Eswatini Country Window:

Energy System Transformation Outlook (ESTO)

GET.transform
Transforming Energy Sectors Globally

GET.transform is supported by

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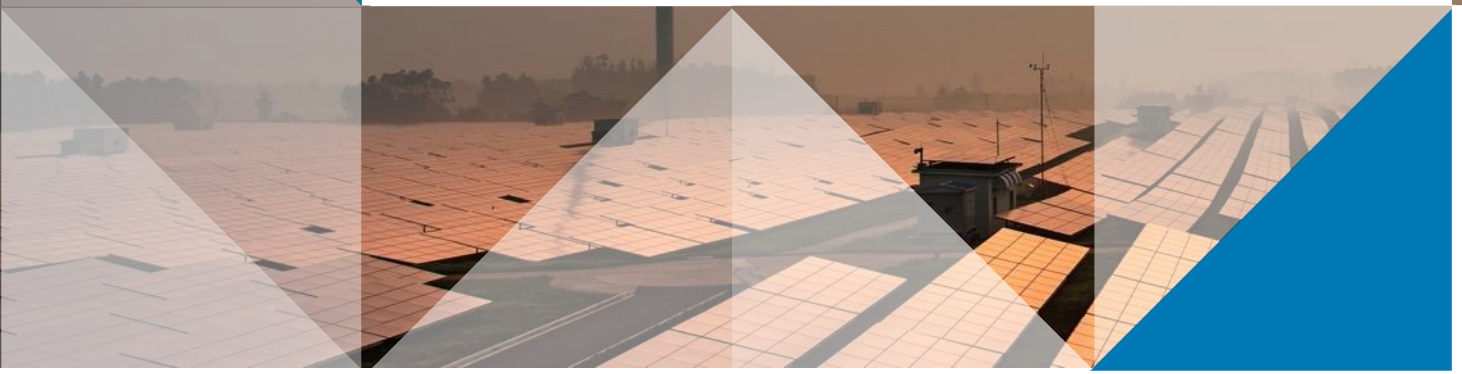

ABOUT GET.transform

European technical assistance programme supporting national and regional public partners in Africa and Latin America

- To advance their power sector transformations; and
- To contribute to knowledge sharing and mainstreaming of country and regional experiences.

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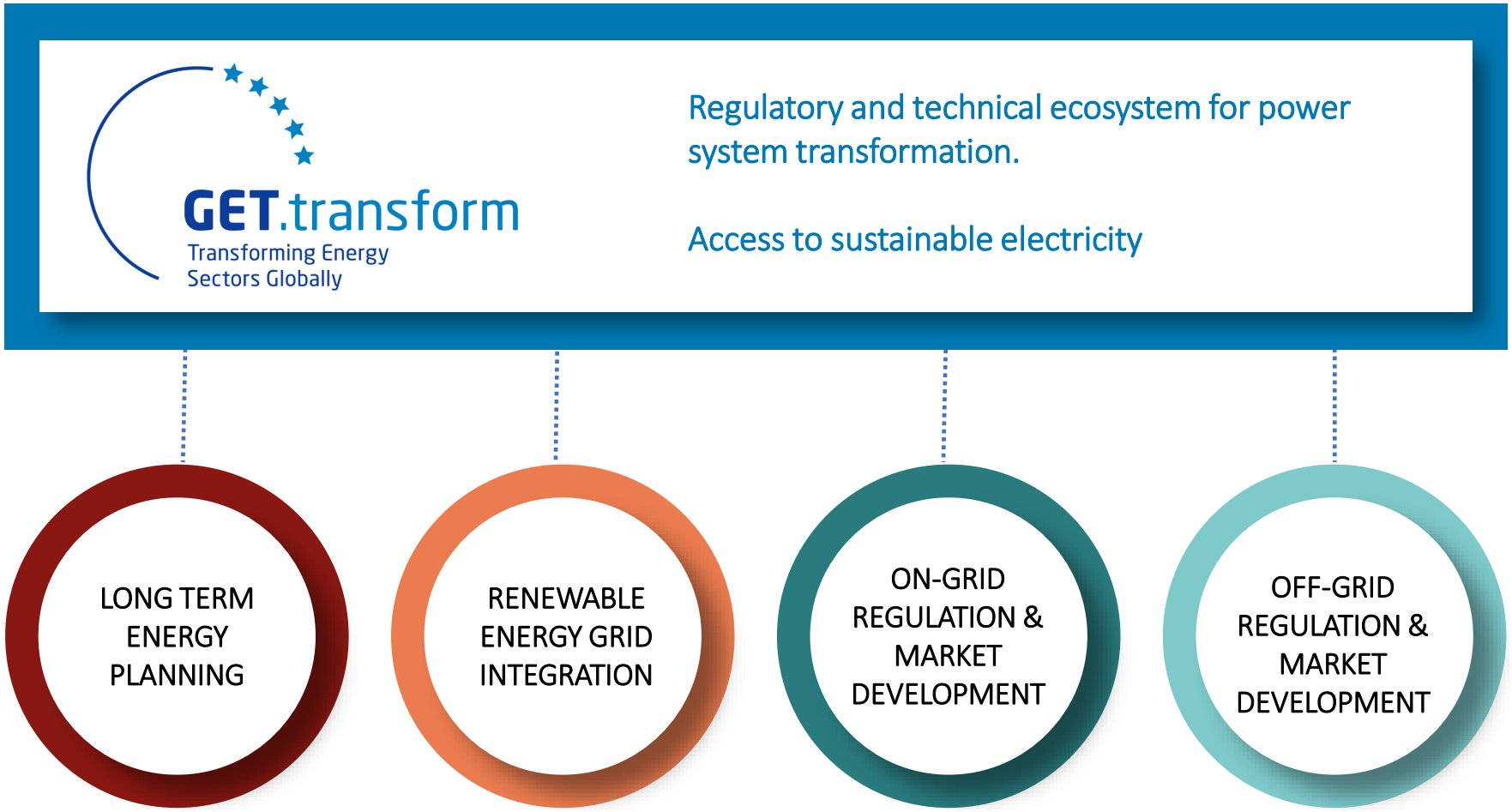
GET.transform Workstreams



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Our Approach to Technical Assistance

LONG TERM ENERGY PLANNING

Developing least-cost, low carbon capacity expansion and investment plans, outlining development paths for power generation projects

