets out highly ambitious 2030 targets for RE capacity development, with the estimated increase of RE in the national energy mix from 42.5MW in 2015 to 1,363MW.[9] This includes capacity additions of: 447.5MWp of utility solar; 200MWp of distributed solar; 20MWp of standalone solar; 325MWp of utility and 2MWp of standalone wind capacity; 72MWp of utility scale biomass; 150MWp of small/medium hydro; and 50MWp of wave power.

While grid-connected systems are expected to deliver most of the new capacity (1094MW), the REMP envisages a role for off-grid, with a particular focus on the electrification of remote and island communities. It is estimated that 300 mini-/micro-grids should be installed at 12MWp total capacity.[10] Private sector investment is a key prerequisite for the successful implementation of REMP targets. The Agenda for Jobs focuses on facilitating participation of IPPs in power generation and distribution.

The importance of clean energy technologies for green development is acknowledged in the National Climate Change Policy (NCCP [2013]). Development of energy infrastructure underlines the implementation of the Long-Term NDP and the Agenda for Jobs.

The REMP notes that 220,000 jobs are expected to be created through the successful implementation of its targets by 2030, the promotion of local content and local participation in the RE industry. The Agenda for Jobs sets out a strategy for establishing a RE industrial zone, in addition to supporting the private sector to build factories for the production and assembly of all components for solar power systems. RE should also support advancement in agricultural development through improved irrigation and improved livelihoods through, for example, easier access to water (REMP; Agenda for Jobs).

The NEP and the REMP both place a specific focus on gender issues in energy sector development.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2016) • National Climate Change Policy (2013)	• National Energy Policy (2010) • Strategic National Energy Plan 2006-2020 (2006) • Renewable Energy Master Plan (2019)	• Long-term National Development Plan 2018-2057 (2018) • Agenda for Jobs: Creating Prosperity and Equal Opportunity for All – a medium-term national development policy framework 2018-2021 (2017)

[9] RE Includes hydro projects of up to 100MW capacity as defined in the Renewable Energy Act 2011.
[10] It should be noted that mini-grids development is public sector led, with unified tariff for mini-grid and grid-connected customers (Mini-grid Electrification Policy 2016).

KENYA

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
Virunga Power	Run-of-river hydro	Grid-connected	40	116,813	USD 750,000 development loan; USD 2.5 million convertible loan at corporate level
Rupingazi	Run-of-river hydro	Grid-connected	6	17,534	USD 200,000 development loan; USD 8.17 million construction loan
Powerhive	Solar PV mini-grids	Off-grid	1	2,190	USD 3 million long-term loan
PowerGen[11]	Solar PV mini-grids	Off-grid	4.98	10,895	USD 2 million equity
Marco Borero	Solar PV	Grid-connected	1.65	1,929	USD 360,000 equity
TOTAL			**53.63**	**149,361**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- REPP investees are expected to reduce Kenya's national GHG emissions by 149,361tCO_2e per year once the projects reach full capacity, thus contributing to the Updated NDC (2020) 32% emission reduction target.

- REPP investments are expected to add 53.63MW of new RE capacity (both on- and off-grid), in line with the policy priorities outlined in all key policy documents.
- REPP's investments in Virunga Power and Rupingazi support the development of a pipeline of small hydro projects, in line with the objectives of the National Energy Policy (NEP [2018]). The two investees are expected to add 46MW of additional run-of-river hydro capacity, contributing to the 2030 target of 1,522MW outlined in the Updated Least Cost Power Development Plan 2011-2027 (LCPDP [2018]).
- Marco Borero, currently under construction, will add 1.68MW of solar capacity, contributing to the ambitious 782MW solar capacity target (LCPDP). Depending on how quickly the project is completed, the Marco Borero project may become the first privately owned solar plant to reach operation in Kenya, thus having a strong demonstration effect for sector development.

[11] The reported capacity and GHG emission figures are a rough estimate based on the total (MW; tCO_2e) divided by the number of countries of operation.

- Powerhive broke new ground when it became the first licenced private mini-grid developer in the country. The developer's 20 operational mini-grids currently deliver 17% of the Government's target of 121 mini-grids by 2030 as set out in the National Electrification Strategy (NES [2018]).

- Powerhive contributes to the aims of the Third Medium-term Plan: Transforming Lives: Advancing socio-economic development through the "Big Four" 2018-2022 (Big Four [2018]) by fostering a wide range of productive use activities in its projects, including milling, welding, brooding, hostels, and village-wide internet access.
- Virunga Power employs a unique "grid-as-anchor" approach to rural electrification by combining MW-scale, contracted generation with thousands of new household connections to surrounding communities through grid-connected mini-grids. This contributes to the development of energy infrastructure – a key enabler for the manufacturing and other development priorities outlined in the Big Four agenda – while also expanding the rural electrification network.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Kenya's Updated NDC aims to reduce its overall GHG emissions by 45.76MtCO_2e by 2030 – a 32% reduction to BAU scenario of 143MtCO_2e. Renewables are expected to play a significant role in driving the GHG reduction. Increasing the resilience of RE infrastructure is one of the adaptation priorities.

NDC implementation is underlined by the National Climate Change Action Plan 2018-2022 (NCCAP [2018]), which sets out a vision for a RE-based electricity supply mix that is resilient to climate change. The NCCAP also promotes the use of efficient irrigation systems and enhancement of the resilience of the agricultural value chain.

It is estimated that USD 62 billion is required for NDC mitigation and adaptation actions up to 2030, of which USD 54 billion is expected to come from international support (Updated NDC). Mobilisation of climate finance is a key priority outlined in the National Policy on Climate Finance (NPCF [2016]).

Kenya's National Adaptation Plan (NAP [2015]) emphases the need to strengthen the adaptive capacity of women, youth and vulnerable groups, calling on actors to create awareness for climate opportunities that women, youth and vulnerable groups can access.

