Ministry of Foreign Affairs of Denmark

DANIDA

ETHIOPIA

Accelerating Wind Power Generation in Ethiopia

THEMATIC PROGRAMME DOCUMENT

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1.	Title:	Accelerating Wind Power Generation in Ethiopia
2.	Partners:	Ministry of Water, Irrigation and Electricity of Ethiopia (MOWIE), Ethiopian Electric Power (EEP), Ethiopian Energy Authority (EEA), Ethiopian Electric Utility (EEU), and the World Bank
3.	Amount:	28 million DKK
4.	Duration:	November 2016 to December 2019 – 38 months
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13. Summary:

Ethiopia has historically focused largely on hydropower for electricity generation, but now wishes to diversify generation from other renewable sources to increase climate resilience. Consequently, the Government of Ethiopia (GoE) has planned for an expansion of its wind power capacity to 5,200 MW by 2020 to be developed through the private sector, i.e. by Independent Power Producers (IPP). This programme is designed with the objective of strengthening the institutional capacity of GoE agencies in the energy sector to accelerate wind power generation, including through realisation of the first Ethiopian IPP-wind auction. Denmark's comparative advantage in wind power generation, with internationally recognized wind power technologies and solid traditions in IPP, place it well to strengthen the institutional capacity in the Ethiopian energy sector focusing on wind. The risks related to Ethiopia's commitment to use IPP auctions to attract wind power are mainly related to the lack of experience with the IPP modality, and the lack of coordination among actors in the sector.

14. Strategic considerations:

The major strategic consideration for the programme is the target set by GoE for the Growth & Transformation II-period until mid-2020, and the challenges to achieve this target. GoE has planned to increase the power generation in the country from 4,180 MW in 2014/15 to 17,000 MW from renewable sources, of which wind energy will have a share of 5,200 MW expected to come from IPP modalities. A number of government entities (Ministry of Water, Irrigation & Electricity, Ethiopian Electric Power, Ethiopian Energy Authority, and Ethiopian Electric Utility), who face challenges regarding their technical capacities, are responsible for the achievement of these targets. Denmark's aim to contribute to the reduction of GHGs through the Climate Envelope, and its proven competences in the wind energy sector makes it an ideal partner for GoE in meeting its target in wind power production. Thus, using Government-to-Government Cooperation, and twinning of Danish and Ethiopian experts, Denmark will strengthen the capacity of the energy sector to accelerate wind power generation and contribute to sustainable growth in Ethiopia.

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ABBREVIATIONS

AWPGE	Accelerating Wind Power Generation in Ethiopia ("the Programme")
AfDB	African Development Bank
CO_2	Carbon Dioxide
CRGE	Climate-Resilient Green Economy (Strategy)
Danida	Danish International Development Cooperation
DEA	Danish Energy Agency
DKK	Danish Kroner
DSO	Distribution System Operator
ED	Engagement Document
EEA	Ethiopian Energy Authority
EEP	Ethiopian Electric Power
EEU	Ethiopian Electric Utility
EPC	Engineering, Procurement and Construction (turn-key project)
ESMAP	Energy Sector Management Assistance Programme
EU	European Union
G-t-G	Government to Government (Cooperation)
GoE	Government of Ethiopia
GTP-2	Growth & Transformation Plan II (2015/16-2020/21)
GWh	1 GWh = 1,000 MWh
HDI	Human Development Index
HRBA	Human Rights Based Approach
INDC	Intended Nationally Determined Contribution
IPP	Independent Power Producer (private sector utilities)
kWh	1,000 kWh = 1 MWh
MFA	Ministry of Foreign Affairs
MOWIE	Ministry of Water, Irrigation and Electricity
MRV	Monitoring Reporting and Verification
MW	MegaWatt; 1 MWh = 1,000 kWh
NEC	Danish Strategic Framework for Natural Resources, Energy, and Climate
PPA	Power Purchase Agreement
PPP	Public Private Partnership
RDE	Royal Danish Embassy in Ethiopia
SDGs	Sustainable Development Goals
TSO	Transmission System Operator
TWh	1 TWh = 1,000 GWh
UNDP	United Nations Development Programme
USD	United States Dollars
WB	World Bank

1 PROGRAMME CONTEXT

1.1 Introduction

The cooperation between Denmark and Ethiopia is strategic in nature and based on a shared interest in peace and stability, poverty reduction, and food security. At the same time, there is a mutual commitment to the global agenda on climate change and green growth which was jointly identified by Denmark and Ethiopia as a strategic entry point to consolidate the Danish-Ethiopian development partnership.

There is a strong coherence between the detailed and comprehensive strategic focus for sustainable and inclusive green growth for Ethiopia and the range of Danish policies which are designed to guide the development cooperation. From the Ethiopian side there is an advanced policy framework with regard to promoting poverty reduction and green growth, as reflected in the Growth & Transformation Plan II (GTP-2, 2015/16-2020/21), the Climate Resilient Green Economy Strategy (CRGE, 2011), the Electricity Sector Specific Master Plan (2014), and the Ethiopian National Electrification Strategy (2016). From the Danish side, relevant strategies include the Right to a Better Life, the Strategic Framework for Natural Resources, Energy, and Climate (NEC), and the Guiding Principles for the Danish Climate Envelope.

Generation of electricity based on diversified renewable energy, as well as the export of electricity, is a central part of the current Ethiopian National Development Plan (GTP-2). During the GTP-2 period Ethiopia plans to increase its power generation to 17,000 MW from diversified renewable resources, including wind. The suggested thematic programme will support this development with its focus on expanding necessary capacities for increased generation of wind power in Ethiopia. Denmark has internationally acknowledged competences in the practical integration of wind power into the overall power supply system, including incorporating private sector investors and owners of wind assets, and mobilising funds for large-scale wind project development. In 2015, wind power represented 42% of the total electricity demand in Denmark.

Cognizant of Danish competences in wind energy, the GoE has requested support to strengthen the capacity of its still young wind energy sector to achieve the target set in GTP-2, and achieve excellence in terms of integration of wind power and quality of service. For this programme Denmark has allocated 28 Million DKK from the Climate Envelope funding mechanism; a mechanism established in 2008 for channelling Danish dedicated climate funding to support climate mitigation and adaptation activities in developing countries.

1.2 National Thematic Context and Policy Framework

With a population of 97 million in 2014 (growing 2.5% p.a.) and a per capita GDP of USD 669,9 Ethiopia ranks 174 out of 187 in the HDI 2015, and is among the world's most vulnerable and poorest countries. However, the country has demonstrated notable achievements for poverty reduction and sustained growth during recent years, with the Ethiopian economy increasing by an average growth rate of 10.8 % from 2004 to 2014. The GoE has been fairly successful in translating this growth to improving living standards, and having reduced the percentage of people living in poverty from 39% in 2004 to 23% in 2015 (UNDP Ethiopia, 2015).

The GoE has an ambitious target of achieving middle-income status (above USD 1,036.00 per capita) by 2025 through building a green economy with carbon neutral growth. The GTP-2 sets out the short-to-medium term framework (2015-2020) for development with the aim of attaining the SDGs, in addition to ambitious goals of strengthening public institutions, decentralisation, mobilising domestic revenues, fighting corruption, and promoting gender equality. The GTP-2 has a high priority with regard to the greening agenda.

The Ethiopian INDC has the goal of reducing CO_2 emissions with 64% by 2030.[1] Since more than 90% of the power in Ethiopia comes from renewable sources, the reduction is mainly foreseen from agriculture and forestry. Because of the large share of hydro generation, the energy sector is only responsible for 3% of the total current CO_2 emissions. On the other hand, depending mainly on hydro-power has made the energy sector vulnerable to climate change, especially in relation to recurring droughts. Hence, the GoE has decided to diversify the source of energy to solar, geothermal, and wind energy, in order to achieve its ambition to become a leader in light manufacturing and become a hub of electric power exports. As a result, the generation from hydro, wind, solar, geothermal, and biomass is expected to reach 17,000 MW by the end of the GTP-2 period.

Annual electricity demand in Ethiopia increased from 1.6 TWh in 2000 to 9.5 TWh in 2014/2015. While 55% of the population reside in areas covered by the network, less than 25% is connected to the grid. Sustained economic growth in Ethiopia will increase electricity demand, which is predicted to increase at about 10% per annum in the medium term, from the current daily peak demand of 1,900 MW. The GTP-2 also sets an ambitious target – to reach 7 million new customers by 2019/20 from the current 2.31 million. There is therefore a pressing need for continued heavy investment in the rehabilitation and expansion of the transmission and distribution network, as well as to intensify connections in the areas covered by the grid.[2]

Today, electricity is exported to Sudan, Djibouti, and some small towns in Kenya. From 2019 exports will be increased with an additional 2,000 MW connection to Kenya. Export of electricity through Kenya to Tanzania is also being negotiated.

In 2025 domestic electricity demand is expected to be 53 TWh, and exports to be 24 TWh.[3] Export of electricity is a key component of Ethiopian economic policy.

Today electricity generation in Ethiopia is dominated by hydro power,[4] while three wind farms are in operation with a total capacity of 324 MW, and a geothermal plant is under construction. All existing generation is owned by Ethiopian Electricity Power (EEP).

A revised GoE energy proclamation is expected to be ratified by Parliament before the end of 2016. A legal framework for IPPs is also expected to be approved following the energy proclamation.

1.3 Synergy

The "Accelerating Wind Power Generation in Ethiopia" (AWPG) programme will broaden the climate change partnership between Denmark and Ethiopia, which is currently focusing on Greening Agricultural Transformation in Ethiopia and improving natural resource management. Similar to the support to Greening Agricultural Transformation, the AWPG programme will work directly with relevant authorities in Ethiopia, complementing and building on already started government initiatives. The programme will contribute to an increase of electricity power production from diversified renewable sources, and improvement of the quality of service in the distribution of electricity. The introduction of international-standard, climate-smart solutions, will strengthen the existing systems and procedures and create an appropriate foundation for a climate resilient electricity power sector, in which the private sector can play a significant role.

[1] Intended Nationally Determined Contribution (INDC) of the Federal Democratic Republic of Ethiopia, 2015.
[2] Ethiopia National Electrification Strategy, 2016
[3] Ethiopian Master Plan, 2014.
[4] 98% of all generation in Ethiopia is from hydro power, with a typical hydro plant having reservoir capacity corresponding to one year's generation; however, this is affected by recurrent droughts that sometimes result in the closure of hydro-power dams and frequent curtailment of power generation.

2 PRESENTATION OF THE PROGRAMME

2.1 Background

Ethiopia has an ambition of developing its electricity generation portfolio in a manner that includes two major changes compared to the current situation:

- Diversification: Hydro-power can deliver electricity at a relatively low cost and essentially without emissions. However, the hydrological conditions vary with dry and wet seasons determining precipitation (see Annex 11). According to the 10 years masterplan, the planned expansion of electricity generation (2015-2025) has three main components: 7,600 MW of hydro-power, 5,200 MW of wind power, 5,200 MW of solar power, and 900 MW of other power (including geothermal).
- IPPs: A significant share of the capacity expansion (69%) is expected to be produced and managed by Independent Power Producers (see box below). The ownership will be private and EEP will enter into long-term contracts to buy electricity from the producers. All solar power, and 3,600 MW of the wind expansion, is planned to be produced using an IPP modality.

Both changes are substantial and will require strengthening technical and management capacities at the ministry (MOWIE), at the regulator (EEA) and at the generation and transmission company (EEP).

***Independent Power Producers, IPPs**: Traditionally, EEP has owned and operated all power plants in Ethiopia. With an IPP contract, the roles are changed: EEP will act as the purchaser of electricity at agreed prices and conditions. This will reduce the financial burden on EEP and at the same time transfer substantial construction and operating risks to the IPPs. Good preparation and transparent procedures can substantially reduce the electricity price for the benefit of all stakeholders.*

*Well-designed and well-prepared **auctions** will attract bidders, increase competition and lower the electricity price. Many details can influence the success of an auction and much can be achieved with a good auction design. If the auction details are too strict, only few bidders may bid – and prices may be too high.[5] Recent auctions in Mexico, South Africa, Egypt, and Morocco have revealed wind prices in the order of 4-5 US cents/kWh for 15-year contracts.*

*An auction will result in a **long-term power purchase agreement** (PPA). The agreement will guarantee the winner the sale of electricity for a defined price for a long-term period, e.g. for the next 15-20 years.*

2.2 Programme objectives

The objective of this programme is:

To strengthen the institutional capacity of the GoE energy sector to accelerate wind power generation.

