Enhanced Danish-Ethiopian Energy Partnership

Introduction:

In 2017 Ethiopia and Denmark commenced a partnership programme on energy aiming at creating attractive framework conditions for developing wind energy projects in Ethiopia.

As the energy mix in Ethiopia develops with more variable renewable energy, an increased level of planning and modelling on how the system will evolve is needed. Therefore, a strategic sector cooperation programme on this was launched in 2020 (2020-22).

This fruitful cooperation has motivated the government of Ethiopia to seek an enhancement of the partnership.This continued support is in line with Danish priorities following the Paris Agreement and the SDGs to provide support and facilitate increased investments in areas related to climate change mitigation and sustainable energy, which is where Denmark has strong expertise and experience.

Key results:

Supporting the Ethiopian vision of building a Climate Resilient Green Economy and achieving Ethiopia's targets in the NDCs under the Paris Agreement on Climate Change, as well as SDG7, SDG13 and SDG 17.

Development of a regulatory, institutional, and financial framework for wind projects.

The energy policy and regulatory decision-making process is based on "choice awareness" guided by state-of-the-art long-term energy planning and modelling.

Ethiopia has developed an increasingly stable electricity system actively using planning and forecasting with more flexibility.

Justification for cooperation:

Ethiopia and Denmark share common goals and have demonstrated high-level commitment to green energy transition and climate change mitigation efforts e.g. joint leadership of the energy track at the UN climate summit, autumn 2019.

Only 44 % of the Ethiopian population have access to electricity. The Ethiopian target is 100 % by 2025 and an increase in electricity demand by a factor 5. Variable renewable energy production through resources like wind is important to reach this target. The challenge is to integrate these into the energy system. This is a key Danish competence and central for the partnership.

Major risks and challenges:

• Political, social, and ethnic tensions remain high. Together with the consequences of the Covid-19 pandemic.

• The limited institutional capacity and specialized human recourses in partner institutions.

• Highly ambitious Ethiopian targets.

• Many other development partners active in climate change mitigation and clean energy development in Ethiopia.

File No.	F2: 2020-35587						
Country	Ethiopia						
Responsible Unit	Addis Ababa with Ministry of Climate, Energy and Utilities and the Danish Energy Agency						
Sector	Climate and Energy						
Partner	Ministry of Water, Irrigation and Energy (MoWIE) – The Ethiopian Electric Power (EEP)						
DKK mill.	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**Tot.**
Commitment	50	10					60.0
Projected ann. disb.	4.2	11.6	12.5	13.2	11.7	6.7	60.0
Duration	Q3 2021 – Q3 2026 (5 Years)						
Previous grants	DKK 35 mill. for the Accelerating Wind Power Generation in Ethiopia Programme (AWPGE) and DKK 10 mill. for Strategic Sector Cooperation on energy planning and modelling with key partners; Ministry of Water, Irrigation and Energy (MoWIE), Ethiopian Electric Power (EEP), Ethiopian Electric Utility (EEU) and Ethiopian Energy Agency (EEA).						
Finance Act code	06.34.01.70 Climate Envelope						
Head of unit	Karin Poulsen						
Desk officer	Jens Skov-Spilling						
Reviewed by CFO	Jesper Clausen						

Relevant SDGs

Strategic objectives:

To support the development of the Ethiopian government structures and systems that in a sustainable and cost effective way improves access to renewable energy (SDG 7) and hereby supporting the Ethiopian vision of building a Climate Resilient Green Economy while reaching lower middle-income status by 2025.

To support the expected increase in supply to accommodate energy demand by enabling an environment for investment, cost-efficient electricity system planning to increase security of supply.

Justification for choice of partner:

The Ministry of Water, Irrigation and Energy is the key institution for development of regulatory frameworks, strategies, and policies for the energy system in Ethiopia. Together with its affiliated institutions especially the state-owned transmissions system operator and power company, Ethiopian Electric Power. This has been confirmed in the ongoing Danish-Ethiopian energy cooperation.

Summary:

Outcome 1: Choice awareness in energy sector development; Outcome 2 Onshore wind energy development; Outcome 3: Integration of variable renewable energy.

Budget:

Outcome 1	DKK 12.2 mill.
Outcome 2	DKK 12.2 mill.
Outcome 3	DKK 11.9 mill.
Two long-term Advisors	DKK 14.1 mill.
Analyses, local activities, inception review and Mid-term Review	DKK 1.2 mill.
Unallocated funds and contingencies	DKK 6.0 mill.
DEEP Project management	DKK 2.4 mill.
Total	**DKK 60.0 mill.**

Enhanced Danish-Ethiopian Energy Partnership Programme (DEEP)

2021-2026

Programme Document

6th of May 2021

List of key abbreviations and selected terminology

AG	Advisory Group
AWPGE	Acceleration Wind Power Generation in Ethiopia
BaU	Business-as-Usual
CCEE	Copenhagen Centre on Energy Efficiency
CO_2	Carbon dioxide
COP	Conference of the Parties
CRGE	Climate-Resilient Green Economy strategy
CTCN	Climate Technology Centre and Network
DAC	Development Assistance Committee (OECD)
DAG	Development Assistance Group
Danida	Danish International Development Assistance, under the Ministry of Foreign Affairs of Denmark
DDD	Doing Development Differently
DE	Development Engagement
DEA	Danish Energy Agency
DEEP	Enhanced Danish-Ethiopian Energy Partnership
DEPP	Danish Energy Partnership Program (China, Mexico, South Africa, and Vietnam)
DFC	Danida Fellowship Centre
DIHR	Danish Institute for Human Rights
DKK	Danish Kroner
DP	Development Partners
DSIF	Danida Sustainable Infrastructure Finance
EAPP	Eastern African Power Pool
EDC	Energy Development Commission
EEA	Ethiopian Energy Authority
EEP	Ethiopian Electric Power
EEU	Ethiopian Electric Utility
Energinet	Danish transmission system operator (TSO)
EDPG	Energy Partners Development Group
EPS	Ethiopian Planning System
ESMAP	Energy Sector Management Assistance Programme
EOR	Energy Outlook Reports
EPC	Engineering, Procurement and Construction
FCDO	UK Government's Department for International Development
GCF	Green Climate Fund
GDK	MFA Department for Green Diplomacy and Climate
GDP	Gross Domestic Product
GERD	Grand Ethiopian Renaissance Dam
GGGI	Global Green Growth Institute
GHG	Greenhouse gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit, German technical cooperation agency
GoE	Government of Ethiopia
GtG	Government-to-government
GTP	Growth and Transformation Plan

GTP II 2016-2020	Growth and Transformation Plan II
HRDD	Human Rights Due Diligence
HRBA	Human Rights-based Approach
IEA	International Energy Agency
IFC	International Financial Corporation
IFU	(Danish) Investment Fund for Developing Countries
IISD	International Institute for Sustainable Development
IFM	International Monetary Fund
IPP	Independent Power Producers
IRENA	International Renewable Energy Agency
KPII	Climate Envelope II
LCOE	Levelized Cost of Energy
LNOB	Leave No-One Behind
LTA	Long-term advisor
MCEU	Danish Ministry of Climate, Energy and Utilities
MFA	Ministry of Foreign Affairs of Denmark
MoF	Ministry of Finance of Ethiopia
MOU	Memorandum of Understanding
MoWIE	Ministry of Water, Irrigation and Energy
MTR	Mid Term Review
M&E	Monitoring and evaluation
NDC	Nationally Determined Contribution
NEP	National Electrification Programme
NLDC	National Load Dispatch Centre
NPC	National Planning Commission
OECD	Organisation for Economic Co-operation and Development
P4G	Partnering for Green Growth and the Global Goals 2030
PD	Programme Document
PPA	Power purchase agreement
PPP	Purchasing Power Parity
PSR	The Power Sector Reform
PV	Photovoltaic
RDE	Royal Danish Embassy in Ethiopia
RE	Renewable Energy
RE	Renewable Energy
RMM	Risk Management Matrix
SC	Steering committee
SDG	Sustainable Development Goals
SDG5	Achieve gender equality and empower all women and girls
SDG7	Ensure access to affordable, reliable, sustainable and modern energy for all
SDG13	Take urgent action to combat climate change and its impacts
SDG17	Partnerships for the goals
SEforALL	Sustainable Energy for All
SMART	Specific, measurable, attainable, relevant, timebound
SSC	Strategic Sector Cooperation
SWOT	Strengths, weaknesses, opportunities, threats
TA	Technical assistance
ToC	Theory of Change

ToR	Terms of reference
TPES	Total Primary Energy Supply
TSO	Transmission system operator
UDP	UNEP DTU Partnership
UN	United Nations
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UNGP	United Nations Guiding Principles on Business and Human Rights
UPR	The Danish Council for Development Policy
USAID	United States of America - International Development
VRE	Variable renewable energy
WB	World Bank
WRI	World Resources Institute

1 ETB = 0.15 DKK

1 DKK = 6.78 ETB

21 April 2021

The Financial Year is the calendar year

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1. Introduction

The World Community's efforts in achieving the United Nations Sustainable Development Goals (SDGs) by 2030 and as well as Paris Agreement climate target[1] is gaining momentum. However, the United Nations Status Report from 2020- is indicating that the world is off-track in meeting these targets and the recommendations are urging for an acceleration of interventions to limit the consequences of a climate crisis. The Status Report[2] emphasises the urgency of stepping up the efforts in expanding the level of renewable energy (RE) to reach the long-term climate goals and the SDG target. The Covid-19 pandemic has also brought a new urgency to expand sustainable energy solutions in support of a green and just recovery from this crisis to mitigate the negative economic and social impact.

Among the world's developing countries, Ethiopia is widely recognized as an ambitious nation towards the development of green energy and climate change mitigation and adaptation initiatives. The National Determined Contribution (NDC[3]) submitted by Ethiopia in 2017 to the United Nations Framework Convention on Climate Change (UNFCCC) includes the country's Climate-Resilient Green Growth Economy Strategy that aims to achieve status as a lower middle-income nation by 2025 while protecting the country from the adverse effects of climate change as well as setting a target for greenhouse gases (GHG) emission reductions in 2030 at 64% or lower.

Access to affordable, secure and modern energy is high on the Ethiopian agenda and a central element for reducing poverty, improving industrial productivity and creating jobs for a young and fast-growing population. Out of a population of approximately 110 mill. citizens, only 44 % have direct access to energy. The Ethiopian target is 100 % access to electricity by 2025 – entailing an increase in energy demand by a factor 5. This target, in view of the current challenges in Ethiopia, is considered unrealistic to fully achieve within the set timeframe. It is strongly believed that through the activities of the Danish-Ethiopian Energy Partnership (DEEP), Ethiopia will be in a better position to increase the momentum and a development that will ensure outcomes that will bring the country closer to the set targets. Solar and wind are likely to be the most cost-effective new energy sources technologies for Ethiopia to reach this target, but it is known to be a challenge to integrate variable renewable energy like solar and wind into the existing hydro-based electricity grid and to balance the supply with the demand, resulting in regular power cuts and load shedding. There is an urgent need for increasing the awareness and informed decision making for the development of the energy system and identifying how wind energy can support the ambitious Ethiopian targets. This discipline is a Danish key-competence, and it will be central for this Danish-Ethiopian Energy Partnership. In order to support the Ethiopian Government in this transition, DEEP will focus on the following areas:

- Creating choice awareness in the energy sector development, through long-term planning and modelling

[1] The central aim of the Paris Agreement on Climate Change is keeping a global temperature rise well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius. Currently, global temperatures are on track to rise as much as 3.2°C by the end of the century. To meet the 1.5°C – or even the 2°C – maximum target called for in the Paris Agreement, greenhouse gas emissions must begin falling by 7.6 % each year starting in 2020.

[2] https://unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf, page 39

[3] The Paris Agreement (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive nationally determined contributions that it intends to achieve.

- Promoting and creating and enabling environment and transparent framework for lowering the cost of onshore wind power development
- Integration of variable renewable energy for a flexible and reliable energy system

In its support to the goals of the Paris Agreement, Denmark is committed to enhanced global efforts by assisting the largest emitters of greenhouse gases to raise their national climate mitigation ambitions. Denmark's Strategy for Development Cooperation and Humanitarian Action, "The World 2030"[4], has a strong focus on the Paris Agreement and the SDGs to provide support and facilitate increased investments in areas related to climate change mitigation and sustainable energy, which is where Denmark has strong expertise and experience. This is further underlined in the Danish Minister for Development Cooperation's four-year plan 2020-2024 and the Government's 2021 Priorities for Danish Development Cooperation [5], and the expected focus of the new Danish Strategy for Development Cooperation, to be launched in 2021. DEEP also matches the greener development cooperation focus of the Danish Government's long-term strategy for global climate action 'A Green and Sustainable World' (2020).

The funding for the proposed programme is from the Danish Climate Envelope which was established in 2008 and is the Danish Government's mechanism for channelling dedicated climate funding to support international development cooperation at both bilateral and multilateral levels within mitigation and adaptation activities in line with Denmark's commitment to contribute to international climate finance. The Danish Climate Envelope targets the following major impacts[6]:

1. Reduced greenhouse gas emissions;
2. Increased climate resilience, specifically for vulnerable and marginalized groups, and
3. Transformational changes in emerging economies and developing countries.

More specifically the targets/monitoring details of the Danish Climate Envelope are:

- Tons of carbon dioxide equivalent (tCO2 eq) reduced as a result of Climate Envelope mitigation projects/programmes
- Total number of people supported to cope with the effects of climate change by Climate Envelope resilience programmes (direct and indirect, gender disaggregated)
- Volume of finance leveraged by Climate Envelope funding (disaggregated by public and private sources, annual)

It is the Ministry of Foreign Affairs of Denmark (MFA) that is overall responsible for the Danish Climate Envelope. The Climate Envelope has funded energy-related climate change mitigation partnership programmes with China, Vietnam, South Africa and Mexico since 2012, with Ethiopia since 2016, and with India since 2019 and with Indonesia since 2020.

The total budget for the five-year programme is DKK 60 million, of which DKK 50 million is sourced from the Danish Climate Envelope 2021. An additional DKK 10 million is expected to be sourced from the Danish Climate Envelope 2022 subject to parliamentary approval of the finance act for 2022.

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[4] MFA/Danida. January 2017. The World 2030.

[5] The Danish Government's Development Priorities for 2021

[6] Guiding principles for the Danish climate envelope, UM and KEFM, February 2016.

DEEP was subject to an appraisal during February-April 2021. Besides the recommendations for additional information in the Programme Document to be submitted to the Danish Council for Development Policy on 27th of May 2021, it was also recommended that further clarifications could be made during the Inception Phase. References are made in the present Programme Document to the topics that are proposed for further elaboration during the Inception Phase.

As further elaborated below, DEEP will continue and expand the current Danish-Ethiopian energy cooperation, and from 2023 have incorporated all activities from previous programmes.

2. Strategic Considerations and Justification

2.1 Programme Identification and Formulation Process

In August 2019, the Ethiopian Minister for Water, Irrigation and Energy (MoWIE) expressed interest for continuing the cooperation with and support from Denmark related to the Energy Sector Development for the Promotion of wind energy development in Ethiopia. The request included more specifically that the Royal Danish Embassy in Ethiopia consider supporting the following areas of mutual interest and for an expansion of the current energy sector cooperation:

1) "Continuing government-to-government engagement to support development of improved framework conditions for competitive wind auctions for Independent Power Producers (IPP) and system integration of variable renewable energy sources like wind and solar,
2) Developing in-house capacity for energy planning and modelling in MoWIE, Ethiopian Electric Power (EEP) and other relevant institutions,
3) Engaging Danish universities to support Ethiopian universities and institutions to take ownership of the Wind Energy Atlas, including reconsiderations on re-locating the measuring masts needed for validation of data,
4) Exploring possibilities and provide pragmatic support in other areas such as water supply and sanitation; (Note: this request is pursued outside the scope of this programme).
5) Maintain an embedded long-term technical advisor in MoWIE to support programme development and implementation as well as internal policy advice."

An identification and formulation process was then initiated, building upon the ongoing cooperation and on recommendations from the March 2020 Mid Term Review (MTR) of the Acceleration Wind Power Generation in Ethiopia (AWPGE) with key stakeholders: MoWIE, Ethiopian Electric Power (EEP), Ethiopian Electric Utility (EEU) and Ethiopian Energy Authority (EEA). A consultant was mobilised in the beginning of August 2020 to assist the Royal Danish Embassy in Ethiopia (RDE) in finalising a Concept Note and assist in formulating the proposed partnership documentation. A Concept Note for an enhanced DEEP was prepared and discussed at the Danida Programme Committee meeting on 05 November 2020.

The Programme Committee concluded that:

- The Concept Note for Danish-Ethiopian Energy Partnership (DEEP) is relevant for the continued support to Ethiopia's vision of building a Climate Resilient Green Economy as well as achieving Ethiopia's targets under the Paris Agreement.
- The proposed support is well justified and focus on Denmark's priorities as well as Denmark's global SDG7 leadership role.

- DEEP maintains and builds on the current partnership programme on energy AWGPE, which aims at creating attractive framework conditions for developing wind energy projects in Ethiopia including for IPPs.
- The Energy Partnership Concept Note clearly describes the focus on Denmark's priorities in relation to green and sustainable development - specifically "The World 2030" as well as the Danish Minister for Development Cooperation's four-year strategy 2020-2024. In relation to the further formulation of the program, the Programme Committee provided the following actions:
- Prioritise deeper engagements in areas where DEEP maintains a unique role in establishing framework conditions for development of the wind energy sector in Ethiopia in order to allow possible synergies with Danish trade and DSIF instruments through more holistic approaches that ultimately seeks to establish framework conditions for IPPs entering the sector;
- Promote adaptive and flexible approaches of DEEP, not least in view of the Covid-19 pandemic, which may hamper further green investments from investors and possibly on the longer run lead to continued non-sustainable energy consumption.
- The reporting and indicators need to be clear in the Danish Support Programme. The results frameworks and reporting on indicators need a careful description and should follow the recommendations of the results project of the MFA – which may include Theory of Change (ToC), outcomes/impacts, transformational change processes etc.
- Elaborate further on priorities such as gender and Human Rights Based Approach (HRBA) when developing wind projects. Specifically, the need raised by the Danish Institute for Human Rights (DIHR) for human rights due diligence (HRDD) of associated renewable projects and commitment to the United Nations Guiding Principles on Business and Human Rights (UNGPs) including integration of human rights concerns as identified in DIHRs written comments;
- Formulate strategic engagements with e.g. Danish trade and instruments of Danida Sustainable Infrastructure Finance (DSIF) in order to enhance possible synergies and improve framework conditions for IPPs;
- Results frameworks and reporting on indicators in accordance with MFA recommendations.

A series of meetings[7] has been held with Ethiopian partners during November and December 2020 in order to identify and confirm Ethiopian partners' needs and priorities and define the concrete purposes of the further cooperation, while ensuring alignment with current Ethiopian policies and plans and ensuring the best match with Danish expertise, experience and added value. Furthermore, meetings with key Ethiopian stakeholders have been held in February 2021 to consolidate the proposed programme and result framework.

The consultation process has shown that the identified key partner priority needs, which Denmark is well placed to deliver on, are scenario-based long-term energy modelling and planning, energy sector regulation (including wind tenders) and grid integration of variable renewable energy. The consultations were guided by a presentation of the overall approach and concept of the proposed

[7] Due to the Covid-19 restrictions, the meetings were held on virtual platforms.

cooperation – the Theory of Change - which had been graphically illustrated and also through tailored questions addressed to the various key-stakeholders.

The formulation and programming process has been conducted with reference to the latest (November 2020) Danida Guidelines for Country Strategic Frameworks, Programmes and Projects. Hence, the concept of "Doing Development Differently" (DDD) has been guiding the process and reflected in defining the outcomes of the proposed intervention as well as setting the framework of the cooperation with key stakeholders. The approach is designed with a holistic focus on ensuring long-term sustainable results, including an appropriate level of adaptiveness as to embrace changes that may emerge in the context of the programme implementation and in addition seeking complementarity with other relevant Danish development instruments in Ethiopia. Important and valuable experiences can be drawn from the DSIF in the Assela 1 and potentially Assela 2 windfarms. It is similarly expected that the DEEP activities will be able to serve as valuable information platform that can benefit the development and implementation of the wind farms and other potential interventions of DSIF and other financing sources. The Assela 1 project will add important knowledge and experience of wind power development and system integration into the work of Energinet and the National Load Dispatch Centre (NLDC) (outcome 3). This will further reduce risks for the wind sector development for both the GoE and future investors in the coming wind tenders (outcome 2). In addition, coordination has been initiated between the Danish support to New Climate Economy's[8] (NCE) activities in Ethiopia on driving transformative and inclusive green growth, concretely on the work within the National Planning Commission (NPC) on overall planning and modelling for climate targets, which will be complemented by the SSC and DEEP work within MoWIE and EEP (outcome 1) and will thus secure synergies between the overall Danish engagements.

Furthermore, the DDD approach will, in response to the request from both the Government of Ethiopia (GoE) as well as comments made during the Programme Committee to the Concept Note, focus on "adaptive management" (cf. the Guidance note for Adaptive Management, Nov. 2020) of the programme in order to respond to the ever-changing conditions under which the programme is implemented. Both in light of the Covid-19 pandemic and the current instability in Ethiopia (see contextual risks in Annex 5: Risk Management), that can create new and unforeseen challenges which might change the political priorities in the country and thereby creating a need for changes in areas of cooperation.

2.2 Strategic Considerations

The Ethiopian Context

Ethiopia is a large and diverse country with an estimated population of approximately 112 million people and an annual population growth rate of 2.5 percent (2019)[9]. Only 20% of the population reside in the urban centres, but the government expects that the urbanisation rate will double over

[8] The Global Commission on the Economy and Climate is a major international initiative to examine how countries can achieve economic growth while dealing with the risks posed by climate change. The Commission comprises former heads of government and finance ministers and leaders in the fields of economics and business, and was commissioned by seven countries – Colombia, Ethiopia, Indonesia, Norway, South Korea, Sweden and the United Kingdom – as an independent initiative to report to the international community.

[9] https://data.worldbank.org/indicator/SP.POP.TOTL?end=2019&locations=ET&start=1960&view=chart

the next two decades. Over the last decade Ethiopia has experienced significant economic growth and lifted millions out of poverty. Albeit this improvement, major challenges pertaining to democracy, civil society, and human rights remain. Underlined by the recent developments in the Ethiopian security with the conflict in Tigray and human rights situation. This will have impacts on the level of achievement of the 2025 targets and which is calling for attention in the context of the DEEP and other donors. This is in addition to the negative impact of the Covid-19 pandemic.

Following this, investments in the energy sector remain important as one of the key drivers of Ethiopia's overall development and transformation strategy. Access to adequate, reliable, affordable, and environmentally sustainable energy is fundamental for enabling the structural transformation of the Ethiopian economy and society, and for promoting poverty reduction and industrialisation. The Climate Resilient Green Economy strategy is together with the five-year Growth and Transformation Plan II that covered 2016 – 2020[10], the drivers for reaching the goal of lower-middle income status in 2025 together with 100 % access to energy (SDG7).

The key institutions in Ethiopia involved in the development of the energy sector are MoWIE and the state-owned transmission system operator and power company, EEP. Currently, these institutions are the key stakeholders in the development of power sector policies and regulatory frameworks. In addition, it is expected that – if established - the proposed but still undecided Energy Development Commission (EDC), within MoWIE, reporting directly to the Prime Ministers' office, can potentially become the key institution with responsibility of future planning and development of the Ethiopian energy sector. Other MoWIE affiliated institutions such as EEA and EEU will be engaged in DEEP when relevant.

The Ministry of Finance of Ethiopia (MoF) has the overall responsibility of allocating public and private funding and necessary sovereign guarantees for international funding in planning activities. The MoF is supported by the NPC which is responsible for developing the country's development plans and is seen as an important stakeholder that must be engaged in the in the modelling and planning activities and the development of the wind energy sector.

Figure 1 below provides an overview of the organizational structure in MoWIE and the energy sector.

[10] A "New" Growth and Transformation Plan III, (Home Grown 10 years Economic Reform Agenda: A Pathway to Prosperity) covering 2021 – 2030 is currently being prepared but has not yet been made public.

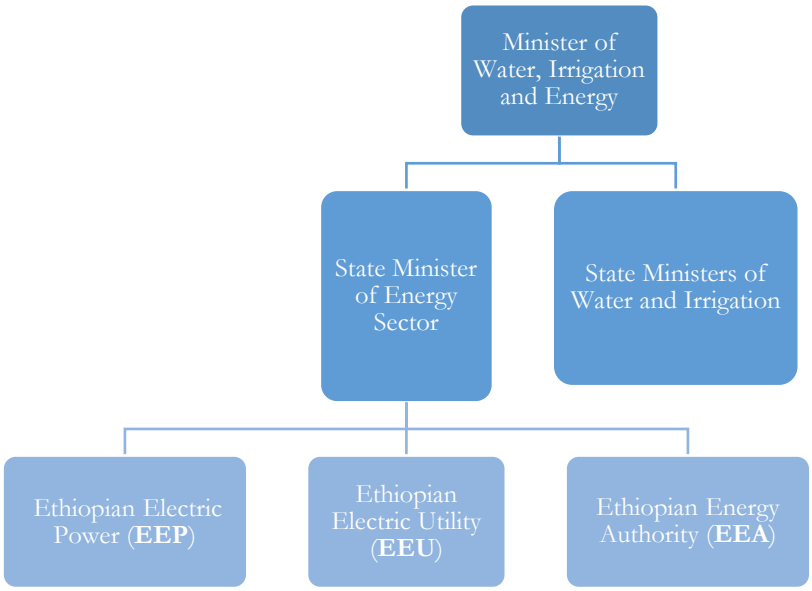


Figure 1: MoWIE, organizational structure.

As mentioned above, the national Growth and Transformation Plan II (GTP II 2016-2020) presents and outlines national priorities in realising Ethiopia's vision of becoming a lower middle-income country by 2025, where access to energy is a central element e.g. increasing the access to electricity from 44% to 100%. Ethiopia has developed and launched the Climate Resilient Green Economy (CRGE) Strategy in 2011 with a vison to be reached by 2025, which is fully aligned and integrated into GTP II as well as sector plans, programmes and projects. This will continue in the next 10-year Plan (Home Grown 10 years Economic Reform Agenda: A Pathway to Prosperity), planned for 2021-2030). The government has therefore established a range of ambitious policy goals related to economic and low-carbon development. As stated in its NDC, Ethiopia intends to reduce its CO2 emission by 64% compared to the business-as-usual scenario in 2030. In December 2020, Ethiopia submitted an update to its NDCs. This included an adjustment of the Baseline Emissions, which saw an increase in the GHG emissions of approximately 12 MtCO2. This was due to methodological improvements in inventory/GHG sources, global warming potentials, and country-specific paramenters for livestock and biomass. The reported NDCs are assessed to be within the 2-degree compliance. Ethiopia also intends to undertake adaptation initiatives to reduce the vulnerability of its population, environment and economy to the adverse effects of climate change, based on its CRGE. On the Ethiopian 2025-targets, it should be noted that these are ambitious and will, due to the consequences of the Covid-19 pandemic, and the current situation in the country most likely not be reached that early.

The electricity sector in the country is responsible for only 3% of the current annual CO2 emissions, but with a rapidly increase in population and the goal of becoming a lower middle-income economy through industrialisation, the demand for electricity is likely to increase by a factor 5. The Ethiopian power system, both on-grid and off-grid will need to undertake extensive developments and expansion to meet the increased demand in a cost effective and a sustainable way. It must therefore be ensured that such needed expansion of the electricity generation capacity, transmission and distribution are made through investments in clean energy technologies in line with the priorities of the country and the NDCs.