Geothermal energy is prioritised as baseload generation that is climate resilient (NCCAP). Hydropower, solar and wind are also strongly prioritised. The NEP puts a specific focus on the development of small hydro projects (<10MW). Detailed long-term RE capacity targets are outlined in the LCPDP: between 2017 and 2030, geothermal energy capacity is expected to grow from 650.8MW to 1868.8MW; hydro from 805MW to 1522MW; wind from 25.5MW to 861MW; and solar from 0MW in 2017 to 782MW. The LCPDP also puts a strong emphasis on electricity cost reduction.

The NES acknowledges the importance of both grid extension and off-grid solutions (with a stronger focus on SHS than mini-grids). Kenya aims to reach universal energy access by 2022, with 269,000 connections through grid expansion; 2.77 million connections through grid intensification and densification (including 100,000 connections through intensification of existing mini-grids); 35,000 connections through 121 new mini-grids; and 1.96 million connections through standalone solar (NES, based on the LCPDP). Energy access is seen as a measure to increase the climate resilience of the population.

Kenya's development agenda is outlined in Vision 2030, the implementation of which is driven by medium-term plans. The Big Four considers infrastructure as one of the nine enablers to achieve the policy priorities. This includes energy capacity development and last mile connectivity projects involving electrification of households and public facilities through on- and off-grid solutions. The Government aims to stimulate the 24-hour economy and catalyse the manufacturing sector, including through electricity cost reduction.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Updated Nationally Determined Contribution (2020) • Nationally Determined Contribution (2016) • National Climate Change Action Plan 2018-2022 (2018) • National Adaptation Plan 2015-2030 (2015) • National Policy on Climate Finance (2016)	• National Energy Policy (2018) • Updated Least Cost Power Development Plan 2011 - 2027 (2018) • National Electrification Strategy (2018)	• Vision 2030 (to be implemented through medium-term plans) • Third Medium-term Plan: Transforming Lives: Advancing socio-economic development through the "Big Four" 2018-2022 (2018)

LESOTHO

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
Ha Makebe	Solar PV mini-grids	Off-grid	1.87	4,095	USD 462,000 senior loan
TOTAL			**1.87**	**4,095**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- REPP's investment in the Ha Makebe solar PV mini-grid project[12] is strongly aligned with Lesotho's NDC (2018) and national policy priorities. Once fully operational, the project will help avoid 4,095tCO_2e per year, supporting the achievement of the country's more ambitious but conditional NDC target of a 35% reduction in GHG emissions.

- Ha Makebe is expected to add 1.87MW of RE capacity, supporting the NDC target of increasing access to clean energy by 50% by 2030.
- The project is Lesotho's first ever private mini-grid project and the first to receive a mini-grid concession. As such, it has a strong demonstration effect and is well aligned with the Lesotho Energy Policy 2015-2025 (LEP [2015]), which aims to increase private sector engagement in energy sector development, with a specific focus on RE mini-grids.

- When fully operational, the mini-grids will provide low-cost, consistent and very often first-time electricity access to nearly 25,000 people, as well as small enterprises, schools and health clinics, thus contributing to the implementation of Vision 2020.

[12] Solar PV mini-grids with battery storage and (limited) liquified petroleum gas backup generation.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Lesotho's NDC places a strong emphasis on adaptation, with the country's energy sector seen as a key focus area for adaptation, as well as mitigation. The NDC and the National Climate Change Policy 2017 - 2027 (NCCP [2017]) both note the extensive potential for the development of RE projects in the country. The NCCP acknowledges climate risks associated with a heavy reliance on hydropower generation and calls for assessment of climate risks in infrastructure development projects.

The NDC and LEP focus on increasing energy access and promoting the uptake of renewable sources of energy, particularly wind and solar. The NDC sets out the target of increasing access to clean energy by 50% by 2030, which should be achieved through the development of new grid-connected and off-grid projects. Technology-specific 2030 targets include an increase in hydropower generation capacity from 75MW to 125MW; the development of 40MW of solar and 35MW of wind capacity. Off-grid priorities include scaling up the use of SHS from approximately 5,000 systems in 2015 to 10,000 by 2030 and the installation of 10 solar PV mini-grids (NDC).

The National Strategic Development Plan II 2019-2023 (NSDP II [2019]) aims to increase private sector participation in the power sector's development. The LEP places a strong focus on development of a regulatory framework for IPPs in mini or micro hydro, wind, solar and biomass power generation.

The NSDP considers energy infrastructure as a pre-requisite to achieving inclusive economic growth, and acknowledges the job creation potential of the clean energy and green technology sectors. To support the implementation of this co-benefit, the policy prioritises energy provision to industrial areas that are considered critical for economic growth.

Gender mainstreaming plays an important role in energy sector development, with the NDC and NDSP including an objective to promote gender mainstreaming in policies, programmes and projects.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2018) • National Climate Change Policy 2017-2027 (2017)	• Lesotho Energy Policy 2015-2025 (2015)	• Vision 2020 • National Strategic Development Plan II 2019-2023 (2019)

LIBERIA

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
Mobile Power[13]	Solar-powered battery hubs	Off-grid	2.25	6,750	USD 1.3 million equity
TOTAL			**2.25**	**6,750**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- Once Mobile Power operations reach full capacity, they will result in approximately 6,750 tonnes of avoided GHG emissions per year, thus contributing to the country's long-term strategy of achieving carbon neutrality by 2050 (NDC [2018]).

- Mobile Power is expected to increase RE capacity in Liberia by approximately 2.25MW, in line with the 75% RE target outlined in the Rural Energy Strategy and Master Plan (RESMP [2016]).
- Through its operations, Mobile Power is assisting the implementation of the Government's objectives, outlined in the RESMP, which support rural electrification through a range of on- and off-grid solutions.