RENEWABLE ENERGY GRID INTEGRATION

Updating of technical power system planning and operational procedures that enable the operation of renewable energy dominated power systems

ON-GRID REGULATION & MARKET DEVELOPMENT

Supporting institutional reforms that allow for new market actors and renewable energy participation: market model design, non-discriminatory grid access, cost-reflective services
Design and management of solicited auctions as well as market-driven mechanisms for procuring on-grid energy

OFF-GRID REGULATION & MARKET DEVELOPMENT

Developing electrification pathways building on socio-economic development and productive-use policies
Design and management of award mechanisms for procuring off-grid energy

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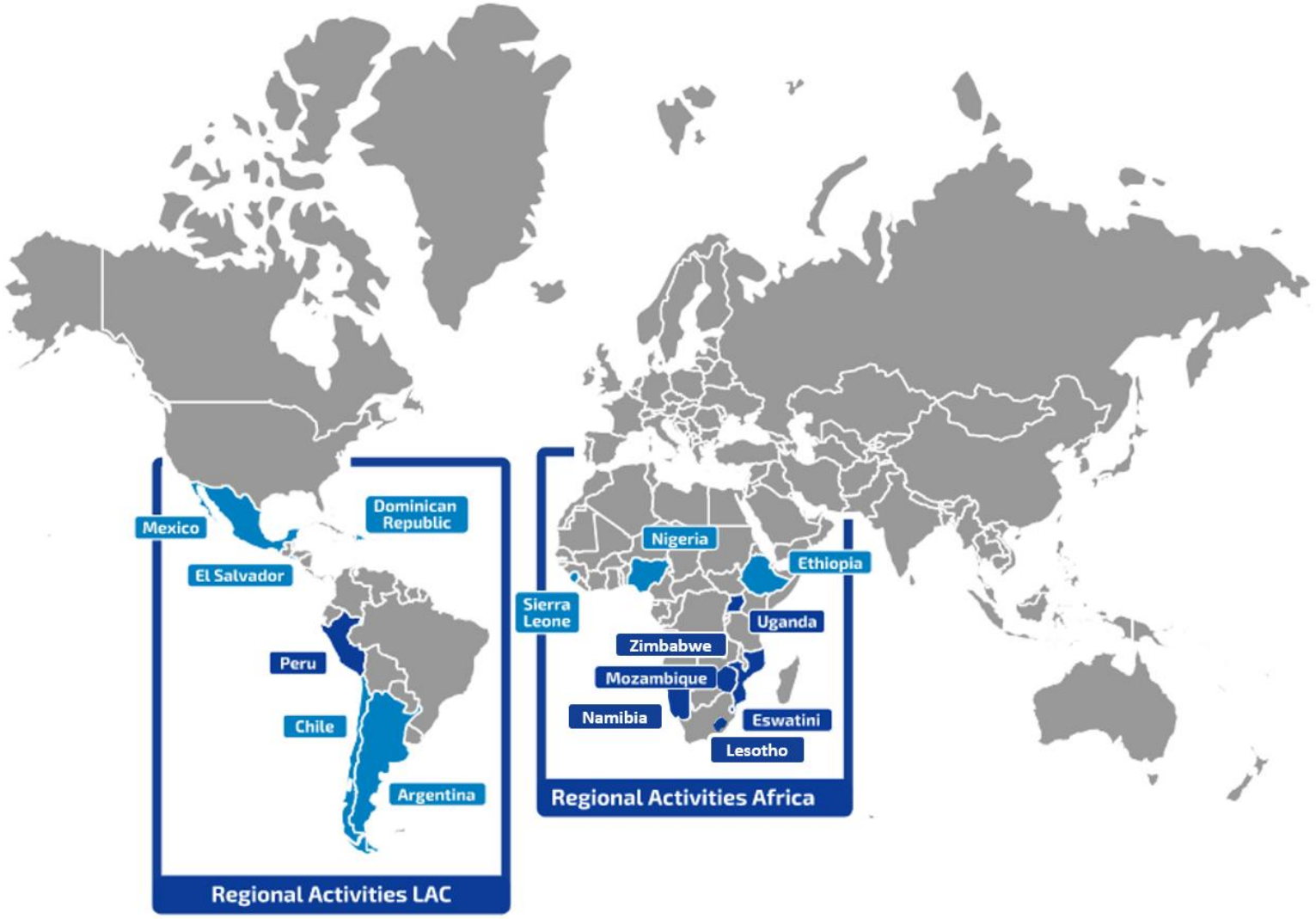
Visit Our Global Activity Navigator