It is thus a high priority for the GoE to expand the electricity generation capacity in order to respond to the increasing domestic demand and reach the economic development objectives,

while fulfilling the ambition to export electricity to neighbouring countries. The planned capacity expansion will have to be more diversified and geographically distributed for a more climate-resilient power system, with an expected increase in the share of wind, solar and geothermal power generation. The National Electrification Programme (NEP 2.0) was launched in 2019 with the aim of realizing reliable access to electricity for all by 2025 and is the guiding programme for reaching these targets. The aim of NEP 2.0 is to bring together all sector stakeholders and development partners, led by the GoE. NEP 2.0 is thus the framework, within which the Danish engagements will be implemented and contribute to reaching the national electrification targets. The GoE has initiated a series of actions towards transforming the regulatory framework and to promote the involvement of the private sector in the development and expansion of the national power sector. This includes the process of unbundling the entities responsible for transmission and generation and a partial privatisation of utilities. The Power Sector Reform (PSR) process is primarily supported by the World Bank. The PSR reform consists of 6 pillars focusing on the restructuring of the energy sector through e.g. unbundling and tariff reform. The current Danish engagements focusing on facilitation and promotion of IPP, system integration, strategic energy planning and modelling are in line with this reform and NEP 2.0

Further information on the progress of the Power Sector Reform will be provided during the Inception Phase, including the perspective for implementing parts of the reform within the next five-year period. The contributions from DEEP and other development interventions – in accordance with the sector-wide approach – will be highlighted.

Economic and political development impact on the energy sector

Stable and secure energy supply is vital for the development of Ethiopia, and thus has a strong political focus illustrated by the ambitious target for access to energy. Energy policy is also social policy as illustrated by the access for all agenda prioritised by the GoE.

The positive feedback from the GoE requesting continued deepened cooperation indicates a strong Ethiopian support to the partnership with Denmark, and Denmark is considered a strong strategic partner in support to pursue the National development policies and strategies. In addition, Denmark and the World Bank co-chair the Energy Development Partners Group (EDPG) under the Development Assistance Group (DAG). This enables a continuous and real time overview of interventions and a coordinated support from various donor organisations. Especially with regards to energy planning and modelling and securing donor coordination this is very valuable. A part of the energy donor group is a current focus on restructuring the group setup to further improve coordination in reaching the targets of the Power Sector Reform and the NEP 2.0.

The line-up of various reform plans in Ethiopia creates opportunities for DEEP to adopt the Build-Back-Better approach as the timing of the engagement coincides with processes of formulating concrete actions for achievements of the defined policy targets.

However, there are different geo and safety policy issues that may impact the political situation in Ethiopia. The Covid-19 pandemic had an immediate negative effect on Ethiopia and to the postponement of the planned general election in 2020. A new date for the election has been announced for June 2021. The International Monetary Fund (IMF) forecasts that in 2021 Africa will be the slowest-growing major region. In many countries it will take several years for GDP per person to get back to where it was before Covid-19.

The recent conflict in Ethiopia's Tigray region and the further development of the conflict impose a risk for the energy sector development and for DEEP. This underlined by the fact that this risks heightening tensions surrounding the country's hydroelectric power project, the Grand Ethiopian Renaissance Dam (GERD). Negotiations over the dam with neighbouring countries Sudan and Egypt have reached a crucial stage, but talks could be delayed while the Ethiopian Government responds to the ongoing crisis. Worryingly, the conflict has spread across the region.

Although the hydropower capacity will increase over time, its relative share will diminish as other electricity generation technology are developed (ref. International Energy Agency (IEA) Energy Outlook 2019, figure 6.1B) The power system supply on large amount of hydro resources makes it vulnerable to precipitation variations, with climate change, droughts and floods becoming more frequent. Lack of both short- and long-term planning has already caused such challenges. Capacity building within energy planning and modelling, integration of renewable energy etc. in MoWIE and EEP can enable integration of a larger share of variable renewable energy. It is noted that a result of the current cooperation is already that the load shedding has diminished substantially by improvements in the operations performance. The critical situation of power shortages experienced during 2019 has created a burning platform for energy sector administration capacity building with a high political attention.

However, it is anticipated that the energy sector will continue to be central, and thus also the support to the programme. Therefore, it is also crucial for the programme to be adaptive and to closely monitor the risks of the programme.

Key Danish strategic considerations

The participation from the Minister of Energy of Ethiopia in the current AWPGE Steering Committee meetings historically held four times annually is evident for the high political attention and priority of the current Danish cooperation. The high-level involvement emphasises the demand for Danish knowledge and expertise in an equal and trustworthy relationship.

As part of the identification process of the Strategic Sector Cooperation (SSC) programme and the preparation of the new climate and energy cooperation, the RDE and Danish Energy Agency (DEA) has conducted two inception missions in May and August 2019 seeking to identify the main challenges and opportunities in the Ethiopian energy sector. The missions have been supported by a number of additional missions by DEA identifying activities within the SSC programme and potential new elements in DEEP. Furthermore, the Embassy has conducted a mid-term review of the AWPGE programme, also providing recommendations for a future cooperation and extensively discussed the matter with the Ethiopian counterparts. The primary challenges identified is the expected large increase in electricity demand and the current low security of supply causing black outs and load shedding, with a hydro-based power system highly vulnerable to climate change.[11] Based on this, three areas for cooperation have been identified: (1) Energy planning and modelling through Choice Awareness; (2) Development of the wind energy sector; (3) Flexibility and system integration.

The high relevance of the Danish Ethiopian energy cooperation is confirmed by a mid-term review carried out in February 2020 of the AWPGE Programme. Here it was emphasized the

[11] The challenges and opportunities are described more closely in both the DAC Criteria and the Country context, Annex 1.

programme's high relevance to Denmark's ambition under the Paris Agreement to assist partner countries "decouple carbon emissions from economic growth through cost-effective mitigation actions". The MTR also found clear coherence between the strategic objectives of the AWPGE Programme and the overarching climate change and sustainability goals of the governments of Ethiopia and Denmark and supported the formulation of a second phase.

Denmark has more than 40 years of experience in development and implementation of energy policies in a partnership between public and private sector and civil society. This Ethiopian cooperation is through the establishment of a fruitful partnership with openness between the parties based on trust, flexibility, and mutual respect for the contribution by each party to the development of green solutions in the society. Through Danish policies and strategies, it has demonstrated that it is possible to decouple economic growth and the level of GHG emissions, resulting in a greener and sustainable development and growth. The partnership with Ethiopia involves the sharing of this experience and learnings. Thus, partnering with Ethiopia on the access to energy agenda is in line with Denmark's Strategy for Development Cooperation and Humanitarian Action, "The World 2030", the Danish Minister for Development Cooperation's four-year plan 2020-2024, the Government's 2021 Priorities for Danish Development Cooperation, the expected focus of the new Danish Strategy for Development Cooperation, to be launched in 202, the Danish Government's long-term strategy for global climate action 'A Green and Sustainable World' (2020), the Paris Agreement and the Danish SDG7 leadership.

The applied setup of government-to-government cooperation is following the current cooperation structure in Ethiopia and is a replication of the successful Danish cooperation approach with other countries with similar challenges. The partnership programme will also build on a clear recognition of the specific areas of Danish expertise and partnership modalities that best match the prioritised needs of the Ethiopian partners. The interventions are closely connected to Ethiopia's targets to providing 100% access to electricity, and hence also addressing poverty related issues.

Ethiopia's strong commitment to development through its CRGE strategy – not only in the energy sector but for all relevant sectors – is expected to open several opportunities for Danish companies especially in the context of the NEP 2.0.

By evaluating the intentions and targets of the Ethiopian CRGE and associated growth strategy it seems likely that it will present opportunities for Danish companies, though the Ethiopian market has some challenging framework conditions. The expected increasing mix of variable renewable energy will provide more opportunities for Danish companies as the need for private investments increase. Along with the AWPGE Programme, DSIFs activities and the GoE's policies will lay the foundation for increasing share of Danish businesses opportunities in Ethiopia. This is fully in line with the strategic objectives of the overarching climate change and sustainability goals of both governments. Denmark has a strong interest in sharing its experience with Ethiopia for mutual benefits, which will also contribute to Denmark's interest in achieving global climate goals and meeting SDG targets and securing opportunities for Danish green technologies.

2.3 Justification[12] for the Proposed Programme in relation to OECD DAC Criteria

The Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) has defined six evaluation criteria which serve as the reference frame for evaluating international cooperation projects and programmes and which are also a useful reference for the justification of the programme, as reflected in the table below.

Table 2.3 Programme justification related to OECD DAC criteria

Criteria	Justification
Relevance	• The Programme (DEEP) is considered highly relevant to the partner's needs as it is directly aligned to and supportive of the Ethiopian CRGE which is a development strategy that aims at protecting the country from the adverse effects of climate change and to build a green economy that will help realise its ambition of reaching low middle-income status before 2025. • The large increase in electricity demand in Ethiopia in order to support economic growth, requires a focus on the development of the energy sector in a cost-efficient manner with a high security of supply. The current situation with load shedding and curtailment of wind power will be addressed in the programme, focusing on long-term planning of the energy system, integration of variable renewable energy in the grid and the introduction of IPP's to the market to ensure a diversified energy system. • The programme is further and directly supportive to the Roadmap of the ongoing Ethiopian Power Sector Reform, which aims at tackling challenges such as need to improve quality of service, expand access and increase generation capacity, while achieving efficiencies in investment and operation, and leveraging public-private partnerships to mobilize resources. • DEEP gives priority to interventions where transformational change can lead to the development of an enabling environment for the energy transition. This includes changes in systems and structures aligned to Ethiopian priority needs, including designing scenario-based long-term energy plans and regulation and integration of renewable energy. • The support was specifically requested by the key-partner ministry (MoWIE) and during the formulation process the strong relevance to partner needs has been re-confirmed and articulated through a consultation process. • The Programme is also highly relevant to the global sustainable development agenda, including SDG7, SDG13 and several other SDGs as well as to the Paris Agreement on Climate Change.
Internal and external coherence	External coherence: • DEEP interventions have interlinkages to other activities being carried out by other government institutions in the sector. As example can be mentioned the initiatives implemented with support from the European Union, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the World Bank (WB) and the African Development Bank (AfDB) on scaling up utilization of solar power – the same framework will be used for the introduction of wind IPP's. Coordination will continue – as under the SSC and AWPGE - with other international cooperation projects and programmes to align these with DEEP and to avoid duplication of effort. This coordination with other international cooperation

[12] While this may not be directly related to the OECD DAC criteria, DEEP is highly relevant to Danish development priorities as articulated in "The World 2030" (its section 2.6 focuses on SDGs 7 and 13 in transition and growth economies and in global public goods/Danish key issues) and to the Guiding Principles for the Danish Climate Envelope. The focus on RE is directly relevant to the Danish Government 's priorities for development cooperation including the green ambitions and strategic importance of SDG7 contained therein. The Project is also highly relevant to Danish strengths, interest and opportunities for engaging Danish public and private actors. This is illustrated by the strong role played by DEA in SSC where experience from the Danish energy model and its emphasis on RE has been demonstrated and applied in reponse to partner needs.

Criteria	Justification
	partners will be ensured under the leadership of the host government, the RDE's co-chairing of EDPG and will be monitored by a programme Steering Committee. • Coordination with international donors and organisations collaborating with the neighbouring countries and under the East African Power Pool will contribute to coherence at a regional level. • Successful achievements made by the Danish engagement can already be measured by the strong relationship that has been developed with other donors and multilateral development partners through the AWPGE and SSC as well as the regular consultations taking place at ministerial level. Internal coherence: • The proposed approach of the DEEP design is continuously integrating the concept of Doing Development Differently in the programme and in the broader Danish support to Ethiopia. This is exemplified by linkages between DEEP, DSIF as well as multilateral activities like NCE where appropriate. It is the Danish ambition to continue linking Danish instruments to securing the best possible impact of the broad Danish engagement being bilateral and multilateral for the benefit of the Ethiopian National targets. • The mechanisms of cooperation have already been set-up under the ongoing AWPGE, SSC and the Steering committee/management structure has demonstrated flexibility to allow adjustments in programme activities – and to utilise the complementarities of the different Danish instruments. Especially, as the Minister of MoWIE and the ambassador of RDE are heading the SC, important experiences and lessons learnt from e.g. AWPGE and in the DSIF Assela project are utilized.
Effectiveness	• Effectiveness – is the intervention achieving its outcomes - is best evaluated when implementation has begun and towards the phase out of the action. However, it can be noted that the programme's cooperation modality of peer-to-peer exchanges of good practice and learnings from mistakes will help to facilitate effectiveness by making use of the DEA's experience from cooperation in other partnership countries – keeping in mind the special Ethiopian context and requests. • Earlier reviews of this approach have concluded that processes and structures have been built and enabling the partners towards achievements of the overall objectives. • Capacity Development will constitute a large part of the engagement. It will partly be carried out in the form of peer-to-peer experts exchange and there will be room for reflexions on how analytical work and results can be translated into policy tools and regulations. Deployment of Danish Long-term Advisors (LTAs) are key in the approach. Demand driven training will be identified during the course of implementation. LTAs will, because of their continuous presences and close engagement with partner staff be able to promptly identify gabs and need for training.
Efficiency	• Efficiency – is the intervention achieving its outputs in an economic and timely way, thus using the funds and resources in the most cost-effective way. • Lessons from other similar partnership programmes have shown that the combination of a Sector Counsellor at the Embassy, DEA short-term inputs, embedded LTAs and external consultants, can provide a flexible and efficient package of support in long term partnership for transformational change. • The use of Terms of Reference (ToR), jointly formulated by the partners, to define the best combination of inputs for each major task in the agreed work plans will further enable attention to efficiency in resource utilisation. And while it is recognised that Danish TA is comparatively expensive, the proven model for DEA's energy partnerships and DEA's experience from such cooperation in over 15 countries will further facilitate efficiency in delivery of technical assistance under DEEP.

Criteria	Justification
	• The mechanisms of cooperation have already been set-up under the ongoing AWPGE, SSC and the Steering committee/management structure has demonstrated flexibility to allow adjustments in programme activities – and to utilise the complementarities of the different Danish instruments. Especially, as the Minister of MoWIE and the ambassador of RDE are heading the SC, important experiences and lessons learnt from, e.g. AWPGE and in the DSIF Assela project are utilized. • Successful achievements made by the Danish engagement can already be measured by the strong relationship that has been developed with other donors and multilateral development partners through the AWPGE as well as the regular consultations taking place at minister level. • Current energy models, planning and policy data are not fully consistent, and targets are not sufficiently aligned across institutions in Ethiopia. It is an explicit focus of DEEP to strengthen and align energy policy and planning among stakeholders, which can contribute to major efficiency gains.
Impact	• Access to affordable, sustainable and modern energy is high on the Ethiopian agenda and a central element for reducing poverty, improving industrial productivity and creating jobs for a young and fast-growing population. • The programme will have a focus on supporting the power sector transition process, which in turn will support a sustainable economic development. The focus on developing the power system along with the increase in demand will further enable it to integrate variable energy sources. • The programme's focus is on supporting the national energy sector transition, which is a fundamental requirement for developing a sustainable and green economic growth through a cost-effective power system and job creation in the RE sector and its contribution to public health through reduced air pollution and low GHG emissions[13], and to the country's energy security. Traditional biomass currently accounts for more than 90 percent of total primary energy in Ethiopian households – primarily for cooking using i.e. charcoal and firewood. In addition, the energy sector development contribution on green growth and job creation in the country as a whole through stable and secure electricity supply. • A continued low GHG emission from the increase in power demand/generation will be ensured through the focus on RE investments from both public and private sectors. • Ethiopia will through the intervention be in a better position to meet the national energy demand in a sustainable way, contribute to achievement of its NDC goals, and the achievement of SDG7 and SDG13.
Sustainability	• As part of the ToC, impact drivers have been identified and will be used pro-actively in programme implementation. These include the ministerial high-level engagement and at strategic levels including direct communication with decision makers. • Strong focus on partner ownership to the programme's activities and results are advised to continue to be incorporated into partners annual work plans, as it is seen in the SSC within MoWIE. • An exit strategy will be jointly formulated by RDE, DEA and MoWIE in preparation for the required MFA mid-term Review of DEEP, which will assess and recommend on the exit of Danish support. Successful exits normally require a realistic period and therefore this engagement is longer than earlier provided support. Considerations such as "train the trainer" is already being requested by the partners and will be initiated.

[13] It is noted that the current GHG emissions in Ethiopia from the energy sector is already low, and therefore the direct target of DEEP is to contribute to increase the electricity supply while maintaining the low GHG emissions.

Criteria	Justification
	• Experience from other similar projects and programmes indicates that the chosen technical assistance (TA) and capacity delivery model with embedded LTAs is likely to enhance effective partner uptake leading to sustainable results. This is ensured through careful selection of the candidates for both the LTA and short-term advisors in addition to the recommendation of the AWPGE MTR on clear targets for the LTA's.

2.4 Lessons Learned from Previous and ongoing Collaboration.

Lessons Learned from earlier engagements.

The current AWPGE Programme has supported the GoE in pursuing wind power expansion and integration of variable renewable energy. Integration of variable renewable energy – such as wind – into the system, demands good planning to ensure that the power system is in balance. As the energy mix in Ethiopia broadens, planning of the power system is needed but also modelling to forecast how the system may or will evolve, if or when different wind opportunities are pursued. Therefore, as the activities under the Danish - Ethiopian cooperation on accelerating wind power are advanced, the subsequent steps on planning and modelling are highly relevant and needed as follow-up activities. The initial steps in this process have been captured in the SSC programme on energy planning and modelling. The strong partnership has created a trust-based relation between the Ethiopian and Danish partners, which has spurred the request for expanding and deepening the scope of the cooperation.

The initial and current program period of AWPGE has been extended twice until end of June 2021. A lesson learnt is hence that the working plans have been too ambitious. Similar observations have also been made during MTR of DEA's bilateral corporation with other partner countries. This is why the new programme is proposed to be a five-year engagement to make it more robust and flexible and based on adaptive management. Recommendations from the MTR of the AWPGE Programme are also being followed.

The AWPGE MTR points to important lessons learnt about the design and subsequent implementation of a new programme, especially with relation to programme management and monitoring and evaluation. Hence, in the formulation of DEEP special attention has been given to formulate and agree on measurable targets for various stages under each of the defined outcomes that constitutes the engagement with Ethiopia. Also, in line with the MTR's comments, the expected contribution by LTAs and short-term experts are linked to the ToC as well as incorporated into the result framework. Still, as part of the proposed LTAs and short-term experts' assistance will be demand driven – in light of the flexible approach to the engagement – specific attribution to all deliverables will be defined as the needs are emerging. Subsequent to the MTR's recommendations on enhancing the level of monitoring an improved approach has been developed and put in place in the AWPGE programme that will be carried over to the new programme.

DEEP will furthermore complement and take over the activities of the SSC, when this programme ends in Q1 2023. A primary output of the current partnership is the Ethiopian Energy Outlook which is an important element in the development of the Ethiopian energy system and support to this output development is key. The outlook can also serve as a basis for the Ethiopian input to future IEA Africa Energy Outlook. The development of the Ethiopian Outlook will be carried out repeatedly and the methodology and the analysis developed and refined. To make the long-

term change an in-depth effort will be made to enable the Ethiopian partners to perform and develop the capacity to do long-term energy planning themselves.

DEEP programme will also benefit from the experiences gained from DSIF Assela 1 (and the preparation of the possible Assela 2) windfarms. These projects will, in addition to an increase in power production, be a valuable input for the development of the Ethiopian wind sector and an excellent supportive supplement for the remaining Danish activities. Several aspects are linked to this activity like the approach on Social and Environmental impact assessments, tendering procedures, concrete experience on the integration of wind into the system. As wind tenders are new to Ethiopia, especially the methodology/experience from Assela will provide many lessons learnt that can be built upon in DEEP. Including the fact that Assela will be constructed and be on grid during the first year of DEEP. In addition, linking the usefulness of a technology catalogue to sector development but also to stakeholder engagement. The latter was introduced in the AWPGE programme as other activities were delayed. The adaptive management approach will enable the programme to support new requests for support, set forth by the GoE, that goes within the scope of the designed programme, but is not directly included. An example from the current AWPGE is the newly emerged challenge with the electrification of the railway lines and grid integration, where Energinet's expertise and knowledge is required and demanded by the Ethiopian partners. It is found that the government-to-government approach goes hand in hand with flexibility and adaptive management as the trust and equal partnership is profound and increase the willingness from the Ethiopian partners to engage Danish institutions in new urgent challenges.

2.5 Considerations on Danish Strengths and Interests

Denmark has demonstrated that it is possible to decouple economic growth, GHG emissions and energy consumption, resulting in green growth. Wind energy contributed to 46% of the electricity consumption in Denmark in 2020 and by 2030 the entire Danish electricity supply will be covered by RE coming from primarily wind and solar.

The Danish energy model has demonstrated the importance of political agreements with a broad consensus in the parliament, which serve as a basis for setting and achieving ambitious long-term targets. A key feature of the model is also a holistic view based on an energy agreement as a roadmap for development of energy supply and demand and long-term energy planning, including the use of models and scenarios. Regulation and targeted investments and support for RE is provided through synergies between taxation schemes and policy. Public-private sector cooperation has fostered important innovation and breakthroughs in the Danish energy concepts and systems and led to public engagement and acceptance, as well as general public support for the energy sector transition. An effective integration and support for renewable energy sources in Denmark combined with a well-functioning open power market with other countries in the region is key to maintaining a very high security of electricity supply closely linked to significant cross border connections. Also important in the model is power generation system flexibility combined with the integration of high levels of variable RE and advancement of the Levelized Cost of

Energy (LCOE)[14] approach; and a broad and integrated one-stop-shop mandate of DEA to regulate the market and deliver on the above features of the Danish model.

Denmark has a strong interest in sharing these experiences in a partnership with Ethiopia for mutual benefit, which can also be seen as Denmark's contribution to achieving global climate goals and meeting the UN SDGs. The Danish private sector is already – to some extent - engaged in Ethiopia, and the Ethiopian market for sustainable energy solutions could be of future interest to the Danish resource base. Over the recent decades Denmark's tradition with an active civil society on energy related issues has also been important in achieving the high levels of RE and building on this experience. Denmark will, through its cooperation in Ethiopia be cognisant of opportunities for engaging civil society in programme activities. In the current AWPGE programme in the development of the technology catalogue – in cooperation with MoWIE – universities have been invited to take part in the development of the catalogue. A similar approach can be used towards involvement of the civil society. This can possibly be done together with other development partners e.g. at the Nordic level, but also within the EDPG. In this context, the traditions and normal practises of civil society involvement in Ethiopia and in relation to major infrastructure interventions will be subject for further analysis by the appointed experts and combined with the insights of the RDE.

The principles of Danida's HRBA have been referred to when considering the stakeholders and partners during the programming phase. DEEP continues partnering with government institutions. This implies that the monitoring of the implementation of DEEP will also refer to the tools developed under HRBA where that human rights standards define the desirable outcome, and human rights principles ensure the legitimacy of the process. The immediate application of addressing issues as non-discrimination, participation and inclusion, transparency and accountability will be in context of identification and development of wind power sites. In the concrete development of wind sites, at programme activity level, it would be required to introduce Human Rights Due Diligence as a way to mitigate potential adverse impacts to human rights. In addition to this the access to energy agenda (SDG7) will promote transparency and accountability in the energy generation.

2.6 Relation to other relevant Partners and Actors

In Ethiopia there is a large donor community within the energy sector, and the general impression is that the various on-going engagements are well-coordinated through the EDPG. The group includes around 20 Development Partners (DPs) that meet regularly to share experiences and updates, coordinate efforts and provide a forum for continuous dialogue with the GoE. The group is co-chaired by the World Bank and RDE in close coordination with the State minister for energy at MoWIE. The EDPG coordinates towards the targets in the NEP 2.0 and the related Power Sector Reform with sub-sector working groups for in-depth coordination e.g. on renewable energy generation and IPPs.

[14] The LCOE Calculator is a tool to estimate and compare the socio-economic electricity production or saving costs in a simplified manner using localized data and estimates. Based on internationally acknowledged methodology, the LCoE Calculator permits comparison of different electricity production technologies based on nuclear, fossil or renewable energy or energy efficiency.

Most relevant to the thematic topic of the proposed DEEP are the development partners such as USAID (PowerAfrica), AfDB and the World Bank who support the transition of the energy sector and are the largest programmes in terms of budget volume. See below outline of the most relevant development partners and their efforts related to DEEP. Other donors like the European Commission and GIZ are also active partners, but not directly linked to DEEP.

Development partner	**Relevant efforts related to DEEP**
World Bank IFC	• Agreement with GoE on adoption and implementation of a power sector reform roadmap under the budget support program. • Support to the GoE's Macroeconomic Committee which is overseeing the development of the power sector reform roadmap and financial recovery of the power sector. • Agreement with GoE on multi-year, cost-reflective power sector tariff reform program for ensuring financial viability of the sector under the budget support program. • Part of the AWPGE ESMAP wind measurement campaign • Transaction Advisory support for solar and wind IPP project bidding process
AfDB	• Technical assistance and capacity building to MoF PPP DG • Development of roadmap for PPP in Ethiopia • Trainings for staff at PPP DG and related stakeholders
USAID	• US Treasury Department advisor within MoF PPP Unit to help develop capacity and accelerate their ability to assess and prioritize bankable PPP projects. • Technical assistance to GoE to streamline the IPP process: close regulatory gaps, clarify and streamline licensing and permitting procedures, clarify the mandate of PPP Unit and establish procedures for interactions between GoE entities. • Provide embedded advisor to EEA to support IPP development process, including establishment of single window for IPP projects. • Least Cost Network Expansion Planning using Geospatial planning framework for EEU. • Least cost generation expansion planning
IEA	• Recently initiated activities in Ethiopia with a focus on statistics and data in relation to energy modelling. In addition, introduction of the need and use of energy modelling across Ethiopian ministries.

The early programming phase included meetings with these partners to ensure synergies and to avoid potential overlap or duplication of efforts for the next phase of the cooperation. This linkage between the DEEP activities and other development partner's activities are important for the programming of the DEEP. During the phase of programming the DEEP, interviews were conducted with representatives from the USAID. These interviews revealed that new initiatives were under development by the USAID, but the details could not be disclosed. It is therefore crucial that continuous efforts are made to make sure that other donor programmes are in line with the overall objectives of the DEEP and vice versa. The assurance of this will be closely monitored by the RDE.

As part of the implementation of the current programmes active DP dialogue is ongoing. Starting with the AWPGE there has been a close relationship with the WB and the International Financial Corporation (IFC). The wind tender approach was, in order to build on previous experiences, closely linked to the WB scaling solar IPP approach. This was widened by using the World Bank's Energy Sector Management Assistance Programme (ESMAP)[15]for the wind measurement campaign – again to use the activities proven on the ground. Through ESMAP a number of masts were collecting wind data from 17 potential wind sites. Based on the co-chairing between RDE and WB, and the close link from the DEEP to the power sector reform activities, activities in the new programme will continue to be in close coordination with the WB. Furthermore, EEP has chosen IFC as the transaction advisor for the wind tenders and alignment of the Danish technical assistance and capacity building with IFC's transaction process – as requested by EEP.