The objective directly reflects the GoE's power expansion plans and is fully aligned with the Danish Climate Envelope. Wind power capacity will help expand and diversify the power generation portfolio in Ethiopia and can assist in securing the supply needed to cover the rapidly expanding in-country and export demand for electricity. Wind power and hydro-power are also a good mix in so far as adapting energy requirements to climate change. In combination with the large storage capacity of the Ethiopian hydro plants, wind power can act as a base load.[6]

[5] See: IRENA and CEM (2015): Renewable Energy Auctions – A Guide to Design. And EWEA (2015): Design options for wind energy tenders.

[6] Base load means the demand during regular time.

Thematic outcome: *Accelerated wind power generation as a result of strengthened institutional capacity of the GoE energy sector.*

Engagement objective 1: *To ensure availability of high quality wind resource assessments for the preparation of bankable wind energy IPP auctions.*

Outcome 1.1: *High quality and validated wind resource assessments, at a number of prioritised sites, made public.*

Engagement objective 2: *To strengthen the GoE's efforts to increase wind power production, and improve quality of service in the distribution of electricity.*

Outcome 2.1: *Improved GoE institutional framework, and market readiness, including the approval of a credible IPP wind auction roadmap.*

Outcome 2.2: *Improved system integration of wind power.*

Outcome 2.3: *Reduced grid loss, and improved quality of service at distribution level.*

2.3 Development engagements

The AWPG programme will have two engagements. The World Bank, as part of the Energy Sector Management Assistance Programme (ESMAP), will implement the first engagement: Wind measurements, focusing on specific sites selected together with the GoE energy sector entities, mainly MOWIE and EEP, for their potential wind power production. The second engagement will be implemented by MOWIE, partly through a Government-to-Government (G-t-G) Cooperation, with Danish Energy Agency, including Energinet.dk, partly through an international consultant and a Distribution System Operator. In both engagements, strengthening technical and organisational capacities of the GoE energy entities along with solving challenges to accelerate wind power generation will be the focus. This programme will create an opportunity for Denmark to share its internationally acknowledged expertise in wind power generation and experience in IPP modalities.

Danish Energy Agency and Energinet.dk have been and are currently involved in similar G-t-G projects in China, South Africa, Vietnam, Mexico, Ukraine, Indonesia, and Turkey.[7] The G-t-G setup is a well-proven model for engaging on a low carbon agenda and produce sustainable results, including capacity building, accommodating frameworks for low carbon growth and development, activating Danish experiences, technology solutions, and energy system designs in a growth and development country context.

2.3.1 Engagement 1: Wind measurements

The aim of this engagement is to ensure availability of high quality wind resource assessments for the preparation of bankable wind energy IPP auctions and increased wind power generation. The World Bank, which is currently engaged in the implementation of a wind mapping exercise in Ethiopia, and thus in a good position to facilitate the much needed wind measurement data for the IPP auction in a speedy manner, will implement this engagement. The World Bank, using consultants currently engaged in the ESMAP programme, will conduct wind resource assessments, including wind speed measurements, for at least one year at the exact sites of the planned wind farms. On-site measurement data are validated, analysed, and combined with reference to long-term meteorological wind data, e.g. from the ongoing ESMAP programme. In this way, the meteorological data can be used to derive information about expected long-term wind resources at the specific sites. Having measurements for more than one year can further improve the accuracy of the wind data, and improve the level of certainty of availability of wind

[7] China, South Africa, Vietnam and Mexico are all part of the Danish Climate Envelope – as the current Ethiopia programme.

resources. Wind resource assessments of this nature are used for estimating annual power production, and to reduce the risk that planned wind projects do not meet expected generation. Furthermore, it informs wind power developers and investors as well. With the complex terrain in many of the relevant sites in the mountainous areas of Ethiopia, more than one measurement mast may be needed per site. The measured wind data, together with available meteorological information, will be key elements in assessing the wind resource at the sites. An agreement will be entered with the GoE, who will be the owner of the information to make it public. In addition to this, the World Bank will closely work and train a team of technical experts from EEP, MOWIE, and universities selected as Centres of Excellence for Wind Energy to ensure transfer of knowledge. The World Bank is currently engaged in a wind mapping exercise in Ethiopia which will be expanded to include measuring wind resources on specific sites, thus making it possible to produce early data from wind measurements in a short time, which is important for IPP auctions.

Outcome 1.1 High quality and validated wind resource assessments, at a number of prioritised sites, made public: The purpose is to deliver bankable wind resource assessments, i.e. to have reliable high quality wind data so investors have confidence in the accuracy of the calculated electricity generation from the proposed wind farm. The starting point for site selection will be available information from wind atlases generated from existing sites. Ten wind masts will be erected at potential wind farm sites and a technical team comprising technical experts from EEP, MOWIE, and relevant universities, established and trained in wind measurement and analysis of wind measurement data.

2.3.2 Engagement 2: Capacity building for wind power expansion

The aim of this engagement is to strengthen the GoE's efforts to increase wind power production, and improve the quality of service in the distribution of electricity. MOWIE, together with other government entities in the energy sector such as EEP, EEU, and EEA, will implement this engagement. A G-t-G Cooperation with Danish Energy Agency, including Energinet.dk, will play a central role. It is foreseen that an international advisor will be placed within MOWIE i.a. to advise on policy and strategic issues, as well as to coordinate overall programme implementation. In addition, an international consultant will be engaged as per the Terms of Reference (ref Annex 6). The Danish Energy Agency and the consultant will in their work focus on the implementation of "real-time" tasks at the different GoE levels, by drawing on their experiences. This engagement will have three specific outcomes, i.e. will focus on setting an IPP framework, system integration, and reducing losses and improving quality of service.

Outcome 2.1: Improved institutional framework and market readiness, including the approval of a credible IPP wind auction roadmap in place: For carrying out competitive auctions be it EPC or IPP, a range of framework conditions must be in place, including clarity on roles, rights, and obligations in all phases of the auction process. This task is an important part of the G-t-G Cooperation. The current institutional framework will be evaluated, and recommendations fitting the Ethiopian context will be prepared, based on Danish and international experiences. It is suggested that a high-level conference, wherein potential developers and financers take part, be arranged prior to developing the final recommendations. This activity will be realised in close cooperation between the Danish Energy Agency and MOWIE, EEA, EEP and to a certain extent the Ministry of Finance and Cooperation (MOFEC). How to make use of the successful Danish experience with a "one-stop-shop" for efficient cooperation between public institutions will be analysed in this task.

Ethiopia is starting to use IPPs in relation to the ongoing solar auctions. A number of aspects influence the success of an auction, including the PPA timeframe, how the price structure is formulated (price or bonus), the currency exchange risk, inflation correction, penalties, requirements for bidders to be prequalified, timelines, notices, technical requirements (e.g. grid

codes), evaluation criteria, etc. It will also be necessary to strike a balance between a generalised auction approach (only stating the amount of electric power with no specific site or choice of technology for the wind production) and a specific auction (for a specific wind farm and specific technology). Regarding auction design, the programme will incorporate experiences and knowledge from ongoing activities involving Power Africa, as this institution is currently involved in the solar auction process and other auction processes, in Ethiopia.

Based on the developed framework and the resource assessments, the entire IPP wind auction process will be realised as part of this project. Each auction will be for a specific site, and each will have a wind power capacity in the range of 50–100 MW. A plan for the coming rounds of auctions will also be developed and announced. For bidders it is important to appreciate the pipeline of potential projects.

In addition to attracting investments to install the planned capacity (MW), it is of paramount importance that the price is right. The main criteria for success is the signing of PPA contracts at competitive (low) prices ($/kWh). The actual production (MWh) from each site is dependent on the wind resources and appropriate technical design. With an IPP modality, the investor is strongly incentivised to optimise design and operations, and to keep costs down.

EEA's capacity, and that of the relevant regional offices, will be strengthened for reviewing IPP frameworks and monitor the process of auctions.

Furthermore, the programme will also be involved in a selected EPC process, including wind farm design and feasibility studies; in order to increase the capacity of EEP and EEA to plan, undertake, regulate, and monitor such processes.

Outcome 2.2: Improved system integration of wind power: Ethiopia's hydro-power, including the reservoirs that typically can store water for a full year's power generation, represents an excellent starting point for the integration of wind power. The current integration of the existing 324 MW of wind power is working satisfactorily, but as wind and solar start to contribute significantly to overall power generation, more advanced methods need to be in place. The variable nature of wind power generation, and its increased role in overall power generation, may require the development of new procedures, e.g. in the National Electricity Transmission Control Centre. Effective operation includes state of the art wind prognoses, as well as the use of real-time information about wind and solar generation and electricity demand.

The main implementing agencies for this outcome will be EEP and Energinet.dk through the G-t-G Cooperation. As the generation of power from different sources, and the export of power to neighbouring countries, increases, the need for effective and real-time system integration will be paramount. Hence, Energinet.dk, using its vast experience in system integration, and with the necessary software and systems, will strengthen the capacity of EEP to effectively integrate the growing power generation from diversified sources, and manage power supply and demand effectively, not only in the country but also in the region, reducing the level of unused power generating capacity to a minimum level.

This activity involves maximising the value of generated fluctuating power (wind and solar), combining with other energy sources like hydro-power. This includes activities spanning from long-term planning to the daily operation of the electricity system. With adequate wind integration, curtailment of wind power and/or spillage of water from hydro-plants can be reduced, or maybe even avoided.

Besides, the Ethiopian connection codes and the recent Master Plan will be reviewed, from a wind and solar power perspective. The use of model-based analyses that can demonstrate the

optimal interaction (hour-by-hour) among wind, solar and hydro, taking planned exports, domestic consumption plans and security of supply issues into consideration will be implemented. This least-cost planning can give new insights into the best timing of generation capacity expansion, as well as transmission capacity expansion, in order to optimize scarce financial resources through integrated resource planning.

Outcome 2.3: Reduced grid loss, and improved quality of service at distribution level:
The quality of service is not satisfactory for electricity end-users in Ethiopia. Power cuts often occur, and several of these are related to the poor distribution grid. The distribution company EEU faces major challenges in maintaining a high quality of service, and delivering the expected rate of connections for new customers. Furthermore, currently 23% of the power produced is lost due to low quality grid and distribution system. The GoE has planned to bring this loss down to 11% by the end of 2019/20. Moreover, EEA faces challenges in efficiently carrying out their regulation and inspection tasks in relation to EEU.

A more reliable supply of electricity to different end-users will reduce economic losses incurred by enterprises due to black-outs, and the widespread use of diesel-driven back-up generators, which operate inefficiently, produce costly electricity and emit CO_2. In addition, reducing distribution losses can make more electric power available to local end-users, and thus make it possible for additional households and businesses to substitute the current use of e.g. wood, charcoal and kerosene with modern, clean energy, i.e. electricity, which due to the low power tariffs often will be a cheaper option.