GET.transform Focal Countries/Regions

Long-Term Energy Planning

On-Grid Regulation & Market Development

Off-Grid Regulation & Market Development

Renewable Energy Grid Integration

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ESWATINI ESTO

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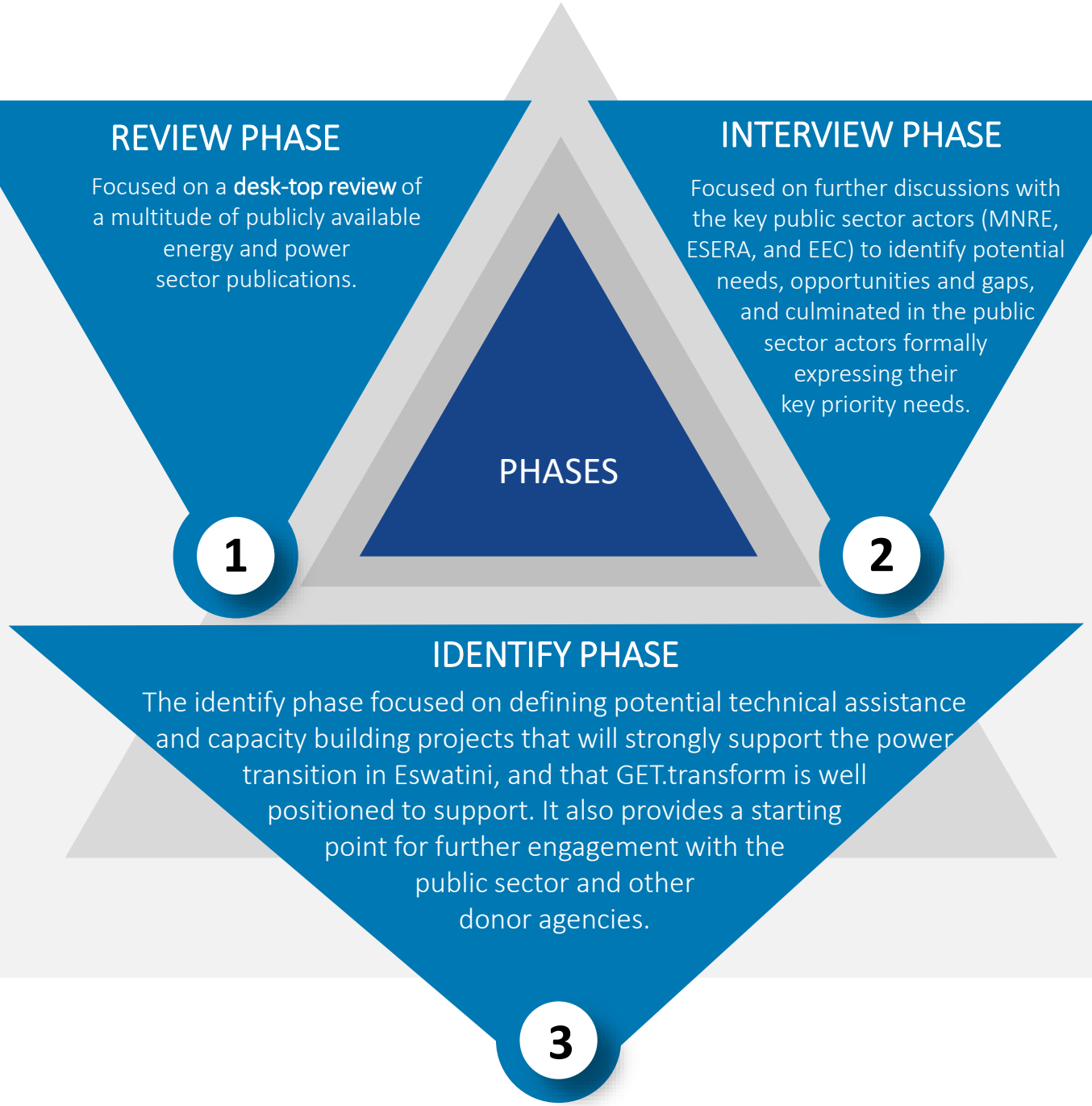
Foreword

The purpose of the Energy System Transformation Outlook (**ESTO**) is to document a high-level summary of the electricity landscape in Eswatini and to present the outcome of a high-level overview and assessment that followed a 'review, interview, identify' approach.



The ESTO is not a formula of what should be done by the country or the public sector actors.

The ESTO is a means of obtaining feedback to enrich our understanding of the power sector in Eswatini and to identify support activities and synergies with other donor and development agencies.

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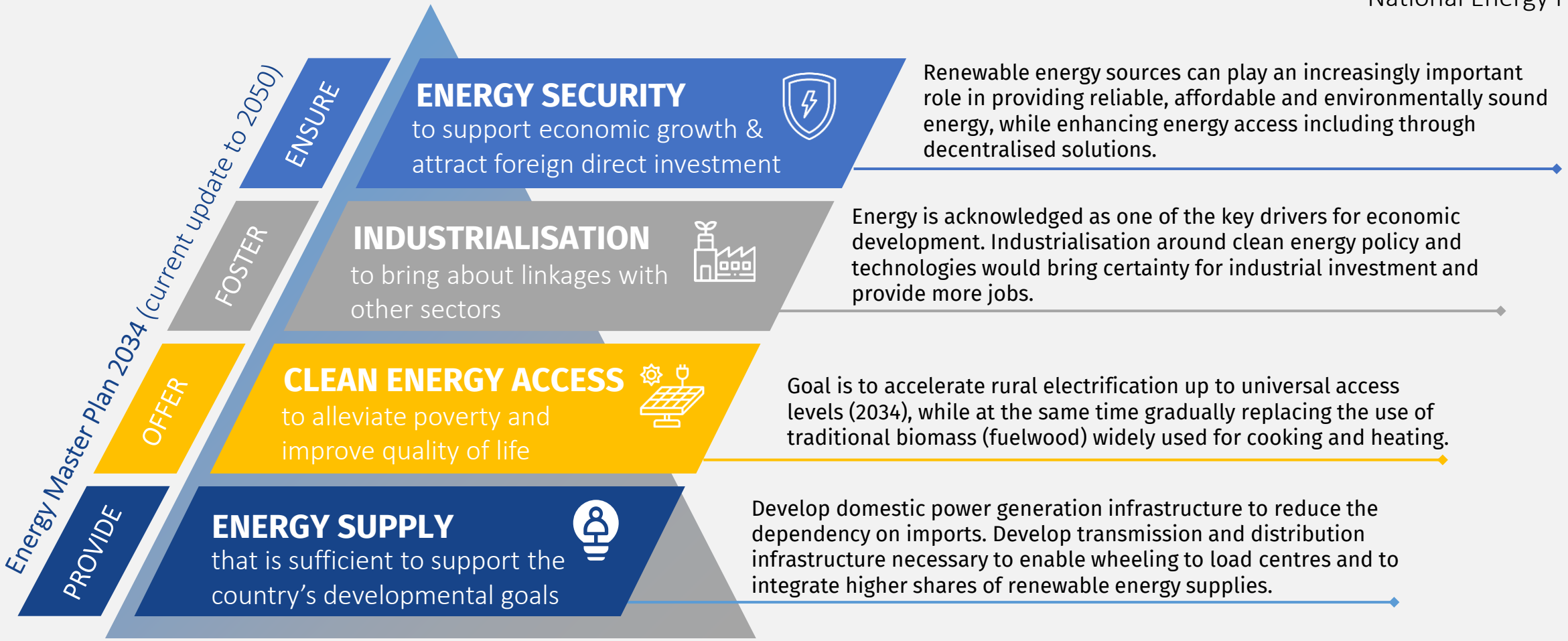
Eswatini's Energy Vision

"To meet the energy needs of the country in a sustainable manner that contributes to economic growth and well-being of the population".
National Energy Policy



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Status of Energy Sector Transformation in Eswatini

The electricity supply industry in Eswatini has undergone changes both from a policy and regulatory point of view.

The following issues (not exhaustive list) have introduced a change in the policy trajectory with regards to how Eswatini as a nation views electricity: changing global trends towards liberalised energy markets; security of supply; achieving efficiencies; affordability; and access to electricity supply.