Donor coordination will also be relevant for the long-term planning and energy modelling component (outcome 1). In addition, the International Energy Agency has commenced work on energy statistics and data collection, where synergies have been discussed and a cooperation will benefit the value and efficiency of the modelling activities. In addition, it is also considered that the IEA with its state-of-the-art expertise on energy outlook scenarios can peer review the Ethiopian Energy Outlook. Similarly, the USAID/Power Africa is working on generation capacity modelling particularly within EEP. This is a different but complementary activity to the Energy Outlook, but close coordination will be important.

The DP co-chairs together with the State Minister for energy are currently restructuring the EDPG subgroup structure to secure the right links to the power sector reform process and to secure as much complementarity as possible.

In addition to the above further coordination is being explored with other Danish multilateral engagements. Building on the experience with the Assela windfarm, where AfDB conducted a feasibility study for Assela 1. In the same manner - as mentioned above - the Danish will support NCE's work with the NPC on overall planning and modelling for climate targets complements the SSC and DEEP work within MoWIE and EEP and will thus secure synergies between the overall Danish engagements. This is also the case with International Renewable Energy Agency (IRENA). The organisation has a strong focus on the transition to renewable energy and serves a principle platform for international cooperation with a repository of policy, technology, resources and financial knowledge on renewable energy. The work of the organisation will be followed in order to identify possible linkages or input to DEEP.

[15] ESMAP is a partnership between the World Bank and 19 partners (including Denmark) to help low and middle-income countries reduce poverty and boost growth through sustainable energy solutions.

3. Presentation of the DEEP Programme

3.1 Overall Objectives and Outcomes

The Ethiopian power sector is growing at an unprecedented rate - more than a doubling of electricity supply in 8 years (2010-18)[16]. Additional generating capacity is needed in order to support strong, broad-based economic growth, which before the Covid-19 pandemic averaging approx. 10% per year. This has now been halted by the Covid-19 pandemic and the current instability in Ethiopia. However, the energy demand will continue to rise, and the energy sector will continue to be of importance in a post pandemic period. To accommodate this transformation, substantial investments and reforms in the energy sector are needed. Not least to address the key challenges:

- Access to electricity,
- Security of energy supply,
- Least-cost development of the energy sector,
- Future power generation mix based on security including climate resilience, local resources and cost effectiveness.
- The ambition of Ethiopia regarding its role as a regional energy hub (East African Power Pool), seen in the perspective of challenges with system integration.

The overall objectives and outcomes of DEEP are summarised in the table below:

Table 3.1 – DEEP Objective and Outcomes

Programme	**Enhanced Danish-Ethiopian Energy Partnership (DEEP)**
Programme Objective	To support the development of the Ethiopian government structures and systems that in a sustainable and cost effective way improves access to renewable energy (SDG 7) and hereby supporting the Ethiopian vision of building a Climate Resilient Green Economy while reaching lower middle-income status by 2025. To support the expected increase in supply to accommodate energy demand by enabling an environment for investment, cost-efficient electricity system planning to increase security of supply.
Outcome 1	**Choice awareness in energy sector development;** Ethiopia has introduced "choice awareness" in the decision-making process and taken ownership of an Ethiopia Energy Outlook. Choices in energy planning activities are guided by transparency and state-of-the-art analyses, including clear descriptions of challenges, and neutral analyses of alternatives (scenarios) supporting the policy development of the energy sector.
Outcome 2	**Onshore wind energy development** to promote and create an enabling environment and transparent framework for lowering the cost of onshore wind power using best available practice in planning, procurement and cost reducing measure to continue the implementation of the ambitious Ethiopian wind energy targets.
Outcome 3	**Integration of variable renewable energy;** Regulatory framework and flexible options in the power system supports the efficient and secure expansion of renewable energy and a diversified energy mix fully integrated with the region.

[16] Source IEA:

https://www.iea.org/data-and-statistics?country=ETHIOPIA&fuel=Energy%20supply&indicator=ElecGenByFuel

After recommendations from the appraisal team, the results framework will be amended during the Inception Phase based on the probable development of the risk situation and the anticipated programme results as derived from the preparation of work plans (see Section 3.5) in order to follow the adaptive management approach. Below is an overall presentation of the three different outcomes.

Outcome 1: Choice awareness in the energy sector development

Energy modelling and planning is an important element in creating a clean, stable and secure energy supply. Planning long term allows Ethiopia to achieve the ambitious targets for 100 % electricity access through least cost development of sustainable energy.

Previously most of the GoE decisions on the planning of the energy system have been based upon external reports. These reports did not enable the GoE to analyse and make their own conclusions, as the underlying assumptions have been unavailable to them. The SSC has started the important work of building modelling capacity in the governmental institutions.

The DEEP will build on the platfom created in the SSC where a dedicated modelling team was created, consisting of both engineers and economists from MoWIE and EEP respectively. Thereby creating a joint Ethiopian planning platform with the staff trained to use energy modelling tools on a continued basis in order to deeply root the capacity in the institutions. To further enhance the transfer of knowledge between the national institutions, the aim is to engage the universities by demonstration of gained knowledge and continued involvement. Consultations with universities in Ethiopia have confirmed that university leaders are interested and see themselves in important roles in ensuring both common interests in the topic but also in ensuring that competences are developed for the overall benefit of the nation's sustainable energy supply development. When well-established within MoWIE and affiliated institutions, the programme will explore the possibility of assisting universities in developing curriculum within the field of energy modelling – to secure the future experts and create a sustainable change. Secure energy supply, through appropriate planning, will benefit the development of the country. This will imply an indirect effect on job creation, not least for the increasing youth generation, but also a direct effect by creating an important link from universities to possible employment within the government administration and energy sector in generel.

Developing modelling capacity in-house will be a signifiact change to the foundation of policy development, bringing choice awareness to the decision-makers. But also providing the government administration with the tools needed to develop the regulatory framework for the energy sector development in addition to delivering needed input to the countries future development. The ability to conduct planning and modelling of the energy sector is central for the ability to carry out appropriate sector regulation and legislation.

A power sector model has been developed in Balmorel – an open source, least cost tool. Balmorel is a bottom-up partial equilibrium energy system optimisation model with a special focus on electricity and district heating sectors and is widely used in both the public and private sector.

One of the most important tools to address the challenges and influence policy action is the development of Energy Outlook Reports (EOR) for Ethiopia. The EORs are based on well-documented and detailed modeling of the energy system. The first Ethiopian EOR is expected to

be published in 2021 as part of the SSC programme. This Outlook focus primarily on modelling the power sector using the Eastern African Power Pool (EAPP), thereby including import/export to neighbouring countries. There is further a strong interest and request from MoWIE to broaden the scope of the Energy Outlook to a Climate and Energy Outlook, thereby including more sectors for a complete green transition. This means potentially to include other sectors like agriculture and further develop currently included sectors like transport to have a solid outlook describing scenarios for reaching the Ethiopian climate and energy targets. Broadening of the EOR scope needs to be discussed and carefully assessed with the partners along with the frequency of its publication. EORs will continue to be developed in DEEP with the purpose to guide decision makers and energy planners to achieve a sustainable green transmission of the energy system and to foster a wide consensus and understanding of Ethiopia's energy challenges and opportunities in the long term.

Outcome 2: Onshore wind energy development

With a high dependency on hydropower in Ethiopia, the expansion to other renewable eneryg sources is necessary in order to increase security of supply with the threat from climate changes and lack of rainfall. Development of the onshore wind energy sector in Ethiopia can support such change increasing the diversity of the energy system and taking advantage of the vast wind ressources available in Ethiopia.

In order to promote and create an enabling environment and transparent framework for lowering the cost of onshore wind energy, introducing best available practise in planning, procurement and cost reduction is necessary to continue the implementation of the ambitious Ethiopian wind energy targets. There is only four working wind parks today with a total capacity of 324 MW and of varying quality, establish according to the EPC modality (Engineering, Procurement and Construction). In the AWPGE 18 sites have been part of the wind measurement campaign and a more strategic approach to the usage of the sites is necessary for efficient planning. Planning and wind resource assessment, using spatial planning tools to explore the resources and also create a link to the modelling activities is the first steps towards developing an onshore energy sector in Ethiopia.

The introduction of the Power Sector Reform (PSR) supports the introduction of IPP's to the market and the expansion of private sector participation has been institutionalized through the Public-Private Partnership Directive, approved by MoF in 2018. The PPP Act is fully functional. The ground for private sector investment in wind sector through promotion of IPPs is gaining momentum. A number of sites have been identified for on-grid wind farms and the first two sites have started the tender procedure process as part of the AWPGE program with support from both DEA and IFC/WB. This process will be continued in DEEP with a timeline that goes will into 2022. The development and procurement of wind energy projects requires a regulatory, institutional, and financial framework that streamlines pre-development of wind projects reducing risk for investors and lenders. Activities such as an institutionalisation of IPP activities and capacity building in EEP and MoWIE on the development of an efficient wind tendering process will together with the planning activties create an enabling environment for lowering the cost of onshore wind power.

It is thus a high priority for the GoE to expand the electricity generation capacity in order to respond to the increasing domestic demand and reach the economic development objectives,

while fulfilling the ambition to export electricity to neighbouring countries. The planned capacity expansion will have to be more diversified and geographically distributed for a more climate-resilient power system, with an expected increase in the share of wind, solar and geothermal power generation.

Outcome 3: Integration of variable renewable energy

This outcomet will develop EEP's (the national TSO) capacity to create and or improve the regulatory framework, in the power system to support cost-effective security in supply with a rising share of electricity from variable renewable energy. This will be accomplished through the development or enhancement of grid codes for increasing renewable energy penetration, changing load patterns for promoting efficient operation of the network; developing better tools for forecasting, scheduling and dispatching variable renewable energy sources and ensure that these are applied.

There is a need to strengthen or create the regulatory framework for integrating large shares of variable renewable energy sources, thereby improving the capacity to forecast production in conjunction with the ability to ramp the hydro power plants up and down allowing variable renewable energy sources to be used at their full capacity. If these measures are not in place, the grid and energy supply in Ethiopia will be very vulnerable and will hamper economic and social growth dramatically. The activities in the DEEP programme are therefore essential for implementing SDG7 objectives and support the Ethiopian targets for 100% electricity for all.

The DEEP will build in the activities and experiences learned in the AWPGE where Energinet used twinning as a measure to do capacity building directly with their colleagues in the NLDC.

In DEEP, through Energinet, Ethiopia will get unique access to experts that can assist the NLDC in optimizing renewable energy integration. The assistance will include: promotion of greater flexibility in the power system, removing constraints on the integration of variable renewable energy and thus reducing the losses caused by "curtailment" (where energy from variable sources, such as wind and solar, cannot be used in the grid and is therefore wasted) which results in unnecessary loss of income for the government; development of a regulatory framework that will ensure the security and quality of power system operation and permit increased integration of variable renewable energy into the network, including technical requirements for connection to, and use of, the grid (so-called "Grid Codes"); assistance in and updating solutions for flexibility in power generation and demand-response to optimise variable renewable energy integration; and, assistance to NLDC in the design and application of forecasting and monitoring tools for optimal variable renewable energy integration.

The result will be that the share of variable renewable energy in the Ethiopian energy mix will be significantly increased. Losses of energy will be reduced and the security and predictability of the market and the access to the grid will encourage the private sector to invest more in renewable energy. The overall outcome will be a faster transition towards a low carbon energy system and greater national energy security. A more flexible energy system with low curtailment rates will ultimately contribute to lower energy intensity of the economy (less energy is used per unit of GDP), but also raise awareness the socio economic negative impact caused by "losses of energy". This can be done through training and development of the human and institutional capacity of the authorities in Ethiopia responsible for operating the grid and by ensuring a market based

energy system giving priority to renewable energy in the national grid ultimately supporting SDG13.

3.2 Theory of Change, key Assumptions, Impact Drivers, and Risks

The overall theory of change (ToC) is that a Government-to-Government sharing of the Danish energy model and transition experience will assist and enable Ethiopia to more rapidly attain its energy and climate goals and support the Climate Resilient Green Economy strategy - an important step to achieving the status of a lower middle-income country where there is 100% access to electricity. The government peer-to-peer sharing will also support the overall objectives of the Danish "Climate Envelope", which are to:

1. Assist developing countries to adapt to climate change,
2. Assist developing countries with the transition to a low carbon economy, and
3. Prepare developing countries to enter into and implement the new global climate agreement, agreed at COP21[17] in Paris with a view to sustainable development.

The specific impact that is targeted by the Climate Envelope is the following:

- Reduced greenhouse gas emissions
- Increased climate resilience specifically for vulnerable and marginalised groups

To achieve this impact Climate Envelope interventions will address the following outcomes:

- Strengthened national and community-level climate change policies, planning frameworks and information systems
- Scale up of climate-relevant technologies, infrastructure and markets
- More consolidated, effective and ambitious international climate architecture

In the following, the ToC in the programme context is further elaborated through responses to some strategic questions.

What are the changes the programme wants to contribute to?

The programme aims to create change in three areas as defined by the outcomes: creating choice awareness in the energy sector through long-term planning, developing the wind energy sector, and ensuring power system integration;

- Within long-term planning and modelling the programme aims to enable the Ethiopian partners to make decisions on an informed basis to increase security of supply of the energy system. Through capacity building in scenario-based energy planning, the current fragmented and inconsistent planning and target setting with little coordination between institutions will be changed and lead to a solid foundation for energy sector decisions regarding i.a. cost, diversification (introducing solar and wind) and regional market scenarios.

[17] The 2015 United Nations Climate Change Conference.

- Within the Wind Energy Sector, the programme aims to contribute to a continued high RE share with a consolidated energy mix in the national electricity system by developing capacity, removing barriers and have a clear planning for how to utilise the abundant wind resources. Within regulation the main focus will be on improving the environment for private and public wind sector investment. Thus, there will be a focus on RE tendering procedures and on streamlining the development clearances and procurement while reducing risk.
- Within power system integration the aim is to increase the levels of variable renewable energy in the power system and optimize flexibility of the power system through forecasting and maintenance, consolidated grid codes; pricing of energy sources for system optimization; incentive schemes for improved flexibility in the power plants thereby accommodating for the expected increase in electricity demand and electrification.

How will change happen in the specific context?

In concrete terms the expected change will happen through government-to-government cooperation between key partners in Ethiopia and in Denmark. Through the exposure to the Danish experiences (good and bad) and supported by a range of technical assistance initiatives to transfer good practices and lessons learnt to the Ethiopian context it has proven fruitful and effective in the current cooperation. A key success factor in the AWPGE and SSC engagements has been the continuity of the partnership through Long-term Advisors that have close interactions on a nearly daily basis with both decision makers as well as technical and administrative staff. Hence the capacity building is holistic and within several levels in the organisation. This approach is maintained overall, while the topics for development are deeper and more comprehensive compared with these previous AWGPE interventions. In addition to this, concrete interventions will be to arrange a number of study tours, possible short secondments to Denmark and short-term inputs by Danish experts in Ethiopia. The capacity building will for several activities be carried out in a learning process, where results from analytical processes will be evaluated and discussed with partners to see how these analytical results can be translated into more concrete policies and actions. As part of the inception phase further information about the cooperating partners' institutional set-up and capacity; and that a capacity development assessment is undertaken during the inception phase which would then provide the background for the various training activities.

In addition to this and in line with DDD, also the Danida Fellowship Centre training facilities will be targeted in supporting the objectives of DEEP. Other interventions or "measures" may also be needed based on the demands that emerges during the cooperation, but they will be based on the approached (peer-to-peer cooperation) that are adopted in the achievements of the main outcomes already specified. This will be pursued by the Danish engagement in Ethiopia through interventions and taking relevant experiences and learnings further and linking them to other actions at bi- and multilateral level. This is closely linked to the Danish effort as Green Frontline Mission in Ethiopia.

What is the role of the key national partners in the change process?

The programme will be aligned to the policies, strategies and plans of the Ethiopian government and partners. The role of the Ethiopian partners – to ensure an effective change process – is that of leading on the implementation of their strategies and plans with the support of the programme. The implementation of National strategies and plans involve considerable financial and human resources from the partners and through the ongoing cooperation there has been a good and

mutual understanding of this assumption and the programme has an opportunity to maintain a continuity in the approach.

The key partners will internalise the relevant approaches of the Danish model and where possible apply them to their area of work consistent with their mandate and with the support of both long-term and short-term advisers from Denmark. At Ministry level the Ethiopian partners will engage in bilateral climate dialogue with Denmark through the RDE and also other international actors for mutual learning and engagement in developing responses to energy and climate challenges. Key-partners have been pro-active during the programming by identifying gaps in their organisation's competences. Management skills and competencies among key-partners decision makings have been pointed out. This illustrates a good understanding of the role that the key partners have in a change process.

What are the prerequisites that must be realized before the goal is achieved?

The key conditions are that the Ethiopian partners continue to find, that elements of the Danish model are useful and that these elements can be adjusted and successfully transferred to the Ethiopian context. Building on the achievements and experiences from the current cooperation, milestones for the DEEP programme must be identified and planned during the inception of DEEP, where the Danish and Ethiopian partners are reviewing and evaluating the effect of the interventions of applying the concepts and measures of the Danish Energy Model, both in techncial and institutional terms. When the partners, during a continuous review process are concluding that there are positive impacts to notice – that means for example the results of the planning and modelling processes are initially integrated into policies and decisions - the conditions are realized and pointing towards an achievement of the overall goal. The programme will build on the current government-to-government cooperation, using Danish experience to develop the use of convenient planning and operational tools and systems.

Who are the key partners that need to be engaged for this change to happen?

Ethiopian key partners under Outcome 1 will include MoWIE and the affiliated institution EEP, and the expected EDC (long-term planning, modelling, forecasting). MoWIE is responsible the overall development of regulatory frameworks, strategies and policies for the energy system in Ethiopia. EEP is MoWIE's affiliated institution and the state-owned electricity company and TSO. Outcome 2 will be MoWIE and EEP (wind and tendering) and MoF PPP directorate (IPP's and tendering). For Outcome 3 the partners will be MoWIE and EEP and NLDC (forecasting, grid integration, flexibility), EEA and EEU (regulation, market development and enabling environment).

What is within and beyond the influence of the key programme partners?

There is demand and good levels of commitment by all relevant parties, hence the activities and outputs are to a large extent within the sphere of control of the programme. The outcomes are within the sphere of influence as it is more difficult to ensure that the outputs created will be used and applied e.g. that the modelling capacity will be used to improve reporting and will be used to support improved decision making in practice. The effectiveness of ongoing public sector reforms and political and macro-economic situation will influence the attainment of outcomes and ultimately impacts related to increased RE and energy supply. These factors and elements of the political economy and influence of vested interests against the programme aims are to a large extent beyond the programme.

What assumptions are relevant for the change to happen?

A key assumption between outcomes and impacts is that Ethiopia retains ambition and commitment to a continued high share of VRE in the energy supply and to adhering to the NDC targets and the Climate-Resilient Green Economy strategy.

At institutional level, it is assumed that partners are committed to sustain engagement and willingness to allocate staff time and inputs in-kind to engage effectively with Danish advisors and experts. It is therefore important to reflect on this aspect and draw experiences from the current AWPGE and SSC programmes. It is also crucial that Ethiopian partners find value in the strategic cooperation with Denmark for informed decision-making to achieve Ethiopia's goals. As a result of recognising this value, all partners are expected to engage effectively throughout the programme and benefit from peer-to-peer government exchanges of good practice. This will be monitored as part of the adaptive management approach following which changes may be agreed. The commitment needed from both sides and adaptive management will also be part of the DEEP Government Agreement. It is noted that the main thrust of the programme is to develop capacity in areas where the partner organisations are less experienced and where the Danish organisations are strong or have proven experience to share and transfer. The main areas where this takes place are wind energy market development, scenario planning and integration of renewable energy. Although there are gaps in knowledge and skills, the Ethiopian partners in general have absorption capacity in terms of numbers of staff, their qualifications and experience in the energy sector. The programme will build on the current programmes and the lessons learnt during these engagements. The main issue is not the inherent absorption capacity but on whether the programme is framed and communicated in a way that gives value to the high-level decision-makers in Ethiopia and the confidence and conviction that Denmark and Danish know-how is highly appropriate for their situation. Management skills at decision making level has been pointed out during the consultation with key-partners as a topic for capacity building and will be highly relevant to pursue. A number of high-level meetings have consistently reiterated the commitments by the top management and decision makes of the Ethiopian partners, but it will be important to continue to frame and communicate and deliver so that the capacity development is found relevant and made best use of. At its essence, peer-to-peer on-the-job-training and mentoring will be combined with short courses, study tours, and remote mentoring. At the completion of each training conducted during the DEEP it is recommended that a training evaluation is conducted in order to track the perceived gains of the training provided and how this will be utilised in the context of the partners working programmes.

The theory of change is graphically illustrated in figure 2 below.

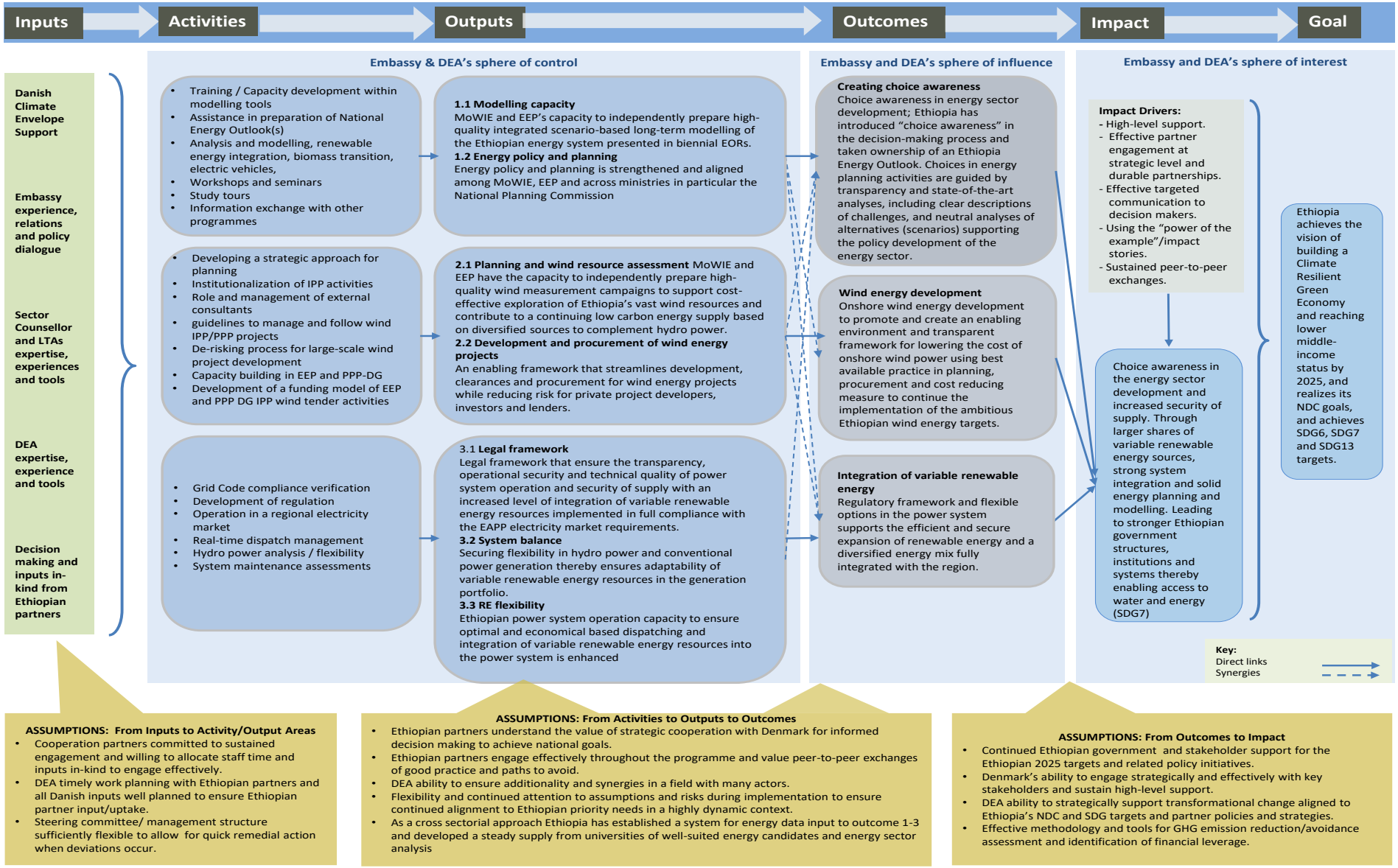


Figure 2: Theory of Change for the DEEP Programme

Explanatory notes to the ToC illustration

From inputs to activities: The programme will, through the Danish climate envelope funding and overall cooperation with Ethiopia, provide and make available a range of inputs. This will involve mobilising Danish expertise through both long and short-term advisors and technical assistance from Danish government institution and Danish universities. External consultants will also be mobilised, as well the involvement of specialist organisations such as Energinet under outcome 3. High level dialogue will take place through the RDE. Decision making and inputs in kind will be provided by the Ethiopian partners cooperating closely on joint workplans. Furthermore, the RDE will as programme owner, and as appointed Green Frontline Mission bridge the technical part of the programme to the political, thereby exploring paths to bring the cooperation further. Both with relation to Global scene as was evident with the Danish Ethiopian leadership of the energy track at the United Nations (UN) Climate Summit held in the autumn of 2019, but also to other Danish priorities.

With the technical lead taken by MoWIE and DEA, these inputs will be mobilised and will engage with and strengthen the capacity of the DEEP partner institutions through a range of cooperation mechanisms including: i) information exchange, ii) study tours, iii) diagnostic studies, iv) jointly organised seminars, v) targeted courses in Denmark and Ethiopia, vi) and, promoting close cooperation with other complementary international initiatives. The experience from ongoing DEA cooperation in other countries will be included through the sharing between DEA staff that are involved in these other countries. Arranging fora for sharing of experiences between key stakeholders from other DEA partnerships may also be initiated.

From activities to outputs and outcomes: The experience from earlier and ongoing DEA cooperation in other countries and from both the AWPGE and SSC in Ethiopia have shown that a combination of the intervention activities outlined above and also expanded on in the strategy section (Chapter 2) have contributed to developing capacity in the energy sector and making changes in the enabling environment. The experience and expertise from the transition of Denmark's energy system within long term planning and renewable energy will be applied to contribute to the three main outcome areas through delivering on a number of supportive outputs:

- Energy planning and modelling: creating choice awareness: Achieved through outputs related to developing an advanced energy model for robust long-term planning and creating a regulatory environment that is conducive to investments in renewable energy. Enhanced *energy modelling capacity* (output 1.1) in the relevant Ethiopian institutions will provide a stronger basis for planning the development of the Ethiopian energy system, supported by specific activities such as support to development the Ethiopian Energy Outlook and update of the Technology Catalogue. The advanced training and development of in-house capacity will enable the decision makers to make decisions on an informed basis, *strengthening and aligning the energy policy and planning* (output 1.2) among government entities. Activities will focus on how to translate the results of the modelling analysis into policy and planning recommendations, improving the regulatory environment to encourage and facilitate greater private and public investments in renewable energy projects. Key system changes includes also improved data management and development of master plans.