- Jobs created through the distribution and rental of MOPO batteries, as well as through the economic activities the batteries power, are supporting the implementation of the Pro-Poor Agenda for Prosperity and Development 2018-2023 (PAPD [2018]).

[13] The reported capacity and emission figures are a rough estimate based on the total (MW; tCO e avoided) divided by the number of countries of operation. REPP currently monitors country-specific data only for operational units / sales.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Liberia's NDC outlines the country's aim to reduce its GHG emissions by 10% by 2030, with a long- term strategy of achieving carbon neutrality by 2050 (aligned with its National Energy Policy (NEP [2009]). Key sector mitigation targets include a 20% improvement in energy efficiency and an increase in the share of RE to at least 30% of electricity production and 10% of overall energy consumption by 2030. This target is further increased in the subsequently developed RESMP, which aims for 75% of all electricity generated from renewables by 2030, with 19% coming from mini-hydro, solar and biomass.

The NDC focuses primarily on the development of large hydro and biomass-based generation projects (in the 30% RE scenario, hydropower production is expected to reach 367,000MWh by 2030, while biomass-based energy production expected to reach 198,000MWh). While the RESMP places a strong focus on hydropower generation, it also sets out minimum added capacity targets of 60MW of grid-connected solar and 5MW of biomass by 2030. The subsequently approved National Policy and Response Strategy on Climate Change (NPRSCC [2018]), while aligned with the NDC priorities, promotes diversification of energy sources.

The RESMP advocates for the use of a holistic planning approach with a focus on grid extension, mini-grids, decentralised grids and stand-alone systems. Its key target is to increase the electrification rate outside of capital city Monrovia to 35% in 2030. Priority is given to county capitals and the largest settlements.

The PAPD, developed under the current presidency, considers energy infrastructure development as an underlying factor for economic growth, highlighting the importance of affordability of energy supply. The strategy strongly encourages private sector participation in energy sector development. These goals are well aligned with those of the Agenda for Transformation (2012).

Equity is an important principle for energy sector development, reflected in the NPRSCC, RESMP and Agenda for Transformation. The policies outline an objective on mainstreaming gender in planning, decision making and implementation of climate change responses. RESMP aims to ensure 'equity across regions, social classes and genders while balancing efficiency on the allocation of available resources'. NPRSCC calls for the collection of appropriately disaggregated data to support the mainstreaming process.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2018) • National Policy and Response Strategy on Climate Change (2018)	• National Energy Policy: An Agenda for Action and Economic and Social Development (2009) • National Renewable Energy Action Plans 2015-2020/2030 (2015) • Rural Energy Strategy and Master Plan (2016)	• Pro-Poor Agenda for Prosperity and Development 2018-2023 (2018) • Agenda for Transformation (to implement RISING 2030) (2012)

MADAGASCAR

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
Malile*	Solar PV	Grid-connected	5.7	5,552	USD 6 million senior loan
TOTAL			**5.7**	**5,552**	

* Project contracted, but conditions precedent not fully met at time of writing.

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- The Malile project is expected to avoid 5,552 tonnes of GHG emissions per year once operational, thus contributing to the conditional NDC (2016) target of a 14% (30MtCO_2e) reduction of national emissions by 2030.

- Malile will add 5.7MW of solar generation capacity, in line with the New Energy Policy 2015-2030 (NEP [2015]) targets.[14]

- The project supports the implementation of the President's Emergence Initiative for Madagascar 2018-2023 (2018) and will be the country's first large-scale PV hybridisation of heavy fuel oil (HFO) plants once completed.
- The project is expected to reduce the current electricity tariff of USD 0.25/kWh to USD 0.09/kWh, delivering significant socio-economic benefits to the Malagasy economy and population in line with the aims of the Emergence Initiative.

[14] The project has planned a second phase of expansion, which would bring the total generation capacity to 42MW.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Madagascar's NDC outlines the country's commitment to mitigate climate change, as well as to reduce climate change vulnerability and promote adaptation action. It sets out a conditional commitment to reduce national GHG emissions by 14% (30MtCO2) in 2030, compared to a BAU scenario (214MtCO2). RE development and modernisation of rural electrification technologies are among the priority mitigation action areas outlined in the NDC.

The NEP acknowledges the country's high dependence on oil, which has resulted in increased costs of electricity for the consumers and the growing arrears of the national utility. Going beyond the NDC target, the NEP sets out a commitment to increase the share of RE to 85% by 2030 (75% hydro, 5% wind, 5% solar) and an objective to apply the least-cost principle to the development of the energy sector.

The NEP also includes a target of extending access to modern energy to 70% of households by 2030 (through 70% grid extension, 20% mini-grids, 5% SHS and 5% solar lamps). Mini-grids should include at least 50% RE generation (hydro, biogas, solar or wind).[15]

Hybridisation of Madagascar's existing production facilities with the aim of reducing the cost of electricity for the population and increasing clean energy supply is a key policy objective of the new Government, as outlined in the vision of the President's Emergence Initiative for Madagascar 2018-2023 (2018).

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2016) • National Climate Change Policy (2011)	• Ministerial Letter on the New Energy Policy (2015) • The New Energy Policy 2015-2030 (2015)	• Emergence Initiative for Madagascar 2018-2023 (2018)

[15] The National Electrification Strategy could not be accessed. It is understood that the Strategy strongly supports electrification through off-grid technologies.

MALI

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
PEG Africa[16]	SHS	Off-grid	4	12,000	USD 1.1 million equity; USD 2 million subordinated loan (convertible) and USD 600,000 COVID-19 working capital loan at corporate level
TOTAL			**4**	**12,000**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- PEG's operations in Mali are expected to lead to an estimated 12,000 tonnes of avoided GHG emissions, representing an important contribution to the national mitigation target, where the energy sector is expected to play a key role. However, the limited level of detail of the NDC (2016) makes direct attribution challenging.