Overall, the electricity supply industry in Eswatini can be broadly defined as an industy in transition, informed both by policy imperatives and regulatory reform.

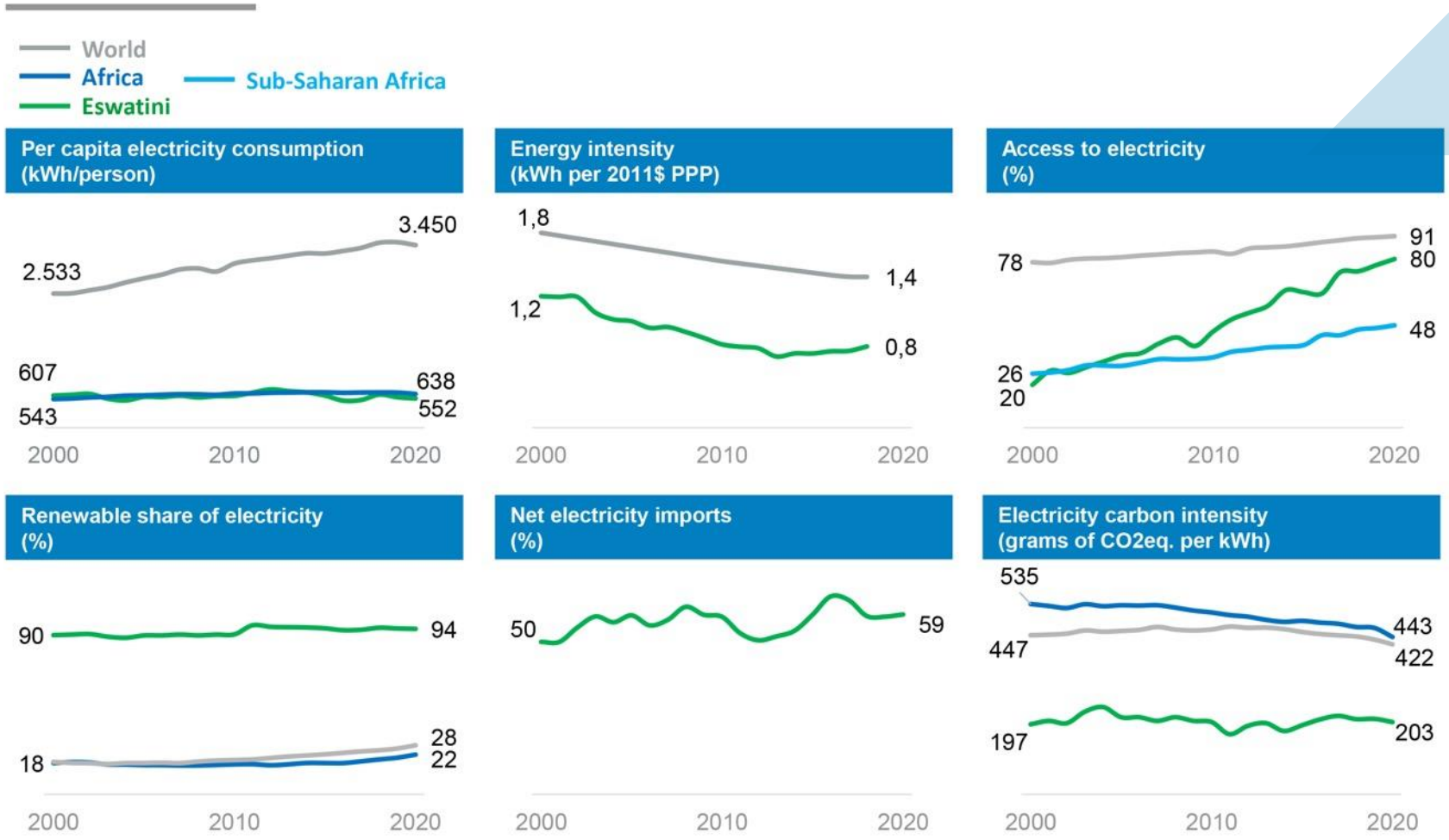
Key policy instruments includes the ' Independent Power Producer Policy' of 2016 and the 'National Energy Policy' of 2018.

Work is underway on a range of regulations and frameworks, which includes inter alia:

- Wheeling framework (near completion),
- SSEG regulations (under development),
- Ring Fencing guidelines,
- Reviewal of Tariff Methodology,
- Reviewal of Grid Codes (partially underway),
- and Mini-grid and Off-grid regulatory framework (issued, to be gazetted).

Eswatini is in the process of updating their Long-term Energy Masterplan of 2034 to a 2050 version (expected completion in 2023). This will inform an updated Short-term Generation Expansion Plan.

Energy Snapshot



Source: OurWorldInData.org and data.worldbank.org

Key figures Economy

Population: 1.17 million
GDP per capita (current US$): 4,214.9
GDP growth: 7.4%

Environmental

CO2 emissions: 0.8 metric tons per capita
Electricity carbon intensity: 203 grams of CO2eq. per kWh