- Wind energy development: achieved through outputs related to building a strategic approach to planning of wind energy development and the preparation for conducting IPP tenders for large-scale wind projects. *Planning and wind resource assessment* (output 2.1) is the

first steps towards exploring and implementing the ambitious Ethiopian wind energy targets, where activities for developing a strategic approach to planning using spatial planning tools to explore the resources and also provide a link and support to the energy modelling activities is necessary. The *development and procurement of wind energy projects* (outcome 2.2) requires a regulatory, institutional, and financial framework that streamlines pre-development of wind projects reducing risk for investors and lenders. Activities such as an institutionalization of IPP activities and capacity building in EEP and MoWIE on the development of an efficient wind tendering process will together with the planning output (2.1) create an enabling environment for lowering the cost of onshore wind power.

- Integration of renewable energy: achieved through outputs related to securing a transparent regulatory framework in line with international standards for secure and market based integration of energy generation and increased flexibility in the grid with an increased amount of variable renewable energy. Creating a regulatory framework (output 3.1) for renewable energy integration requires activities related to grid code compliance, development of regulation for transparency and equal access to the grid for all producers. Securing flexibility in the power generation (output 3.2) requires activities in real-time dispatch management and analysis of the water value and how hydro can support flexibility. Optimal dispatching (output 3.3) use the principles of economical dispatching for system integration where the system operators' capacity to optimize integration of variable renewable energy is enhanced, looking concretely at the implementation of the "Ethiopian Planning System" (EPS) and operator training.

From outcomes to impacts: The outcomes will combine to strengthen the Ethiopian partners' energy planning and modelling, the share and integration of variable renewable energy sources. These will contribute to:

- Choice awareness in the energy sector development and increased security of supply.
- Through larger shares of variable renewable energy sources, strong system integration and solid energy planning and modelling.
- Leading to stronger Ethiopian government structures, institutions and systems thereby enabling access to energy (SDG7).
- Realistic and sustainable electricity tariffs based on the generation and transmission/distribution costs.
- Job generation in the RE energy sector and in the economy as a whole – arising through new industries and a more attractive investment market.

Together, these impacts will directly contribute to Ethiopia's Climate-Resilient Green Economy strategy with focus on RE investment from both public and private sectors. Ethiopia will thus be in a better position to meet the national energy demand in a sustainable way, maintain a low GHG emission and thus contribute, to achieve SDG7 and SDG13 targets.

Impact drivers and assumptions: A key driver for the programme is and will be the continued high-level political commitment and support for energy and climate targets. Pressure from consumers and energy sector actors for reliable, and low-cost energy as well as from international actors, are among the factors that drive political commitment. The large correlation between energy and economic development is an important impact driver and a central element in the GoE's ambitions for development. Clear communication and demonstration of the advantages of advanced energy policies and capacities will be instrumental in maintaining and ensuring

implementation of these commitments. A key assumption rest on that policy makers in partner institutions at all levels are seeking and ready to adopt changes that promote demand management, increased generation,and more efficient use of renewable energy, leading to a continued low carbon energy generation.

The ToC for the Programme will also be based on the key assumptions that socio-economic and political reforms will continue in Ethiopia. The current Covid-19 pandemic and conflict in the country may impact negatively if measures to reduce or mitigate this risk are not forthcoming in the short-term. However, it is the main assumption that access to energy - regardless - will remain a main priority for the country and the GoE.

The energy sector is complex and, like in many countries, there are powerful vested interests that might oppose higher shares of RE in the energy mix. It also implies that DEA and its Danish partners are in a position to provide high quality inputs on demand and that close cooperation with other international cooperation efforts is established to minimise overlaps and gaps, and also the ability to adopt the Danish experience to the Ethiopian setting and structure of the energy sector.

The following is a summary of the assumptions and drivers identified as part of the theory of change.

Box 3.1 Key assumptions and impact drivers

Key Assumptions:

From inputs to activities:

- Cooperation partners committed to sustained engagement and willing to allocate staff time and inputs in-kind to engage effectively.
- Danish partners are able to respond to demands in a well-planned manner to ensure Ethiopian partner input/uptake.
- Steering committee/ management structure sufficiently flexible to allow for quick remedial action when deviations occur. DDD Principles and guidance from Guideline on Adaptive Management will be adhered to at both strategic framework and implementation level.
- Ethiopia effectively coordinates international cooperation.

From activities to outputs to outcomes:

- Ethiopian partners engage effectively throughout the programme and value peer-to-peer exchanges of good practice and paths to avoid.
- DEA ability to ensure additionality and synergies in a field with many stakeholders.
- Flexibility and continued attention to assumptions and risks during implementation to ensure continued alignment to Ethiopian priority needs in a highly dynamic context.

From outcomes to impact:

- Continued Ethiopian government support for the 2025 and 2030 targets and related policy initiatives despite a complex political economy environment.
- Climate-diplomatic relations maintained that support Ethiopia in addressing both climate and sustainable development policy.
- DEA ability to strategically support transformational change aligned to Ethiopia's NDC and SDG targets and partner policies and strategies.

Impact drivers:

- High-level political commitment and support to meeting energy and climate targets.
- Pressure from consumers, energy sector actors and international actors.
- Effective partner engagement at strategic level and durable partnerships.
- Effective targeted communication and solid input for decision making.

The risk management matrix is found in Annex 5. Key contextual risks include political, social and ethnic tensions, the effects of Covid-19 pandemic, and the potential lack of social acceptance of wind energy.

Key programmatic risks include the Covid-19 pandemic that could affect programme implementation, any changes of priority given to the cooperation from partner organisations, lack of continuity of personnel in key positions in partner organisations (including staff who will have benefited from learning opportunities under DEEP and a potential lack of willingness in partner institutions to share available data, which could affect the quality of the technical assistance provided.

Key institutional risks include the risk of duplication of efforts or failures to recognise interfaces and synergies with other initiatives due to many donors and development partners – and if the programme fails to deliver its outcomes, this will reflect negatively on DEA, MoWIE, RDE, the MFA and Ministry of Climate Energy and Utilities (MCEU)

Risk mitigation measures are proposed and integrated in programme design leaving the residual risks at low-medium levels. The Steering Committee should regularly monitor and discuss risks, and the planned Mid-term Review should assess and update the risk analysis. In addition, input on this will be obtained from the existing M&E consortium engaged at the Embassy to strengthening the overall engagement of Denmark in Ethiopia.

The Risk Management Matrix (RMM) will be reviewed during the Inception Phase in order to outline potential risk scenarios and to update the RMM accordingly. The risk review will assess the probability for achieving the anticipated results and propose amendments as deemed necessary. The risks related to the current instability in Ethiopia and Covid-19 situations will be given particular attention.

The Theory of Change including the results framework will be amended during the Inception Phase based on the probable development of the risk situation and the anticipated programme results as derived from the preparation of workplans (see Section 3.5). Correspondingly assumptions and drivers will be reconsidered based on the most likely development scenario for the power sector.

3.3 Choice of Partners

The Ministry of Water, Irrigation and Energy is the key institution for development of regulatory frameworks, strategies, and policies for the energy system in Ethiopia. Together with its affiliated institutions especially the state-owned transmissions system operator and power company, Ethiopian Electric Power.

MoWIE will be the main national partner for the programme and with its sub-organisations will lead the outcomes under its area of responsibility with the active involvement of other relevant stakeholders. For the programme outcome and output areas, the partners chosen are those that have the government mandate for that area of work. There are a wide range of other stakeholders. These have also been involved in the ongoing AWPGE and will remain relevant stakeholders in the DEEP programme.

Objective	Outcomes	Outputs	Stakeholders
To support the development of the Ethiopian government structures and systems that in a sustainable and cost effective way improves access to renewable energy (SDG 7) and hereby supporting the Ethiopian vision of building a Climate Resilient Green Economy while reaching lower middle-income status by 2025.	1 Energy planning and modelling: Creating choice awareness	1.1 Modelling capacity 1.2 Energy policy and planning	MoWIE, EEP
	2 Wind energy development	2.1 Planning and wind resource assessment 2.2 Development and procurement of wind energy projects	EEP Engineering, MoWIE
	3 Integration of Renewable Energy	3.1 Regulatory Framework 3.2 Flexibility in power generation 3.3 Optimal dispatching	EEP Load Dispatch Centre

3.4 Cross-cutting Concerns

While access to affordable, reliable, sustainable and modern energy for all is a Sustainable Development Goal (SDG7), access to renewable energy is not a human right in itself. But given the role of clean and sustainable energy as a broader enabler of social and economic development, it is strongly interconnected with basic rights such as the right to life, food, health, shelter, education, environment etc. Also, the access to energy agenda (SDG7) will promote transparency and accountability in the energy generation.

As it is the case with conventional technologies for generating electricity based on fossil fuels, there are also several socio-economic issues emerging when deploying clean energy technologies and by clean it here refers to various renewable energy technologies. It is well known what controversial issues that can emerge from planning and implementing larger hydropower plants. Ethiopia has a comprehensive experience in this field already. Larger photovoltaic (PV) and wind power plants can also face community and public resistance due the expropriation of land it requires to be installed. The land preparation may also in some cases have impacts on e.g. biodiversity in the area where a plant is proposed. It also requires careful considerations to several environmental and social aspects when identifying suitable and appropriate locations for RE power plants, which must be evaluated against the economy of a planned project. When relevant and timely, DEA may promote and technically support elements of a Strategic Environmental and Social Assessment at policy and programming levels in order to meet such potential cross-cutting concerns. In this context Denmark has gained comprehensive experience in addressing such issues not least from a Danish context. The guidance that the Danida HRBA provides will be instrumental in this context to ensure that these cross-cutting issues are well considered during the programme implementation. An important process in this context is to include human rights due diligence which will ensure that potential adverse impacts on humans are well addressed and managed. Similarly, will environmental impacts need to be addressed, such as potential negative impacts on biodiversity at locations for RE development.

There is also a strong link from the SDG7 – access to energy agenda, to the leave no-one behind (LNOB) and gender equality. The DEEPs contribution to the GoE's ambition of access to energy for all by 2025 will have a significant immediate impact on LNOB as it being the main target for the GoE. Also, concerning gender equality in Ethiopia this will have a direct impact. The transformation to modern energy and increased electrification will contribute to e.g. clean cooking with less pollution and freed time. More directly to the cooperation with MoWIE it has been a part of the dialogue within the SSC that the modelling team should consist of both men and women.

Through the cooperation with universities the programme will explore the possibility of assisting universities in developing curriculum within the field of energy modelling – to secure the future experts and create a sustainable change. This will be an important youth aspect with potential valuable effect on the youth employment. Both, as secure energy supply will benefit the development of the country, and thereby the job creation, but also a direct effect by creating an important link from universities to possible employment within the government administration and energy sector in generel.

Incorporation of thematic issues – such as gender equality, LNOB, HRBA, etc. – will be further reconsidered during the Inception Phase. Consultations will be held with MoWIE/EEP and the WB on progress of achieving equitable, transparent and accountable energy institutions. Inspiration and engagement will for example be found in the WB's support to a new model to promote equality between men and women while it works toward universal electricity access. This involves shifting from ad-hoc disconnected interventions to a programmatic approach with investments in technical staff, and an earmarked budget to support gender equality across the entire energy sector. The coordinated approach between the WB Group and Ethiopia includes deep engagement with the energy experts, as well as with the new actors such as the private sector, financial institutions and civil society, to identify exactly where gender gaps are most significant and what solutions may be possible.

The contribution to be made by the programme in terms of capacity development and tools for more well-informed and transparent decision making in the energy transition, will support the human-rights principles of participation accountability, non-discrimination, and transparency.

4. Management Set-up

The programme will be managed by a Steering Committee chaired by the Energy minister and the Danish Ambassador to Ethiopia[18]. The Steering Committee will be the forum for the overall strategic dialogue between Ethiopia and Denmark on energy. The management set-up has been kept as simple and lean as possible, to ensure an efficient accountability mechanism for progress and results reporting as well as an effective mechanism for giving strategic directions to the programme. The model agreed upon and in place for the AWPGE and the SSC will be applied for DEEP. The established practice is that decision making will be by consensus. The Steering Committee will be responsible for:

- Approving annual work plans and related overall resource allocations;
- Monitoring progress against the theory of change and results framework, based on half-yearly M&E (Monitoring and evaluation) reports that are systematic, analytic and issue-oriented, identifying deviations from set targets and identifying the underlying causes and whether remedial action is needed;
- Monitoring assumptions for the theory of change, determining if adjustments are needed. Under this context it is important that the SC is referring to "Guidance Note for Adaptive Management" and assess the programme and its progress in a holistic perspective.
- Monitoring risks, and make recommendations to eliminate or reduce the risks..
- Broader dialogue on development in the sector and progress towards meeting Paris commitments including where relevant securing the complementarity between different instruments, e.g. Assela 1+2, and coherence with other development partners' activities.

The RDE is overall responsible for the DEEP administration. RDE together with MoWIE head the SC and secures a progressive and coordinated programme.

Programme Management Teams

Day-to-day progress on the agreed work programme targets will be followed by Programme Management Teams who will manage the day-to-day implementation of each engagement and report progress towards the results framework at output and outcome levels of this engagement.

There will be formed a management team designated to each of the three outcomes and each team will consist of at least one representative from Denmark and a selection of senior management from the Ethiopian partner organisation that are involved in the three outcome areas. All teams will report to the Steering Committee through RDE as the programme owner and coordinator.

The Programme Management Teams will be responsible for:

- Managing and coordinating the implementation of outputs and outcome under their responsibility;
- Monitoring against the result frame indicators the outputs and outcome under their responsibility;

[18] Other representatives such as members from the management of EEP, EEU, EEA and Ministry of Finance may be included in the SC.

- Preparing reports every six months and annual reports, work plans and budget of the outputs and outcome under their responsibility;
- Follow-up on the advice and guidance provided by the Steering Committee.

Long Term Advisors

LTAs are planned as part of the programme and providing technical support to MoWIE and EEP. It is proposed that the LTA in MoWIE will be an energy planning expert and the EEP LTA will be a RE expert with a cross cutting focus in integration. The LTAs will on issues related to their area of expertise also support other relevant institutions than their primary employer. The main role of the LTAs will be to provide advisory and technical inputs as well as coordinate the inputs from Danish institutions and short-term experts. The LTAs will ensure that there is a continuous communication between RDE, DEA and its partners so that the cooperation can be adjusted and fine-tuned to the needs. The LTAs will take a special responsibility for monitoring the outcomes and outputs and especially the progress in capacity development. The two LTAs will work across all three outcomes according to the institutional setup of MoWIE/EEP, however the LTAs will primarily be assigned to specific outcomes:

- One advisor will be selected as an energy system planning and energy modelling expert; preferably with specific knowledge about Balmorel[19], LEAP[20] and Sisyfos[21]. Experience with capacity development, training and technical secondments would be preferred.
- The other advisor will be selected as an RE expert; preferably with specific knowledge about wind power. Experience with RE feasibility studies and RE auctions would be preferred. Experience with integration of RE in the Nordic Countries power system (Denmark, Norway, Sweden and Finland) would be an advantage. The first two years posting is likely to focus on the development of a wind power tender and procurement strategy. In later years the focus is likely to be on developing capacity within forecasting and least cost RE-integration strategies.

The technical assistance package will be refined in relation to the detailed work plans (ref. Section 3.5) during the Inception Phase. This may imply that the LTAs' job profiles (ref. Annex 12 – Roles of LTAs) are slightly modified to be compatible with the work plans. Correspondingly, the scope for short-term consultants is defined during the Inception phase when work plans allow for detailed planning.

Overall program management and coordination

RDE will be responsible for financial management of the programme. The Ethiopian contributions will all be provided in-kind. As noted earlier, the programme management teams will be responsible for drafting annual workplans to be approved by the steering committee.

[19] Balmorel is a partial equilibrium model for analysing the electricity and combined heat and power sectors in an international perspective. It is highly versatile and may be applied for long range planning as well as shorter time operational analysis. Balmorel is implemented as a mainly linear programming optimisation problem.

[20] LEAP is a widely-used software tool for energy policy analysis and climate change mitigation assessment developed at the Stockholm Environment Institute.

[21] Sisyfos is a probabilistic model to determine the level of security of supply.

Implementation will be the joint responsibility of the partners and DEA as specified in the work plans.

The Embassy's overall communication aim for the Programme is to increase awareness of Denmark's development cooperation with and in Ethiopia, specifically Denmark's contribution to supporting Ethiopia's vision of reaching 100 % access to energy by 2025.

The Embassy will aim at making the development cooperation between Denmark and Ethiopia more understandable, accessible, and tangible by exemplifying its relevance and impact, so that a larger share of the Danish and Ethiopian populations has an informed opinion on the responsibility Denmark assumes for the Paris Agreement and access to electricity for all. The communication activities will be developed further together with the existing M&E and communication consultants engaged at the Embassy to strengthen the overall engagement of Denmark in Ethiopia.

The overall management and control of DEEP is the role of SC through the RDE in Ethiopia who will share information on the progress and achievements to the Advisory Group in Copenhagen for its ccompilation of experiences that may be relevant and applicable to other Danish partnership programmes. The Advisory Group (AG) was established in 2017 as part of the consolidated government-to-government (GtG) approach to provide a venue for programme related discussions and decision-making between MFA, MCEU and DEA. The Advisory Group may discuss and evaluate the overall programme progress to ensure cross-exchanges of experience and good practice from/with other bilateral cooperation. The AG will then be able to maximise synergies with Danish multilateral cooperation on climate change and sustainable energy including related financing issues, by leveraging Danish relationships with multilateral partners and i.e. promoting the use of knowledge products developed by multilateral partners.

Box 4.1 Roles of the sector counsellor and project support staff at the embassy

- Play important role in ensuring high level communication and climate diplomacy – also link to the RDE's role as Green frontline Mission.
- Act as the link to the project's high-level partners in ministries and other organisations
- Be a part of the professional advisor team in the programme together with Danish Energy Agency, Long Term Advisors and local partner organisations.
- Participate in the steering committee and the overall coordination of the project.
- Contribute to the general climate diplomatic dialogue related to the bilateral relations between Denmark and Ethiopia on SDG7, SDG13, NDC-targets, climate ambitions.
- Ensure that this programme and the other support provided by Denmark through multi-lateral channels is well coordinated.
- Keep close dialogue with other donors on energy and climate cooperation present in Ethiopia and aim for alignment.
- Facilitate and contribute to other partners' roundtables, high-level policy dialogues, etc.
- Provide technical inputs where relevant.
- Be a link between the programme and the embassy's commercial activities.
- Support DEA and Energinet on the coordination and development of good operational working relations with Ethiopian partners.
- Assist with placing the advice by LTAs and DEA experts into the appropriate political Ethiopian and Danish context.

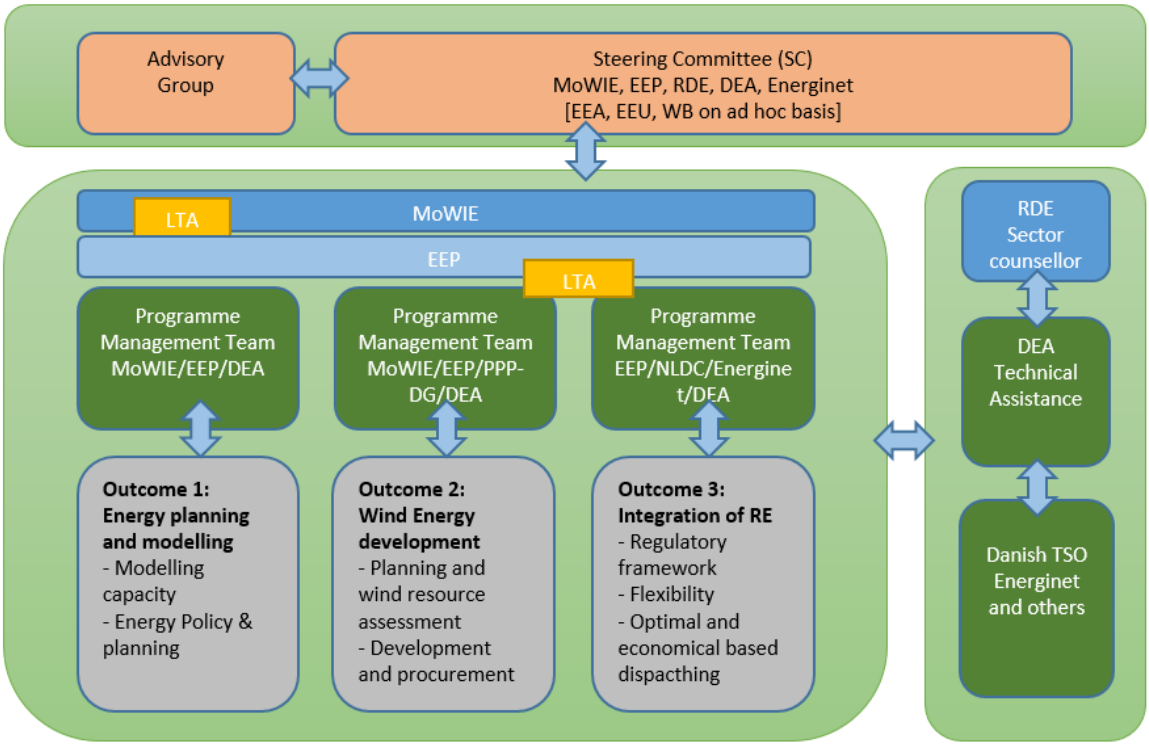


Figure 3: Management organization overview

The concept of 'adaptive management' and implications will be introduced during the Inception Phase to MoWIE/EEP officials with whom the DEEP TA will interact. One or more workshops will be held to present the expected change in management style and decision making.

5. Work Planning, Monitoring and Reporting

General

Annual work plans and budgets will be prepared both at activities and output level and overall, for the programme and will be presented to the Steering Committee for approval. The work plans and budgets will reflect Ethiopian priorities and will record the work done to date as well as noting what is realistic for the remaining period of the programme.

Programme progress and achievements will be monitored and reported against impact and outcome level indicators aligned with the guiding principles and monitoring guidelines for the Danish Climate Envelope, and as far as possible also aligned with the monitoring and reporting systems of Ethiopian partner institutions. Indicators at output level have been identified in the detailed results framework in Annex 3. The programme is aligned to the Ethiopian targets for RE and will in that way benefit from Ethiopian monitoring of the programme objective.

Indicators for the achievements of both outcomes and outputs have been formulated and are by nature tailored to monitoring the actions of the external programme rather than being part of the internal Ethiopian partners' M&E systems. This also allows them to be concrete and highly specific and more easily reflect actions that relate to more than one partner. During the Capacity Development Assessment it will be identified how the approach to gender disaggregation also can be addressed and included where relevant in the indicators as the work plans are developed

The on-going cooperation with GoE has been provided with recommendations to an improved monitoring and reporting system for the AWPGE and SSC programmes[22]. These recommendations have already been carefully considered and some have also been implemented, for example improvements to the reporting and monitoring of programme activities as well as achievements of outputs and outcomes. Reviews of the experience in using the revised model will be part of the programme management tasks.

To support the monitoring and reporting there will be a close coordination with and input from the already established M&E consortium engaged at the Embassy to strengthen the overall engagement of Denmark in Ethiopia with a prime focus on results.

Start-up phase

As most of the programme content follows from the current SSC and AWPGE engagements, a full inception phase will not be required. A short 4 month combined start-up and inception phase will take place for new areas to allow the further development and detailing of a capacity development strategy (based on the Capacity Development Assessment developed in the Inception phase using general approach set out in Annex 10) for the programme including how to institutionalise capacity development possibly through the use of universities, internal agency and government human resources and training departments. The start-up phase will also be an opportunity to fine tune the results framework. The LTA recruitment will start before the start-up phase to avoid delays as there is a long lead time for recruitment.

The results framework will be updated during the Inception Phase in parallel with the detailed preparation of the workplans and the probable risk scenario. The monitoring approach will be

[22] Mid-term Review, 2020

amended to ascertain that tangible results are recorded - and if not reasons will be provided for not reaching set targets. The ToC will be harmonised with the updated results framework.

Mid-term Review

In accordance with MFA guidelines, the programme will be subject to a mandatory MTR managed by the MFA. This MTR is tentatively planned for 2024. It will have a mandate to recommend adjustments to programme inputs, outputs and outcomes as relevant, and the MTR will assess the programme's exit strategy, which will be prepared by RDE, DEA and MoWIE as an input to the MTR. Criteria for successful exit is evidence of capacity developed, update and use of know-how that has been transferred. The exit strategy will also take budget performance as well as progress into consideration. Criteria for a potential continuation of collaboration would be based on the emergence of new or expanded areas of cooperation, building on the success of DEEP and offering cost effective use of resources – and availability of funding. The MTR will also to the extent possible monitor the development of and recommend on further integration of HRBA, LNOB and SDG5. Together with the achievement of the Green Climate Fund (GCF) indicators conducted in accordance with the OECD/DAC criteria.

Workplans

Workplans should be matched with the partners' annual workplans and capacity development needs. The results framework (Annex 3) outlines a number of activities and areas of possible targeted intervention. These are a menu of possible support areas discussed with the Ethiopian partners during the formulation process, but will not necessarily all be done or involve the same intensity of cooperation. It will depend on the needs identified by the partners, the available programme resources and what other international partners are doing. In the formulation of and possible changes to workplans consensus and adaptive management should be applied. This approach is considered to be well in line with the principles of adaptive management. The annual workplan will provide the mechanism to prioritise which activities are done and to sequence them. To ensure that all Danish support will assist partners in achieving their goals, any DEEP workplan prepared, should reflect priorities in the partners' annual workplans and reflect Danish specialist availability. The work plans should:

- identify delivery options that match needs, making use of existing options where possible;
- articulate how the level of ambitions matches resources available;
- focus on value-for-money with partners – getting the highest impact with the fewest resources;
- plan and prioritize resources across the outcomes to make sure they can be focused in the right areas;
- identify options for cooperation when high level climate diplomacy opportunities emerge and;
- ensure that capacity development is properly defined and integrated into all activities. Multi-year capacity development strategies and plans will be developed for the key areas of and these will help to strategically inform the annual workplans.

Detailed workplans by outcome and output for year 2022 and 2023 will be prepared during the Inception Phase. The workplans will be activity based with clear indications of the inputs from

the DEEP TA and MoWIE/EEP respectively and associated costs. It will also be acertained that the activities will lead to the anticipated outputs. A part of the inception phase is also to develop the modalities and decision-making at programme level. The management arrangements will include specific descriptions/ procedures manuals. Furthermore, this includes an introduction of adaptive management and the implications for the implementation of DEEP to the cooperating partners. The procedure manuals are drafted in the Terms of Reference for the Inception Phase.

Progress reporting

The programme management team will report on progress as indicated in the M&E instructions at the half-yearly steering committee meetings and in accordance with the annual workplans. An annual progress status as indicated in the M&E instructions will be approved by the steering committee. The annual status will include an assessment of overall progress in relation to objectives and outcomes and will provide reporting against the results framework as well as against the approved workplan and budget.

The M&E system will facilitate the steering committee's role as an accountability mechanism and also facilitate the programme management teams' own proactive remedial action. The reporting will be a factual description of activities and outputs in a format that has been developed within the RDE M&E methodology. This M&E methodology is gradually being improved along with the on-going programme implementation.

Impact indicators and the Danish Climate Envelope Core Indicators

The overall objective is "To develop the Ethiopian government structures and systems that in a sustainable and cost optimal way improves access to energy (SDG7) and hereby supporting the Ethiopian vision of building a Climate Resilient Green Economy while reaching lower middle-income status by 2025". The programme will contribute to maintaining a high share of RE in the power generation and creating a more diversified energy system, lowering the dependency on hydropower and increasing the security of supply.