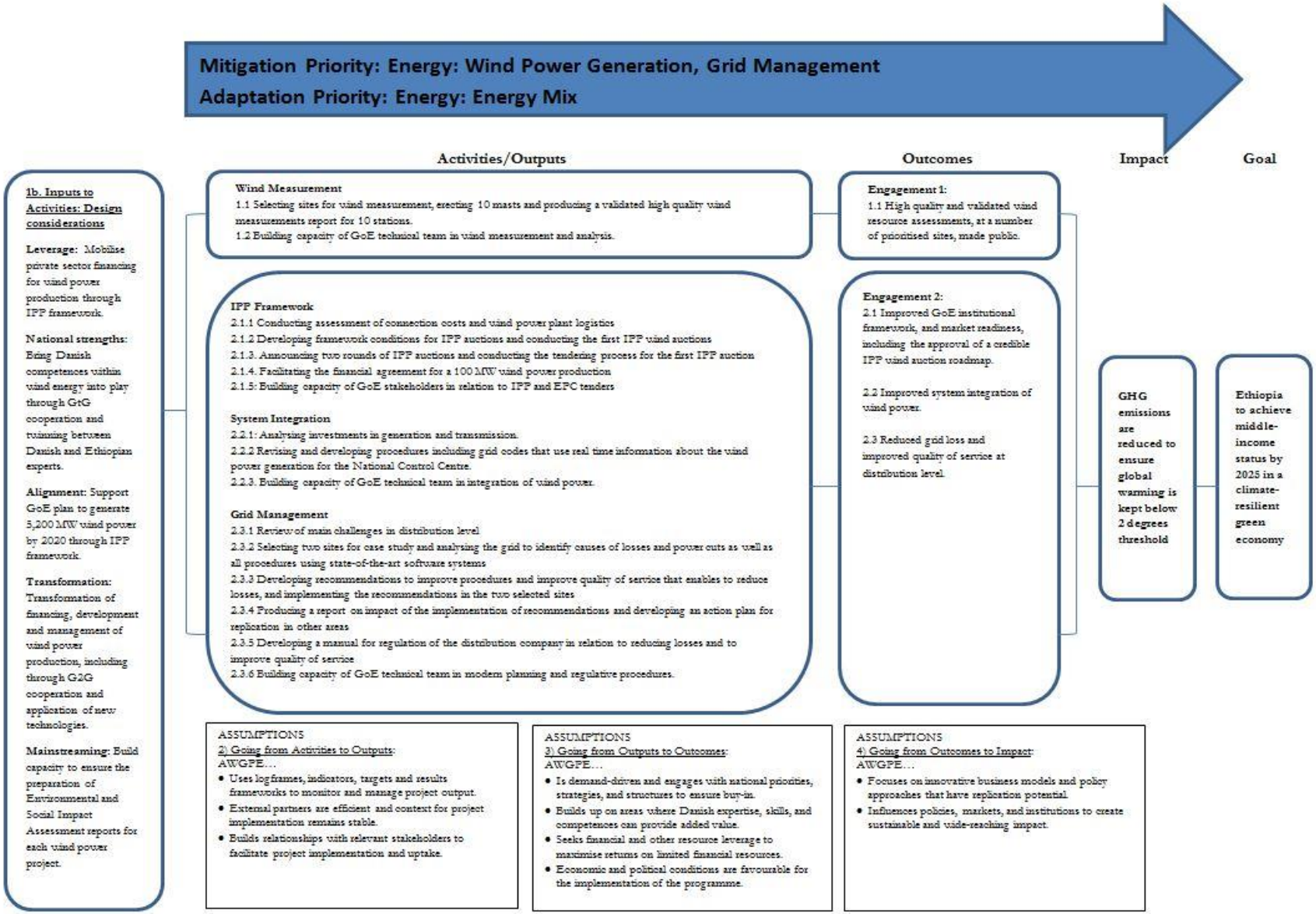
The aim of this component is to increase the capacity of EEU and EEA with a focus on reducing power cuts and improving customer satisfaction. This is done by training a number of personnel in modern planning, fault-seeking, and operative and regulative procedures. Twinning will be set-up between EEU and a DSO.

The training will be based on one to two selected distribution grid cases (possibly one urban and one rural), where the challenges are jointly analysed using state-of-the-art methods and software systems. The activity includes limited investment in hardware and software, mainly to facilitate the learning process. A specific output is the development of recommendations to address the identified challenges, approval and implementation of the recommendation in the one to two case study sites and developing an action plan for the possible replication in other areas. The action plan is also expected to include an overview of resources and funds. Other donors may be able to support the replication of recommendations in other areas.

Special focus will be placed on the regulation of EEU and the possibilities of EEA to control and motivate improvements in the quality of service. A guideline and/or manual for regulation of EEU in relation to reducing losses and to improve quality of service will be developed and put to use.

2.4 Theory of change

The programme is organised into a number of well-defined tasks, which will contribute to the achievement of the outputs and outcomes. The logic behind how this programme will bring the desired change and the inputs for the programme is explained in the table below:


Mitigation Priority: Energy: Wind Power Generation, Grid Management
Adaptation Priority: Energy: Energy Mix
Activities/Outputs
Outcomes
Impact
Goal
1b. Inputs to Activities: Design considerations
Leverage: Mobilise private sector financing for wind power production through IPP framework.
National strengths: Bring Danish competences within wind energy into play through GtG cooperation and twinning between Danish and Ethiopian experts.
Alignment: Support GoE plan to generate 5,200 MW wind power by 2020 through IPP framework.
Transformation: Transformation of financing, development and management of wind power production, including through G2G cooperation and application of new technologies.
Mainstreaming: Build capacity to ensure the preparation of Environmental and Social Impact Assessment reports for each wind power project.
Wind Measurement
1.1 Selecting sites for wind measurement, erecting 10 masts and producing a validated high quality wind measurements report for 10 stations.
1.2 Building capacity of GoE technical team in wind measurement and analysis.
IPP Framework
2.1.1 Conducting assessment of connection costs and wind power plant logistics
2.1.2 Developing framework conditions for IPP auctions and conducting the first IPP wind auctions
2.1.3. Announcing two rounds of IPP auctions and conducting the tendering process for the first IPP auction
2.1.4. Facilitating the financial agreement for a 100 MW wind power production
2.1.5: Building capacity of GoE stakeholders in relation to IPP and EPC tenders
System Integration
2.2.1: Analysing investments in generation and transmission.
2.2.2 Revising and developing procedures including grid codes that use real time information about the wind power generation for the National Control Centre.
2.2.3. Building capacity of GoE technical team in integration of wind power.
Grid Management
2.3.1 Review of main challenges in distribution level
2.3.2 Selecting two sites for case study and analysing the grid to identify causes of losses and power cuts as well as all procedures using state-of-the-art software systems
2.3.3 Developing recommendations to improve procedures and improve quality of service that enables to reduce losses, and implementing the recommendations in the two selected sites
2.3.4 Producing a report on impact of the implementation of recommendations and developing an action plan for replication in other areas
2.3.5 Developing a manual for regulation of the distribution company in relation to reducing losses and to improve quality of service
2.3.6 Building capacity of GoE technical team in modern planning and regulative procedures.
Engagement 1:
1.1 High quality and validated wind resource assessments, at a number of prioritised sites, made public.
Engagement 2:
2.1 Improved GoE institutional framework, and market readiness, including the approval of a credible IPP wind auction roadmap.
2.2 Improved system integration of wind power.
2.3 Reduced grid loss and improved quality of service at distribution level.
GHG emissions are reduced to ensure global warming is kept below 2 degrees threshold
Ethiopia to achieve middle-income status by 2025 in a climate-resilient green economy
ASSUMPTIONS
2) Going from Activities to Outputs:
AWGPE…
• Uses log frames, indicators, targets and results frameworks to monitor and manage project output.
• External partners are efficient and context for project implementation remains stable.
• Builds relationships with relevant stakeholders to facilitate project implementation and uptake.
ASSUMPTIONS
3) Going from Outputs to Outcomes:
AWGPE…
• Is demand-driven and engages with national priorities, strategies, and structures to ensure buy-in.
• Builds up on areas where Danish expertise, skills, and competences can provide added value.
• Seeks financial and other resource leverage to maximise returns on limited financial resources.
• Economic and political conditions are favourable for the implementation of the programme.
ASSUMPTIONS
4) Going from Outcomes to Impact:
AWGPE…
• Focuses on innovative business models and policy approaches that have replication potential.
• Influences policies, markets, and institutions to create sustainable and wide-reaching impact.

2.5 Justification

The strong commitment of Ethiopia and Denmark to the global agenda on climate change and reduction of GHG justifies renewable energy as the strategic entry point for the AWPG programme. The GTP-2 has a target of producing 5,200 MW from wind, and this programme will focus on developing the capacity of the GoE entities in the energy sector to achieve this ambitious goal. This will primarily be done via G-t-G Cooperation, which will strengthen the Danish–Ethiopian partnership in an area that is a major focus for the Ethiopian development vision, i.e. of becoming a middle-income country with zero net-carbon emissions, and for Denmark, which can contribute to supporting sustainable economic growth in Ethiopia.

Denmark has a solid tradition of integrated energy planning as a foundation for its goal to become carbon neutral in 2050, and is moving towards achieving 50% wind power in its electricity production portfolio before 2020. Strong commercial and institutional competences are present in Denmark in regard to low carbon solutions. Denmark's ongoing energy transition away from a fossil-fuel-based economy, and the ability to efficiently integrate wind in the electricity mix, can serve as a powerful example in the Ethiopian context. In addition, Denmark has a long tradition of conducting IPP wind power auctions for off-shore wind parks, and is engaged in a number of G-t-G activities around the world, including in China, South Africa, Mexico, and Vietnam, with the aim of engaging on these issues. The AWPGE Programme, including through G-t-G Cooperation, lays the foundation for increasing electricity power production from diversified sources, and will not only strengthen the capacity of the energy sector, but also ensure its resilience to climate change. Hence, the **relevance** of the programme is considered very high and timely.

As the focus of the AWPG programme is building capacity within the GoE energy sector, and solving actual challenges the GoE faces to increase wind power generation, the programme is expected to have a long-term **impact**. With its focus on developing an IPP modality, the programme will not only leverage private sector financing to accelerate power production, but also contribute to Ethiopian export earnings through the export of electricity and a reduction of CO_2 emission as a result of replacing fossil fuel power with wind power

When designing the programme and agreeing on the engagements' various outcomes, high priority has been given to addressing the capacity gaps in the energy sector through tackling practical "real-time" challenges and tasks. Moreover, the G-t-G Cooperation will ensure the transfer of proven Danish expertise and knowledge within the wind energy sector and IPP modalities. Hence, **effectiveness** is also expected to be high.

Laying the foundation for IPP auctions and landing successful IPP contracts in three years' time requires efficiency. Through regular Steering Committee meetings that involve all the implementing partners, and through rigorous planning, monitoring, and evaluation, the programme will contribute to the achievement of the milestones and solve problems in a timely fashion, and ensure programme **efficiency.**

The focus of the programme is building the national capacity in the wind sector, while contributing to the increase in the production of renewable energy. GoE institutions within the energy sector are the foundation of the design logic. The major focus of the programme is to enable the GoE institutions to raise their systems up to international standards, and to have the human capital required to make use of these systems. This will enable an improvement in planning, decision-making, and operational processes, and thereby contribute to increased generation and integration of wind (and solar) power. In addition, the GoE has identified three universities, Adama, Mekelle, and Addis Ababa, as Centres of Excellence for Wind Energy. Collaboration with these universities, including linking them with the Danish Technical

University, will create and sustain continued in-house capacity. As such, the programme has a high degree of **sustainability**, as these institutions are permanent and will apply technologies and systems to proven international standards.

In conclusion, the Accelerating Wind Power Generation Programme in Ethiopia is a timely and strategic opportunity for Danish-Ethiopian cooperation and partnership.

2.6 Climate change

Expansion of wind power will directly reduce CO_2 emission. This will primarily be through reductions achieved in neighbouring countries that use imported, near-zero-emission, Ethiopian electricity, as it will replace the burning of fossil fuels. The impact is estimated to be at least 65,000 tons CO_2 per year per for each 100 MW of wind power.

Ethiopia has an Environmental Impact Assessment Proclamation. The objective of this proclamation is to facilitate the implementation of the environmental rights and objectives enshrined in the constitution of the country, and to maximize socio-economic benefits by predicting and managing environmental effects. There is an established tradition of conducting environmental and social impact assessment for power plants, but there is a need to strengthen the capacity of MOWIE and EEP in this respect, which is included in the AWPG. Refer also to the Climate Change Screening Note in Annex 8.