- REPP's investment in PEG is directly supporting the implementation of the national SE4All Action Agenda (2015). With the aim of delivering first-time access to electricity to 400,000 people, PEG is contributing towards Mali's ambitious national and rural electrification rate targets of 87% and 81.5% by 2030, respectively.
- REPP's investment also supports the decentralisation of the energy system, in line with the SE4All Action Agenda.

- PEG's focus on gender mainstreaming in its operations also supports the SE4All Action Agenda, which places a strong emphasis on the empowerment of women. The company, which was behind the first project to qualify for a 2X Challenge gender lens investment grant, has established a gender action plan and 40% of its employees are female.

[16] The reported capacity and emission figures are a rough estimate based on the total (MW; tCO_2e avoided) divided by the number of countries of operation. REPP currently monitors country-specific data only for operational units / sales.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

While Mali's anticipated economic development will increase national emissions in the run up to 2030, the country expects to remain a carbon sink, with -29.2MtCO_2e in 2030 under a BAU scenario. The NDC sets out a conditional commitment to extend Mali's GHG abatement efforts, resulting in an emission level of -84.4MtCO_2e in 2030. The energy sector is expected to play a key role in this conditional mitigation scenario, contributing 31% of total emission reductions. Mitigation action is estimated to cost USD 34.68 billion, of which USD 1.16 billion for the energy sector.

The National Energy Policy (NEP [2006]) and the National Strategy for the Development of Renewable Energy (2006), both developed in 2006, were relatively ahead of their time in envisioning a role for grid-connected and off-grid RE sources in national energy sector planning. The NEP's vision is built on key principles, which include liberalisation, public-private collaboration, participative approaches and decentralisation.

The most up-to-date RE capacity targets are set out in the SE4All Investment Prospectus (IP [2019]), which is aligned with the National Renewable Energy Action Plan (NREAP [2015]) and the SE4All Action Agenda. Grid-connected RE capacity is estimated to reach 977.4MW by 2030, representing 52% of total installed energy capacity. Technology-specific capacity targets for 2030 include 528MW solar capacity, 20MW additional wind capacity, and 30MW of biomass-based generation. Small hydro capacity is expected to increase from 6.3MW in 2010 to 106.8MW in 2030 (NREAP).

The policies set out a target of 87% total electrification by 2030 (up from 31.7% in 2010), with a rural electrification rate of 81.5% by the same year (up from 17.78% in 2010) (SE4All Action Agenda; IP). This should be achieved through a mix of different technologies, including isolated centres[17], as well as mini-grids, solar PV systems and other off-grid solar equipment (treated as the 'pre-electrification').

The Economic Recovery and Sustainable Development Strategy 2019-2023 (ERSDS [2019]) envisions energy as a critical aspect for inclusive growth and structural transformation of the economy. Priority action areas include transmission and distribution system strengthening, RE capacity development and the extension of energy access.

Cross-cutting themes addressed through energy sector development include the reduction in household labour and the increased economic independence of women; improvements in health and education; the use of electricity to improve access to water; and decentralisation and regionalisation involving a participative planning process for off-grid electrification (Action Agenda).

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2016) • National Policy on Climate Change (2011)	• National Energy Policy (2006) • National Renewable Energy Policy (2006) • National Strategy for the Development of Renewable Energy (2006) • National Renewable Energy Action Plan (2015) • Mali's SE4All Action Agenda (2015) • Mali's SE4All Investment Prospectus (2019)	• Economic Recovery and Sustainable Development Strategy 2019-2023 (2019)

[17] Société Energie du Mali SA (EDM-SA) is the former national utility privatised in 2000, which manages the large-scale isolated grids which supply electricity to urban centres and regional capitals.

NIGERIA

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
GVE	Solar PV Mini-grids	Off-grid	2,72	5,957	USD 290,000 development loan
PowerGen[18]	Solar PV Mini-grids	Off-grid	4.98	10,895	USD 2 million equity
PAS Solar Ltd (PAS)	SHS	Off-grid	0.52	1,560	USD 2.24 million senior loan; USD 1.6 million subordinated loan
TOTAL			**8.22**	**18,412**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- REPP investees are jointly expected to contribute to 18,412 tonnes of avoided GHG emissions, supporting the NDC (2017) conditional target to reduce emissions by 45% by 2030.

- The three companies are expected to add 8.22MW of RE capacity through off-grid solutions in line with the NDC commitment of developing 13GW of renewable electricity to rural communities in the form of off-grid solar PV.
- With a strong focus on off-grid and a range of different technological solutions in its current portfolio, REPP is strongly aligned with the Nigerian Government's 'new paradigm for rural electrification' – delivering energy access through a combination of centralised and decentralised approaches, as outlined in Rural Electrification Strategy and Implementation Plan (RESIP [2016]) and the Rural Electrification Agency's Off-grid Electrification Strategy (REA Strategy).
- Between them, REPP investees are expected to bring access to clean electricity to 243,639 people. GVE and PowerGen are among the leading private sector partners for REA in delivering its target of 10,000 mini-grids by 2023, which are expected to provide power to 14% of the population (REA Strategy).

- GVE is exploring how to strengthen the productive use of electricity (PUE) uptake at its mini-grid sites. Over the last year, the company has been partnering with REPP partner CrossBoundary Energy Access in piloting new PUE approaches in several operating mini-grid sites.[19]
- PAS currently supplies over 500 businesses (15% of its customer base) with clean electricity.