However, the objective is difficult to be accurately estimated at the overall programme level as impacts of the Danish contribution are impossible to separate from those of many other initiatives in Ethiopia. Moreover, impacts are likely to manifest themselves concretely in the longer term, beyond completion of the five-year programme. The long-term planning and scenario modelling will be able to analyse potential for maintaining a low GHG emission from the power system and indicate capital investment for meeting the National targets. The degree of the programme contribution will need to be assessed qualitatively with all three outcomes potentially contributing to strengthened awareness and capacity of decision-makers and experts that will lead to more well-informed decision making contributing to the achievement of the targets set in SDG7 and SDG13 and Ethiopia's NDC.

6. Inputs, Budget, and Financial Management

The total budget for the five-year programme is DKK 60 million, of which DKK 50 million is sourced from the Danish Climate Envelope 2021. An additional DKK 10 million is expected to be sourced from the Danish Climate Envelope 2022 subject to parliamentary approval of the finance act for 2022.

The budget is presented in Annex 4. The two embedded long-term advisors will be budgeted for a 4.5-year period. It is anticipated that the mobilisation of the LTAs will take up to 6 months from the commencement of DEEP. Experience from both the current AWPGE and general government-to-government partnerships in DEA show the importance and value of embedded advisors that on a daily basis can create the link to the local context and build trustful relations with partners, justifying the budget allocation to the two LTA's. The upscaling from one to two LTA's falls in line with the request from the Ethiopian Minister of Energy.

The other major activities are the DEA and Energinet inputs, DKK 28,5 million (48%) and DKK 9 million (15%) respectively. Inputs provided by Energinet and other related inputs by external international and Ethiopian consultants are procured through DEA. Funds will not be channelled through Ethiopian partner systems. There is an unallocated reserve of 7% or DKK 4 million which is allocated to provide flexibility in the programme to support new activities and respond to the complexity and uncertainty that might be experienced throughout the programme The unallocated budget will be increased with a relatively higher budget in the years 2022-2024 as the MTR may give rise to further demand for flexibility. A budget line for contingencies is planned for unforeseen expenses and shortfalls on other budget lines. The inception phase will not be budgeted separately but amendments to the budget might occur after the inception phase. However, a budget line of DKK 100,000 has been allocated to an inception review. A budget for a MTR has also been set aside for DKK 600,000 and the possibility of local activities, e.g. costs for external workshops, seminars, etc. in order to have a strong local focus, is included as a separate budget line.

An outline of the budget at outcome level is presented in Table 6.1.

DEA will report yearly on outcome/output level and at least on the same detailed level as the detailed budget in Table A-4.1.The financial management of the DEEP is the role of the RDE in Addis Ababa. The Sector counsellor based at the RDE will have the responsibility of the daily oversight and will report directly to the Steering Committee.

During the Inception Phase – proposed to be the first 4 months from commencement of the DEEP – the RDE will review and consider external factors that may have an impact on the initial budget and will be responsible for making appropriate and needed adjustments to the budget lines. Potential adjustments will involve consultations with DEA and the members of Steering Committee.

Table 6.1 Budget at outcome level

Budget by year (mDKK)	(H2)2021	2022	2023	2024	2025	(H1)2026	Total	%
Outcome 1	0,78	1,83	2,50	2,74	2,74	1,60	**12,19**	20%
Outcome 2	1,26	2,81	2,53	2,50	2,00	1,09	**12,19**	20%
Outcome 3	1,14	2,81	2,81	2,21	1,81	1,14	**11,92**	20%
DEEP Programme Management	0,24	0,48	0,48	0,48	0,48	0,24	**2,40**	4%
Long term advisers	0,30	3,00	3,30	3,00	3,00	1,50	**14,10**	23%
Local Activities	0,05	0,10	0,10	0,10	0,10	0,05	**0,50**	1%
Reviews	0,10	-	-	0,60	-	-	**0,70**	1%
Contingencies	0,20	0,40	0,40	0,40	0,40	0,20	**2,00**	3%
Unallocated	0,10	0,20	0,40	1,20	1,20	0,90	**4,00**	7%
Total	4,17	11,63	12,53	13,23	11,73	6,71	**60,00**	100%

The budget will be updated during the Inception Phase based on the detailed workplans and the perceived need for flexibility to accommodate 'adaptive management'. Furthermore, as suggested by the Appraisal Team, the budget will be revised yearly to support possible changes to adhere to adaptive management.

7. Closure

In accordance with MFA guidelines, the programme will be subject to MIR managed by the MFA. This MTR is tentatively planned for 2024. This review will assess the programme's exit strategy, which will be prepared by RDE, DEA and MoWIE as an input to the MTR.

Annex 1: Context Analysis

1. Overall development challenges, opportunities and risks

Briefly summarise the key conclusions from the analyses consulted and their implications for the programme regarding each of the following points:

General development challenges:
Ethiopia is a large and diverse country with an estimated population of approximately 110 million people and an annual population growth rate of 2.6 percent (2019). More than 75 percent of the population live in rural areas, but the urbanisation rate is predicted to increase rapidly. Figures from the Ethiopian Central Statistics Agency, project the urban population will triple to 42.3 million by 2037, growing at 3.8% a year. Over the last decade Ethiopia has experienced significant economic growth and lifted millions out of poverty. Albeit this improvement major challenges pertaining to democracy, civil society, and human rights remain.

This is underlined by the recent developments in the Ethiopian security with the conflict in Tigray and human rights situation. This may have impacts on the level of achievement of the 2025 targets and which is calling for attention in the context of the DEEP and other donors. This is in addition to the negative impact of the Covid-19 pandemic.

Ethiopia continues to face deeply rooted humanitarian challenges. More than 28.5 million people are affected by various shocks such as ongoing conflict, community violence and displacement, the COVID-19 pandemic, cholera outbreaks, desert locust invasion and recurrent climatic shocks such as floods and droughts. The escalation of conflict in Tigray and surrounding areas in 2020 has resulted in further civilian casualties, displacement and disruption of essential services. An increasing number of internally displaced people (IDPs) in different parts of the country affected by insecurity and localized conflict, climate shocks, and COVID-19 need relief assistance and protection. In 2021, a projected 28.5 million people will need urgent humanitarian assistance— representing an alarming increase from 8.4 million at the start of 2020. Of an estimated 2.7 million internally displaced persons in Ethiopia, 1 million were displaced in 2020 and 1.9 million (70 per cent) were displaced by conflict.

Investment in the energy sector is a key driver of Ethiopia's overall development and transformation strategy. Access to adequate, reliable, affordable and environmentally sustainable energy is fundamental for enabling the structural transformation of the Ethiopian economy and society, and for promoting poverty reduction and industrialisation. The Climate Resilient Green Economy strategy is together with the ten-year Growth and Transformation Plan III (2021-30) the drivers for reaching the goal of a lower-middle income status in 2025 together with 100 % access to energy (SDG 7). The GTPIII plan is replacing the GTPII plan. Details on the new plan are yet to be made public.

Development in key economic indicators:
According to WB data for 2019 the GDP per capita is 855 USD, which is below the regional average and placing Ethiopia as a lower income country. However, Ethiopia is experiencing a continuous economic growth with an annual increase in GDP of around 8.5% over the last decade. The impact of the Covid pandemic and the current instability in Ethiopia is likely to halt this development. The economic growth is followed by an increase in annual average electricity demand of 12% from 2000-2017, while only having a 44% access to electricity. Furthermore, current demand side models predict a fivefold increase in peak electricity demand in 2030, which includes a significant increase in export of electricity within the East African Power Pool.

Of Ethiopia's 110 million population, 41% is under the age of 15 and 28% is aged 15-29. Youth unemployment is estimated at nearly 27% and the need for job creation is urgent for the next generation. The country's ambition is to create 20 million jobs in 2030 with the industrial and service sectors being the main drivers.

Ethiopia has taken significant steps towards liberalization of the economy through promotion of private investments. Foreign direct investments are an important source of capital. However, performance of goods exports remains weak and foreign exchange shortages persists.

In 2020 the inflation rate was at 20%, largely due to increasing food prices.

Status and progress in relation to SDGs:

Ethiopia has an ambitious goal of becoming a lower-middle in-come country by 2025. The development plan consists of 9 pillars including "Building a Climate Resilient Green Economy".

The SDG's are central elements in the strategic development of Ethiopia. This is also illustrated by the Danish and Ethiopian mutual commitment to the global agenda on climate change and sustainable economic growth, as the programme will focus on SDG 7 – ensuring access to affordable and clean energy in Ethiopia. The joint Danish Ethiopian leadership on SDG 7 together with SEforAll at the energy transition track during the UN Climate Action Summit in New York in 2019 is evidence for a strong partnership of the two countries.

The programme will contribute to the achievement of the following SDGs:

- SDG 7: Affordable and Clean Energy
- SDG 13: Climate Action
- SDG 17: Partnerships for the goals

The NDC tracker states that Ethiopia's Paris Agreement target is one of the few that the Climate Action Tracker rates as "2°C compatible". This rating indicates that Ethiopia's climate plans are within the range of what is considered to be a "fair share of global effort". Ethiopia's target would lead to an emission reduction of 64% below the business-as-usual scenario by 2030, which among other is achieved through a renewable energy expansion.

Political economy:

Stable and secure energy supply is fundamental for a sustainable development of Ethiopia, and thus has a strong political attention illustrated by the ambitious target for access to energy. Energy policy is also social policy as illustrated by the access to energy for all agenda. Both in light of the Covid-19 pandemic and the current instability in Ethiopia (see contextual risks in Annex 5: Risk Management), that can create new and unforeseen challenges which might change the political priorities in the country and thereby creating a need for changes in areas of cooperation. It is also noted that recent developments in the Ethiopian security with the conflict in Tigray and human rights situation may have impacts on the level of achievement of the 2025 targets and which is calling for attention in the context of the DEEP and other donors.

The COVID-19 pandemic had an immediate negative effect on Ethiopia, from a health, economic and political dimension. The IMF forecasts that in 2021 it will be the slowest-growing major region. In many countries it will take several years for GDP per person to get back to where it was before COVID-19. In addition to this, the pandemic had an effect in the postponement of the planned general election in 2020. A new date for the election has been announced for June 2021. However, it is the main assumption that access to energy - regardless - will remain a main priority for the country and the GoE.

Basing the power system supply on hydro resources makes the country vulnerable to precipitation variations with climate change, droughts and floods becoming more frequent. Lack of both short- and long-term planning has reinforced this challenge. Capacity building within energy planning and modelling, integration of renewable energy etc. in MoWIE and EEP can enable integration of a larger share of variable renewable energy. A result of the cooperation is that the load shedding has diminished substantially. The critical situation with a long period of interrupted electricity supply experienced during 2019 has created a burning platform for energy sector administration capacity building with a high political attention.

The Ministry of Water, Irrigation and Energy is the key institution for development of regulatory frameworks, strategies and policies for the energy system in Ethiopia. Together with the affiliated institutions and state-owned transmissions system operator and power company, Ethiopian Electric Power, they are all central players.

List the key documentation and sources used for the analysis:

- Climate Resilient Green Economy Strategy
- Ethiopia Growth and Transformation Plan II (and III)
- Executive brief on DK-ETH energy sector cooperation (in Danish)

- AWPGE Thematic Programme Document Implementing Partnership Agreement and Development Engagement Documents
- Supplementary Support Agreement for 1-year Cost-Extension MoU, including revised activity plan and budget
- Progress Reports for 2017, 2018 and 2019 (restricted)
- Minutes from meetings of Management Group and Steering Committee (restricted)
- Wind Project Development Roadmap
- Wind Curtailment Report (confidential)
- Real-times Values Assessment (confidential)
- Draft 2018 Operation Analysis (confidential)
- Midterm review of the AWPGE programme
- SSC programme agreement and workplans
- Presentations by State Minister Dr. Frehiwot Woldehanna on 1) Energy Reform Overview and Reform Direction" and 2) Energy Resource Mix in Ethiopia – Current Status and Future Direction
- National Electrification Programme 2.0
- USAID/Nexant Grid Management Program System Integration Study (confidential)
- RES4Africa/CESI Integration of Variable Renewable Energy in the National Electricity System of Ethiopia
- MoF/ Public Private Partnership Directorate General Public Private Partnership Guidelines (restricted)
- Ethiopia NDC and NDC tracker
- World Bank: Risk and Vulnerability Assessment

Are additional studies / analytic work needed? How and when will it be done?

No additional studies or analytical work required.

2. Fragility, conflict, migration and resilience

Briefly summarise the key conclusions and implications for the programme of the analysis of the below points:

The key drivers of humanitarian needs in Ethiopia are ongoing conflict, desert locust invasion, recurrent climatic shocks such as floods and droughts, and socioeconomic impact of COVID-19. Amidst the political transition, armed conflict and community violence remains a critical concern across Ethiopia, from Benishangul Gumuz, to Oromia, to Tigray. Heightened competition over resources due to pressures from climatic shocks, COVID-19 containment measures, and desert locust infestation in certain areas, create further inter-communal tension, violence, and displacement. Of an estimated 2.7 million people currently internally displaced in Ethiopia, 1 million of which occurred in 2020, approximately 68 per cent were displaced by conflict, underlining the rapidly evolving protection crisis in Ethiopia.

The COVID-19 pandemic and its containment measures worsened a dire humanitarian situation, with an estimated loss of up to 2.4 million jobs. As a result, 31 million people were estimated to be living below the poverty line in 2020, up from 26 million people in 2019. Women, who had comprised a large majority in the hard-hit tourism and hospitality sector, have been disproportionately affected by not only the economic crisis, but also by related protection concerns, including gender-based violence, which has seen an exponential rise since April 2020.

The crippling socioeconomic impacts of COVID-19 are expected to persist throughout 2021. Furthermore, ongoing insecurity both in and beyond Tigray will continue to severely undermine the availability and access to food and other basic goods and services and have further socioeconomic impact. Predicted La Niña conditions and below-average rainfall particularly in the South and South-Eastern parts of the country also threaten to exacerbate food insecurity and other humanitarian needs, in addition to increasing the concern for unrest as communities compete for even more limited water resources.

The programme's focus on climate change mitigation and the green energy transition is expected to have a positive but indirect effect on domestic conflicts, migration and resilience issues. Increased access to energy is expected to contribute to reducing climate change related conflicts. The dependency on water resources spans beyond the borders of Ethiopia and can lead to geopolitical disputes over water resources e.g. geo-political disputes over the Nile due to the construction of GERD. The recent conflict in Ethiopia's Tigray region and the further development of the conflict impose a risk for the energy sector development. Negotiations over the dam with neighbouring countries Sudan and Egypt have reached a crucial stage, but talks could be delayed while the Ethiopian Government responds to the ongoing crisis. Worryingly, the conflict has the potential to spread across the whole region. In general, the integration of variable renewable energy into the Ethiopian energy system as part of the overall increased energy supply is central for the continued development. The country's dominating dependency on hydro power will be less pronounced along with the increased ability to integrate alternative and renewable energy sources into the power system resulting in cost-effective power generation to the benefit of both the supply and demand side.

Are additional studies / analytic work needed? How and when will it be done?

No additional studies or analytical work required.

3. Assessment of human rights situation (HRBA) and gender[23]

Briefly summarise the key conclusions and implications for the programme of the analysis of the below points:

While access to affordable, reliable, sustainable and modern energy for all is a major agenda point SDG (#7), access to renewable energy is not a human right in itself. But, given the role of clean and sustainable energy as a broader enabler of human and economic development, it is strongly interconnected with basic rights such as the right to a certain level of life quality, food, health, shelter, education, etc. The contribution to be made by the programme in terms of capacity development and tools for more well-informed and transparent decision making in the energy transition, will enable the duty bearers (i.e. the political decision makers and public authorities) to be mindful of the needs and priorities of end-users and ultimately beneficiaries at the household and enterprise level (the rights holders). The human rights principles of participation, accountability, non-discrimination, and transparency will thus be an integrated concern throughout the programme. Human rights due diligence processes will be conducted in this context. Similarly, the potential impacts and benefits, as a result of the cooperation for both women, men and youth have been careful addressed in the formulation process and during consultations with the various stakeholders and will also during implementation be issues that need to be considered, for example when assessing potential new locations for wind power plant.

Gender

The number of women engaged in the energy sector is very low. This is a focus area in the current Danish-Ethiopian cooperation and will also be in the new programme. References to guidelines on ensuring gender aspects and equalities will be an integral part of the specific activities during programme implementation.

Youth

With more than 40% of the population under the age of 15, it is crucial that industrial development and access to education is prioritised in order to achieve the country's ambitious development goals. This is crucial for the Ethiopian development, as it is estimated that Ethiopia will be lacking more than 20 million jobs in 2030. Hence, the ambition it currently to create 14 million jobs by 2025. Stable and secure energy supply is vital for this development. Therefore, the programme needs to pay attention to consider creating possibilities in education, jobs and hope for the youth of Ethiopia.

[23] The purpose of the analysis is to facilitate and strengthen the application of the Human Rights Based Approach, and integrate gender in Danish development cooperation. The analysis should identify the main human rights issues in respect of social and economic rights, cultural rights, and civil and political rights. Gender is an integral part of all three categories.

This effect on youth will be explored through cooperation with universities. If feasible, there will be a main focus on academia with an increasing role for universities on wind data analysis. It will also be explored how energy planning and modelling as curriculum topics could be supported by the programme. Such initiative could support the future experts of MoWIE/EEP and create a sustainable change. Consultations with universities in Ethiopia - during the formulation phase -has confirmed that university leaders are interested and see themselves in important roles in ensuring both common interests in the topic but also in ensuring that competences are developed for the overall benefit of the nation's sustainable energy supply development.

Are additional studies / analytic work needed? How and when will it be done?

No additional studies or analytical work required. It is, however crucial, that during implementation the programme management (the steering committee) maintain attention and focus on the above discussed issues and ensure appropriate actions are taken to ensure that building capacity among youth is critical in terms of the overall sustainability of the programme.

4. Inclusive sustainable growth, climate change and environment

Briefly summarise the key conclusions and implications for the programme of the analysis of the below points:

The programme is designed to have a main focus on climate change mitigation and sustainable economic growth. Environmental sustainability issues are considered part of addressing the enabling framework for e.g. onshore wind energy.

The Ethiopian energy supply system is dominated by hydro power which is contributing up to 96% of the total generation with only limited other variable renewable energy, such as wind and solar in the system. The national targets include increase of the wind power capacity from 324 MW in 2018 to 1,224 MW in 2030 according to GTP II, but new and more ambitious targets have been discussed. With high dependency on hydropower, the country is very vulnerable to climate changes, limited water resources and geo-political disputes over the Nile hydro power due to the construction of the GERD, and therefore the integration of other variable renewable energy into the Ethiopian energy system is central for the continued development. However, the Ethiopian partners are lacking knowledge and overview of the sector, as wind energy potentials have only recently been explored and attracted attentions.

Hydrological conditions in Ethiopia vary with dry and wet seasons. Basing power system supply on hydro resources makes Ethiopia vulnerable to precipitation variations. With climate change, droughts and floods have becoming more frequent, over the last 20 years. In 2019 several months of outages were experienced. The early-rainy season failed in the southern regions, which caused significantly less accumulation of the important -reservoir than usual, thereby resulting in limited production of hydro powered electricity.

However, the increasing level of outages cannot alone be explained by climate change and unusual precipitation. Throughout the year a degree of wind power curtailment (reduction of power delivery usually from fluctuating sources like wind or solar caused by system inability to intake produced power) has been experienced due to inefficient system operation and lack of flexibility in the hydro based energy generation. Instead of prioritizing the usage of wind power – hydropower is prioritized, not accounting for changes in demand and forecasting. Lack of both short- and long-term planning has imposed this challenge. Capacity building within energy planning and modelling, integration of renewable energy etc. in MoWIE and EEP can enable integration of a larger share of variable renewable energy. A result of the ongoing cooperation is that the load shedding has diminished substantially. The critical situation experienced during 2019, has created a platform for energy sector administration capacity building with a high political attention.

List the key documentation and sources used for the analysis:

Same as are listed above under item 1.

If this initial assessment shows that further work will be needed during the formulation phase, please list how and when will it be done?

No additional studies or analytical work required.

5. Capacity of public sector, public financial management and corruption

Briefly summarise the key conclusions and implications for the programme of the analysis of the below points:

Capacity of the public sector for policy making, enforcement and service delivery.
Without established structures, allowing building knowledge capacities within energy planning and renewable energy integration there is a high risk of lack of know-how and human resources in relevant public and private institutions.

This assessment is based on consultations with various stakeholders, and it is indicating that the institutions in GoE are lacking human resources with required know-how and technical capabilities within a broad range of areas related to sustainable economic growth as emphasized in the GTP III & III as a priority action.

Currently, international development organisations and donors take on this role in many cases. In the energy sector, the World Bank, Power Africa and other institutions with technical energy experiences and know-how have prepared analytical studies for the GoE aiming at supporting establishment of relevant energy plans and strategies. However, in order to create a sustainable path moving forward, the Ethiopians have recognized the need for having the knowledge in house, to be able to navigate and plan long-term.

Furthermore, the limited knowledge within energy planning and modelling is also visible at the university level, where there is not sufficient research and education available in these fields. The university sector is currently completely excluded from the industry and energy planning within the public entities. When well-established within MoWIE and affiliated institutions, the programme will explore the possibility of assisting universities in developing curriculum within the field of energy modelling – to secure the future experts and create a sustainable change.

Moreover, very often data necessary for undertaking research and development activities are not available, scattered within different institutions, or difficult to access. Data and information are located in multiple sites and often each institution has their own dataset and system. This jeopardizes research activities for the academia and when developed, it hinders validity of obtained results as no unified and agreed upon data sets can be acquired.

Among high level officers and decision makers it is often found that many are technically very skilled which is indicating that they have a technical training background. When it comes to management skills, they often have no proof of training in this aspect. Hence executive decision may often be based on experiences – business as usual – rather than from an economically and strategically founded viewpoint.

Corruption situation
Ethiopia ranks #114 of 180 countries on Transparency International's Corruption Perceptions Index 2018.

List the key documentation and sources used for the analysis:

Same as above and Transparency International and local corruption assessments (corruption diagnostics and barometer reports, etc.)

Are additional studies / analytic work needed? How and when will it be done?

No additional studies or analytical work required

6. Matching with Danish strengths and interests, engaging Danish actors, seeking synergy

Briefly summarise the key conclusions and implications for the programme of the analysis of the below points:

Identify:

- where we have the most at stake – interests and values,
- where we can (have) influence through strategic use of positions of strength, expertise and experience, and
- where we see that Denmark can play a role through active partnerships for a common aim/agenda or see the need for Denmark to take lead in pushing an agenda forward.

The Danish Energy Agency (and other Danish energy institutions such as the transmission system operator Energinet) have strong competences in long-term model-based energy scenarios and energy planning for RE deployment, including grid integration of high proportions of variable RE.

Denmark has demonstrated that it is possible to decouple economic growth, GHG emissions and energy consumption, resulting in green growth. Wind energy contributed 47% of the electricity consumption in Denmark in 2019.

The Danish energy model has also demonstrated the importance of:

- a holistic approach based upon an energy agreement as a roadmap for development of energy supply and demand
- energy planning including models, scenarios and long-term planning
- power generation system flexibility
- integration of renewable energy
- maintaining a very high security of electricity supply closely linked to significant cross border connections
- close public and private cooperation, public engagement and acceptance, general public support for the energy sector transition
- advancement of the LCOE approach
- wind
- biomass utilization
- regulation of and targeted investments in energy efficiency
- and a broad and integrated one-stop-shop mandate of DEA to regulate and deliver on the above.

Denmark has a strong interest in sharing this experience in a partnership with Ethiopia for mutual benefit, which will also contribute to Denmark's interest in achieving global climate goals and meeting SDG targets.

Denmark is a global leader in many aspects of the green energy transition, including RE and EE. Denmark's interests and values are strong in this space, as mentioned above.

The strong and trust based partnership that has been developed with Ethiopia is built through the past four years of cooperation and has established access

	to the key decision-makers in Ethiopia and a high credibility as a government institution. This strong partnership is key for a successful programme in the future.
- Brief mapping of areas where there is potential for increased commercial engagement, trade relations and investment as well as involvement of Danish local and central authorities, civil society organisations and academia.	The Ethiopian market has some challenging framework conditions but has a large potential for Danish solutions. Wind, solar and battery technologies are opportunities that can be pursued commercially from the Danish side.
- Assessment of the donor landscape and coordination, and opportunities for Denmark to deliver results through partners including through multilaterals and EU;	The energy donor field in Ethiopia is characterised by a large number of players. The Energy Development Partners Coordination Group is established and ensures a high coordination and cooperation between the different organisations. The group is co-chaired by the World Bank and Denmark. WB is very active in Ethiopia running a number of projects, e.g. the scaling solar project, transmission, rehabilitation of network, providing guarantees. EU is a new player in the energy sector, where they have previously focused more on transportation. The main focus is now on off-grid solutions and micro-grids, but also support to the national biogas programmes. FCDO has recently started a new programme focusing on bridging the gap to researchers in the energy planning field, working primarily with the universities and academia. There could be good possibility for synergies through potential collaborations in this field. USAID (PowerAfria) USAID is working through Power Africa within a number of areas in the Ethiopian energy sector. This includes the Grid Management Support Program Study (February 2019) that have analysed both demand forecasting, power system expansion planning and operational analysis. Power Africa also provides advice to the GoE and EEP on transaction of ongoing solar tenders.
List the key documentation and sources used for the analysis: Same as above under item 1.	
Are additional studies / analytic work needed? How and when will it be done? No additional studies or analytical work required.	

7. Stakeholder analysis

Briefly summarise the key conclusions and implications for the programme of the analysis of the below points:

The key partners and stakeholders in the programme are Ministry of Water, Irrigation and Energy (MoWIE) and Ethiopian Electric Power (EEP).
Key stakeholders (beyond partners):

The Ministry of Finance (MoF): MoF is responsible for managing the country's financial and economic policy. The ministry handles planning and implementation of development programmes including those that address climate change. MoF's mandate is to develop and implement Ethiopia's CRGE and mobilizes funding for relevant projects compliant with national targets. The MoF is responsible for aligning engagements where development partners, government and the society can agree on decisions regarding climate financing. They are responsible for setting up relevant actions and evaluate status of programmes related to GHG emissions reduction as set out in CRGE. In collaboration with the Commission of Environment, Forest and Climate Change (EFCC) – reporting to the Prime Minister's office – MoF has established and operationalized the CRGE Facility responsible for attracting and managing funds supporting CRGE targets.

PPP-DG within the Ministry of Finance is responsible for the overall approval of IPPs and location of these.

National Planning Commission (NPC), under the MoF, is an important institution being responsible for developing the country's development plans, thus a key partner as recipient of scenarios for decision-making. The NPC is mandated to lead and coordinate the planning, monitoring and evaluation system of the country. Strong emphasis will be given to strengthening the national M&E system in order to produce and analyse timely, complete and credible data from surveys and administrative sources as well as prepare and disseminate M&E reports to relevant users. The NPC is playing a central role in framing the country's socio-economic development discourse in the medium- and long-term perspective. It is expected to work in collaboration with think tanks specializing in policy analysis, conducting research, and preparing development plans and monitoring and evaluation that help in realizing the national vision.

Ethiopian Electricity Utility (EEU): EEU was established in 2013 after an unbundling process of the Ethiopian Electric Power Corporation (EEPCo) and is responsible for the power distribution. The state-owned distribution company is subject to maintaining distribution lines up to 66 kV as well as off-grid electricity generation. Its mandate includes undertaking feasibility studies for both on-grid and off-grid expansions and contract qualified consultants. Its overall objective is to coordinate responsibilities with EEP on the distribution level with an objective of increasing electricity access to rural communities currently not connected to the national grid. EEU is responsible for collecting electricity tariff payments from end-users. The distribution activity in Ethiopia has recently started the process of the horizontal unbundling of EEU, identifying four regional EEU units to act on behalf of the central office. However, this process is not completed yet, mostly because there are a number of aspects affecting it that are not clear or not properly covered by the corresponding regulations. This is expected to be an element of the power sector reform roadmap.