2.7 Human rights based approach

Power production requires land. In Ethiopia all land is per definition owned by the State. Thus, even if it is being used by an individual or a community, it can be taken over by the State if needed for development purposes. The GoE has clear regulations and guidelines that set out the procedures on how land is taken over from communities, including on compensation. These regulations and guidelines are applied. In this context it should be noted that wind farms enable dual use of the land, i.e. that the land required to establish a wind farm, apart from what is needed for foundations and access roads, can still be utilized for farming purposes. The programme will work with MOWIE and EEP to ensure that transparency and accountability is maintained in aggregating land for the erection of wind masts and wind turbines. The programme will also ensure that procedures are in place for community participation, and that timely information about projects and the communities' rights to compensation is provided.

In any case, conducting Environmental and Social Impact Assessments prior to the establishment of wind power plants is mandatory and will identify issues, which need to be addressed. Furthermore, international experience will be explored and adapted to ensure involvement of local communities and wherever possible to provide direct benefits in different ways, e.g. improving access to electricity or by allocating a small percentage of the revenues from a wind farm to a local development fund.

Focus will also be on promoting gender equality, e.g. in selecting participants for on- and off-the-job trainings. Refer also to the HRBA and Gender Screening Note in Annex 9.

2.8 Results framework

As the programme focuses on strengthening capacity with the aim of accelerating wind power generation in Ethiopia, the results framework has been developed together with the GoE energy sector officials using GTP-2 wind energy targets, and the identified gaps to achieve those targets. However, once the G-t-G Cooperation and the international consultant are in place, the results framework will be revised during the inception phase, i.e. in the first three months of the

programme implementation period. The revision will focus on outputs and preparing detailed work plans, as outcomes are not expected to be changed. Please refer to Annex 2 to see the detailed results framework with annual targets.

Summary of Results Framework

CCE intervention	Accelerating Wind Power Generation in Ethiopia.
Objective	Accelerated wind power generation as a result of strengthened capacity of the GoE energy sector.
CCE Core Indicator(s)	Low-carbon and climate resilient enabling environment (IPP-framework and model system/structure for reduction of grid-loss) developed.

Engagement Objective 1	To ensure availability of high quality wind resource assessments for the preparation of bankable wind energy IPP auctions.
Outcome 1.1	High quality and validated wind resource assessments, at a number of prioritised sites, made public.
Supporting Indicator	Wind resource assessments based on measurements from 10 masts generated and made public.

Engagement Objective 2	To strengthen the GoE's efforts to increase wind power production, and improve quality of service in the distribution of electricity.
Outcome 2.1	Improved GoE institutional framework, and market readiness, including the approval of a credible IPP wind auction framework.
Supporting Indicator	IPP-framework for wind power production developed, approved, and used.
Outcome 2.2	Improved system integration of wind power.
Supporting Indicator	Effective and timely integration of wind power into the energy-mix.
Outcome 2.3	Reduced grid loss and improved quality of service at distribution level.
Supporting Indicator	# KWH reduction of grid-loss and improved quality of service in case study areas.

2.9 Support modalities

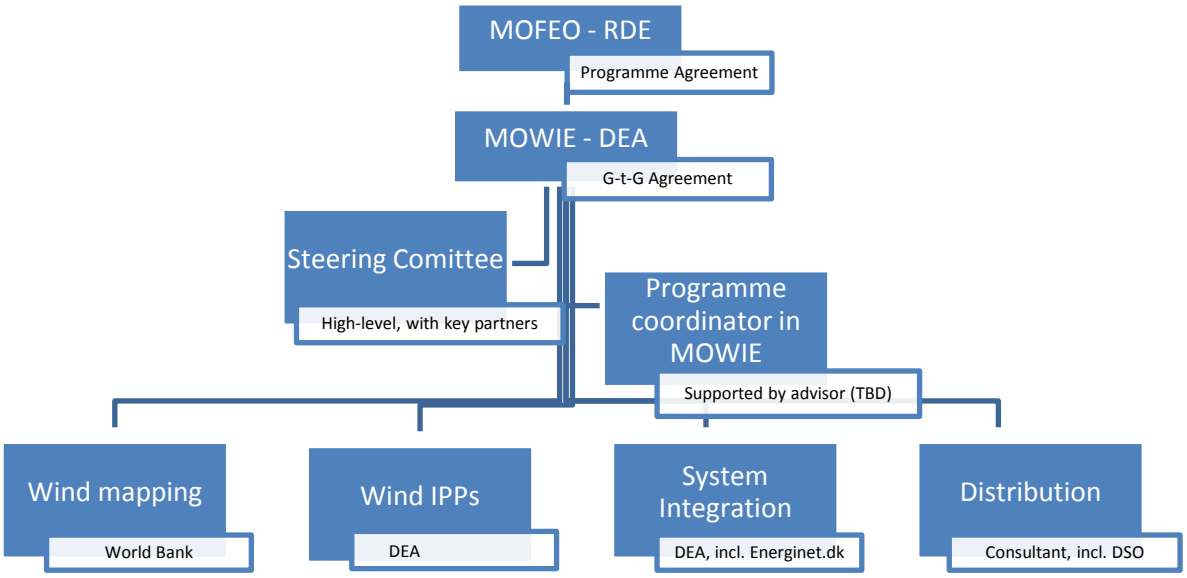
The AWPGE Programme will use a mix of different support modalities, including:

1. G-t-G Cooperation shall play an important role in the programme in technology and knowledge transfer, including through on-the-job training and twinning focusing on solving actual "real-time" tasks to ensure that inputs, actions, and decisions are focused towards relevant challenges in the Ethiopian context using Danish experience in the sector and providing for the necessary software;
2. International consultancy, including a DSO, and providing for the necessary hardware and software focusing on improving service delivery and reduction of grid loss;
3. Analytical capacity and equipment for wind measurement (e.g. masts and software).

3 PROGRAMME MANAGEMENT

3.1 Programme and engagement level management

The signatories to the Programme Agreement (the Embassy and MOFEC) can call for meetings on an ad hoc basis, and official minutes will be taken and agreed upon. Programme level management will be carried out via biannual (in the first year) and annual (for the remainder of the programme period) high-level Steering Committee Meetings comprising the Embassy, Danish Energy Agency, MOWIE, EEP, EEU, EEA, and the international consultant when relevant.



The engagements will be managed by the partners following their own administrative and management procedures.

The Embassy will coordinate directly with the engagement partners on any issue related to the agreements.

Engagement one: Wind measurement will be implemented under a sub-agreement between MOWIE, the Embassy, and World Bank. This has already been discussed and agreed in principle with both MOWIE and the World Bank. A Danish contribution will be seen as an extension of the ongoing ESMAP wind mapping programme, providing an additional 10 measurement masts, which will be sited in high potential areas. The agreement with the World Bank will include a capacity building component on wind measurements and analysis involving relevant Ethiopian institutions, including selected universities.

Engagement two: An engagement agreement will be entered into with MOWIE, and it will be partly implemented through a G-t-G Cooperation with the Danish Energy Agency and partly by an international consultant. The Danish Energy Agency with the relevant government entities (MOWIE, EEP, and EEA) will be responsible for developing an IPP roadmap, and will engage Energinet.dk to implement system integration together with EEP. A detailed plan clearly outlining activities, timelines, roles, and responsibilities of each stakeholder is expected to be developed once a commitment is entered into between the Embassy and the GoE. This will be

followed by the G-t-G Agreement, including a possibility to place an international advisor at senior level in MOWIE, between the Danish Energy Agency and MOWIE.

The G-t-G Cooperation agreement will provide specific details on the inputs the Danish Energy Agency will deliver under the agreement and expected outputs and results. Please refer to Annex 6 for Terms of Reference. The advisor foreseen will work closely with all stakeholders (both the GoE and the Danish Energy Agency) and advise in identifying key skills and expertise needed for the implementation of the programme and is also expected to coordinate the with the World Bank for the wind measurement, and with the international consultant and EEU for the grid management. Please refer to Annex 8 for Terms of Reference.

The implementation of the reduction of grid loss will be subject to a competitive tender process following Danida tendering procedures in order to contract an international consultant who will work with a Distribution Systems Operator with sufficient knowledge of the Danish experience at distribution level. In addition, the contract with the international consultant may also include a support function for MOWIE, should the foreseen placement of an international advisor not materialise. Please refer to Annex 7 for Terms of Reference.

Technical Meetings involving all relevant partners in the programme will take place on a quarterly basis with the possibility of more frequent meetings during the first year.

3.2 Programme monitoring, reporting and reviews

The Embassy and the partners will agree to a draft results framework, detailed work plans, including budgets, at the latest one month prior to the end of the Inception Phase which will cover the first three months. If justified, the Inception Phase can be extended with the approval of all partners. In addition, the G-t-G Cooperation Agreement is expected to be signed during the Inception Phase.

The foreseen international advisor will be responsible for collecting the necessary information/reports from implementing partners in order to produce annual narrative and financial progress and final reports for the programme.

The issue of long-term sustainability, including exit-strategy, will be developed in the course of the second year into the programme through an inclusive process amongst partners. This could be informed by a light review that can also reorient implementation of the programme and/or inform future programming.

3.3 Coordination

Continuous coordination among partners in this programme is paramount for the success of the programme. Hence, Terms of Reference for a Steering Committee overseeing implementation, with clear mandates and roles for each of the partners, will be developed. The Steering Committee will comprise representatives from Ethiopian and Danish institutions and the consultant re above.

During the validation of this programme end of June 2016, it was also agreed to have a regular joint meetings involving Ethiopian government agencies in the energy sector and development partners, proposed to be chaired by the State Minister of MOWIE. This will ensure transparency and provide an overview of the sector, including with aim of avoiding duplication. The Embassy will take an active role, including in developing Terms of Reference for the meeting structure.

Currently, a number of donors, including the World Bank, the African Development Bank, EU, USAID (through the Power Africa initiative), DFID, GIZ, and Norway, are engaged within the energy sector in Ethiopia. The AWPGE Programme will coordinate closely with the other donors to ensure complementarity and avoid duplication of efforts. In this regard, arrangements for such coordination are currently being discussed with the relevant partners. At this point in time, donors are focused on wind measurement (the World Bank through the ESMAP Programme), IPP modalities (Power Africa with a focus on geothermal and solar), technical support to the PPP Unit within MOFEC (DFID), grid-loss and improving quality of services (DFID), and improvement of grid-management (EU). Thus the AWPGE will build on and complement these interventions.

3.4 Risk management

The GoE has ambitious targets and a strong focus on continued growth in new electricity generation capacity. This includes wind energy expected to be developed through an IPP modality. On one hand, this could result in a push from the GoE to rush the process of designing such a modality. On the other hand, the AWPGE Programme involves a number of complicated and closely interrelated tasks, e.g. the selection of wind sites and measurements. Thus, challenges and delays are likely to occur during implementation. The programme will closely monitor and identify such challenges and solve them in a timely manner. Open and trustful communication and local presence of the foreseen international advisor and consultant, is expected to reduce these risks. Significant priority is given to the achievement of high-quality results during implementation. Therefore, the programme will maintain a certain degree of flexibility.

Some contextual, programmatic and institutional risks have been identified. These will be monitored closely, and reports to that effect will be produced annually. A summary is presented below and a full overview of the risk assessment and risk management framework is provided in Annex 4.

Although most of the capacity building activities especially setting the IPP framework and the system integration will be in Addis Ababa, the wind measurement and the grid management activities are expected to be implemented in the regions. Current demonstrations may delay implementation especially in Amhara and Oromia regions.

Slow or stagnant improvements in private sector framework conditions, such as uncertainty about licences for foreign companies, transparency of tendering procedures, uncertainty about taxes, and crowding out the private sector due to continued or increased public financing, are some of the expected risks. The power generation targets are high and require significant funding, and a delay in having the right framework conditions in place could discourage the private sector and lead to minimising interests in IPP.