[18] The reported capacity and emission figures are a rough estimate based on the total (MW; tCO_2e avoided) divided by the number of countries of operation.
[19] Under an initiative supported by the UK Foreign, Commonwealth and Development Office-funded Transforming Energy Access programme.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Nigeria's NDC sets out an unconditional mitigation target of 20% and a conditional target of 45%, with an estimated RE sector contribution of 31MtCO_2e avoided per year by 2030. The NDC stresses the importance of increasing resilience and reducing the vulnerability of the energy sector to climate impacts, including through risk assessments of infrastructure, the development of sustainable energy sources and decentralisation of transmission systems. The NDC also includes a conditional commitment to increasing levels of energy efficiency and a significant reduction in the use of generators, while providing access to energy for all Nigerians.

The National Renewable Energy Action Plans 2015-2030 (NREAP [2016]) sets out the country's aims to expand its RE capacity, including small and large hydro, to 13.8GW by 2030.[20] National energy sector policies promote a wide range of RE technologies, including hydro, solar, wind and bioenergy. The (draft) National Energy Policy (NEP [2018]) outlines a policy of 'aggressively pursuing' the integration of solar energy into the nation's energy mix. Specific targets for grid-connected RE capacity include: 1.2GW of small and medium hydro, 500MW of solar PV, 800MW of wind energy and 1100MW of bioenergy (NREAP). Beyond the development of already proven technologies, exploration of geothermal, wave and tidal energy (NREEEP), as well as hydrogen (NEP) are encouraged.

Decentralised electricity technology is widely acknowledged as a core element in the implementation of the country's energy access, climate and development goals. The NDC outlines a commitment to developing 13GW of RE to rural communities in the form of off-grid solar PV. The RESIP outlines electricity access targets of 75% and 90% by 2020 and 2030 respectively – an ambitious goal whose bar was further raised by the 100% electrification target by 2030 outlined in the NEP in 2018. In the short term, the REA Strategy includes goals of deploying 5 million standalone solar systems for homes and SMEs and developing 10,000 mini-grids by 2023.

Investing in energy infrastructure is one of the key priorities in Nigeria's Economic Recovery and Growth Plan 2017-2020 (ERGP [2017]) and the Nigeria Economic Sustainability Plan 2020 (NESP [2020]). The NESP acknowledges the potential of RE to support growth and job creation and places a strong emphasis on promoting local technology development and production (in line with the NEP). The REA Strategy puts a strong emphasis on productive use of energy, with the goal of providing reliable power supply for 250,000 SMEs by 2023. The NESP outlines a target to support 250,000 jobs and impact up to 25 million people and businesses through the installation of 5 million SHS and mini-grids.

National policies acknowledge the co-benefits of rural electrification, particularly livelihood improvement and the empowerment of women. Increased electricity access through RE-based solutions are also expected to reduce migration from rural to urban areas and protect the nation's health and environment. The NESP prioritises strengthening electricity supply for health clinics.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2017) • The National Adaptation Strategy and Plan of Action (2011)	• National Energy Policy (2018 draft revised edition[21]) • National Renewable Energy Action Plans 2015-2030 (2016) • National Renewable Energy and Energy Efficiency Policy (2015) • Rural Electrification Agency's Off-grid Electrification Strategy • Rural Electrification Strategy and Implementation Plan (2016) • Renewable Energy Master Plan (2014)	• Nigeria Economic Sustainability Plan 2020 (2020) • Economic Recovery and Growth Plan 2017-2020 (2020) • Nigeria's Road to the SDGs: Country Transition Strategy (2015)

[20] The overall energy sector policy landscape is rather complex, with several policy documents and strategies developed over the course of the last five years. Capacity targets outlined across these documents are often difficult to compare due to the varied timelines – e.g. the REMP outlines 2025 targets, while the NREAP (used in this assessment) includes 2030 targets.

RWANDA

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
ARC Power	Solar PV Mini-grids	Off-grid	2.25	4,928	USD 780,000 convertible loan; USD 390,000 convertible loan.
TOTAL			**2.25**	**4,928**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- REPP's investment in ARC Power is supporting a two-phase project to build a portfolio of up to 120 solar mini- grids with a total capacity of 2.25MW[22], contributing to the implementation of Rwanda's conditional commitment to deploy 68MWp of solar mini-grids in off-grid rural areas by 2030 (Updated NDC [2020]).
- The project will connect around 145,000 people to clean electricity for the first time, in line with the national electrification target of 1.5 million households being electrified through off-grid solutions (Energy Sector Strategic Plan 2018-2023 (ESSP [2018]); Updated NDC).

- Once it reaches its full capacity, the project will result in an estimated 4,906 tonnes of avoided GHG emissions per year, thus contributing to the conditional mitigation target of 38% as laid out in the Updated NDC. Through its support of ARC Power, REPP is contributing towards increasing the ambition of Rwanda's national climate action.

- In 2020, ARC Power strengthened its focus on supporting productive users in its mini-grid sites, in line with the objectives of Vision 2050 and the NDC. In November 2020, the developer launched the first of its 'solar business parks', which is a collection of commercial premises powered by the mini-grid. The business parks will use a 'plug-and-pay' business model, with entrepreneurs paying for the power consumers and the space and machinery they occupy and use. With a total of 45 parks planned, ARC Power aims to empower rural communities and facilitate the emergence of untapped local business potential.

[22] Currently two mini-grids are operational with 60KW capacity and 5,497 people connected.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Rwanda's Updated NDC demonstrates the country's strong commitment to ambitious climate action and the realisation of the co-benefits of the mitigation and adaptation targets. The country has committed to reducing its emissions by 16% relative to BAU (approx. reduction of 1.9MtCO_2e in 2030) and made a conditional commitment to increase this to 38% (4.6 million tCO_2e) in 2030.

Increased use of renewables to meet increasing energy demand dominates the mitigation potential of the energy sector. The National Environment and Climate Change Policy (NECCP [2019]) sets the objective for Rwanda to have 'a clean and healthy environment resilient to climate variability and change that supports a high quality of life for its society'. The cost of mitigation actions is estimated at USD 5.7 billion by 2030, of which approximately USD 2.6 billion would be required for the implementation of energy sector targets.