Energy

Per capita electricity consumption:
552 kWh/person
Access to electricity: 79.7%

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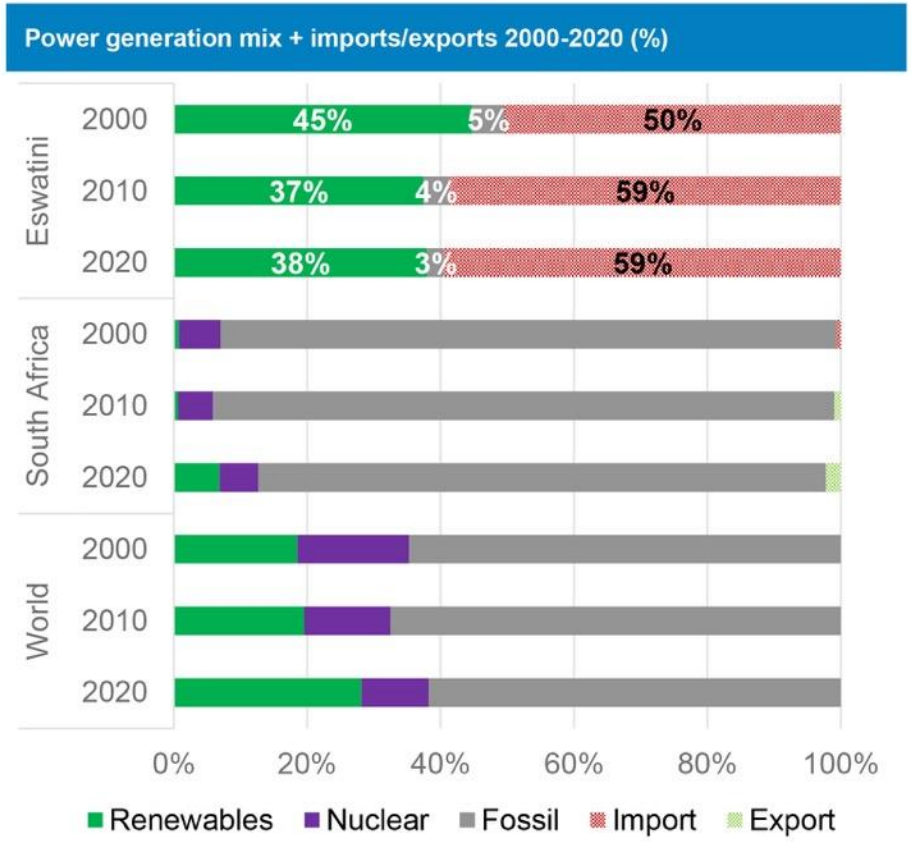
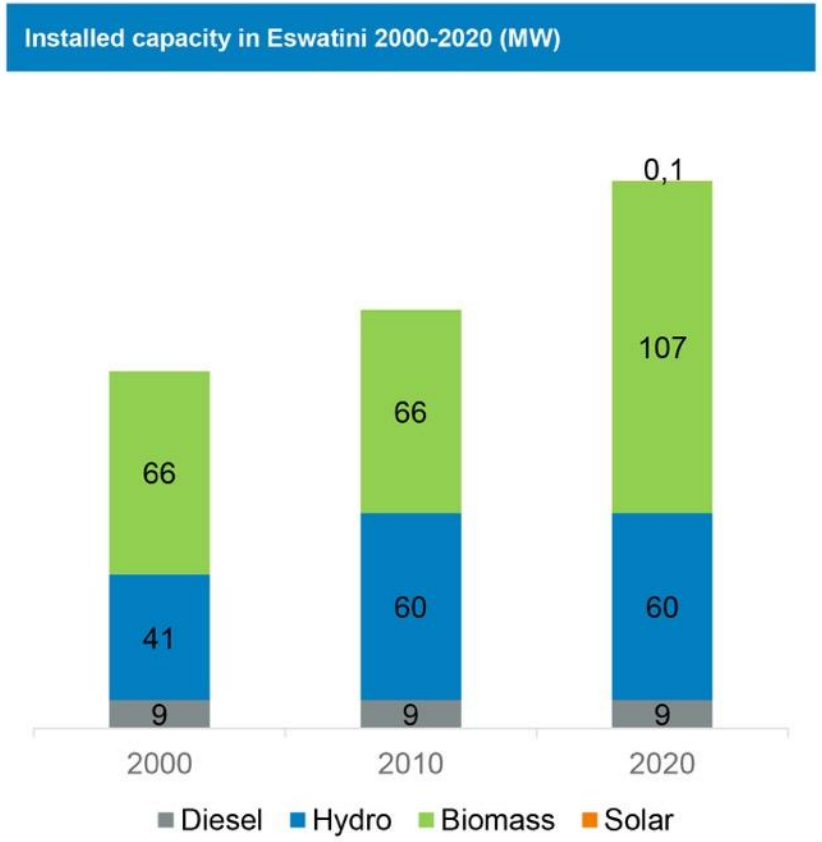
Generation Mix & Installed Capacity



Source: own elaboration based on OurWorldInData.org



Source: own elaboration based on Eswatini's Short-term Generation Expansion Plan (2018) and
Energy Master Plan 2034 (2018)

Key statistics for Eswatini (2021/22)

Electricity demand: 233 MW
Energy sales: 1 225 GWh
Local generation: 302,9 GWh
Imported energy: 913,4 GWh

Installed capacity:

EEC (Eswatini Electricity Company)
- Hydro: 60.4 MW
- Diesel: 9 MW (mothballed)
- Solar PV:10 MW (comm 2021)
- BESS: 1 MWh (testing)

USL (Ubombo Sugar Limited)
- Thermal Biomass: 40.5 MW
- Hydro: 1 MW

RES (Royal Eswatini Sugar)
- Thermal Biomass: 65.5 MW

USA Distillers
- Coal: 2.2 MW

Wundersight
- Solar PV: 100 kW

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Key stakeholders in Current Power Supply Market

Institution		Description
Ministry of Natural Resources and Energy (MNRE)		The Energy Department of the Ministry of Natural Resources and Energy (MNRE) is the custodian of policy and activities pertaining to the energy sector. Its mission is to effectively manage the national energy resources and to work towards affordable and sustainable energy provision for all people in the country, while ensuring the international competitiveness of the energy sector.
Eswatini Energy Regulatory Authority (ESERA)		The Eswatini Energy Regulatory Authority (ESERA), is a statutory body established through the Energy Regulatory Act, 2007. The Authority is mandated to administer the Electricity Act, 2007 (Act No. 3 of 2007), with the primary and core responsibilities of exercising control over the electricity supply industry (ESI) and ensuring the security of supply of electricity through the issuance of licenses and the regulation of electricity tariffs and quality of supply and services.
Eswatini Electricity Company (ECC)		Eswatini's electricity is mainly supplied by the Eswatini Electricity Company (ECC), who is engaged in the business of generation, transmission and distribution of electricity. EEC is governed by the following legislations: (i) Eswatini Electricity Company Act, 2007. (ii) the Electricity Act, 2007, (iii) the Companies Act, (2009), (iv) the Eswatini Energy Regulatory Act, 2007, (v) the Public Enterprises Unit Act, 1989, and the (vi) the Procurement Act, 2011. EEC is the successor to the Swaziland Electricity Board (SEB) which was established in terms of the Electricity Act, 1963 (Act No. 10 of 1963). EEC is subject to regulation by ESERA.