The programme will require substantial cross-institutional cooperation, and will involve universities and the private sector. Since key partners are still developing their capacity, coordination is expected to be a challenge. In order to facilitate communication and transparency, the foreseen international advisor, will be placed in MOWIE close to the senior management and regular Steering Committee meetings will be conducted. Potential institutional weaknesses and capacity gaps will also be thoroughly assessed and tackled when needed, to avoid the risk of e.g. slow implementation and potential overlaps in tasks and mandates.

4 PROGRAMME BUDGET

4.1 Programme budget

The budget (in DKK M) is summarised in the table below; a more detailed budget, showing allocations per implementing partner, is provided in Annex 3.

Development Engagement	**2016**	**2017**	**2018**	**2019**	**Total**
Development Engagement 1 – Availability of high quality wind resource assessments for the wind energy IPP auctions					
Outcome 1.1: Validated wind resource assessments	1,5	10,0			11,5
Subtotal Development Engagement 1	**1,5**	**10,0**			**11,5**
Development Engagement 2 – Strengthen the GoE's efforts to increase wind power production, and improve quality of service in the distribution of electricity					
Outcome 2.1: Improved GoE institutional framework and market readiness		2,0	6,0	1,0	9,0
Outcome 2.2: Improved system integration of wind power		0,5	1,0		1,5
Outcome 2.3: Reduced grid loss and improved quality of service at distribution level		2,5	2,0	0,5	5,0
Subtotal Development Engagement 2		**5,0**	**9,0**	**1,5**	**15,5**
Subtotal Thematic Programme	**1,5**	**15,0**	**9,0**	**1,5**	**27,0**
Ad hoc technical assistance, reviews, and programme management	0,5			0,5	1,0
Grand total	**2,0**	**15,0**	**9,0**	**2,0**	**28,0**

ANNEX 1: PARTNERS

Ministry of Water, Irrigation and Electricity (MOWIE)	The Ministry was established in 2010. Since 2010, the Ministry has been making efforts to achieve the targets set in the Growth & Transformation Plan (GTP) for the water and energy sectors. Major aspects include: potable drinking water and sanitation programs, irrigation and drainage development studies, design and construction, river basin and master plan studies, and energy development such as hydro-power and alternative energies from solar, wind and bio-fuel as well.
Ethiopian Electric Power (EEP)	Responsible for generation and transmission. EEP is the sole provider of bulk electricity to users, mainly to the Ethiopian Electric Utility (EEU), direct industrial customers, and exports to neighbouring countries. Djibouti and Sudan are connected to Ethiopia by a high-voltage power line. A 400 MW energy purchase agreement has been signed between Kenya and Ethiopia, and a 500 kilovolt (kV) HVDC line between the two countries is under construction. EEP operates and maintains more than 12 hydro-power plants and three wind power plants in different parts of the country with installed capacity of more than 4,290 MW, including the Gibe III plant (1,870 MW). There are two major hydro-power projects under construction, the Grand Ethiopian Renaissance Dam (6,000 MW) and Genale-Dawa 3 (254 MW). EEP operates and maintains all high-voltage transmission lines across the country, which covers more than 9,000 km with varying voltage levels ranging from 66kV to 500kV; and more than 90 sub-stations. Largescale transmission line expansion is planned to extend the system and cover the whole country, including border crossing power lines. Total staff: 3,521.
Ethiopian Electric Utility (EEU)	EEU owns, operates and manages electricity distribution networks across Ethiopia. EEU is presently serving app. 2.3 million customers and expected to reach 7 million new customers by 2019/20. EEU is responsible for maintaining, upgrading and modernising distribution networks to ensure that there is adequate distribution network capacity available to meet the needs of its existing customers as well as prospective customers. EEU is also responsible to enhance the electricity access coverage from 55% to 90% in the next five years in addition to operate and manage sub transmission (45 and 66 KV) and sub-stations. The inter-border connection of power such as to Somaliland, Kenya, etc. at distribution voltage level below 66KV is also the scope of EEU. Total staff: 12,172.
Ethiopian Energy Authority (EEA)	Established in 2013, Ethiopian Energy Authority, a regulatory agency for the energy sector, is mandated to issue licenses for generation, transferring, distribution, and selling, as well as the import and export of electricity in Ethiopia. As per the provision of the relevant proclamation, the agency is also responsible for issuing permits for private sector actors and reviewing tariff proposals in relation to the national grid.

The vertical integrated utility EEPCo was spilt into EEP and EEU in 2013. Ethiopia is one of the 10 members of Eastern Africa Power Pool (EAPP). The purpose of EAPP is to facilitate trade of electricity between member countries. The EAPP headquarter is in Addis Ababa.

ANNEX 2: RESULTS FRAMEWORK

CCE intervention		Accelerating Wind Power Generation in Ethiopia.	
Objective		Accelerated wind power generation as a result of strengthened capacity of the GoE energy sector.	
CCE Core Indicator(s)		Low-carbon and climate resilient enabling environment (IPP-framework and model system/structure for reduction of grid-loss) developed.	
Baseline	Year	2016	No IPP-framework and no model system/structure for reduction of grid-loss.
Target	Year	2019	IPP-framework and model system/structure for reduction of grid-loss developed and approved.

Engagement Objective 1		To ensure availability of high quality wind resource assessments for the preparation of bankable wind energy IPP auctions.	
Outcome 1.1		High quality and validated wind resource assessments, at a number of prioritised sites, made public.	
Supporting Indicator		Wind resource assessments based on measurements from 10 masts generated and made public.	
Baseline	Year	2016	Measurement for three sites available (Debre Birhan, Adama, Ayisha).
Target	Year	2017	10 masts erected in selected sites, wind resource measurement started, and the first six months wind measurement report produced.
Target	Year	2018	One year high quality and validated wind resource measurements report made public.
Target	Year	2019	Two years high quality and validated wind resource measurements report made public.

Engagement Objective 2		To strengthen the GoE's efforts to increase wind power production, and improve quality of service in the distribution of electricity.	
Outcome 2.1		Improved GoE institutional framework, and market readiness, including the approval of a credible IPP wind auction framework.	
Supporting Indicator		IPP-framework for wind power production developed, approved, and used.	
Baseline	Year	2016	No IPP framework for wind power production in place.
Target	Year	2017	IPP framework developed and validated.
Target	Year	2018	IPP tender documents for the first auction finalised and roadmap for two coming auctions developed accordingly.
Target	Year	2019	International standard power purchase agreement concluded for a 100 MW wind power production using IPP modality.
Outcome 2.2		Improved system integration of wind power.	
Supporting Indicator		Effective and timely integration of wind power into the energy-mix.	
Baseline	Year	2016	324 MW wind power integrated into the energy-mix.
Target	Year	2017	Effective planning and operational procedures developed and approved.
Target	Year	2018	Document with an updated list of least-cost investments in transmission capacity developed and approved.
Target	Year	2019	At least 424 MW wind power integrated into the energy-mix.
Outcome 2.3		Reduced grid loss and improved quality of service at distribution level.	
Supporting Indicator		# KWH reduction of grid-loss and improved quality of service in case study areas.	
Baseline	Year	2017	# KWH grid loss and level of client satisfaction in case study areas. *[To be defined in 2017]*
Target	Year	2017	One to two sites for case studies identified and studies initiated.
Target	Year	2018	Study report on the case studies, including recommendations to improve planning and management of the distribution system, completed and implementation of recommendations initiated.
Target	Year	2019	Reduction of # KWH grid loss and improvement in level of client satisfaction in case study areas. *[To be defined in 2017-18]*

ANNEX 3: DETAILED BUDGET PER PARTNER

I	Direct Programme Cost	World Bank	Government-to-Government		Consultant +DSO	Embassy	Total
			Energinet .dk	DEA			
1.1	**Hardware**						-
1.1.1	Wind measurement	8,450,000					8,450,000
1.1.2	Local Grid				2,348,000		2,348,000
	Total 1.1	***8,450,000***			***2,348,000***		***2,348,000***
1.2	**Software**						
1.2.1	Wind Measurement	375,000					375,000
1.2.2	Framework readiness			375,000			375,000
1.2.3	Wind integration						
1.2.5	Local grid management				256,000		256,000
	Total 1.2	***375,000***		***375,000***	***256,000***		***1,006,000***
	Total I	**8,825,000**		**375,000**	**2,604,000**		**11,804,000**
II	**Programme management**						
2.1	Policies, studies and management systems			3,577,320			3,577,320
2.2	Salary						
	Wind Measurement						
	Framework readiness		300,000	3,888,000			4,188,000
	Wind integration		1,402,500				1,402,500
	Local grid management				2,130,000		2,130,000
	Total 2.1		***1,702,500***	***3,888,000***	***2,130,000***		***7,720,500***
2.3	Per diem and flights						
	Framework readiness		52,400	659,680			712,080
	Wind integration		245,100				245,100
	EPC prefeasibility and feasibility						
	Local grid management				266,000		266,000
	Total 2.2		***297,500***	***659,680***	***266,000***		***1,223,180***
2.4	Trainings, Reviews, studies and Audits	1,922,664				1,000,000	2,922,664
2.5	Administrative fee	752,336					752,336
	Total II	**2,675,000**	**2,000,000**	**8,125,000**	**2,396,000**	**1,000,000**	**16,196,000**
	Grand total	**11,500,000**	**2,000,000**	**8,500,000**	**5,000,000**	**1,000,000**	**28,000,000**

ANNEX 4. RISK ASSESSMENT

Contextual Risks

Context: **Ethiopia**
File No: **2016-9613**

	Risk factor	Likelihood	Background to assessment	Impact	Background to assessment	Risk response if applicable / potential effect on development cooperation in context
1	Downgrading of Ethiopia's credit rating	Unlikely	Although the debt level is increasing, Ethiopia is committed to service its debts regularly. Hence, international financiers, including the World Bank, continue providing loans to Ethiopia.	Major	The IPP modality requires backing of financiers, who need to be convinced of the commitment of the country to regularly service its debt; a downgrading of Ethiopia's credit rating will discourage them from financing projects in the country.	This will be beyond the capacity of the Embassy. Denmark will engage in political dialogues and relevant partner forums at various levels to regularly assess the situation and raise issues of concern. Note that contracts with IPP will be signed in USD.
2	Deteriorating regional stability (potential terrorism, or influx of refugees from neighbouring countries) adds pressure on GoE resources and diverts the national development agenda.	Likely	Continued instability in the Horn of Africa is likely.	Minor	The GoE is active in promoting peace and stability at the Horn of Africa. Combined with a tight security system, the GoE has managed to minimise the occurrence of terrorist attacks in the country. Security concerns do exist, e.g. in the Somali-Region, as well as in the border areas with South Sudan and Eritrea.	This will be beyond the capacity of the Embassy. The Embassy will closely monitor the regional situation, also through its close dialogue with the AU and IGAD (including through the African Programme for Peace).

	Risk factor	Likelihood	Background to assessment	Impact	Background to assessment	Risk response if applicable / potential effect on development cooperation in context
3	Social and political unrest/dissatisfaction may disrupt the implementation of the Accelerating Wind Power Generation in Ethiopia Programme	Significant	Currently, there is significant public unrest in the country, especially in Amhara, Oromia and some parts of SNNPR and GoE has declared a state of Emergency for six months starting 8 October 2016.	Significant	Social and political unrest and instability can significantly delay and implementation, in particular GoE implemented programmes and projects. This could negatively impact the capacity building activity and the wind measurement activities as well.	Denmark will engage in political dialogue and relevant partner forums at various levels to regularly assess the situation, raise issues of concerns, and promote peaceful resolution of conflicts and public unrest. If necessary, adjust actions in a timely manner, e.g. revise implementation period together with partners.
4	Slow or stagnant improvements in private sector framework conditions, e.g. uncertainty about licences for foreign companies, taxes, transparency of tendering procedures, and crowding out of private sector due to continued or increased public financing.	Likely	Although, the opportunity to export power and the need for significant funding has encouraged the GoE to open up the sector to private investors, which is clearly demonstrated by the geothermal and solar power tenders, there are still significant challenges in improving the framework conditions for the engagement of the private sector.	Major	The GoE has set high targets for power generation infrastructure projects/development. This requires significant funding. A delay in having the framework conditions in place will discourage the private sector and lead to minimising their interest.	G-t-G Cooperation between Ethiopia and Denmark, and sharing experiences especially in IPP modalities, are expected to contribute positively to address the challenges, and to set competitive and transparent tendering procedures and systems within the energy sector.