The National Energy Policy (NEP [2015]) aims to diversify power generation resources over time and increase the share of RE in the power mix by exploiting local resources (i.e., hydropower, geothermal, solar and methane gas). Rwanda's SE4ALL Action Agenda (2016) has set a target of 60% of on-grid electricity generation from renewable sources by 2030.

Unconditional measures laid out in the Updated NDC for the electricity sector include an increase in grid-connected hydropower generation, including 24.5MW small and mini hydro projects each with a capacity of <5MW.

The ESSP sets the target of 100% electricity access for households by 2023/24. The NECCP sets out the goal of achieving universal access to electricity through the development of renewable energies. It is expected that 48% of all households will have their electricity needs met by off-grid solutions, of which mini-grids are expected to contribute 10% (ESSP). Conditional measures outlined in the Updated NDC include the deployment of 68MWp of solar mini-grids to be installed in off-grid rural areas by 2030. Development of off-grid and rooftop solar electrification is also included as a conditional commitment, with around 1.5 million households to be electrified - equivalent to 250,000 connections per year - displacing grid-connection and diesel-based power generation.

Through its Vision 2050, Rwanda aspires to reach middle-income country and high-income country status by 2035 and 2050, respectively. Reliable and affordable electricity is a considered a prerequisite for economic growth in the document, and that energy sector development should give priority to productive- use connections.

The NEP encourages gender mainstreaming, including by proactively targeting female-headed households in awareness-raising activities and promoting women as energy entrepreneurs.

The Updated NDC has a strong focus on the co-benefits of climate mitigation and adaptation actions, including improved water management through flood and drought control, increased agricultural production due to improved water management and increased adaptative capacity through productive uses of electricity.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Updated Nationally Determined Contribution (2020) • Nationally Determined Contribution (2016) • Green Growth and Climate Resilience Strategy (2011) • National Environment and Climate Change Policy (2019)	• Least Cost Power Development Plan 2019-2040 (2019) • Energy Sector Strategic Plan (2018/19-2023/24 (2018) • Rwanda's SE4All Action Agenda (2016) • National Energy Policy (2015) • Rural Electrification Strategy (2016)	• Vision 2050 • 7 Years Government Programme: National Strategy for Transformation 2017-2024 (2017)

SENEGAL

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
PEG Africa[23]	SHS	Off-grid	4	12,000	USD 1.1 million equity; USD 2 million subordinated (convertible) loan and USD 600,000 COVID-19 working capital loan at corporate level
TOTAL			**4**	**12,000**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- PEG's, operations in Senegal are expected to lead to an estimated 12,000 tonnes of avoided GHG emissions per year once completed. This will contribute to the conditional 29% GHG mitigation target and the 6.18MWc off-grid solar 2030 capacity target, outlined in the country's NDC (2020).

- Stand-alone systems play an important role in Senegal's national electrification vision. Based on its estimated growth trajectory, PEG is expected to extend modern energy access to 400,000 people. Since REPP's involvement, PEG has connected approximately 55,000 people in Senegal, thus contributing towards the achievement of the national target of 81.6% electricity access in rural areas by 2023, as outlined in the Emerging Senegal Plan: Priority Action Plan 2019-2023 (PAP [2018])), and universal access to electricity by 2025, as per the Letter on the Development of the Energy Sector 2019-2023 (LPDSE [2019]).

- Through its investment, REPP is increasing energy access in the country, which underlines the implementation of the national development vision set out in the Emerging Senegal Plan 2035 (ESP [2014]).

[23] The reported capacity and emission figures are a rough estimate based on the total (MW; tCO_2e avoided) divided by the number of countries of operation. REPP currently monitors country-specific data only for operational units / sales.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

In its NDC, Senegal commits to reducing its GHG emissions by 7% (unconditional target), with the aim of increasing this to 29%, provided that international support is available. The energy sector is expected to play an important role in the overall mitigation action, with a 10% unconditional reduction from the current sector emission level and up to 41.2% as a conditional target. The estimated cost of the electricity sector mitigation action is USD 2.7 billion, of which USD 1.9 billion would be for the conditional measures.

The NDC sets out a target for the development of 669-999MW of added RE capacity (depending on the availability of international support. Technology-specific targets include solar at 235MW/335MW (unconditional/conditional, respectively); wind at 150MW/250MW (unconditional/conditional); hydro at 314MW (unconditional); 50MW of biomass (conditional); and 50MW of concentrated solar power (conditional).

PAP sets out Senegal's aims to increase the national electrification rate to 85.9% and rural electrification to 81.6% by 2023. The LPDSE aims to achieve universal access to electricity by 2025. This is to be achieved through a combination of grid-extension, mini-grids and stand-alone systems. The NDC sets out an unconditional target of 6.18MWc supplied through off-grid solar installations by 2030, with additional conditional measures including the development of 2,292 mini-grids and 4,356 localities electrified by SHS by 2025.

The ESP considers energy as one of the 'foundations' for socio-economic development. Diversification of the energy mix and universal energy access are identified as priorities. The strong focus on cost reduction for electricity services aims to support the regional competitiveness of the national economy. The ESP also maintains that rural electrification programmes should encourage productive use of electricity.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2020) • Intended Nationally Determined Contribution (2015)	• Letter on the Development of the Energy Sector 2019-2023 (2019) • National Renewable Energy Action Plans 2015-2020/2030 (2015)	• Emerging Senegal Plan 2035 (2014) • Emerging Senegal Plan: Priority Action Plan 2019-2023 (2018)

SIERRA LEONE

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
Moyamba*	Solar PV mini-grids	Off-grid	1.3	2,847	USD 1.25 million senior loan
PowerGen[24]	Solar PV mini-grids	Off-grid	4.98	10,895	USD 2 million equity
Mobile Power[25]	Solar-powered battery hubs	Off-grid	2.25	6,750	USD 1.3 equity
TOTAL			**8.53**	**20,492**	

* Project contracted, but conditions precedent not fully met at time of writing.