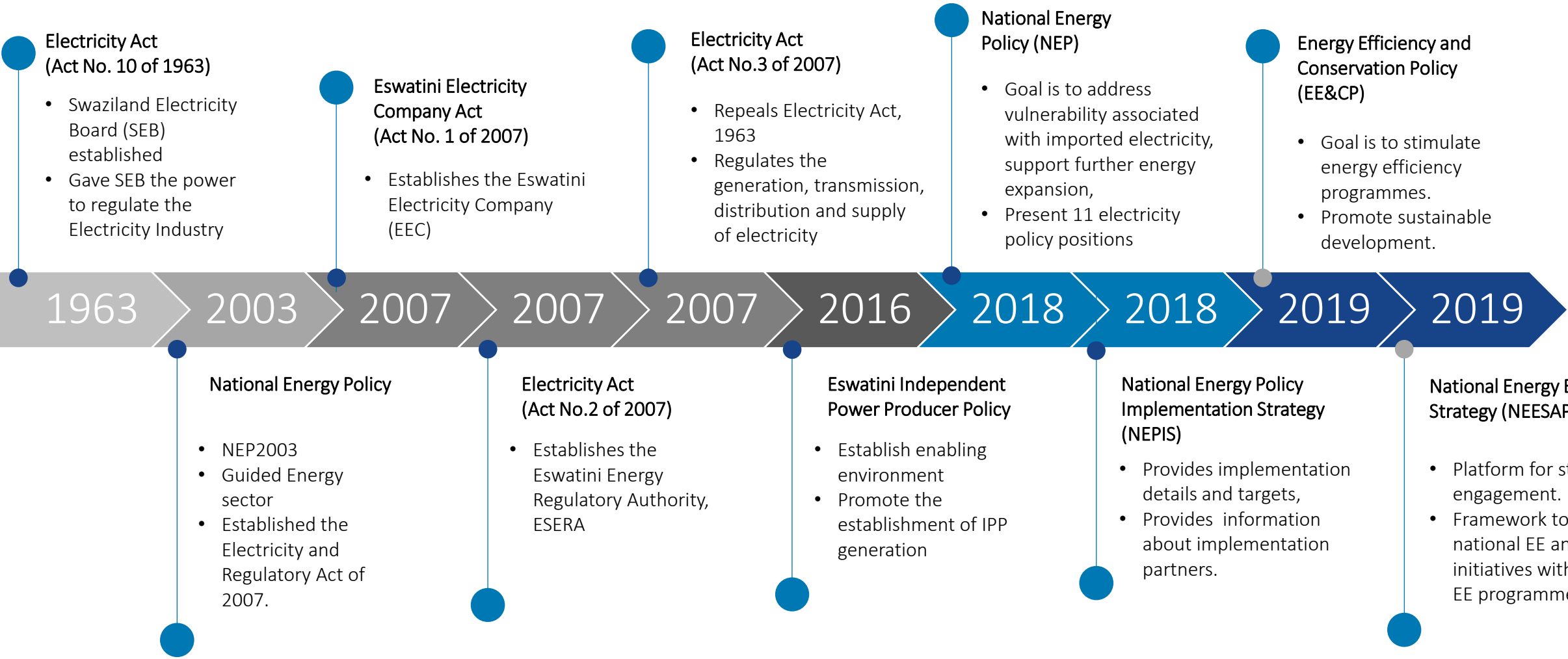
Source: own elaboration based on esera.org.sz and gov.sz

Key Stakeholders in Current Power Supply Market

Institution		Description
Private Sector Self-Generators and/or IPP's	UBOMBO SUGAR LIMITED AN ILLOVO SUGAR AFRICA COMPANY; RES CORPORATION	Key private sector players include co-generators in the sugar industry at Umbombo Sugar Limited (USL) and the Royal Eswatini Sugar Corporation (RES) which use bagasse and wood chips as fuel. USL has an installed capacity of 41.5 MW which is utilized for self-consumption and export to EEC. RES's 65.5 MW generation is currently limited to self-consumption.
Import Partners	Eskom; ELECTRICIDADE DE MOÇAMBIQUE, E.P.; SAPP	Eskom is a South African electricity utility that is a member of SAPP and has entered into a long-term agreement with EEC for the supply of electricity. EEC imports bulk of its electricity from Eskom. The current import agreement lapsed in 2025, and re-negotiation of the agreement is taking place. EDM is a Mozambican electricity utility that is a member of SAPP and currently supply Eswatini with up to 20 MW of power on an agreed 17-month power purchase agreement. Eswatini also buys electricity from the SAPP Day Ahead market from time to time.

Source: own elaboration based on esera.org.sz and gov.sz

Regulation and Energy Policy Instruments



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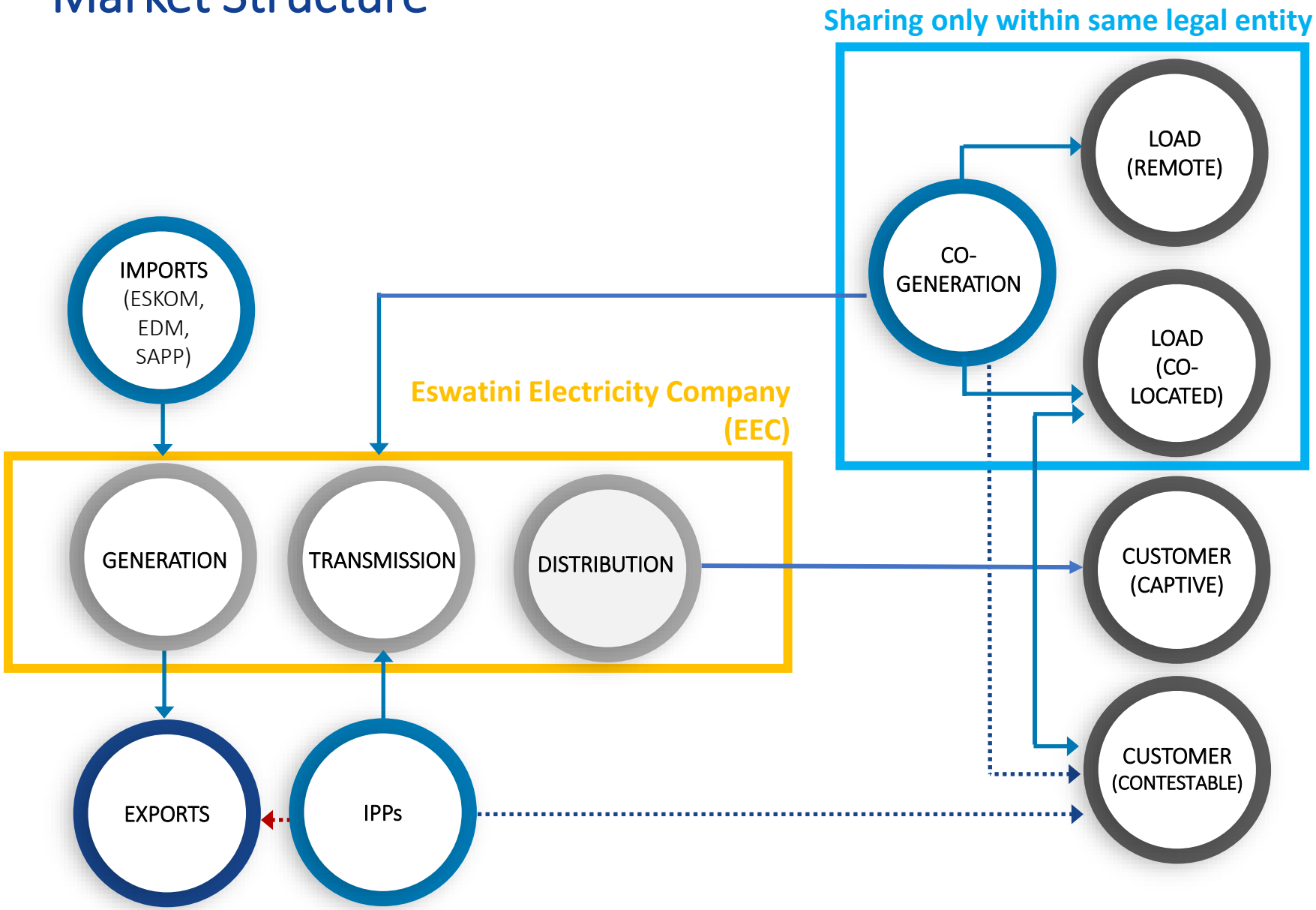
Market Structure