Programmatic and Institutional Risks

Title: Accelerating Wind Power Generation in Ethiopia

File No: 2016-9613

Programmatic Risks

	Risk factor	Likelihood	Background to assessment of likelihood	Impact	Background to assessment to potential impact	Risk response	Combined residual risk
P1	Delay in having wind measurement data for the preparation of the IPP tenders.	Likely	The wind measurement engagement is going to be implemented as part of the already started wind mapping exercise (ESMAP) by the World Bank. Currently, discussions among partners on the use of ESMAP masts for measurements not finalised yet. In addition, public unrest may affect erection of the masts in some of the sites.	Major	This might affect the preparation of the measurement report for some of the sites but will not stop the process.	The Embassy together with the World Bank, the GoE, the foreseen international advisor and consultant, will monitor the situation and make the necessary adjustments.	Major
P2	Received bids too high.	Likely	Since there is no precedence in IPP tendering for wind power, developers and investors may assume there is high risk and may request for a higher price.	Major	This may discourage the GoE and may lead in turning back to the EPC modality.	The programme will work meticulously in attending to all the details of the IPP procedures the GoE to make the whole process transparent by providing all information to all bidders.	Major

	Risk factor	Likelihood	Background to assessment of likelihood	Impact	Background to assessment to potential impact	Risk response	Combined residual risk
P4	Unrealistic time planning.	Likely	There is a tendency to have high targets for a short period of time, which often end in delaying project completion.	Minor	Stakeholders are aware that implementing a new modality takes time and some delay is expected in perfecting the modality before it is in place and implemented.	The programme planning has taken into consideration the detailed activities to be implemented and allowed for sufficient time.	Minor
P5	Disputes over land rights.	Likely	All land in Ethiopia is owned by the State. There are guidelines on how to acquire land and pay compensation. Wind energy installations do not as such require significant space. However, in practice disputes over land have occurred frequently due both poor guidelines and the inadequate implementation thereof.	Major	Disputes about land rights can disrupt the implementation of the project and create losses for the investor.	The programme will work to identify and addressing the land ownership issue as part of the readiness for the wind power production using an IPP modality. In addition, the programme will follow GoE announced work on improving guidelines for land tenure. The programme could facilitate constructive dialogue between the private sector and the GoE, including by bringing in Danish experience on the inclusion of local communities.	Major

P6	Lack of commitment to IPP or IPP legalisation not approved.	Unlikely	There is an ambitious target for the production of wind power, and the GoE needs to leverage private sector financing to achieve its target. Moreover, the IPP proclamation is drafted and going through a GoE approval and expected to be ratified before the end of 2016.	Major	If suddenly the GoE loses interest in the IPP modality, the programme results will be achieved only partially and the wind power expansion will be negatively affected.	The Embassy will engage in political dialogues and relevant partner forums at various levels and raise issues of concern, and if necessary adjust actions in a timely manner.	Minor

Institutional Risks

	Risk factor	**Likelihood**	**Background to assessment of likelihood**	**Impact**	**Background to assessment of potential impact**	**Risk response**	**Combined residual risk**
I1	High staff turnover challenges the success of the programme in building technical skills of staff members in the partner organisations, mainly in MOWIE and EEA (as public entities).	Likely	The GoE entities, especially MOWIE and EEA, are negatively affected by high staff turnover. This situation is expected to continue.	Major	The Danish Energy Agency, including Energinet.dk, is expected to closely work with the partners and build their technical capacity in the process. If and when a staff member, who is part of the team working closely with the Danish counterpart and the international consultant, leave his/her position, it will pose a challenge and create delays in the implementation of the programme.	The Embassy will engage in political dialogues and relevant partner forums at various levels and raise issues of concern and if necessary adjust actions in a timely manner.	Major

I2	Poor cooperation and coordination among the institutions participating in the AWPG (MOWIE, EEP, EEU, and EEA), and absence of counterparts that closely work and engage with the Danish counterparts and the international consultant on implementation, will create delays and increases transaction costs.	Likely	Coordination has been a challenge in the past. Especially when a task is shared among different GoE entities.	Major	There are a number GoE entities that will be the main actors for this programme. In most cases they need to work together; if this does not happen, it will have a negative impact on implementation and on the achievement of the results.	The programme will have a detailed plan with clear tasks and roles designated to all participating agencies, and will have an information sharing system in place including regular and documented Steering Committee meetings.	Major

	Risk factor	**Likelihood**	**Background to assessment of likelihood**	**Impact**	**Background to assessment of potential impact**	**Risk response**	**Combined residual risk**
I3	MoWIE, EEP, EEA ready for IPP?	Likely	There is a clear commitment at senior management level for introducing an IPP modality. But since there is no precedence in IPP tendering for wind power. IPP procedures and workflows need time to be internalised and implemented in public entities.	Major	IPP auctions are complex and delays can happen.	Close monitoring is needed. Prepare for a quick response to address challenges.	Major

I5	Lack of commitment to IPP or IPP legalisation not approved.	Likely	EPC modality has been in place and the GoE entities are used to this modality. It will take time to get used to new procedures and processes.	Major	If the implementation of an IPP modality takes more time than anticipated due to slow trickle down of guidelines and procedures, it may frustrate potential developers and lower their commitment.	The Embassy will engage in political dialogues and relevant partner forums at various levels and raise issues of concern and if necessary adjust actions in a timely manner.	Major

ANNEX 5: TOR – FOR ENGAGEMENT 1: WIND MEASUREMENTS

Tasks	Outcome
Task 1: Wind mapping and wind site preparation	Outcome 1: Wind measurements
Task 2: Wind measurements on selected sites	

The purpose of this engagement is to deliver wind resource assessments for candidate wind sites. The activities will be performed mainly as twinning, with inclusion of MOWIE, EEP and selected universities in all steps, including dedicated training sessions with focus on methods and procedures.

Task 1: Wind mapping and wind site preparation
Review of existing wind speed measurements, wind atlases, and earlier priority lists and methods (Hydro China, ESMAP, Master Plan, generation data from the three existing wind farms).

- Develop a priority index for wind sites. The index should capture the economic attractiveness of the sites[8], as well as other qualitative information. This can include wind speeds, altitude, grid connection costs, transport infrastructure, land right concerns, security concerns, and uncertainty of data (e.g. simple or complex terrain). Site visits to candidate sites.
- Select candidate sites for wind measurements based on the priority list, with focus on the ten sites with the highest priority. The goal is to have as many *bankable* measurements for actual wind sites as possible.

Task 2: Wind measurements at selected sites

- Develop requirements for measurements based on international standards, e.g. IEC 61400-12-1. Quality management. Data management and adjustments.
- Micro siting of wind masts.
- Procurement and installation of met masts and equipment.
- Operation of measurements. The operation should continue for two years.
- Continued data quality analysis and sharing of measured raw data as well as analysed data (on public web site).

Task	Competences
Task 1: Wind mapping and wind site preparation	Experience in practical wind power siting. Infrastructure evaluation (road, electricity grid, including costs of expansion).
Task 2: Wind measurements on selected sites	Wind mapping. Wind measurements. Design of measuring masts. Installation and operation of measuring masts. Quality checking and analyses of data.

[8] E.g. in form of Levelised Cost of Electricity. Levelised Cost of Electricity is a standardised measure of the overall competiveness of different generating technologies. It represents the per-kilowatt hour cost (in real dollars) of building and operating a generating plant over an assumed financial life and duty cycle.

ANNEX 6: TOR – ENGAGEMENT 2: IPP FRAMEWORK

Project coordination and support to Steering Committee	Project management and well-planned Steering committee meetings
Task 3: Connection and integration of wind	Outcome 2.2: System integration
Task 4: Framework readiness for wind farm investment decisions (IPP)	Outcome 2.1: First IPP wind auction and IPP wind roadmap
Task 5: IPP and EPC auctions design and timeline	
Task 6: Conduct first IPP wind auction	
Task 7: Capacity building in relation to EPC tenders	

The Terms of Reference covers the following programme stream:

- Preparing, and tendering for one IPP wind farm project, including all major technical and financial aspects, and building on experiences and ongoing work including cooperation with other stakeholders.

The aim is that the programme stream be realised as twinning programmes where relevant Ethiopian and Danish Authorities and other actors work together to deliver the expected outcomes of the AWPGE Programme. The Danish twinning partners will be Danish Energy Agency and Energniet.dk.

The main objective of this engagement is to strengthen the GoE's efforts to increase wind power production, and improve quality of service in the distribution of electricity:

a) To increase capacity in the Ethiopian energy sector (MOWIE, EEP, and EEA) in order to meet the ambitious goals of expanding renewable energy electricity generation, particularly wind power.
b) To ensure that wind farm projects are planned, contracted, and efficiently connected, and that the generated electricity is integrated into the transmission grid according to updated international planning, tendering, and operational procedures.

A central function will be the international advisor. This is expected to be a full-time position placed centrally at MOWIE. The advisor is responsible for arranging Steering Committee meetings and for the overall coordination of the entire project (Engagement 1 and 2). Please refer Annex 7 for Terms of Reference.

Task 3: Connection and integration of wind

- Review of connection codes from selected countries, and connection codes for current Ethiopian wind projects. Prepare revised connection codes for wind. Review of the 2014 Ethiopian Master plan.
- Least-cost wind deployment plan towards 2030:
    - Focus on least-cost planning for generation and a balanced expansion of transmission capacity. Selection of relevant model e.g. Power Factory and Balmorel, or similar. The use of model-based analyses (e.g. combined dispatch and investments models). With the variable generation from wind power it can be particularly relevant to work with models with detailed time resolution, e.g. hourly time steps.
    - Data collection (e.g. on technology costs for generation and transmission) and set-up of model. Hands on training. Working with all relevant generation technologies, e.g. hydro, solar and wind.

- Capacity building in relation to effective wind power integration. Including training of EEP (e.g. control room operators) in optimal dispatch in a system with a significant share of solar and wind generation.
    - Wind forecast for control room. Day-ahead and intra-day planning. Contracting for met data. Software for control room. Control room procedures. Wind power generation and dispatch planning. Use of online measurements and prediction of imbalances. Case: Procedures used by Danish TSO and DSO's (transmission and distribution system operators).

Task 4: Framework readiness for wind farm investment decisions (IPP)
Review of relevant energy sector regulation, IPP connection modalities and together with MOWIE, EEA, and EEP concretise gaps in regulation and resources.

This includes clear conditions and timing regarding things like power off-taker/counterpart risk, available wind data, planning permission, wind farm outline and restrictions, land-rights, timing and potential costs related to grid access, current and planned infrastructure related to construction and operation, etc.

Task 5: IPP and EPC auctions design and timeline
The auction design must be based on international experience including Danish experience with large-scale complex wind projects adjusted to the Ethiopian context.

- In-depth review of international and Ethiopian auctions that are either concluded or in progress. Recommendations on the way forward.
- Stakeholder and experts conference to present findings.
- Decision process and announcement:
    - Choice of prioritised sites for IPP and EPC. Using WASP and similar software.
    - Choice of (IPP & EPC) auction design and timeline. Action plan for future auctions, including needed changes in documents and legal framework.
    - Prepare (IPP) auction documents including plan for needed decisions, commitments and consequences. Pre-bid materials and supporting materials like overview of needed licences, tax and customs issues. How long should the PPA span? Inflation adjustment, currency. Price formulated (price or bonus), penalties and requirements for bidders to be prequalified. Time lines, notice. Evaluation criteria. Any non-price elements?
    - Criteria (operational and financial) for potential bidders, rights, and liabilities including compensation schemes and penalties related to deadlines and timing of milestones, etc.
    - Conditions related to land-rights and local acceptance/benefits using Danish and international examples of framework and tender design that improves local and regional benefits, "ownership" and acceptance for large scale wind project development including element such as creation of local jobs, various financial compensation schemes, improved local access to electricity and other benefit related to infrastructure, etc.
    - Conditions that reduce the risk of corruption, human rights violations, issues related to gender, environmental issues, etc.