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- Through its investments, REPP will contribute to ~20.5 kilotonnes of avoided GHG emissions per year, which will support the country's vision for low-emission development, with the ultimate goal of becoming a carbon neutral economy (NDC [2016]).

- Jointly, REPP investees are expected to add 8.53MW of RE (or hybrid) capacity.
- The strong focus on off-grid is in line with the national policy priority of promoting RE development in rural areas, as set out in the NDC.
- REPP investees will deliver first-time electricity access to an estimated 295,043 people (136,918 through solar-powered battery hubs and 158,125 through mini-grid development), representing a significant contribution towards the Government's ambitious national electrification targets.
- The two mini-grid developers – Moyamba and PowerGen – are developing mini-grids as part of the flagship national Rural Renewable Energy Project.
- Mobile Power, through its innovative business model, has delivered over 750,000 daily rentals of solar PV-powered MOPO batteries, providing 28 MWh – or 18 million hours – of clean and affordable electricity in hard-to-reach off-grid communities.

- Jobs created by REPP investees in the construction and operation of mini-grids, as well as the distribution and rental of MOPO batteries and the economic activities they power, will support the implementation of the National Renewable Energy Policy (NREP [2016]).

[24] The reported capacity and emission figures are a rough estimate based on the total (MW; tCO_2e avoided) divided by the number of countries of operation.
[25] The reported capacity and emission figures are a rough estimate based on the total (MW; tCO_2e avoided) divided by the number of countries of operation. REPP currently monitors country-specific data only for operational units / sales.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Sierra Leone's NDC notes the country's low GHG emissions at the national level and thus does not commit to a specific reduction target. Instead, it communicates the aim of maintaining low-level emissions, with the possibility of the country becoming carbon neutral by 2050. Promotion of RE sources, particularly in the rural areas, is one of the key mitigation strategies outlined in the NDC. International support is required to ensure the implementation of this sustainable development vision.

The energy policies highlight the potential of small hydro, wind and solar resources in the country. The NREP estimates that in 2030, RE capacity will reach 1,229MW, accounting for 65.3% of the total energy mix (13.5% or 293MW without medium and large hydro). Hydro will continue to dominate the energy mix, of which small hydro (project size <30MW) could reach 126MW. Solar installed capacity is expected to grow from 73MW in 2020 to 95MW in 2030 and bioenergy from 41MW to 68MW. According to the National Renewable Energy Action Plan (NREAP [2016]), wind is expected to play a rather negligible role, expanding from 2MW in 2020 to 5MW in 2030.

Sierra Leone aims to increase the share of the population with electricity access from 8.6% in 2010 to 92% in 2030 (NREAP). 27% of the rural population will be served by RE/hybrid mini-grids (65 in total), while 10% will be served by standalone RE systems. The Government's flagship Rural Renewable Energy Project focuses on expanding energy access in rural areas and providing 5MW of RE capacity through mini-grids.

Inclusion and equality are important cross-cutting themes across all key policy documents. NREP aims to ensure women's economic and social empowerment and to build capacity of women to work in the energy sector. The National Energy Policy (2009) and the National Energy Strategic Plan (2009) envision the development of the sector to support increased productivity, wealth creation and improved quality of life. The NREP also places a strong emphasis on strengthening local content and fostering productive uses of electricity.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2016)	• National Renewable Energy Action Plan (2016) • National Renewable Energy Policy (2016) • National Energy Policy (2009) • National Energy Strategic Plan (2009)	• Sierra Leone Vision 2025 (2003)

TANZANIA

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
PowerGen[26]	Solar PV mini-grids	Off-grid	4.98	10,895	USD 2 million equity
CrossBoundary East Africa - PowerGen	Solar hybrid mini-grids	Off-grid	1.2	2,634	USD 3 million development loan
Virunga Power	Run-of-river hydro	Grid-connected	42	102,834	USD 2.5 million convertible loan at corporate level
Mwenga	On-shore wind	Grid-connected	2.4	3,526	USD 1.2 million subordinated loan
TOTAL			**50.58**	**119,889**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- Jointly, REPP investments are expected to contribute to 119,889 tonnes of avoided GHG emissions per year by 2023, potentially raising the ambition of Tanzania's NDC (2018).
- REPP's technologically diverse investment portfolio in Tanzania is in line with the Government's aim to diversify the electricity mix as outlined in the NDC, National Climate Change Strategy (NCCS [2012]) and National Energy Policy (NEP [2015]).

- REPP's investees are expected to add 50.58MW of RE capacity between them, thus contributing to the National Five-Year Development Plan 2016/17-2020/21 (NDP [2016]) target of 70% of energy derived from 'renewable green' energy sources by 2025.
- More specifically, REPP investees are expected to add 42MW of hydropower capacity, 6.18MW of new solar capacity and 2.4MW of on-shore wind power.
- Through their mini-grid projects, PowerGen is expected to provide first-time clean energy access to 268,125 people across the country, thus contributing to the national target of a 75% electrification rate by 2030.

[26] The reported capacity and emission figures are a rough estimate based on the total (MW; tCO_2e avoided) divided by the number of countries of operation.