Ethiopian Energy Authority (EEA): The EEA was established in 2013 by the new Proclamation 810/2013 and Counsel of Ministers Regulation 308/2014. EEA is authorized to fully undertake all regulatory activities related to energy sector mainly in terms of efficiency, conservation and safety. Its main responsibilities are to promote reliable electricity service, issue operational licenses, set up performance standards and determine tariffs structures. The capacity of the regulator, EEA needs to be strengthened so that it can make independent power sector regulatory decisions. The country's legal framework provides and enables the delegation of more power and responsibilities to the EEA, which will be needed to implement power sector reforms. EEA should carry out a more proactive role in becoming a credible reference institution for the private sector, state institutions, local companies, as well as for consumers.

World Bank (WB): The WB is working in many different areas in Ethiopia within a broad spectrum of sectors with a larger budget compared with other agencies. Within the energy sector can be mentioned transmission expansion, rehabilitation of the network, network guarantees, and funding for IPP's. The World Bank is especially involved in grid development, both on grid, off grid and micro grids, supporting the access to electricity for all targets and the development of the National Energy Sector Reform Roadmap, where World

Bank is the lead partner to MoWIE. The Roadmap includes NEP 2.0, strengthening of the regulator, use of modern ICT, sector restructuring (unbundling and privatization of utility), tariff adjustments and loss reduction, wider option resource mix as well as capacity building and technical support. There will be a high level of synergies between this engagement and the proposed DEEP.
Are additional studies / analytic work needed? How and when will it be done? No additional studies or analytical work required.

Annex 2: Partners

1. Summary of stakeholder analysis

The main partner of the cooperation is the Ministry of Water, Irrigation and Energy (MoWIE) and the affiliated institutions, where for the DEEP programme Ethiopian Electric Power (EEP) is a key-partner. MoWIE plans, leads, coordinates and monitors overall energy/power sector development. The GoE has announced the establishment of a new Energy Development Commission (EDC) that will be placed under the MoWIE. The EDC and its mandate/role remain to be concluded, but it is expected – if established – that it will play a central role in the cooperation.

2. Criteria for selecting programme partners.

As the programme builds on the current AWPGE and SSC programme and previous the same partners are maintained in order to support the request from GoE and continue the strong relationship with the partners. The partners directly work with and influence:

- Mitigation of climate change
- Energy related activities
- Energy and climate policy formulation
- Provide inputs to and influence the Growth and Transformation Plan, mid and long-term strategies and plans, including development of update on NDC
- Producing or using energy scenario planning and modelling through decision making
- The development of the generation, transmission and distribution energy system in Ethiopia

3. Brief presentation of partners

Ministry of Water, Irrigation and Energy (MOWIE) is responsible for water resources and water supply, irrigation and energy and is involved in the planning, development and management of guidelines and strategies related to the specific areas, including the execution of the National Electrification Plan 2017 (NEP 2017). In case of transboundary water resources and regional development related to cross-African water resources, MoWIE engages in the negotiations regarding national agreements, such as the GERD.

The Ministry consists of three departments supervised by three state Ministers: Water Supply and Sanitation Sector, Irrigation and Drainage Sector and Energy Sector. The department with most direct relevance for the programme is the department of Energy Sector where there are three main energy directorates with responsibility of the energy sector study, development and associated activities:

- Energy Policy, Strategy and Information Directorate
- Alternative Energy Technology Development & Promotion Directorate
- Hydro Power Development, Study and Design Directorate

Through the AWGPE with Ethiopia from 2017-2020 a Danish Long-term advisor has been embedded in MoWIE in the Energy Policy, Strategy and Information Directorate, reporting directly to the State Minister of Energy. The advisor's primary responsibilities dealt with executive advisory, programme management and liaising with the implementing entities to ensure linkages

and synergies; in particular focusing on MoWIE, EEP, the Royal Danish Embassy (RDE) in Addis Ababa, the Danish Energy Agency, Energinet and the World Bank Group.

Directly supervised by the State Minister of Energy Sector is three affiliated sectoral institutions;

- Ethiopian Electric Power (EEP) – power generation, transmission and bulk sales
- Ethiopian Electric Utility (EEU) – power distribution, sales
- Ethiopian Energy Authority (EEA) – regulatory body for electricity and energy efficiency

The Ethiopian power services were traditionally organized in a vertically integrated utility in the Ethiopian Electric Power Corporation (EEPCo). In 2013, EEPCo was split up into two companies, unbundling distribution in the Ethiopian Electric Utility (EEU) from transmission and generation in the Ethiopian Electric Power (EEP). Both companies are supervised through a joint board and refer to MoWIE. In addition, the GoE has in earlier reforms established an independent regulator, EEA. A part of the power sector reform process is to examine effects of the tariff reform and a reform of the financial structure and deficit of EEP in particular. The main obstacle is that with the current tariff, even with the process of phased increments currently under way, is not high enough to run a financially sound system.

The Ethiopian Electric Power (EEP) is the state-owned electricity company and is the country's dominant power generation company. It was established in 2013 with a responsibility for generation, transmission and overall system operation. EEP administers currently 18 power plants out of which 3,214 MW is hydro energy, 324 MW comes from wind, 7.3 MW from geothermal sources and remaining 104 MW is supplied by diesel generators (total of 4,244 MW power capacity). Besides generation, EEP is responsible for maintaining high voltage transmission lines, substations and wholesale of electricity.

In relation to the DEEP programme, the following divisions in EEP have been identified to be the most important partners to engage with:

- Engineering Division
- Corporate Planning Division
- Transmission and Substation Operation Division
- National Load Dispatch Center

There are increasing reports on the unbundling process of EEP which consequently will separate the TSO responsibilities from the generation side. The Prime Minister has expressed his discontent with the disruption of electricity supply and has, in response to this, established commissions to deal with specific issues, investment commission, jobs commission etc. The Prime Minister also calls for a new focus on the energy sector and has therefore announced the intension of the establishment of an Energy Development Commission. The idea is to have a focused commission on the sector development without preferred options and obligations. The establishment is yet to be formed.

Ethiopian Electric Utility (EEU): EEU was established in 2013 after unbundling of the Ethiopian Electric Power Corporation (EEPCo) and is responsible for power distribution. The state-owned distribution company is subject to maintaining distribution lines up to 66 kV as well as off-grid electricity generation. Its mandate is to undertake feasibility studies for both on-grid and off-gird expansions and contract relevant consultants. Its overall objective is to coordinate responsibilities with EEP but on the distribution level with an objective of increasing electricity access to rural communities currently not connected to the national grid. EEU is responsible for

collecting electricity tariff payments from end-users. The distribution activity in Ethiopia has recently started the process of the horizontal unbundling of EEU, identifying four regional EEU units. However, this process is not completed yet, mostly because there are a number of aspects affecting it that are not clear or not properly covered by the corresponding regulations. This is expected to be an element of the power sector reform roadmap.

Ethiopian Energy Authority (EEA): The Ethiopian Energy Authority (EEA) was established in 2013 by the new Proclamation 810/2013 and Counsel of Ministers Regulation 308/2014. EEA is authorized to fully undertake all regulatory activities related with energy sector mainly in terms of efficiency, conservation and safety. Its main responsibilities are to promote reliable electricity service, issue operational licenses, set up performance standards and determine tariffs. The capacity of the regulator, EEA needs to be strengthened so that it can make independent power sector regulatory decisions. The country's legal framework provides and enables delegating more powers and responsibilities to the EEA, which will be needed to implement power sector reform. EEA should carry out a more proactive role to become a credible reference institution for the private sector, state institutions, local companies, as well as for consumers.

Possible Energy Development Commission (EDC): An element of the power sector reform proposed by MoWIE, includes the establishment of an Energy Development Commission within the Ministry. The details are still under consideration, but in a reformed power sector, attracting private sector participation in a sustainable manner and improving quality of service, it is expected that the key role of MoWIE will essentially be to set overall energy policies and deal with the Council Ministers, whilst the Commission will be responsible for:

- Translating general national policies into sector policy, strategies, targets and plans, including engaging with the National Development Commission on mid- to long-term planning;
- Monitoring the overall development of the energy sector and security of supply;
- Drafting the secondary legal regulation to implement the Proclamation.

It is also likely that the Commission will draw on the planning and modelling resources in MoWIE and EEP. It may also receive some of the responsibilities for preparing competitive tenders with Independent Power Producers in cooperation with the new Ethiopian Transmission and System Operation Company (ETSO) expected to be created as another element of the power sector reform.

Between them, MoWIE and the Commission need tools and procedures for issuing national energy policies, strategies and plans to provide a medium- and long-term vision of the sector and current challenges to develop sustainability. Additional tools for monitoring investment and security of supply and monitoring results of reform based on reporting by other institutions will also be an essential task. Further clarifications and details on responsibilities will be needed as part of power sector reform, in particular for each institution to be assigned the necessary powers to carry out its functions providing predictability and credibility to investors and the public. When established, the EDC is therefore expected to play a central role in the DEEP programme.

Summary of key partner features

Partner name	Core business	Importance	Influence	Contribution	Capacity	Exit strategy
MoWIE	MoWIE is responsible for water resources and water supply, irrigation and energy being a key government entity as it plans, leads, coordinates and monitors overall energy sector development and strategies. The reform of the energy sector is anchored and driven by MowIE. MoWIE is the main partner and responsible for the development of the first Ethiopian Energy Outlook.	High – the mandate of the ministry is closely linked to the areas of support offered through the Danish energy partnership – especially by securing security of supply and long-term energy planning.	High – MoWIE holds a key role as the coordinating body in the energy sector and is given high political attention due to the critical importance of the energy sector, responding directly to the prime ministers' office.	Main partner for the programme, and directly responsible for the affiliates contributions. MoWIE will give in-kind contribution by providing staff, office space and meeting facilities.	Without established structures, allowing building knowledge capacities within energy planning and renewable energy integration there is a high risk of lack of know-how and human resources in relevant public and private institutions.	Evidence of uptake and use of know-how that has been transferred and capacity developed. Further formulations on an appropriate strategy for exiting the DEEP will be addressed during the implementation along with the feedback from the partner(s)
EEP	EEP has the responsibility for generation, transmission and overall system operation of the Ethiopian energy system (TSO).	High – There is a great need for knowledge of transfer in both energy modelling and energy integration where practical technical capabilities are necessary for running a sustainable and flexible energy system with a high	High – with direct ownership of the entire generation capacity in Ethiopia, EEP plays a central role in the development of variable renewable energy.	Key partner for the programme, and directly responsible for renewable energy expansion including contracting authority for IPP energy tenders and RE system integration. EEP will give in-kind contribution by providing staff and facilities.	EEP has different interest in the development of the energy sector, e.g. institutional expertise regarding design, construction and operation of hydropower facilities. EEP is lacking some human resources with know-how and technical capabilities.	Evidence of uptake and use of know-how that has been transferred and capacity developed

Partner name	Core business	Importance	Influence	Contribution	Capacity	Exit strategy
		share of variable renewable energy.				
Energy Development Commission (announced)	The newly announced EDC is yet to be established and the role of the commission decided. However, it is expected that if established the commission will play a key role in the development of energy policies and strategies focusing on i.e. long-term scenarios.	High (expected) – GoE have requested support for the institutional setup of the commission and the programme can therefore influence the importance and role of commission.	Unknown – depending on the decided role and mandate of the commission.	-	-	-

Annex 3: Results Framework at Outcome and Output Levels

Overview:

Objective	Outcomes	Outputs
To support the development of the Ethiopian government structures and systems that in a sustainable and cost effective way improves access to renewable energy (SDG 7) and hereby supporting the Ethiopian vision of building a Climate Resilient Green Economy while reaching lower middle-income status by 2025. To support the expected increase in supply to accommodate energy demand by enabling an environment for investment, cost-efficient electricity system planning to increase security of supply	1 Energy planning and modelling: Creating choice awareness	1.1 Modelling capacity 1.2 Energy policy and planning
	2 Wind energy development	2.1 Planning and wind resource assessment 2.2 Development and procurement of wind energy projects
	3 Integration of Renewable Energy	3.1 Regulatory Framework 3.2 Flexibility in power generation 3.3 Optimal dispatching

Detailed Result Framework

Programme	**Enhanced Danish-Ethiopian Energy Partnership (DEEP)**
Programme Objective	To support the development of the Ethiopian government structures and systems that in a sustainable and cost effective way improves access to renewable energy (SDG 7) and hereby supporting the Ethiopian vision of building a Climate Resilient Green Economy while reaching lower middle-income status by 2025. To support the expected increase in supply to accomodate energy demand by enabling an environment for investment, cost-efficient electricity system planning to increase security of supply

Outcome 1 Energy planning and modelling: Creating choice awareness	**Choice awareness in energy sector development;** Ethiopia has introduced **"choice awareness"** in the decision-making process and taken ownership of an Ethiopia Energy Outlook. Choices in energy planning activities are guided by transparency and state-of-the-art analyses, including clear descriptions of challenges, and neutral analyses of alternatives (scenarios) supporting the policy development of the energy sector.

Outcome indicator		National energy planning and policy development is based on the process and work with the Ethiopian Energy Outlook Report which is prepared with the engagement of all relevant stakeholders in a transparent process.
Baseline	2021	First Ethiopia Energy Outlook is published. It has a broad introduction, with analyses of various sectors including biomass, transport, electrification, and natural gas – and has a deep dive into power sector analyses based on the Balmorel model but has not been integrated in national energy plans.
Target	2026	Energy sector policy development and national energy plans, plans related to the Economic Reform Agenda and EEP master plans, have been developed based on the process and work with the Energy Outlook Report including a high degree of choice awareness, transparency, and stakeholder involvement.

Output 1.1 Modelling capacity		MoWIE and EEP's capacity to independently prepare high-quality integrated scenario-based long-term modelling of the Ethiopian energy system presented in biennial EORs.
Output indicator		The development of energy policy is based on Energy Outlook tools, transparent data and scenario-based analyses which lead to "choice awareness" for decision makers
Baseline	2021	The Ethiopian Energy Outlook Report is prepared in cooperation between MoWIE, EEP and DEA with significant external support and is used as input to national energy plans.
Target	2024	The Ethiopian Energy Outlook Report is developed and published, headed by MoWIE and EEP with support from DEA, based on input data from line ministries. The outlook scenarios are used for national energy plans, including stock-taking of the progress of GTP and progress toward meeting the targets of the NEP and SDG7 Access for all.
Target	2026	MoWIE and EEP leads, independently, the development of further improved Ethiopian Energy Outlook Report

Output 1.2 Energy policy and planning		Energy policy and planning is strengthened and aligned among MoWIE, EEP and across ministries in particular the National Planning Commission
Output indicator		Advances in energy policy and planning tools lead to formulation of scenarios and pathways to reach the targets of the NEP, GTP and SDG 7 – access for all.
Baseline	2021	Current energy models, planning and policy data are not consistent
Target	2024	- Data and assumptions between various strategies and planning systems are consistent and synchronized according to their purpose

		- Decision makers use enhanced energy policy and planning based on energy scenarios.
Target	2026	- Energy policy and planning based on least cost development of energy models is the key contributions to defining and tracking Ethiopian CRGE/SDG targets - The pipeline of new generation capacity is updated based on the least cost development outlooks.

Outcome 2 Wind energy development		Onshore wind energy development to promote and create an enabling environment and transparent framework for lowering the cost of onshore wind power using best available practice in planning, procurement and cost reducing measure to continue the implementation of the ambitious Ethiopian wind energy targets.
Outcome indicator		A strategic approach to planning of wind energy development is in place and finalization of all preparation for conducting IPP tenders of development of large-scale wind projects in Ethiopia in a transparet manner.
Baseline	2021	- Apart from three operational wind projects a number of wind projects are in the development phase mainly based upon the traditional EPC modality. - Sites have been approved for IPP development both based upon a tender process and an unsolicited offer. - There is no strategic approach to planning of wind resources
Target	2026	- Transparent and attractive frameworks for private wind project developers are developed (illustrated by bid ready projects and pipeline for OEM's and IPP's, to meet the Ethiopian targets for wind power) - A strategic approach to planning for wind energy resources is in place.

Output 2.1 Planning and wind resource assessment		MOWIE and EEP have the capacity to independently prepare high-quality wind measurement campaigns to support cost-effective exploration of Ethiopia's vast wind resources and contribute to a continuing low carbon energy supply based on diversified sources to complement hydro power.
Output indicator		Key Ethiopian energy planning and development authorities to plan, execute, operate, maintain and analyse high quality wind measurement campaigns and equipment to support energy planning and resource management. A strategic approach to planning for wind sites has been adopted indicating priorities for tender and open-door respectively.
Baseline	2021	Limited knowledge and hands on experience in house with wind ressource assessments.
Target	2024	In-house capacity for wind ressource assessments has been built
Target	2026	A strategic plan for utilisation of wind resources and sites has been adopted

Output 2.2 Development and procurement of wind energy projects		An enabling framework that streamlines development, clearances and procurement for wind energy projects while reducing risk for private project developers, investors and lenders.
Output indicator		GoE and key stakeholders (EEP, PPP-DG, etc.) will be able to structure and execute future wind energy development and project maturing in order to fulfil energy plans and low carbon energy expansion. First wind power tender is completed and capacity strenghened in wind power developement (i.e. has demonstrated means of optimizing costs, attracting bidders and providing a basis for commercial and/or concessional financing and ready for wider replication).
Baseline	2021	- First sites selected for wind tender - Roadmap for wind development in Ethiopia developed
Target	2024	- Feasibility studies for first sites completed and tender documents finalised and ready to launch
Target	2026	- IPP tender(s) have been conducted, proces and prices evaluated, and the IPP framework has further been developed based on the experience

Outcome 3 Integration of variable renewable energy		Regulatory framework and flexible options in the power system supports the efficient and secure expansion of renewable energy and a diversified energy mix fully integrated with the region.
Outcome indicator		Transparent regulatory framework in line with international/regional (EAPP) standards in place for efficient, secure and market-based integration of energy generation in the power system and full compliance with the EAPP Interconnector requirements.
Baseline	Year 2021	Incomplete framework for integration of the Ethiopian power system into the region and limited capacity and flexiblity to integrate VRE in the most efficient and cost-effective manner.
Target	Year 2026	- Operational procedures in the NLDC revised and enchanced to support a economical dispatching of generation and demand facilities. - Grid codes revised and evaluated with reliant of electricity market stakeholders for all kind of generation technology and fuel types including variable renewable energy resosurces as well as any kind of demand facility is governed by en enhanced regulatory framework. - Increased variable renewable energy integration, system flexibility based on economoical dispathing principle reling on improved demand forecsating and variable renewable energy forecasting, resulting in an enhanced system stability.

Output 3.1		Legal framework that ensure the transparency, operational security and technical quality of power system operation and security of supply with an increased level of integration of variable renewable energy resources implemented in full compliance with the EAPP electricity market requirements.
Output indicator		- Legal framework for integration of all kind of generation and demand facilities including variable renewable energy implemented. - Revised and enhanced operational procedures for economical dispatching implemented in NLDC. - Revised Grid Codes and an established compliance verification team including procedures for securing full compliance of any kind of generation and demand facilty as well as any kind of grid elements before entering into operation.
Baseline	2021	- Limited compliance with grid codes secured before generation and demand facilities as well as grid elements (lines, transformer stations, SCADA systems, telecommunication facilities etc). - Current grid codes has limitations for adaption to the Ethiopan grid system and operational environment. - Operational procedures for the dispatching is not up to international standards.
Target	2024	Draft regulatory framework, which consider full tranparency and technology neutrality and covers all electricity sector stakeholders related to the development of the Power Sector Reform is ready for implementation.
Target	2026	Relevant regulation, including rules for transparency and equal treatment of all parties, updated set of grid codes, operational procedures and full verified EAPP compliance, for increased variable renewable energy integration into the grid are enforced and implemented.

Output 3.2		Securing flexibility in hydro power and conventional power generation thereby ensures adaptability of variable renewable energy resources in the generation portfolio.
Output indicator		Mechanisms that ensures optimal integration of variable renewable energy resources through an economical dispatching of hydro and conventrional generation as well as demand facilities with an appropriate flexibility implemented and ready for economical dispatching.
Baseline	2021	Incentives for demand flexibility is limited.
Target	2024	Solutions that allow optimal integration of variable renewable energy and flexibility in hydro power generation and demand-response implemented.

Target	2026	Updated mechanisms enforced to regulate and optimize variable renewable energy integration.

Output 3.3		Ethiopian power system operation capacity to ensure optimal and economical based dispatching and integration of variable renewable energy resources into the power system is enhanced
Output indicator		Principle of economical based dispatching and indicators of system operator performance related to the fundamental principle is established. Sufficient system operator capacity to optimize integration of variable renewable energy into the grid available.
Baseline	2021	- Limited capacity to apply variable renewable energy integration in system operation. - Operational procedures for the dispatching is not up to international standards.
Target	2023	Application of decision support tools, e.g. revised operational procedures, enchanced demand forecasting, generation output forecasting and real-time monitoring measurements, for optimal integration of variable renewable energy resources fully implemented and ready for verification and testing in the NLDC.
Target	2025	Implemented decision support tools for economical dispatching of all generation portfolio applied in the NLDC for optimal and transparent system operation.

Annex 4: Budget Details at Output Level

Table A-4.1: Overall Budget by outcome and output

Outcome	Output	Outline Budget (mDKK)										% within each outcome
		TA					Long term Advisers	Analysis and reviews	Totals		Totals %	
		DEA	Energinet	Workshops, study tours, etc.	Consultants							
1 Energy planning and modelling: Creating choice awareness	1.1 Modelling capacity	5,77		0,17	2,66		3,38		11,98	18,94	32%	63%
	1.2 Energy policy and planning	2,82		0,17	0,60		3,38		6,96			37%
2 Wind energy development	2.1 Planning and wind resources assessment	3,71		0,17	2,10		2,25		8,23	16,69	28%	49%
	2.2 Development and procurement of wind energy projects	4,53		0,17	1,50		2,25		8,46			51%
3 Integration of variable renewable energy	3.1 Regulatory framework	1,03	2,50	0,17	0,00		2,25		5,95	14,17	24%	42%
	3.2 Flexibility in power generation	0,69	3,10	0,17	0,00				3,96			28%
	3.3 Optimal dispatching	0,69	3,40	0,17	0,00				4,26			30%
Cross cutting	Programme management DEA	2,40		0,00	0,00				2,40	2,40	4%	
	Recruitment costs						0,60		0,60	0,60	1%	
	Local Activities								0,50	0,50	1%	
	Reviews							0,70	0,70	0,70	1%	
	Contingencies								2,00	2,00	3%	
	Unallocated funds								4,00	4,00	7%	
Total		**21,64**	**9,00**	**1,20**	**6,86**		**14,10**	**0,70**	**60,00**	60,00	100%	

Notes		Explanation
Hourly rate of DEA (DKK)	600,0	see 'Hour rate DEA' sheet
DEA travel expenses (DKK m)	2,74	see 'Travel expenses' sheet
Long term adviser cost per year (DKK m), for 4.5 years with first year only 6 months	1,50	
Mid term review and inception review managed by MFA (DKK m)	0,70	
Recruitment costs, 4 recruitments of DKK 150.000 (DKK m)	0,60	
Study tours etc. For 5 years (DKK m)	1,20	See sheet 'Study trips and workshops'. Based on experience from the current SSC and AWPGE. Workshops and study tours is expected to go across outcomes and budget is therefore combined.
Programme management across outputs (DKK m)	2,40	Tasks under the programme management include: Coordination across outputs and team management; tender and management of framework contract; financial controlling of budgets and expenditures; preparation and follow-up on Advisory Group- and steering committee meetings;
Contingencies (DKK m)	2,00	The outputs cover all general areas of activities in the programme.
Unallocated funds, new activities/outputs not included (DKK m)	4,00	A small buffer for the possibility of an output not already accounted for.
Local activities	0,5	Local activities such as room rent for workshops, seminars, etc.

Table A-4.2: Budgets by year - expenditure type

Budget by year (mDKK)	(H2)2021	2022	2023	2024	2025	(H1)2026	Total	%
Outcome 1	0,78	1,83	2,50	2,74	2,74	1,60	**12,19**	20%
Outcome 2	1,26	2,81	2,53	2,50	2,00	1,09	**12,19**	20%
Outcome 3	1,14	2,81	2,81	2,21	1,81	1,14	**11,92**	20%
DEEP Programme Management	0,24	0,48	0,48	0,48	0,48	0,24	**2,40**	4%
Long term advisers	0,30	3,00	3,30	3,00	3,00	1,50	**14,10**	23%
Local Activities	0,05	0,10	0,10	0,10	0,10	0,05	**0,50**	1%
Reviews	0,10	-	-	0,60	-	-	**0,70**	1%
Contingencies	0,20	0,40	0,40	0,40	0,40	0,20	**2,00**	3%
Unallocated	0,10	0,20	0,40	1,20	1,20	0,90	**4,00**	7%
Total	4,17	11,63	12,53	13,23	11,73	6,71	**60,00**	100%

Budget by year (mDKK)	Notes:
DEA Staff resources	In accordance with expected use on outputs
DEA travel, hotel, per diem	See sheet 'Travel expenses'
Consultants incl. Energinet	In accordance with expected use on outputs. Here cost for Energinet also included
Study tours etc.	Based on experience from study tour and workshop costs in the current SSC and AWPGE programme. Workshops and study tours is expected to go across outputs and budget is therefore combined. Some tasks will be handled by consultants and therefore be included in the consultant budget. More info in the study trips and
Long term advisers	Based on costs from previous AWPGE programme
Local Activities	Local activities such as room rent for workshops, seminars, etc.
Reviews	Price for one MTR and inception review
Contingencies	The outputs cover all general areas of activities in the programme.
Unallocated	Unallocated in order to be flexible across the program during its 5 year period.