LEGEND (POWER FLOWS)

CURRENT ALLOWED TRANSACTIONS

STAGE I ALLOWED TRANSACTIONS

STAGE II ALLOWED TRANSACTIONS

STAGE III ALLOWED TRANSACTIONS

Source: Market Structure from IPP Policy Document (p.31-32)

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GET.transform Framework

Overarching activities	Capacity Building
	Knowledge Products
	Peer-to-Peer Exchanges
	Technical Assistance

Governance	Grid Codes	Market Design	Electrification Planning
Data Inputs	Interconnection	Investments	Stand-alone Systems
Modelling	Regional Integration	Economic Regulation	Mini Grids
NDC Integration	Flexibility	Tariff Design	Business Models & Finance

Key Topics

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State of Play

LONG TERM ENERGY PLANNING

RENEWABLE ENERGY GRID INTEGRATION

ON-GRID REGULATION & MARKET DEVELOPMENT

OFF-GRID REGULATION & MARKET DEVELOPMENT

Energy Masterplan 2034, 2018 (MRNE)

The long-term energy planning of Eswatini is the responsibility of the Department of Energy, within the MNRE. The Energy Masterplan 2034 was released in 2018 and was developed in conjunction with IRENA and provides an analysis of all the available energy resources and investment requirements to meet the forecasted energy demand at minimum cost to the country. This long-term energy plan should be reviewed every 3 to 5 years, and currently the International Atomic Energy Agency (IAEA), in conjunction with IRENA and MNRE, EEC, ESERA, CSO and UNISWA, is updating the masterplan up to year 2050. The updated Energy Masterplan 2050 is expected to be published soon.

Short-term Generation Expansion Plan, 2018 (MNRE)

The MNRE commissioned Energy Systems Planning (Pty)Ltd (ESP) in 2017 in conjunction with African Legal Support Facility (ALSF) to prepare a Short-term Generation Expansion Plan for Eswatini (SGEP). This plan was published in March 2018. With the issue of the new Energy Masterplan 2050 it is good practice to now also review and update the SGEP.

Priority support projects identified by Public Sector Actors:

- Short-term Generation Expansion Plan aligned to Energy Masterplan (2050)
- Assessment of biomass for purposes of maximizing local power generation
- Assistance with a Feasibility study for the Ngwempisi Multipurpose Hydro Scheme
- Assistance with Feasibility studies on wind energy resource assessment in Eswatini

CHALLENGES AND OPPORTUNITIES

- Limited funding for assessment of viable alternative sources of electricity such as wind, biomass and hydro.

State of Play

LONG TERM ENERGY PLANNING

RENEWABLE ENERGY GRID INTEGRATION

ON-GRID REGULATION & MARKET DEVELOPMENT

OFF-GRID REGULATION & MARKET DEVELOPMENT

The Eswatini grid codes were developed in 2014/2015. Part of these codes was the release of the "Grid Connection Code for Renewable Power Plants (RPPs) connected to the electricity Transmission System (TS) or the Distribution System (DS)". This grid code for RE was largely a copy of the South African grid code for renewable power plants. Since the South African grid code for RPPs has undergone several changes since 2014, this has prompted ESERA to appoint an external consultant to update the RPP grid code. The updated grid code for RPPs is expected to be updated by December 2022. The other codes in the Grid Code suite also need revision and updating.

Considering the activity in the EG (SSEG) space within the Eswatini electricity industry, no formal standards or codes exist to regulate integration of SSEG. EEC staff are presently following and participating in programs within the South African industry, in order to acquire a better understanding of SSEG impacts and regulation required. A need to capacitate the different stakeholders on development of suitable standards and grid codes, to integrate SSEG, has been clearly identified as potential area of assistance by GET.transform.

Priority support projects identified by Public Sector Actors:

- Develop a standard for grid integration for Embedded Generation (EG) above 1MW
- Develop regulatory framework for Energy Storage Systems
- Capacity Building on Renewable Energy Integration
- Defining the ancillary services market for Eswatini
- Review of Grid Codes
- Capacitation on combined demand/load forecasting with generation

CHALLENGES AND OPPORTUNITIES

- The impact of increased RE penetration on the Eswatini network is unknown.
- Regulation of EG, in particular SSEG, needs to be implemented. A mandatory approval process is required so that all necessary information about the EG can be captured.
- Enable planning methods and tools to take into account EG in network plans.