- REPP is supporting the implementation of the country's Development Vision 2025 and the NDP through the development of energy infrastructure.
- Powerhive customers include numerous productive users and social service providers, including 8 agrovets, 6 welders, 16 milling machines, 4 guest houses, 12 clinics/dispensaries, and over 550 shops, to name a few. This has had a significant impact on the sustainable economic growth of rural communities, thus contributing to the realisation of the NEP and Development Vision 2025.
- Virunga Power has recently designed and adopted a gender action plan, which mainstreams gender across the company's operations – in line with the goals of the NDP and Development Vision 2025.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Through its NDC, Tanzania has committed to a 10-20% reduction of its GHG emissions by 2030. This is to be achieved partly through the promotion of a diverse range of clean energy technologies and the expansion of rural electrification. Diversification of the energy mix is outlined as a priority in several policy documents, including the NDC, the NCCS and the NEP. Investment in clean energy is expected to place the country on a low emission growth pathway while achieving the desired sustainable development.

That NEP supports the development of renewables, noting the potential of solar, biomass, wind, small-scale hydro and geothermal. The policy also aims to increase the reliability of the transmission and distribution network. Private sector participation in the electricity supply industry is encouraged. The NDP sets a 70% RE capacity target to be achieved by 2025/26. The National Electrification Programme Prospectus (Prospectus [2014]) sets a target of 75% by 2035, with this ambition further increased in the SE4All Action Agenda (2015), which lists the target of 75% electrification by 2030.

Development of energy infrastructure is seen as one of the enablers for the implementation of Tanzania's Development Vision 2025 and the NDP. The NEP encourages the use of local capacity for manufacture, installation, maintenance and operation of rural energy systems. Equality and equity are identified as priority cross-cutting themes in energy sector development.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Nationally Determined Contribution (2018) • National Climate Change Strategy (2012)	• National Energy Policy (2015) • Tanzania SE4All Action Agenda (2015) • National Electrification Programme Prospectus (2014)	• Tanzania Development Vision 2025 • National Five-Year Development Plan 2016/17 - 2020/21 (2016)

ZAMBIA

REPP COUNTRY-LEVEL PORTFOLIO

PROJECT / COMPANY	TECHNOLOGY	PROJECT TYPE	PLANNED CAPACITY (MW)	GHG AVOIDED (tCO_2e per year)	REPP FUNDING
Buffalo Energy	Grid-connected solar PV, wind, biomass, mini-grids	Grid-connected and off-grid	30[27]	49,869	USD 750,000 corporate convertible loan
Bweengwa	Geothermal	Grid-connected	15	87,271	USD 3.2 million convertible loan
Virunga Power	Run-of-river hydro	Grid-connected	26.4	109,712	USD 2.5 million convertible loan at corporate level
TOTAL			**71.4**	**246,852**	

REPP PORTFOLIO ALIGNMENT WITH NATIONAL PRIORITIES

- REPP's investments are expected to help avoid 246,852 tonnes of GHG emissions per year once the projects are fully operational, supporting the Updated NDC's target (2020).
- With a total investment of USD 6.1 million, REPP will contribute towards the investment required for the successful implementation of the NDC by 2030 (estimated at USD 35 billion).

- The diverse technological focus of REPP's current portfolio is well-aligned with the National Energy Policy (NEP [2019]) objective of diversifying the energy mix.
- Bweengwa is the first geothermal investment in REPP's portfolio and is a pioneering project in Zambia. REPP's support for the development stage of the geothermal project addresses the need for further exploration of the potential of geothermal energy in the country, as outlined in the NEP.

- Through its investments, REPP is directly supporting the implementation of the Vision 2030 (2008) and the 7NDP Implementation Plan 2017-2021 (7NDP IP [2017]), which consider improved energy production and distribution as a key prerequisite for sustainable growth.

[27] Estimate of achieved capacity during REPP's support.

OVERVIEW OF THE NATIONAL POLICY LANDSCAPE AND PRIORITIES

Zambia's provisional Updated NDC outlines the total conditional emission reduction target of 47% (38,000,000 tCO_2e) by 2030. The NDC is aligned with the Vision 2030, which supports a low carbon and climate-resilient development pathway towards becoming a middle-income country by 2030. The National Policy on Climate Change (NPCC [2016]) highlights the heavy reliance on the use of biomass and hydropower – two resources which will be significantly affected by the impacts of climate change.

The 7NDP IP includes a total generation capacity target of 3,746.55MW by 2021, dominated by hydropower projects (86%). The new NEP also observes the large hydropower potential but notes the climate change risks associated with hydro development. The 7NDP IP also notes the important role for climate-resilient small and mini/micro hydropower plants, with the number of new projects expected to be between 6-10 throughout the duration of the plan. The NEP aims to increase exploitation of RE to diversify the energy mix and identifies solar, wind, geothermal, small hydro and biomass as the key sources of RE.

The Rural Electrification Master Plan (REMP [2008]) has set targets for increasing access to electricity to 51% in rural areas and 66% nationwide by 2030. The potential of off-grid RE technologies (SHS and mini-grids) for rural electrification is also acknowledged in the NEP.

Energy is acknowledged as one of the drivers of economic development (Vision 2030; NDP). The implementation of the Updated NDC's RE and energy efficiency programmes is expected to deliver multiple co-benefits, including improved health and education, rural development impacts due to increased economic activities through SMEs, and the empowerment of women. The NEP includes an objective to mainstream gender, climate change, and health and safety in the energy sector.

LIST OF KEY POLICY DOCUMENTS ANALYSED

CLIMATE GOALS & STRATEGY	ENERGY SECTOR POLICY AND PLANNING	SUSTAINABLE DEVELOPMENT STRATEGIES
• Provisional Updated Nationally Determined Contribution (2020) • Nationally Determined Contribution (2016) • National Policy on Climate Change (2016)	• National Energy Policy (NEP, 2019) • Rural Electrification Master Plan for Zambia 2008-2030: A blueprint for providing electricity to rural areas (2008)	• Vision 2030 (2008) • 7NDP Implementation Plan 2017-2021 (2017)

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