Task 6: Conduct First IPP wind auction

- Confirmation of site and capacity (MOWIE and EPP)
- Site preparation, including land-rights, ESIA, plan for infrastructure improvements (e.g. road and grid), definition of connection point. Coordination between local and central authorities.
- Site-adjustment and update of auction documents.

    - Sharing of wind data.
- Management and processing of auction. Selection and announcement of winning bid(s).
- Facilitating the signing of contract.

Task 7: Capacity building IPP and EPC tenders

- Pre-feasibility on three sites.
- Feasibility study on chosen priority that includes both Danish and international/African experiences and best practices.

Project team

The tasks will be completed by cooperation between Ethiopian and Danish authorities (Government to Government).

Ethiopian institution	Danish institution	Tasks
MoWIE	DEA	(3), 4, 5, 6, 7
EEA	DEA	4, 5, 6, 7
EEP	Energinet.dk	3 (4, 5, 6)

Task	Required Competences
Project coordination and support to Steering Committee.	General planning and good communication skills Experience from international projects as well as at least 10 years' employment in relevant authorities related to wind power and/or power sector development
Task 3: Connection and integration of wind	Connection codes Least-cost planning and modelling Integration of wind power (value of wind) Technology review, future investment costs Wind forecasts Control room procedures
Task 4: Framework readiness for wind farm investment decisions (IPP)	Legal expert Senior planner
Task 5: IPP and EPC auctions design and timeline	Investment planning Legal expertise Economic analyses
Task 6: Conduct first IPP wind auction	Legal expertise Auction procedures
Task 7: Capacity building in relation to EPC and IPP tenders	Wind farm design Tendering

ANNEX 7: TOR – INTERNATIONAL ADVISOR[9]

1) Support MOWIE in the coordination of the overall programme in order to ensure achievement of objectives, progress and coherence, including:
    a. Closely follow the implementation of the four AWPGE Programme action areas,
    b. Facilitate liaison with the implementing entities to ensure linkages and synergies between the four action areas, in particular between the WB implemented wind mapping activities and the DEA implemented IPP activities,
    c. Reporting as required on the overall progress of the AWPGE Programme with inputs from each of the four action areas,
    d. Meet regularly with the high level counterpart, to report on progress and discuss AWPGE Programme related issues,
    e. Co-organise Steering Committee meetings, with RDE, organize programme level conferences and workshops, with support from the international consultant,
    f. Organise information and awareness activities, to ensure visibility of the AWPGE Programme.

2) Support MOWIE and the other implementing entities in mobilising and coordinating inputs from the involved Danish institutions:
    a. Ensure that the technical assistance from Denmark contributes to and fits into the regular work plans of MOWIE,
    b. Keep regular contact to DEA, Energinet.dk and the international consultant/DSO to follow their twinning activities with their Ethiopian counterparts, and their delivery/timing of specific inputs,
    c. Work to ensure coherence between the Danish inputs and to exploit synergies and possibly joint activities between them (e.g. joint workshops, as relevant),
    d. Be a link to the Danish partners, e.g. on issues raised by the GoE and their Ethiopian counterparts.

3) Provide advice to MOWIE and other implementing entities on relevant areas of the AWPGE Programme:
    a. Advise on overall AWPGE Programme related policy and strategic issues, based on Danish and international experience,
    b. If relevant, suggest possible adjustments in policies and strategies, based on the AWPGE Programme experience,
    c. Facilitate access to experience from relevant DEA and Danida supported programmes in other countries,
    d. Provide additional AWPGE Programme related advice, based on own expertise.

4) Support MOWIE and other implementing entities to ensure coordination with and linkages to other related programs:
    a. Follow wind energy and other renewable energy activities in Ethiopia, implemented by Government entities and/or private sector,
    b. Actively communicate and share experience with Development Partners supporting related programmes,
    c. Actively explore synergies with programmes of other Development Partners, such as e.g. WB and AfDB, who has shown interest in the distribution level activities (DE 2.3), and Power Africa, who are working on IPP models for renewable energy,
    d. Support RDE in providing inputs to the regular development partner coordination meetings, and participate in such meetings.

[9] Additional role of the international consultant if the placement of the international advisor does not materialise.

The further design and elaboration of the Terms of Reference for the DEA inputs and the inputs from MOWIE and other implementing entities, the international advisor should clarify the specific inputs from both sides, to avoid overlaps and un-clarity about roles and responsibilities.

The contract with the international consultant responsible for implementing DE 2.3, will include a support function for the international advisor, e.g. for organising conferences, workshops and report writing.

ANNEX 8: TOR – ENGAGEMENT 2: GRID MANAGEMENT

Tasks	Outcome
Support to the international advisor and to the Wind IPP task (2.1) and the System integration task (2.2).	General planning and good communication skills At least 10 years' international experience in distribution system operation including in Denmark.
Task 8: Reduction of losses and improve quality of service at distribution level.	Outcome 2.3: Improve quality of service at distribution level.

The Terms of Reference covers the following programme stream:

- Analysing and advising on operation and planning in distribution grids, with the perspective of improving security of supply and reduce losses. Activity is based on a detailed review of one to two cases of selected distribution grids.

The main objective of this activity is to improve the capacity of the EEU and EEA for grid-planning, loss reduction and improvement in the quality of service.

Task 8: Reduction of losses and improve quality of service at distribution level
Twinning with EEU to perform the following tasks:

- Review of main challenges in distribution level.
- Choice of one to two case areas. Map the quality of service and losses. Estimate the use of backup generation in the areas and the related diesel consumption and CO_2 emission.
- Workshops on grid planning and asset management in general. Teaching use of software
- Work through one to two case areas, produce plan of action.
- Review of EEA regulation of EEU – with focus on quality of service.
- Prepare ways to finance plan of actions, including possibilities from donors.

Task	**Required Competences**
Management, cooperation and reporting	Project manager with +10 years' experience with similar projects
Task 8: Reduction of losses and improve quality of service at distribution level	Power engineer Regulation of monopolies

Project team
The tasks will be completed by a combination of:

- Cooperation between Ethiopian and an international Distribution System Operator.
- Consultants.

Ethiopian institution	**Danish institution**	**Tasks**
EEA	Consultant in close cooperation with an Energy Regulatory Authority.	8
EEU	Consultant in close cooperation with a distribution company and e.g. a Safety Technology Authority.	8

ANNEX 9: CLIMATE CHANGE AND GREEN GROWTH SCREENING

Basic Information	
Programme title:	Accelerating Wind Power Generation in Ethiopia
Country/region:	Ethiopia
Estimated allocation:	DKK 28 million (from the Danish Climate Envelope)
Brief description of the Programme support:	The AWPG Programme will be implemented from November 2016 to December 2019. The programme aims at encouraging expansion of wind power through auctions for Independent Power Producers (IPPs). This is in line with Ethiopia's on-going efforts to transform the electricity sector and the goal of expanding export of electricity.
Dates:	Programme Committee: 17 March 2016 Appraisal August 2016

Climate change screening

Assess the status of policies and strategies to respond to climate change in the country and sector. If the issue is inadequately dealt with (indicated by a tick in the "no" box), please add comments and assess the potential impact on the programme (see also "next steps" section, below).

Issue:	*Yes*	*No*	*Comments and further work to be done:*
1. Are the processes and **impacts of climate change documented** (e.g. in national communications to the UNFCCC)?	☒	☐	More electricity from wind power will reduce other generation, e.g. fossil based generation in neighboring countries as Ethiopia is entering into electric power export agreements with neighboring countries. E.g. an agreement with Kenya to provide 400 MW.
2. Is there a **national climate change policy or strategy**, including estimates of the economic costs of adaptation?	☒	☐	The GoE has developed the Climate Resilient Green Economy (CRGE) strategy that clearly presented the CO_2 emission for 2010 as 150 Mt per annum, which will be 400 Mt per annum by 2030, if Ethiopia follows conventional growth model. Also, the INDC (2015) indicate significant reduction in emissions.
3. Have **nationally appropriate mitigation actions (NAMAs) and or Low Carbon Development Plans** been identified (e.g. targets for renewable energy production)?	☒	☐	Ethiopia has prepared NAMA and identified a number of initiatives. Among these, the following are identified for fast track implementation between 2010 and 2025: Power generation from renewable energy with expected GHG abatement potential of 19.3 Mt per annum.
4. Has a **national adaptation programme of action**	☒	☐	Ethiopia is following the NAPA guidelines and procedures developed the project selection criteria

(NAPA) been approved identifying key sectors where adaptation is required?		and prioritised 37 project options with a total cost of about 874 million USD. 11 projects identified further for the project using Multi-Criteria Assessment (MCA) for fast track intervention.
5. Are there effective and operational **meteorological** and **disaster preparedness organizations**?	☒☐	The Ethiopian Meteorological Agency gathers, analyses, and announces meteorological data in Ethiopia. However, the agency has limited capacity in analysing data. Ethiopia has a Disaster Risk Management framework that has set up an early warning system throughout the country with local level contingency plans updated regularly.

Summarize the overall assessment of climate change impacts and responses:

The expansion of wind power will directly reduce the CO_2 emission in the region. Model studies indicate an average CO_2 emission reduction of 250 kg/MWh. 100 MW wind power is equivalent to 65,000 tons CO_2.

The GoE has developed and launched a Climate Resilient Green Economy (CRGE) strategy with the aim of building a middle-income climate resilient green economy by 2025 through zero net carbon growth. The GoE has also established the CRGE facility to mobilise, blend, combine and sequence domestic and international, public and private finance to support the institutional building and implementation of Ethiopia's CRGE Strategy.

Screening of Country

Assess the status of policies and strategies and the procedures for environmental impact assessment in the country and sector. If an issue is inadequately dealt with (indicated by a tick in the "no" box), please add comments and indicate further work to be undertaken (see also "next steps" section, below).

Issue:	*Yes No*	*Comments and further work to be done:*
1. Do national procedures and legislation for **Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA)** exist?	☒☐	Ethiopia has an Environmental Impact Assessment Proclamation. The objective of this proclamation is to facilitate the implementation of the environmental rights and objectives enshrined in the constitution of the country and the maximization of their socio-economic benefits by predicting and managing the environmental effects which a proposed development activity or public instruments might entail prior to their implementation. Part of task 6 is to develop the environmental and social impact assessment.
2. Are there operational **Green Growth Strategies/actions plans** and/or **National Environmental Action plans?**	☒☐	The Climate Resilient Green Economy (CRGE) strategy sets the framework for development and environmental actions in Ethiopia. The Growth & Transformation Plan (GTP2) (2015-2020) has a

		focus on green growth.
3. Are there regularly updated **state of the environment reports** and **green growth monitoring systems with indicators**?	☒☐	A monitoring and evaluation framework together with measuring, reporting and verifying (MRV) system is currently being developed, to measure, verify and report the achievements of programs and projects against the indicators set by the CRGE strategy.
4. Is there sufficient **institutional and human capacity for green growth** and **environmental management** in the sector concerned?	☐☒	There is limited capacity in some of the government agencies, especially at local level due to high turnover of staff. Thus, continuous institutional and technical capacity building is required.

Summarize the overall impression of the Country Green Growth Framework:

Ethiopia has Green Growth policies and programmes in place. The CRGE is the strategy that provides the overall framework for all development activities in the country with a focus of following a Green Growth model. The national planning commission released a guideline to guide sectors work in integrating the CRGE in each sector with clear indicators to measure developments in the future. Thus, development programmes are developed and implemented with a conscious effort to minimise carbon emission that lead to a carbon neutral economic growth.