Table A-4.3 Budgets by year – Outcomes

Budget by year (mDKK)	(H2)2021	2022	2023	2024	2025	(H1)2026	Total	%
Outcome 1	0,78	1,83	2,50	2,74	2,74	1,60	**12,19**	20%
Outcome 2	1,26	2,81	2,53	2,50	2,00	1,09	**12,19**	20%
Outcome 3	1,14	2,81	2,81	2,21	1,81	1,14	**11,92**	20%
DEEP Programme Management	0,24	0,48	0,48	0,48	0,48	0,24	**2,40**	4%
Long term advisers	0,30	3,00	3,30	3,00	3,00	1,50	**14,10**	23%
Local Activities	0,05	0,10	0,10	0,10	0,10	0,05	**0,50**	1%
Reviews	0,10	-	-	0,60	-	-	**0,70**	1%
Contingencies	0,20	0,40	0,40	0,40	0,40	0,20	**2,00**	3%
Unallocated	0,10	0,20	0,40	1,20	1,20	0,90	**4,00**	7%
Total	4,17	11,63	12,53	13,23	11,73	6,71	**60,00**	100%

Table A-4.4: DEA staff hours and expenses per output

Outcome	Output	DEA total costs and expenses			
		Hours	Hours costs (mDKK)	Expenses (mDKK)	Total (mDKK)
1 Energy planning and modelling: Creating choice awareness	1.1 Modelling capacity	8400	5,04	0,73	5,77
	1.2 Energy policy and planning	4100	2,46	0,36	2,82
2 Wind energy development	2.1 Planning and wind resources assessment	5400	3,24	0,47	3,71
	2.2 Development and procurement of wind energy projects	6600	3,96	0,57	4,53
3 Integration of variable renewable energy	3.1 Regulatory framework	1500	0,90	0,13	1,03
	3.2 Flexibility in power generation	1000	0,60	0,09	0,69
	3.3 Optimal dispatching	1000	0,60	0,09	0,69
Cross cutting	Programme management DEA	3500	2,10	0,30	2,40
	Recruitment costs				
	Activities				
	Reviews				
	Contingencies				
	Unallocated funds				
	Total	31500	18,9	2,7	21,64

Table A-4.5: DEA hours per year, DEA cost and expenses and other consultant/workshop and study tours per year

Output	DEA hours per year						
	(H2)2021	2022	2023	2024	2025	(H1)2026	Total
1.1 Modelling capacity	700	1400	1800	1800	1800	900	8400
1.2 Energy policy and planning	350	700	700	900	900	550	4100
2.1 Planning and wind resources assessment	600	1200	1000	1100	1100	400	5400
2.2 Development and procurement of wind energy projects	800	1600	1400	1100	1100	600	6600
3.1 Regulatory framework	150	300	300	300	300	150	1500
3.2 Flexibility in power generation	100	200	200	200	200	100	1000
3.3 Optimal dispatching	100	200	200	200	200	100	1000
Programme management DEA	350	700	700	700	700	350	3500
Recruitment costs							
Activities							
Reviews							
Contingencies							
Unallocated funds							
Total	3150	6300	6300	6300	6300	3150	31500

Output	DEA costs and expenses per year (mDKK)						
	(H2)2021	2022	2023	2024	2025	(H1)2026	Total
1.1 Modelling capacity	0,48	0,96	1,24	1,24	1,24	0,62	5,77
1.2 Energy policy and planning	0,24	0,48	0,48	0,62	0,62	0,38	2,82
2.1 Planning and wind resources assessment	0,41	0,82	0,69	0,76	0,76	0,27	3,71
2.2 Development and procurement of wind energy projects	0,55	1,10	0,96	0,76	0,76	0,41	4,53
3.1 Regulatory framework	0,10	0,21	0,21	0,21	0,21	0,10	1,03
3.2 Flexibility in power generation	0,07	0,14	0,14	0,14	0,14	0,07	0,69
3.3 Optimal dispatching	0,07	0,14	0,14	0,14	0,14	0,07	0,69
Programme management DEA	0,24	0,48	0,48	0,48	0,48	0,24	2,40
Recruitment costs							
Activities							
Reviews							
Contingencies							
Unallocated funds							
Total	2,16	4,33	4,33	4,33	4,33	2,16	21,64

Output	Total DEA, consultant, workshop and study tour per year (mDKK)						
	(H2)2021	2022	2023	2024	2025	(H1)2026	Total
1.1 Modelling capacity	0,54	1,20	1,78	1,98	1,98	1,12	8,60
1.2 Energy policy and planning	0,24	0,62	0,72	0,76	0,76	0,48	3,59
2.1 Planning and wind resources assessment	0,61	1,37	1,13	1,40	1,00	0,47	5,98
2.2 Development and procurement of wind energy projects	0,65	1,44	1,40	1,10	1,00	0,61	6,21
3.1 Regulatory framework	0,40	0,85	0,85	0,65	0,55	0,40	3,70
3.2 Flexibility in power generation	0,37	0,98	0,98	0,68	0,58	0,37	3,96
3.3 Optimal dispatching	0,37	0,98	0,98	0,88	0,68	0,37	4,26
Programme management DEA	0,24	0,48	0,48	0,48	0,48	0,24	2,40
Recruitment costs							
Activities							
Reviews							
Contingencies							
Unallocated funds							
Total	3,42	7,93	8,33	7,93	7,03	4,06	38,70

Annex 5: Risk Management Matrix

Contextual risks[24]:

Risk Factor	Likelihood	Impact	Risk response	Residual risk	Background to assessment
Political, social, and ethnic tensions remain high and will result in protests and unrest in parts of the country.	Likely	Medium to high	Monitor the situation and adjust the Programme accordingly. The risk review will assess the probability for achieving the anticipated results and propose amendments as deemed necessary. The risks related to the current instability in Ethiopia and Covid-19 situations will be given particular attention.	Medium	Political, social, and ethnic tensions remain high in Ethiopia underlined by the current conflict.
Political disputes and the Covid-19 pandemic. The general election is postponed. The election will determine the future political direction.	Likely	Medium	Energy sector remains important	Medium	It is expected that the energy sector will continue to be central, and thus also the support to the programme. In the recovery of the Covid-pandemic the energy sector will be central for a fast recovery.
Lack of social acceptance of Wind deployment.	Unlikely	Low to medium	Will be included in programme document	Low	In Denmark the "not-in-my-backyard" syndrome vs. wind turbines and the scepticism about variability and security of supply are examples of challenges to social acceptability. Land rights and land availability for development of RE are also challenges and risk factors

[24] This category covers the range of potential adverse outcomes that may arise in a particular context, including the risk of harm beyond the immediate context or the country's borders and may include governance failure (e.g. the failure of effective public financial management or law enforcement); competition for resources; natural hazards; and pre-existing socio-political tensions. (Danida Guideline to Risk Matrix 2018).

Programmatic Risks[25]:

Risk Factor	Likelihood	Impact	Risk response	Residual risk	Background to assessment
Slow or stagnant improvements in the general private sector framework conditions. This includes the process of unbundling the entities responsible for transmission and generation and a partial privatisation of utilities	Likely	Major	Monitor the situation and engage in dialogue with GoE, including with development partners and private sector, to raise issues of concern.	Major	Improvements in general conditions for private sector investment/engagement in Ethiopia (availability of forex, addressing cumbersome procedures, permits, customs etc.) does not match the ambitions of GoE leading to increased frustration by private sector as well as affecting the growth of the private sector negatively.
Low and overstretched capacity of implementing partners slows down the needed intervention agendas.	Likely	Minor	The Embassy will set realistic milestones and timelines for the early stages of the Programme and allocate appropriate resources to oversight.	Medium	Based on the experience of previous support, GoE-implemented programmes are often delayed and lacks coordination and transparency among stakeholders requiring significant resources from development partners.
Termination of engagement from partner organisations:	Unlikely	Major	The Embassy will set realistic milestones and timelines and engage with implementing partners focusing on timely planning.	Low	The interest to engage in collaboration is clearly expressed by the minister and his request to extend the current partnership. It stipulates the strong political buy-in and engagement also from staff level in partner organisations. The high level of engagement must be continued in the future cooperation by involving a broadened spectre of relevant institutions from GoE. The Danish experiences and expertise within development of renewable energy is highly valued by the Ethiopian partners.
Availability of data and lack of willingness to share the available data can affect the quality of the technical assistance provided.	Moderate to unlikely	Major	The risk is reduced by the existing collaboration where a great deal of trust has been built with the partner organisations.	Low	Efficient capacity building in energy planning and modelling requires detailed information and data on the Ethiopian energy and especially power sector. During the programming it has been emphasised that the cooperation is a Gov-to-Gov cooperation hence the Ethiopian partners have expressed their willingness to share required data.

[25] This category covers include two kinds of risk: (1) the potential for a programme to fail to achieve its objectives; and (2) the potential for the programme to cause harm in the external environment. With regard to (1), the risk factors for programme failure include many of the contextual risks outlined above, as well as institutional and political factors. But there are many other reasons for potential programme failure, including inadequate understanding of the context or flawed assessment of what needs to be done; management and operational failures; and failures of planning and co-ordination. Risk is also associated with new or innovative programme approaches (although there may also be risk in failing to innovate). (Danida Guideline to Risk Matrix 2018). The categorisation of likelihood, impacts, and residual risk is also consistent with Danida guidelines.

Institutional risks[26]:

Risk Factor	Likelihood	Impact	Risk response	Residual risk	Background to assessment
Insufficient capacity and personnel in partner organisations	Likely	Major	The programme will emphasise on transferring technical studies into policy development and/or policy implementation. Solid energy sector administration is central for conducting sector regulation. It is necessary to engage in a true partnership, where the Ethiopian partners are actively involved and reserve the required resources for capacity building.	Major	The partnership is based on the assumption that it is a mutual cooperation where resources for knowledge transfer is available. The partner organisations must ensure sufficient capacity to receive technical assistance in order to create sustainable results. The availability of capacity and resources with the Ethiopian partners has been discussed extensively during the inception phase. The technical capacity of the current staff is estimated to be high due to their level of education and the general technical understanding should be sufficient.
The programme could duplicate existing activities and sources of finance and/or fails to recognise interfaces and synergies with other initiatives in a crowded arena.	Likely	High	Careful identification done of other relevant bilateral donor and multilateral development partner support. Denmark's role as co-chair of energy donor group will actively be used.	Medium	Clean energy development is a crowded field in Ethiopia. Denmark is a small development partner, but the unique value added of authority-to-authority cooperation is a key feature of the programme and something no other development partner provides. Furthermore, Denmark boasts unique knowledge on offshore wind, power plant flexibility, forecasting and modelling.
The programme could fail to deliver its outcomes, which will reflect negatively on DEA, MoWIE, and the MFA.	Unlikely	Major	The theory of change and results framework indicators will be designed with realistic and measurable targets.	Low	This programme is strategic and high-profiled

[26] This category includes "internal" risk from the perspective of the donor or its implementing partners. It includes the range of ways in which an organisation and its staff or stakeholders may be adversely affected by interventions, e.g. damage to a donor's reputation if it fails to achieve its objectives, or from financial/fiduciary failure (Danida Guideline to Risk Matrix, 2018).

Annex 6: List of supplementary materials

#	**Document / Material**	**Source**
1	Ethiopia Growth and Transformation Plan II (and III)	GoE
2	Executive brief on DK-ETH energy sector cooperation (in Danish)	DEA
3	AWPGE Thematic Programme Document	DEA
4	Implementing Partnership Agreement and Development Engagement Documents	RDE
5	Supplementary Support Agreement for 1-year Cost-Extension MoU, including revised activity plan and budget	RDE
6	Progress Reports for 2017, 2018 and 2019 (restricted)	RDE
7	Minutes from meetings of Management Group and Steering Committee (restricted)	RDE
8	Wind Project Development Roadmap	EEP/DEA
9	Wind Curtailment Report (confidential)	Energinet
10	Real-times Values Assessment (confidential)	Energinet
11	Draft 2018 Operation Analysis (confidential)	Energinet
12	Midterm review of the AWPGE programme	RDE/TANA
13	SSC programme agreement and workplans	DEA
14	Presentations by State Minister Dr. Frehiwot Woldehanna on: 1. Energy Reform Overview and Reform Direction, and 2. Energy Resource Mix in Ethiopia – Current Status and Future Direction	MoWIE
15	National Electrification Programme 2.0	GoE
16	USAID/Nexant Grid Management Program System Integration Study (confidential)	USAID
17	RES4Africa/CESI Integration of Variable Renewable Energy in the National Electricity System of Ethiopia	RES4Africa
18	MoF/PPP DG PPP Guidelines (restricted)	MoF PPP/DG
19	Ethiopia NDC and NDC tracker	GoE
20	Transparency International and local corruption assessments (corruption diagnostics and barometer reports, etc.)	Transparency International
21	DEA on the Danish Energy Model	DEA
22	Ethiopia's Climate Resilient Green Economy	GoE

Annex 7: Plan for communication of Results

DEA has developed a communication strategy that involves a set of success stories and fact sheets to ensure the possibility of making swift news- and social media stories (SoMe). This is developed with inputs from the embassy to ensure the diplomatic agenda. The communications strategy is a living document that will be developed continually and thus the plan below is to be seen as a dynamic tool for regular monitoring and updating during programme implementation. In addition to this the below table gives an overview of the embassy's communication plan.

What? (the message)	**When?** (the timing)	**How?** (the mechanism)	**Audience(s)**	**Responsible**
As part of the embassy's new communication strategy and the role as Green Frontline mission major messages and stories will be identified.	Signing of programmes, major results like launching of Ethiopian Energy Outlook, wind power developments. Possibly also a series of articles on programme developments e.g. in Ingeniøren. Ongoing results will be included in the Embassy's inter-active communication platform.	As part of the embassy's communication work, achieved results will be communicated through an established communication platform and social media channels. The programme results and priorities will also be included in ongoing thematic communication products on green growth and green energy transition	Communication activities will be targeted to an Ethiopian and Danish audience - respectively	The Sector Counsellor in cooperation with the communication team at the Embassy.

Annex 8: Process Action Plan

Action/product	Deadlines	Responsible/involved Person and unit	Comment/status
Draft short narrative			
Embassy draft short narrative of Climate and Energy Cooperation Programme	18.02.20	TCE-team	Done
VK amb, AFD, GJL, GID	27.02.20	TCE-TEAM / GJL	Done
Formulation of Energy Cooperation Programme, Concept Note			
Identification of programme (2-3 engagements with known partners). Based on the AWPGE components to carry forward and main components from the short narrative.	27.02.20-31.08.20	TCE-Team	Done
Confirming agenda item for the Programme Committee meeting	01.09.20	TCE-Team	Done
First draft circulating for comments GJL, GIL, EKL, ENS,	30.04.20	TCE-Team.	Done
Comments received	06.05.20	Hearing partner	Done
ToR and tender for Formulation consultant(s).	Primo July 20	TCE-Team	Done
Finalise Concept Note with annexes	By ultimo September	TCE-Team	Done
Submission of Concept Note + annexes to MFA (ELK).	14.10.20	TCE-Team	Done
Presentation of Concept Note to Programme Committee	05.11.20	Embassy (KP, JSS)	Done
Formulation of Energy Programme, including Development Engagements etc.			

Engage programming consultant by direct appointment	01.08.20	TCE-Team	Done
Formulation mission by consultant	After programme committee: Nov-Jan	TCE-Team and consultant	Virtual
Draft Programme incl. Engagement Documents finalised	Medio Feb 21	Consultant, TCE-Team	Done
Draft ToR for appraisal team	02.11.20	Consultant and TCE-Team	Done
Agree with EKL on ToR for appraisal	Jan 2021	TCE-Team	Done
Submit all documents to EKL for appraisal	18.02.20	TCE-Team	Done
Appraisal of Programme			
Appraisal has been requested for Jan 2021.			
Programming document(s) submitted to ELK	12 feb	TCE team	Done
Draft appraisal report submitted to Embassy	05.04.21	ELK	Done
Embassy to submit comments to draft appraisal report and table of recommendations to EKL	19.04.21	TCE-Team approval by management	Done
Final appraisal report and table of recommendations submitted	26.04.21	ELK	Done
Confirmed agenda item to Council for Development Policy	15 April 21	TCE-Team	Done
Final draft Programme Documents ready for internal approval at the Embassy	27 April 21	TCE-Team	Done
Submission of programming documents + annexes to MFA (ELK) for the UPR	6 May	TCE-Team	Done

Presentation of Concept Note and Country Policy Paper to Programme Committee	27 May 21	Embassy (KP, JSS)	
Final Approval			
Forward all final documents to ELK	May / June 21	TCE-Team	
Ministerial approval of Country Programme	May / June 21	EKL/Embassy	
Parlament Finance committtee	4. June	Embassy and APD	
Inception phase	July-November 21	Embasse, DEA	Final approval by ELK/FRU
Signing Government to Government agreement	Autumn (september) 21	Embassy (KP, JSS)	
Signing development engagement agreements	Autumn (september) 21	Embassy (KP, JSS)	
Registration of commitments	Autumn (september) 21	JSS, JC	

Annex 9: Summary of Recommendations of the Appraisal

In this Annex the AT presents its overall conclusion and recommendations:

<table>
<tr><td>Title of project support</td><td>Enhanced Danish-Ethiopian Energy Partnership (DEEP)</td></tr>
<tr><td>File number:</td><td>F2: 2020-35587</td></tr>
<tr><td>Appraisal report date:</td><td>30 March 2021 (draft), Final 26th April</td></tr>
<tr><td>Council for Development Policy meeting date:</td><td>27 May 2021</td></tr>
<tr><td colspan="2">Summary of possible recommendations not followed:</td></tr>
<tr><td colspan="2">Overall conclusion of the appraisal
The appraisal is positive and recommended for approval.
The DEEP concept is well conceived and relevant to support of Ethiopia's Power Sector Reform that aims at restructuring the power sector to achieve SDG 7 and SDG 13. The objectives of the energy sector are to expand power transmission considering environmental conservation issues, make service delivery reliable and efficient and transform institutions. The support to DEEP is well-justified as Ethiopia's energy system is 96% based on hydropower with limited variable renewable energy such as wind and solar in the system. The high dependency on hydropower makes the country vulnerable to climate change and periods with limited water resources.

The DEEP will be implemented in the context of a strategic framework encompassing all Danish power interventions. The potential implementation of Assela 2 Wind Farm will consolidate the enabling environment for wind power in Ethiopia and promote private sector participation through facilitation of Independent Power Producers (IPPs) and Power Purchase Agreements (PPAs).

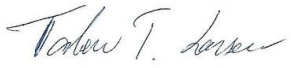
The AT finds that the draft DEEP Project Document has been properly adjusted in line with the recommendations, however, some aspects will benefit from further detailing during the Inception Phase. Furthermore, stock of the fragility and risk situation will be taken early on during the Inception Phase.</td></tr>
<tr><td>Recommendations by the appraisal</td><td>Follow up by the Representation</td></tr>
<tr><td colspan="2">Choice of partners and management arrangement, PD Section 3.3</td></tr>
<tr><td>1. The AT recommends that for specific adaptation modalities and decision-making at programme level the management arrangements should include specific descriptions/ procedures manuals approved by FRU/ELK for:
How possible targets and indicators can be modified at program level.
How new activities can be added, and others terminated.
How funds can be shifted between or within activities/budget lines.
How new partners are taken on-board and old partnerships ended.
How impact, outcome and output indicators can be changed for activities.</td><td>The recommendation is incorporated into the programme documents and will be further developed as part of the inception phase in close coordination with the MFA guidelines.</td></tr>
</table>

Work planning, monitoring, and reporting, PD Section 3.5	
2. The AT **recommends** that 'adaptive management' is introduced to the cooperating partners, the implications for DEEP implementation are highlighted, and that procedures and manuals are implemented for the different adaptive planning modalities/arrangements.	The recommendation is incorporated into the programme documents and will be further developed as part of the inception phase in close coordination with the MFA guidelines.
Theory of Change, key Assumptions, Impact Drivers and Risks, PD Section 3.2	
3. The AT **recommends** that the DEEP ToC and results framework be amended to focus on tangible results in order to bridge the gap between outcomes and outputs in the results framework; and that GCF indicators are assessed and addressed as part of the MTR and the DEEP programme completion report/evaluation.	The result framework will be updated in the inception phase in parallel with the detailed planning of the work plans and further development of the risk scenario. The monitoring approach will be amended to ascertain that tangible results are recorded.
Risk Management, PD Section 3.2	
4. The AT **recommends** adjusting the PD to describe the adaptation and risk management approach, and the monitoring and experience gathering underpinning the risk management. This approach and these activities would be part of the performance goals for Danida. Accountability should be explicit and verifiable, and the focus of possible programme adaptations and be at the centre of the supervision duties of the programme managers and the SC.	Incorporated. The risk matrix has been expanded in the PD but will be reviewed again during the Inception Phase.
Crosscutting concerns, PD Section, PD Section 3.4	
5. The AT **recommends** that: i) considerations on HRBA, LNOB and SDG 5 monitoring be emphasised in the programme document; ii) the MTR should include these issues as well as the achievement of the GCF indicators – and should be conducted in accordance with the OECD/DAC criteria; and iii) the programme completion report/evaluation should follow-up on the same issues.	Incorporated
Management set-up, PD Chapter 4	
6. The AT **recommends** that information is provided about the cooperating partners' institutional set-up and capacity; and that a capacity development assessment is undertaken during the inception phase which would then provide the background for the various training activities. The additional information could be provided in a summary form in the PD or collected during the Inception Phase.	Incorporated. A detailed capacity assessment will be developed while making work plans with the partners to create efficient and relevant activities.
Inputs, Budget and Financial Management, PD Chapter 5	
7. The AT **recommends** that budget outputs, outcomes, and even intermediate outcomes should be gradually specified and refined over time informed by evidence on actual progress also of the PSR. In this way the 'adaptive management' relation to the budget is a foreseen and planned process, which will be assessed as part of the MTR Review.	The budget will be reviewed yearly together with progress review of the different outcomes in order to adhere to the adaptive management approach as suggested.

8. The AT **recommends** that, in case of poor progress of the PSR, triggers for reduction/termination of the DEEP support be established as part of the Inception Phase.	The approach will be followed according to adaptive management.
9. The AT agrees and **recommends** to setting aside unallocated funds to build up resources and accommodate the Adaptive Management Approach for DEEP.	Incorporated. Unallocated funds will support the adaptive management approach.
10. The AT furthermore **recommends** that budget lines tied to long-term inputs be phased – and that an appropriate amount of the budget be reserved and tied to recommendations made by the MTR – including progress on the Power Sector Reform.	The principles of adaptive budgeting are incorporated in the PD. The budget frame will be updated during the Inception Phase by taking the scope for adaptation into account – before and after the MTR.

I hereby confirm that that the above-mentioned issues have been addressed properly as part of the appraisal and that the AT has provided the recommendations stated above.

Signed in Copenhagen on 26th April 2021



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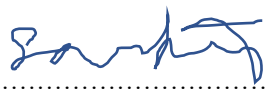
Torben Traustedt Larsen

Chief Consultant, ELK

I hereby confirm that the Representation has undertaken the follow-up activities stated above. In cases where recommendations have not been accepted, reasons for this are given either in the table or in notes enclosed.

Signed in Addis Ababa on 6th May 2021



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Sune Krogstrup for Karin Poulsen

Ambassador, Addis Ababa

Annex 10: Approach to Capacity Development

DEEP's approach to capacity development is based on the OECD / DAC definition:

"capacity is the ability of people, organisations and society as a whole to manage their affairs successfully and capacity development is the process whereby people, organisations and society as a whole strengthen, create, adapt, unleash and maintain capacity over time."

This means in the context of the DEEP partnership that the focus is on capacity development outcomes in partner institutions that lead to follow-up action and are sustainable over time, after the exit of the technical assistance has been provided under the programme. In turn, this means that there is a focus on systematic transformational change and institutional uptake and replication of new knowledge and good practice rather than a focus on delivery of training to individuals.

DEA's approach to capacity development has been successively developed and tested through several bilateral energy partnership programmes in over 15 countries and through AWPGE and SSC cooperation in Ethiopia. Most recently, the DEA capacity development approach has been articulated in the DEPP III documents that in September 2020 have been approved by the Council for Development Policy.

The key elements of the DEEP capacity development approach are summarised below:

- The capacity development must be needs based and demand-driven, taking as its point of departure, an updated needs assessment during the start-up phase, based on the mandated functions of the partner institutions/directorate/units and their current and expected staffing.
- DEA draws on its expertise and experience as responsible in Denmark for creating a well-informed and evidence-based environment for policy decisions for Denmark to meet the climate mitigation targets of the Danish Climate Act within the energy sector. DEA is also responsible for formulation and implementation of energy related policies and regulation in Denmark. This encompasses four decades of experience for promoting green growth by securing evidence-based decision making, formulation of policies and regulatory frameworks as well implementation of policies and regulation for the energy sector.
- DEA's capacity development work in DEEP is based on the well-tested GtG modality for sharing relevant Danish competences on low carbon development and how to combine economic growth while reducing GHG-emissions. DEA contributes unique and hands-on experience for securing frontier levels of energy efficiency, long-term energy planning, favourable framework conditions for renewable energy, and integrating variable renewable energy and security of supply. To a large extent, these experiences are only available to DEEP partner institutions via the GtG modality as other development partners and consultancies do not hold such information.
- Energinet will provide capacity development to key partner(s) based on the expertise and gained experiences as a TSO, responsible for ensuring an efficient and effective power transmission system including integration of variable energy sources. The experiences and knowledge already gained by Energinet and its experts that have been engaged in earlier activities in Ethiopia – and with the same partner - will benefit DEEP as to structure and design the specific activities on further capacity development.
- DEEP provides access for partners to learn from Danish experiences through a peer-to-peer modality. This form of direct exchange between partner line ministries/agencies and DEA has

proven effective and is to a large degree unrivalled and not provided by other development institutions and cannot be procured on the market.

- The GtG modality and the DEA as representatives of the Danish central government provide a high level of credibility and access to high-level decision makers in Ethiopia – this recognized high level of credibility is also a driving force and clear commitment for DEA to deliver world-class expertise to its partners under DEEP.
- The GtG modality with exchange of experience and adjusting to national and local challenges and contexts and the flexibility built into the DEEP design enables a high degree of demand responsiveness, within the framework of progress towards the agreed objectives, to the immediate needs of the partner as part of the peer-to-peer approach.
- The peer-to-peer cooperation provides for a gradual process through which, the cooperation progresses, the partners take increasingly greater responsibility for activities and outputs with the aim they can produce and replicate the activities outputs on their own also after the exit of Danish TA.
- Establishment of an enduring institutional capacity and the ways in which this can be assured will also be incorporated into the DEEP guidance on implementation, LTA ToR, consultant ToR, monitoring systems and dialogues during the Steering Committee meetings.
- Capacity development interventions will be monitored against indicators as defined in the work plans. Applied indicators will ensure progress and internal quality control towards the objectives of these interventions. The result framework will during the inception phase be updated to meet these requirements.
- The placement of LTAs in MoWIE provides for on-going day-to-day technical support as well the ability to acquire the information and insights necessary to design and facilitate the implementation of effective demand-driven capacity development interventions to be delivered by DEA, Energinet, and other consultants.
- DEA tools and techniques will be contextualized to partner needs and will cater for a wider institutionalization of the approach for capacity development.
- Capacity Development activities will be formulated as part of the ToR for each medium to long-term activity in direct collaboration with partners. ToR will include particular attention to documenting the needs of the partner, clearly setting out the scope and objectives of the capacity development activities and reaffirming that indicators capture the capacity development aspect and are SMART.
- High level policy dialogue between the RDE, DEA, LTAs and senior policy and decision makers in partner institutions that helps transform the enabling environment for capacity development and build political support for policy and strategic changes, awareness raising aimed at further policy outreach; knowledge management which ensures that learning, change and development are retained when staff move and, organisational strengthening where necessary to remove barriers to reform, and acceptable to the partner.
- It is a general principle to target a gender balance in capacity development activities (including workshops and study trips). The project will monitor the gender balance in capacity development activities and consider how best to address the issue if there is a gender imbalance as an average over several capacity development activities.
- More specifically, DEEP will, in its capacity development approach, make use of the following:
    - twinning of Ethiopian and Danish specialists, expert-to-expert for on-the-job learning;
    - training courses (including courses offered by the Danida Fellowship Centre);

- attention should be given when selecting participants for courses abroad to their potential as trainers of colleagues and peers, in a "training-of-trainers "(ToT) approach.
- learnings from training courses will ensure that the participants are secure in the application and contextualisation of the Danish approach and share it in their institution. That partner institutions are well-familiar with the methodology and approach is key to build capacities and trust.
- lectures from invited specialists;
- seminars that might include a wider range of stakeholders, including from Ethiopian civil society, research and educational institutions, and the private sector – local universities will be included in capacity development activities as relevant, particularly at provincial level;
- use of external consultants will be considered where relevant for replicating tasks, particularly in regional interventions. A ToT approach may be adopted;
- exposure of partners to new approaches through study tours and field visits "Seeing is believing; the power of the example" - well-prepared study visits to Denmark and other destinations abroad, with selection of participants in study visits on the basis of job relevance and institutional uptake potential, including potentials as trainers of colleagues and peers;
- use of internet platforms and social media, for instance making use of the many webinars that are offered by international development partners on sustainable energy and climate change topics;
- it may be considered to integrate modules on HRBA in training activities including Human Rights due diligence, for example at regional level to support the GoE efforts;
- use of knowledge products developed by multilateral development institutions including those supported by Denmark through multilateral channels (e.g. IEA, World Bank ESMAP, IRENA, IISD, UNEP-DTU Partnership, CTCN, WRI, etc.); from a Danish point of view, synergies can thus also be strengthened between Danish bilateral and multilateral energy cooperation.
- with reference to agreed implementation procedures (as set out in recently developed monitoring guidelines), a set of genetic indicators for measuring capacity development of partner institutions and staff, as well as evaluation templates for training courses, will be developed as standard reporting, monitoring and evaluation. These genetic indicators and templates will be applied in all ToR and underlying activities of DEEP. Using the indicators for capacity development, the collected values from each activity will be applied to underpin the overall progress towards expected outputs and outcomes in combination with measuring the quality of DEEP's capacity development activities. With reference to procedures set out as part of the implementation manual, aggregation of collected values for capacity activities will be possible across activities, development engagements and countries.