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State of Play

LONG TERM ENERGY PLANNING

RENEWABLE ENERGY GRID INTEGRATION

ON-GRID REGULATION & MARKET DEVELOPMENT

OFF-GRID REGULATION & MARKET DEVELOPMENT

National Energy Policy, 2018 (MNRE)
The MNRE published a National Energy Policy (NEP) and National Energy Policy Implementation Strategy (NEPIS) in 2018. The NEP replaced the NEP 2003 which has driven energy sector development up to 2018. The NEP
(2018) provides 11 electricity policy positions.

Independent Power Producer (IPP) Policy
The Independent Power Producer Policy document was prepared by the USAID Southern Africa Trade Hub in close collaboration with the Department of Energy under the Ministry of Natural Resources and Energy.

The goal of the IPP Policy is "ensuring that the development goals of the country as set out in the Vision of the National Development Strategy are met, through the establishment of an enabling environment to promote the establishment of sustainable renewable energy and IPP generation sources for the benefit of all the citizens of the country". The IPP Policy present 28 policy positions.

Priority support projects identified by Public Sector Actors:

- Structuring of bidding process for procuring wind and small hydro Power from IPP's
- Develop Guidelines for market reform to accommodate Contestable Customers
- Develop a Business case for small hydro in Eswatini
- Support the Small-Scale Embedded Generation (SSEG) working group (Various items)

CHALLENGES AND OPPORTUNITIES

- The uptake of EG and SSEG at private level is progressing at a steady rate with little or no regulation, standards or guidelines to assist the authorities to manage these installations.
- Both ESERA and EEC has expressed the need for technical assistance and capacity building on setting up an EG/SSEG framework, standards and procedures.
- The Grid Codes deployed by Eswatini needs review.

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State of Play

LONG TERM ENERGY PLANNING

RENEWABLE ENERGY GRID INTEGRATION

ON-GRID REGULATION & MARKET DEVELOPMENT

OFF-GRID REGULATION & MARKET DEVELOPMENT

ESERA published 'Mini-Grid and Micro-Grid Guidelines' in March 2022. These Guidelines shall come into force on the date of publication in the gazette.

MNRE commissioned the World Bank for a Least-Cost Electrification Study of which the draft report was published in October 2022. An assessment into the potential for mini-grids and off-grids in Eswatini forms part of this study.

The UNDP presented a Programme Framework for Affordable Renewable Energy in Swaziland (PARES). One of the strategic objectives of this program was focused on "Promoting off-grid solutions and formulation of pro poor Investment Support Program for Decentralized Renewable Energy (DRE)".

EEC implemented in August 2020 the Sigcineni Off-Grid Solution Project as a stand-alone mini-grid which consists of a centralised 35kW solar PV generation plant complete with 200kWh battery storage system and an AC LV reticulation network designed to service about 26 rural homesteads through an advanced smart metering system for billing. The customers are charged for electricity usage through the standard domestic tariff.

Priority support projects identified by Public Sector Actors:

- Capacity Building on off-grid Renewable Energy market

CHALLENGES AND OPPORTUNITIES

- As stated in the UNDP report policy, legal, and regulatory frameworks for off-grid RE energy programmes are inadequate and require further development.
- No procurement framework exists for mini-grid or off-grid systems.

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Priority Projects to Be Supported by GET.transform*

LONG TERM ENERGY PLANNING

- Develop a Short-term Generation Expansion Plan aligned to Energy Masterplan (2050)
- Assessment of biomass for purposes of maximizing local power generation
- Assistance with a Feasibility study for the Ngwempisi Multipurpose Hydro Scheme
- Assistance with Feasibility studies on wind energy resource assessment in Eswatini

RENEWABLE ENERGY GRID INTEGRATION

- Review of Grid Codes
- Defining the ancillary services market for Eswatini
- Capacity Building on Renewable Energy Integration
- Capacitation on combined demand/load forecasting with generation
- Capacitation on Short-term planning for renewables and Embedded Generation
- Capacitation of Network Operators and the Trading Desk on renewables and Embedded Generation

ON-GRID REGULATION & MARKET DEVELOPMENT

- Structuring of bidding process for procuring wind and small hydro Power from IPP's
- Develop Guidelines for market reform to accommodate Contestable Customers
- Develop a standard for grid integration for Embedded Generation (EG) above 1MW
- Support the Small-Scale Embedded Generation (SSEG) working group (Various items)
- Support with SSEG training and setting up PV Green card Accreditation in Eswatini
- Develop regulatory framework for Energy Storage Systems
- Develop a Business case for small hydro in Eswatini
- Capacitation of ESERA and MNRE on market reform and regulation

OFF-GRID REGULATION & MARKET DEVELOPMENT

- Development of an Off-grid Renewable Energy market

*NOTE

The table above includes all the requests for project support received from the public sector partners.
The green (current) and orange (completed) highlighted items are the priority projects supported by GET.transform

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COUNTRY WINDOW SETUP

Alignment with Other Development Partners

GET.TRANSFORM	WORLD BANK	UNDP	EIB	AFDB
Energy Sector Reform	Electrification Planning Energy Access Survey Transmission Project Studies	Mini-Grids Small Fund Community Grant System	Project (Development) Funding	Project (Development) Funding
Long-Term Energy Planning • Update of the Short-term Generation Expansion Plan (SGEP) Renewable Energy Grid Integration • Support to the Small-Scale Embedded Generation (SSEG) workgroup On-Grid Regulation and Market Development • Review and update of the Eswatini Grid Codes	Sharing overview of technical assistance projects with each other on an annual basis to avoid duplication in effort	Sharing overview of technical assistance projects with each other on an annual basis to avoid duplication in effort	Provide information on possible projects of the utility that may need financing	Provide information on possible projects of the utility that may need financing AfDB conducted an Energy system assessment for the Ministry of Finance
TECHNICAL ASSISTANCE			GRANTS / LOANS	

Country Window Setup

Country

- The Eswatini Country Window is implemented from the Energy Cluster of the South Africa, Lesotho and Eswatini Country Office in Hatfield, Pretoria.
- 1 x Country Coordinator works from the Energy Cluster in the above-mentioned office.
- 1 x Country Coordinator integrates both the GET.transform and GET.invest instruments.

GET.transform HQ

- 1 x Africa Partnerships coordinator for overarching CW strategy support.
- 1 x Advisory Services Focal Point for LTEP and RE-Integration.
- 1 x Advisory Services Focal Point for Policy and Regulation.

Technical Assistance Partners

- Expert Consulting Pool for LTEP and RE-Integration.
- Expert Consulting Pool for Policy and Regulation.

Thank you for your attention

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