- DEEP will explore options for reporting on capacity development as separate topic to the Steering Committee. The reporting on capacity development activities will be gender disaggregated.
- The Covid-19 pandemic has resulted in major challenges to daily work routines and to learning opportunities, with more emphasis on the use of internet platforms. The implication for the DEEP capacity development approach will be further assessed during the commencement phase depending on how the pandemic has developed. However, experiences from the current AWPGE and SCC activities will be useful in this context.

- There will be a continued emphasis on results in the capacity development approach and a close link to communication. Impact stories can be a good impact driver and the "power of the example" can be strong". This will also involve the DEA strategic communications focal point.

Annex 11: Consultation Document as basis for GoE approval

The following document has been shared with the Ethiopian partners and served as the basis for discussion and approval of the content in the DEEP programme – providing a mutual understanding of the preliminary proposed activities under each output.

Proposed Enhanced Danish-Ethiopian Energy Partnership (DEEP)

Consultation Document

February 2021

Following the request from the honorrable minister to continue the Danish-Ethiopian partnership on expansion on wind, system integration and energi planning and modelling an 'Enhanced Danish-Ethiopian Energy Partnership (DEEP)' is now being programmed.

The present Consultation Document is focused on the proposed DEEP Results Framework, i.e. outcomes and outputs with related indicators, baselines and annual targets - and indicative activities. This result framework has been developed based on consultations with MoWIE, EEP, NLDC and a number of other key Ethiopian and Danish stakeholders.

The ongoing formulation process and agreement with Ethiopian and Danish partners, will be followed by a formal approval by the Danish authorities, with the intention to start the proposed Enhanced Denmark-Ethiopia Energy Partnership (DEEP) in mid 2021.

After the formal approval the programme activities will be further developed and specified during a 4-months inception periode. However, it is important to stress that the partnership programme will build on an adaptive management structure allowing the programme to continue the important work already implemented but also being agile in adapting the programme to new developments and aspects emerging over the 5-year programme period. The main purpose of this document is for the Danish and Ethiopian partners to agree on the outline and implementation purpose of the programme.

Management set-up

The programme will continue to be based on the same structures which have been developed during the current AWPGE and SSC programmes. The programme will be managed by a Steering Committee chaired by the Danish Ambassador to Ethiopia and the Minister for Water, Irrigation and Energy, also including State Minister of Energy, CEO of EEP and Deputy Director from DEA. The Steering Committee will be the forum for the overall strategic energy dialogue between Denmark and Ethiopia.

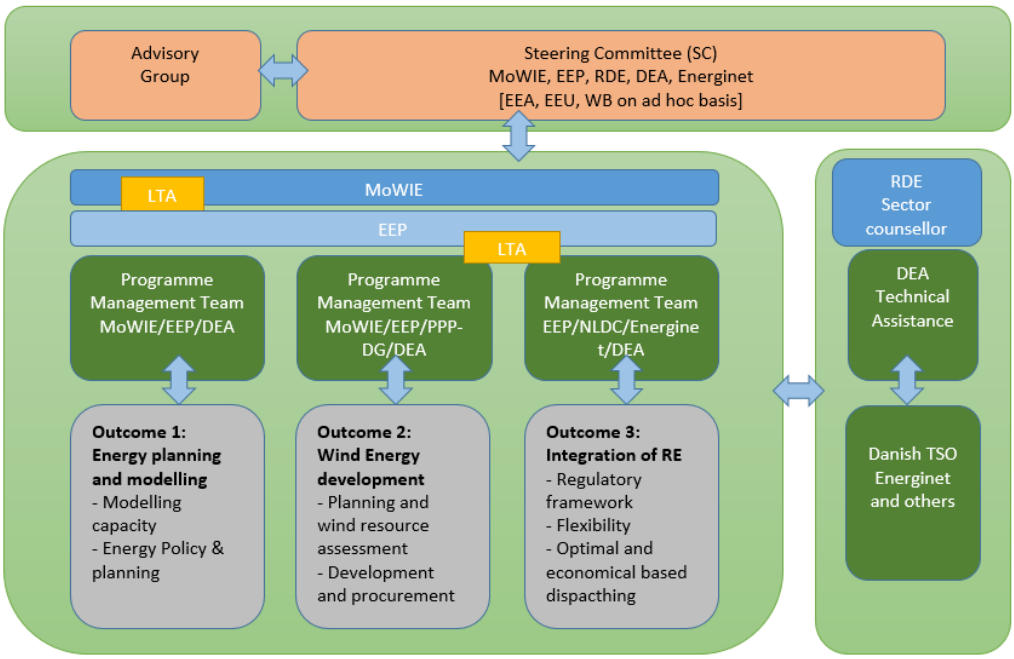
The management set-up will be kept as simple and lean as possible, to ensure an efficient accountability mechanism for progress and results as well as an effective mechanism for giving strategic directions to the Programme stakeholders. As far as possible, the model agreed for the Strategic Sector Cooperation and the AWPGE will be used, with overall guidance and decision-

making by the Steering Committee having the overall strategic dialogue between Denmark and Ethiopia.

The management setup is illustrated in the figure below. It is proposed that MoWIE will be the overall lead for the programme, and in particularly lead Outcome 1 – long term energy modelling and planning with close cooperation of EEP Corporate planning. It is proposed that EEP Engineering and the wind PMT will take the lead on Outcome 2 – wind power development with close coordination of relevant actors in PPP-DG and MoWIE. It is proposed that the NLDC in EEP will be the lead on Outcome 3 – integration of renewable energy with a close linkage to the generel management of EEP. For all outcomes a number of relevant Ethiopian and International stakeholders and institutions will further be involved as reflected in the result framework. This set-up will include Project Management Teams with DEA and Energinet and participation of partner institutions, to manage the day-to-day implementation of the programme, including preparing material for the Steering Committee.

A preliminary draft job profile for each of the two proposed embedded long-term advisors (LTA) is included in annex 1. It is proposed to have one LTA within MoWIE and one within EEP. The first is proposed to have a background within energy planning and modelling, and the latter to have a background within wind energy. The intention is that both LTA's can, within their field of expertise, engage with both MoWIE and EEP and possibly other relevant instiututions as deemed appropriate. The intention with two LTA's is to further increase the technical government-to-government cooperation by also bridging even stronger to the Danish Energy Agency and Energinet.

The Royal Danish Embassy will be responsible for financial management of the programme including the monitoring and evaluation. The Ethiopian contribution will all be provided in-kind. The Embassy and partners, incl. DEA will be responsible for drafting annual work plans to be approved by the Steering Committee. Implementation will be the joint responsibility of the partners and DEA as specified in the work plans. As far as possible the work plans will be aligned to/based on partner work plans and specify, how DEA provides support to these plans. DEA will be responsible for the day-to-day implementation of their technical assistance with Energinet providing a facilitating role especially for high-level liaison and participation in steering committees.



DEEP Results Framework at Outcome and Output Levels:

Overview:

Objective	Outcomes	Outputs
To support the development of the Ethiopian government structures and systems that in a sustainable and cost effective way improves access to renewable energy (SDG 7) and hereby supporting the Ethiopian vision of building a Climate Resilient Green Economy while reaching lower middle-income status by 2025.	1 Energy planning and modelling: Creating choice awareness	1.1 Modelling capacity 1.2 Energy policy and planning
	2 Wind energy development	2.1 Planning and wind resource assessment 2.2 Development and procurement of wind energy projects
	3 Integration of Renewable Energy	3.1 Regulatory Framework 3.2 Flexibility in power generation 3.3 Optimal dispatching

Result framework has been removed from the consultation document as it is included in a separate annex (Annex 3). In this annex it is therefore only the indicative activities as discussed with partners that have been included.

Outcome 1: Energy planning and modelling: creating choice awareness

Output 1 Modelling capacity	MOWIE and EEP's capacity to independently prepare high-quality integrated scenario-based long-term modelling of the Ethiopian energy system presented in biennial EORs. National stakeholders: **MoWIE, EEP, NPC** Danish stakeholders: DEA, RDE
Indicative activities	1) Assistance to MoWIE and EEP in developing the Ethiopian Energy Outlook 2) Regular update of an Ethiopian technology catalogue and development of more specific and detailed technology catalogues if deem relevant. 3) Advanced training in energy modelling using e.g. Balmorel 4) Fuel price projections 5) Analyses of electrification in transport 6) Demand projections 7) Analytical assessment of other energy sub-sectors, in addition to the power sector (incl. the region), and inclusion of these in the Ethiopian Energy Outlook 8) Applied training in relevant energy models, e.g., Balmorel, LEAP, Sisyfos, PSSE 9) Close coordination with other long-term scenarios and studies, e.g. IEA's Africa Outlook, Master plan, etc. 10) Short-term modelling exercises providing relevant information to the public, the Ministry about power system performance and main energy supply trends 11) Including socioeconomic aspects in the modelling, such as job creation, Forex income, and pollution 12) Coordination and linkage to Outcome 2 - wind project development
Output 2 Energy policy and planning	Energy policy and planning is strengthened and aligned among MoWIE, EEP and across ministries in particular the National Planning Commission
Indicative activities	1) Building upon training in long-term energy scenario analysis (output 1), training on how to translate the results of these analyses into policy and planning recommendations, particularly in areas such as: - Renewable energy development (including penetration of renewable energy sources in power supplied to the grid) - Adoption of electric vehicles - Transition from biomass to electricity in households (heating and stoves) - Least cost operation of power generating units, i.e. optimal dispatch, thereby minimising curtailment of VRES (wind and solar) - Ensuring stability of the electricity system (avoidance of blackouts) - Fulfilment of the NEP 2.0 especially SDG7 access for all - Pricing: alignment with the Power Sector Reform, incl. tariff reform to reflect costs and create a sustainable sector - EAPP and regional focus - Equitable Development of Resources ensuring sustainability 2) Technical assistance to the development of the GTP/EEP Master plans 3) Coordination among ministries including a definition of mechanisms to synchronise data quality assurance and management (Ministry of Transport, Mining, etc.), as well as assumptions used for modelling across institutions (NPC, IEA, other donors), e.g. an online tool for fully transparency of the Energy Outlook data (both inputs and results) - A focus on input data collection and coordination with IRENA

Outcome 2: Wind energy development

Output 1 Planning and wind resource assessment	MOWIE and EEP have the capacity to independently prepare high-quality wind measurement campaigns to support cost-effective exploration of Ethiopia's vast wind resources and contribute to a continuing low carbon energy supply based on diversified sources to complement hydro power. National stakeholders: **MoWIE, EEP and selected Ethiopian universities** Danish stakeholders: DEA and DTU Wind Energy
Indicative activities	1) Developing a strategic approach for planning, using spatial planning tools such as GIS to explore the resources and provide a linkage and support to the energy modelling activities. 2) Support development of national regulation and standards for wind energy projects securing an environmental and social sustainable exploration of wind energy resources in Ethiopia based upon Danish and DFI standards (World Bank, etc.) 3) De-risking process for large-scale wind project development, including the Danish procedures for pre-defining and pre-development of large-scale wind energy projects 4) Continued training in using leading wind assessment software tools (WASP, WindPro) 5) Training in operation and maintenance of wind measurement equipment 6) Further verification of the overall resource mapping (ESMAP) in order to plan future wind measurement campaigns in line with the overall energy planning and resource management 7) Utilize links to universities e.g. similar programmes conducted by DTU Wind Energy in other Sub-Sahara African countries 8) Ensuring close cooperation and linkage to outcome 1 on energy modelling
Output 2 Development and procurement of wind energy projects	An enabling framework that streamlines development, clearances and procurement for wind energy projects while reducing risk for private project developers, investors and lenders. National stakeholders: **EEP (PMT), PPP-DG, MoWIE** International stakeholders: WB/IFC Danish stakeholders: DEA
Indicative activities	1) Institutionalisation of IPP activities, with inspiration from other successful IPP instutional structures in the region. - Staffing plan, task descriptions and internal operational guidelines for the office - Role and management of external consultants - Interface and communication with potential bidders - Best practices and recommended guidelines to manage and follow wind IPP/PPP projects 2) De-risking process for large-scale wind project development, including the Danish procedures for pre-defining and pre-development of large-scale wind energy projects. 3) Capacity building in EEP and PPP-DG on the development of an efficient wind tendering process through a combined series of integrated activities and training both supporting current and future wind tender process 4) Based on a government-to-government cooperation DEA acting as a sparring partner and second opinion e.g. for the current cooperation with World Bank/IFC technical and transaction advisory 5) Knowledge transfer on methods of financial modelling and levelized cost of energy for the determination of site-specific tariffs for wind energy projects in order to support EEP's ability to negotiate PPA's in connection with unsolicited IPP wind project offers 6) Development of a funding model of EEP and PPP DG IPP wind tender activities through the tenders process (bid bonds, etc.)? 7) Including relevant Ethiopian universities in support of wind power development including training of wind energy professionals (project developers and technicians, etc.).

Outcome 3: Integration of Variable Renewable Energy

Output 1	Legal framework that ensure the transparency, operational security and technical quality of power system operation and security of supply with an increased level of integration of variable renewable energy resources implemented in full compliance with the EAPP electricity market requirements. National stakeholders: **EEP (NLDC), EEA (?), EEU(?)** Danish stakeholders: Energinet, DEA
Indicative activities	1) Grid Code compliance verification team full functional with all required procedures. 2) Development of regulation on transparency and equal access to the grid (e.g. how to allow equal access to the grid for all producers – linked to output 2.2) 3) Operation in a regional electricity market
Output 2	Securing flexibility in hydro power and conventional power generation thereby ensures adaptability of variable renewable energy resources in the generation portfolio. National stakeholders: **EEP(plant operations), EEP (NLDC)** Danish stakeholders: Energinet
Indicative activities	1) Real-time dispatch management 2) An analysis of water value and how hydro can support flexibility
Output 3	Ethiopian power system operation capacity to ensure optimal and economical based dispatching and integration of variable renewable energy resources into the power system is enhanced National stakeholders: **EEP (NLDC)** Danish stakeholders: Energinet
Indicative activities	1) The jointly discussed decision support tool the "Ethiopian Planning System" (EPS) is implemented and ready for use by the NLDC system operators in a data base configured solution. 2) Water management and integration of VRE to be supported by concrete tools. 3) Two system operator training activities have taken place – one in 2022 and one in 2023.

Annex 12: Outline of job profiles for Long-term Advisors (LTAs)

Financing: The two long-term advisors will be entirely financed by Denmark. The host organisations (MoWIE and EEP, respectively), will in-kind provide office and a daily partner contact point in the host organisation at director-level.

1. Outline Job Profile for LTA, MoWIE:

The outline job profile below will be developed into a specific job description, and a detailed plan will be made for the recruitment of the LTA. The advisor will be selected as an energy system planning and energy modelling expert; preferably with specific knowledge about Balmorel, LEAP and Sisyfos. Experience with capacity development, training and technical secondments would be preferred.

Main tasks for the advisor could be (depending on duration of posting):

1. Provide technical assistance and build capacity in the MoWIE and related agencies/affiliates (EEP, NDC, expected EDC) on energy modelling and planning, in particular forecasting, and building scenarios in close cooperation with DEA experts as well as other international and local experts.
2. Contribute to strengthening the capacity of MoWIE and relevant agencies/affiliates in planning and execution of modelling workshops.
3. Contribute to strengthening the capacity of MoWIE and relevant agencies/affiliates in setting up coordination and harmonisation mechanisms that will govern the energy planning and integration of renewable energy in Ethiopia.
4. Support the data collection and continued model development, including the coordination of updating technology catalogues and Energy Outlooks.
5. Coordinate and contribute to the GTP and Master plans, as well as coordination with the Ethiopian Energy Outlook as well as other scenario analysis for the Ethiopian renewable energy system and technical materials needed (e.g. data consolidation, technology catalogue, other studies)
6. Keep updated on Ethiopien energy sector development and provide input to policy dialogues relevant for the partners and DEEP. Inputs may include the preparation of short policy briefs or background notes as required and establishing a personal network with development partners, civil society organisations and private sector.
7. Participate in the working groups under DEEP and follow up on progress in project activities.
8. Advise on the implementation of DEEP in a cohesive and coordinated manner that aligns with Ethiopian plans and priorities.
9. Actively explore synergies between Ethiopia and the multilateral fora, and other cooperation, where Denmark is active, e.g. IEA, AU, IRENA etc.
10. Coordinate with the Danish Embassy in Ethiopia to explore synergies between DEEP and other activities carried out by the Embassy.

Requirements and expectations concerning the qualifications of the candidate

- Solid knowledge of Danish energy policy and energy planning and integration of renewable energy is a requirement
- A master level degree or corresponding qualifications in energy planning/power sector management, engineering and/or subjects relevant

- Extensive experience working with one or more related fields such as: long-term modelling of energy systems, power market design with regards to increased renewables.
- Project management and coordination experience and experience from delivery of technical assistance, exchange visits and technical secondments
- Experience from emerging economies or developing countries, preferably Ethiopia will be an advantage
- Knowledge of the energy technology providers an advantage
- Fluency in English, written and spoken, is required. Fluency in Danish/Nordic language is an advantage. Knowledge of Amharic is an advantage.
- Good written and verbal communication skills
- Openness towards and understanding of different cultures and capacity to work in a different cultural setting
- Inter-personal skills with a high level of initiative and diplomacy
- Ability to work as part of an interdisciplinary team with relations to different ministries and stakeholders
- Proactive and flexible attitude, adaptability, social sensitivity, with respect for other cultures
- Capacity to manage and facilitate working processes involving parties at different levels

2. Outline Job Profile for LTA, EEP:

Proposed profile for the advisor: The advisor will be selected as an RE expert; preferably with specific knowledge about wind power. Experience with RE feasibility studies and RE auctions would be preferred.

Experience with integration of RE in the Nordic Countries power system (Denmark, Norway, Sweden and Finland) would be an advantage. The first two years posting is likely to focus on the development of a wind power tender and procurement strategy. In later years the focus is likely to be on developing capacity within forecasting and least cost RE-integration strategies.

Main tasks for the advisor would be for the first two year period:

1) Support the development of the first tender project on wind power in Ethiopia, tasks include (in close coordination with consultants from IFC):

- Accompany EEP on a feasibility study for a wind farm at selected site. Assistance in developing sound procurement strategy and practice including: i) assisting EEP in preparing tender material including feasibility study and other background documents, such as PPA-template and selection criteria and ii) Assistance to design tender process with Danish experience potentially assisting in the process of PPA process (Danish Energy Agency Experts may be involved)
- Assist in the PPA process
- Assist in securing alignment with WB's Scaling Solar project.
- After the tender, write a synthesis report about experience from the pilot tender combined with international experience. The focus in report should be on how to attract sufficient number of bidders and to achieve prices on RE that are comparable to other countries, e.g. emerging economies and Denmark.
- The advisor will follow the tendering process from A-Z

Support tasks on

2) Forecasting on variable renewable energy

- Follow the operation of the wind farm (capacity factor, performance, improve accuracy in projected production)
- Facilitate training for EEP staff on forecasting
- Assist in making training material on grid management and RE integration which can be used in EEP regional offices with RE.
- Be a focal point for training sessions at Energinet in Denmark for selected EEP staff on grid management, system operation procedures and integration of the renewable energy
- Facilitate training for EEP staff on forecasting
- Grid code support (e.g. technical assessment from Energinet and DEA, technical assistance to the Grid Code Committee)
- Be focal point for EEP staff joining courses and study trips in Denmark before and after the course study trip

3) Least-cost strategies for RE integration

- Analysis of RE integration strategies through grid strengthening, batteries, flexibility of thermal power plants, SCADA systems, flexibility in hydropower or other initiatives
- Provide recommendations (technical or financial) for improving RE integration and making load dispatch more cost-efficient
- Facilitate courses and study trips on cost-efficient RE integration strategies with Energinet in Denmark
- Assist in better procurement of forecast services for variable RE sources
- Assess need of ancillary services (e.g. how to remunerate different kinds of ancillary services and allow equal access for providing them)

Duration: 3 years with possibility of extension with 2 years.

Annex 13: List of key Persons Interviewed during the Formulation Process

No.	Institution	Name	Email	Phone	Comments (roles and involvement)	Meeting
Denmark						
	Danish Energy Agency	Cecilie Buch Thomsen / Ole Emmik	cebt@ens.dk	+45 33 92 68 01	Discussion on overall programme objectives. - Partnership with EEP - Wind IPPs and tendering - Long term energy modelling tools - Ole & Cecilie join meeting / interview - Total 7 staff from DEA, two teams	24 Nov. 13 - 14
	Danish Energy Agency Wind team	Henrik Breum Sine Matzen Alexander Newcombe	hebr@ens.dk smcn@ens.dk alcn@ens.dk		Wind project development: - Wind tenders, regulatory framework - Wind data assessment	25 Nov. 9 - 10
	Danish Energy Agency Modelling team	Ieva Linkeviciute Mourad Boucenna Mikael Togeby (EA consultant)	ivle@ens.dk mdba@ens.dk mt@eaea.dk		Long term energy planning: - Modelling, energy outlook, technology catalogue	24 Nov. 14 - 15
	Energinet	Knud Johansen / Peter Markussen	KDJ@energinet.dk	+45 23 33 88 39	Key partner Power Planning, forecasting, modelling - Cecilie and Jens, and Knud	25 Nov. 12 - 13
	Ministry of Climate, Energy and Utilities	Anne Marx Lorentzen	anmal@kefm.dk		DK Objectives Partnership + KPII - Linkages to multi lateral + SDG 7 - 30 min.	26 Nov. 09 - 10
	Ministry of Foreign Affairs	TILDE HELLSTEN og Jakob Haugaard	TILHEL@UM.DK	+45 23 48 26 73	DK Objectives Partnership + KPII SSC, law and regulation 30 min	26 Nov. 16 – 16:45
	Ministry of Foreign Affairs	GDI, Tobias von Platen-Hallermund	tobpla@um.dk	+4520266012	Monitoring & Evaluation KP - wind programme 30 min	26 Nov 16 – 16:45
	Dansk Industri	Hans Peter Slente	hps@di.dk		Business opportunities Not interviewed	
	Wind Denmark	Anders Dalegaard	amd@windpower.org		Business opportunities	25 Nov 15:00
	Vestas	Eva Larsen	evlar@vestas.com		Business opportunities Not interviewed	
	Siemens Garmesa	Jean-Pierre Sánchez	jean.sanchez@siemensgamesa.com		Business opportunities Not interviewed	
	DTU Vind	Birte Holst Jørgensen Jens Carsten Hansen	bhjq@dtu.dk			

No.	Institution	Name	Email	Phone	Comments (roles and involvement)	Meeting
			jcha@dtu.dk			
Ethiopia						
	Danish Embassy	Jens Skov-Spilling og Amb. Karin Poulsen (start-up meeting)	jeskov@um.dk	+251 944 35 54 92	Overall programme objectives	23 Nov 11:00
	EEP CEO	Ashebir Balcha	ashecha@gmail.com			Consulted through his staff.
	MoWIE	State minister Dr. Frehiwot, Yehyis Eshetu Gudeta	yiheyise@yahoo.com	+251 116 62 73 68	Overall programme objectives	30 Nov. 09:00
	EEP Engineering	Wudineh (through Siae contact can also be made to Dr Bizuayehu Tesfaye and Tesfaye Tillaye)	eepenggexecutiveoffice@gmail.com	+251 911 39 00 43	Overall programme objectives - Regulation, market development and enabling environment	30 Nov. 20 11:15
	EEP Cooperate Planning	Andulem Siae	andusiae@gmail.com		Overall programme objectives Regulation, market development, enabling environment, energy planning	30. Nov 11:15
	EEP Transmission and Substation Operation	Miraje Fereja Habtamu, Director, EEP NLDC	dagimdess@yahoo.com	+251 911 21 92 96	Overall programme objectives - Regulation, market development and enabling environment	1ST Dec 9:15 – 10:00
	Working group: Energy landscape group	Contact: EEP, Yalewayker Mandefro	Yalewayker2000@yahoo.com		Description of other energy sources and infrastructure	8 Dec 07:30
	Working group: Power sector modelling group	Contact: MoWIE, Mesfin Dabi	dabimesfin@yahoo.com		Energy planning and modelling	??
	EEA	Getahun Moges	getahunmoges@gmail.com	+251 115 50 77 36	- Regulation, market development and enabling environment	1st Dec 13:45 – 14:15
	Ministry of Finance	Tilahun Tadesse	pppethiopiatilahun@gmail.com	+251 911 47 22 18		1st Dec. 13:00 – 13:30
	The world Bank	Lara Born Mikul Bhatia	lborn@worldbank.org mbhatia2@worldbank.org	+1 202 446 7817 +1 240 715 5928	- Synergies and coordination - Windmap	1st Dec 11 - 12
	African Development Bank (AfDB)	Sahele Fekede	S.FEKEDE@AFDB.ORG		-	-
	AFD (France)	M. Ahmed Mechkane Maitane CONCELLON	mechkanea@afd.fr concellonm@afd.fr		Not interviewed mechkanea@afd.fr concellonm@afd.fr	-

No.	Institution	Name	Email	Phone	Comments (roles and involvement)	Meeting
	Power Africa	Samson Atsbha	satsbha@usaid.gov		Coordination on modelling activities.	4th Dec 11:00
	GiZ	Samson Tolessa (David)	Samson.tolessa@giz.de		Not interviewed	
	Addis Ababa university, Institute of technology	Dr Getachew Bekele	getachewb@gmail.com			Dec
	Addis Ababa university	Dr Kamil Dino	kamildino@yahoo.com			
	Addis Ababa university	Dr Solomon Tesfamariam	solomontem@yahoo.com			
	Addis Ababa Science and Technology University	Dr. Abebe Worku	abebe.worku@aastu.edu.et			
	Addis Ababa Science and Technology University	Mr. Arkbom Hailu	arkbom.hailu@aastu.edu.et			
	Addis Ababa Science and Technology University	Mr. Mintesinot Gizaw	mintesnot.g@aastu.edu.e			
	Ministry of transport					No interview
	Ministry of Agriculture					No interview