Climate change and Green Growth opportunities and risks of programme

Assess how climate change and environmental opportunities and risks will arise through the program:

Will the programme ...	Opportunity:	Risk:	None:
1. ... support **green growth initiatives** including livelihood improvements and resource efficiency	☒	☐	☐
2. ... support the creation of **decent** and **green job**?	☒	☐	☐
3. ... contribute to **effective management and efficient use of natural resources**	☒	☐	☐
4. ... have direct or indirect impact on **climate change** (e.g. through increasing or reducing emissions of greenhouse gases)?	☒	☐	☐
5. ... have direct or indirect impact on **occupational health and safety?**	☐	☐	☒
6. ... lead to changes in land and resource **tenure and access** rights, including the **rights of indigenous peoples**?	☐	☒	☐
7. ... include activities within or adjacent	☐	☐	☒

to **protected or environmentally sensitive areas?**			
8. ... have direct or indirect impact on the **resilience of communities in the face of natural disasters**?	☒	☐	☐

Summarize and explain **climate change and green growth opportunities**:

The programme will have a positive impact on green growth in Ethiopia. Ethiopia has an ambitious economic growth plan in which increased power production is expected to play a vital role in increasing export earnings both from export of clean electric power and manufactured goods. It is also expected to reduce GHG emission as it will enable Ethiopia to produce and export clean power to neighbouring countries which are depending partly on fossil fuel for electric power generation.

Summarize and explain **climate change and green growth risks**:

Although Ethiopia has compensation guidelines, when land is taken from individual or community owners for development purpose, implementation of the guidelines and involving the community in the process has gaps that needs to be addressed.

Identify requirements for undertaking an Environmental Impact Assessment (EIA). Categories are: [A] Full EIA required; [B] Partial EIA required; [C] No EIA required[10].

Intervention Name	*Category A, B or C:*
1: Wind resource assessment	C
2: IPP auctions	B
3:	

Will national regulations and procedures for EIA be applicable to activities of the program that have potential environmental impacts? – Yes ☒ - No ☐

When will the EIA be undertaken? It will be part of the detail planning of activities of the two engagement partners.

Next Steps – process action plan

Need for further work during the preparation, appraisal and implementation of the program arising from the climate change screening:

Suggested activity:	*Action needed*
1. Assessment of green growth and climate change opportunities in sector development plan.	No

[10] Category A=Intervention is likely to have adverse environmental impacts that may be sensitive, irreversible, and significant in scale/scope; B = Intervention is likely to have negative impacts, but which are less significant, not as sensitive, numerous, major or diverse; C = The environmental risk of the intervention are of little or no concern.

2. Assessment of capacity for green growth and climate change management in the sector/country.	No, part of the programme.
3. Prepare ToR for and conduct Country Analytical Work.	No
4. Prepare ToR for and conduct SEA(s) of sector policies or plans.	No
5. Prepare ToR for and conduct EIA(s) for programme interventions.	No
6. Initiate donor harmonisation in the sector on green growth and climate change..	Yes, Denmark will work with other development partners and the GoE to avoid duplication and promote transparency and harmonisation.
7. Other...?	
Signature of Screening Note	
Addis Ababa ……. Mette Thygesen The Embassy of Denmark in Addis Ababa	

ANNEX 10 HRBA SCREENING NOTE

Tool for Human Rights Based Approach (HRBA) and Gender Equality Screening

Purpose: The HRBA and Gender Screening Note complement the HRBA Guidance Note and the up-coming Gender Equality Strategy and the Gender Equality Toolbox. The purpose of the note is to facilitate and strengthen the application of the Human Rights Based Approach and mainstreaming of gender equality programming related to Danish development cooperation. It can be used as an inspirational checklist by all staff.

The information in the note should be based on the analysis undertaken as part of the preparation of the Country policy paper and should draw on major Human Rights and gender equality analysis relevant for the country such as UPR-processes, reports and documents from OHCHR, EU HR Strategy, CEDAW-reporting as well as relevant analysis prepared by other major donors. The Screening Note should be attached to the country programme concept note, and the questions raised below should be reflected in the country programme document. Appraisal of country programmes will include a specific focus on HRBA and Gender Equality.

Basic info	
Title	Accelerating Wind Power Generation in Ethiopia
Country/ region	Ethiopia
Budget in DKK mio.	28 Million DKK
Starting date and duration	November 2016 for three years

Human Rights Based Approach

Assess whether a Human Rights (HR) Based Approach has been applied in the programme:

Human Rights Assessment and Standards			
Issues:	**yes**	**no**	**Explain:**
Have major HR analysis relevant for the country been consulted (UPR, OHCHR, EU HR Strategy, other relevant donor documents)	**X**		Ethiopia has submitted the second cycle national report on working group on the Universal Periodic Review. In preparation of the AWPGE programme, the UPR recommendations to Ethiopia, EU HR strategy, Report of the Working Group on the Universal Periodic Review (A/HRC/27/14) were consulted. Relevant issues for the programme are identified. These include the adoption and implementation of the new national Human Rights Action Plan, improving the social status of women in society and enhancing their political and social rights, constructive engagement with civil society,

			fighting poverty and continuing cooperation with regional and international human rights mechanisms.
Have key international **HR standards** and/or mechanisms influenced choice and formulation of outcome areas?	**X**		The AWPGE Programme is focused on strengthening the capacity of the energy sector public agencies in Ethiopia to realise and increased wind power production through Independent Power Production (IPP). The programme will work to have a tender system in place that is open and transparent to ensure information about any wind project is truly accessible to all concerned parties' (government agencies, the private sector and the general public) as well. The programme will also identify and assess accountability mechanisms and the capacity of the duty bearers; both public and private agencies engaged in wind sector and address the identified gaps in the sector.
Where relevant, is application at national level, including **major gaps between human rights in principle vs. human rights** in practice, evaluated and identified?	**X**		IPP is a new approach in the energy sector, which the GoE has started testing in solar and geothermal power production. Since this is the initial stage, the system in place for engaging private sector in the production of power is so far note always open and transparent. The programme will work to address issues and build the confidence of all stakeholders. In working on establishing a readiness framework, the programme will have constructive dialogue with stakeholders to ensure the practice of international standard environmental safeguards and the involvement of local communities in the projects.
Are **key recommendations from UPR** for the thematic programmes and from any treaty bodies, special procedures, INGOs, HNRIs etc. that require follow up at national level considered?			The key recommendations that are considered in the preparation of the this programme and the issues to be followed up are: • Capacity building of the public sector will be a core element of the programme. Denmark through EU+ and high level dialogue will work in cooperation with regional and international human rights mechanisms to encourage the GoE and other actors to have an open and transparent procedure especially when aggregating land for power plants and erection of transmission lines. • The programme, facilitating the production and reduction of loss of renewable energy will contribute to the

			effort of protecting the environment and improving access and connectivity to electricity.
Are rights-holders identified?	**X**		Rights holders are the community where wind power plants will be established, the private companies, who will be engaged in the tendering process and later in the production of power, and staff members of both the private sector and the GoE energy sector.
Are duty-bearers identified?	**X**		The GoE, the Government of Denmark, international and national companies that will be involved in the implementation of the programme and private companies engaged in the development of the wind power plants.

Assess whether Human Rights Principles have been applied in the preparation and in the design of the programme?			
Non-discrimination: Are any groups among rights-holders excluded from access and influence in the thematic programme areas identified?	**X**		Fear of the unknown: GoE may prefer companies, who have been engaged in Ethiopia in power production and they may get preferential treatment.
Are disaggregated data available on most vulnerable groups?	**X**		Mostly no in the case of local communities but implementing agencies has disaggregated data of their employees and data about the number of female staff members holding different positions can be available.
List any key support elements included to promote non-discrimination	**X**		This programme will not directly work with communities. Nevertheless, in conducting the environmental and social impact assessment, a company will be required to have disaggregated data of the local community in the area where a wind park will be established. Unless and otherwise, a developer is gets preference as a result of the criteria set by the GoE Public Procurement Proclamation, AWPGE will promote nondiscrimination in selecting developers. As part of the IPP Framework, the programme will work to have open and transparent procedures in place to provide equal access to bidders.
Participation and inclusion: Are barriers for participation, inclusion and empowerment of rights holders identified?	**X**		The low level of female staff members holding the relevant positions for the programme in the implementing agencies could be barriers to achieve gender equality. At community level, poor and illiterate households with limited knowledge about their rights may be

			excluded from important discussion.
List any key support elements included to promote participation and inclusion	**X**		The Implementing partners MOWIE, EEP and local administration offices will have a key role in the promotion of the participation and inclusion the community in the decision making process in identifying the specific sites for the erection of the wind masts and turbines and in the implementation of compensation and transfer of title deeds. Ensuring all female staff members holding the relevant positions in the implementing agencies to take part in the on and off the job trainings. The programme will also work to put selection criteria that will get additional points to the developer, when a developer ensure inclusion of local communities in different and creative ways.
Transparency: Is the extent to which information is accessible to rights holders including marginalised groups assessed? Where relevant, whether information is available in other than official languages of the country in question should be indicated.	**X**		The Implementing partners, MOWIE and EEP will avail all the relevant Information to all stakeholders regarding the IPP tenders and the project sites. E.g. wind measurement reports will be made public.
List any key support elements included to promote transparency	**X**		• Release of all relevant information about the IPP auctions via the official websites of the implementing agencies. • Meetings with community members of the identified site for the wind farm. • Officially shared reports and plans.
Are key **accountability** mechanisms in the relevant area – both horizontal and vertical listed?	**X**		• The engagement partners as well as the private companies that will be involved in the construction of the wind farms will be accountable to the communities. • Government of Denmark will be responsible for availing the funding for the implementation of the programme. • The Government of Denmark agencies and consultants will be accountable to provide international standard technical support as per the designed programme. GoE officials at different levels will be accountable for the implementation modalities for aggregating land as per the guidelines and procedures.
Are obstacles, e.g. capacity and political-economy incentives that duty-bearers and	**X**		Conflicting political and economic agenda especially in the area selected for the

rights holders face to exercise their obligations and rights listed?			construction of the wind farm, high staff turnover that can result less number of available staff to work as a counterpart with the employees of the Danish Agencies and the consultants, limited capacity of staff at local level to implement new procedures and guidelines and low institutionalization of systems and procedures.
List any key support elements included to promote accountability	**X**		Regular monitoring and reporting, Steering Committee meetings and regular dialogue with the implementing agencies.

Results/Indicators			
List any indicators designed to monitor the realisation of specific human rights	**X**		a. Improved GoE institutional framework, and market readiness, including the approval of a credible IPP wind auction roadmap b. Reduction of use of fossil fuel power in KWH and # of newly connected households in the case study areas.
List any indicators designed to monitor the integration of the four principles	**X**		a. Improved GoE institutional framework, and market readiness, including the approval of a credible IPP wind auction roadmap b. Reduction of use of fossil fuel power in KWH and # of newly connected households in the case study areas.
List any key indicators chosen to track capacity of key partners (both rights holders and duty bearers)	**X**		a. Wind resource assessments based on measurements from 10 masts generated and made public b. Improved GoE institutional framework, and market readiness, including the approval of a credible IPP wind auction roadmap c. Improved system integration of wind power d. Reduction of use of fossil fuel power in KWH and # of newly connected households in the case study areas.

Dialogue Partners			
Define key dialogue partners (duty bearers) to be addressed by the country programme	**X**		The GoE energy agencies (MOWIE, EEP, EEU, and EEA), The international consultant, and other Danish Agencies.
Define key alliance partners, including other likeminded donors, multilateral partners and CSO's	**X**		Development partners, (World Bank, EU, USAID (Power Africa), DFID, Norway, France, GIZ)
State major dilemmas/risks associated with the policy dialogue and proposed mitigation measures (incl. reference to Framework for Risk Assessment)	**X**		Coordination among actors is expected to be a challenge. The programme will have a detailed plan with clear tasks and roles designated to all participating agencies and have an information sharing system in

			place including a regular documented steering committee meeting.

Gender Screening Tool			
Are key challenges and opportunities for gender equality identified?	**X**		Low female staff members holding relevant positions in the implementing partners. There is a generic understanding of gender issues in the country. The barriers range from low number of female staff in different public agencies to low levels of awareness on the part of implementer. When it comes to opportunities, the government has placed policies, systems and structures from national to local level that led to the promotion and protection of human rights and women empowerment.
Are reference made to CEDAW-reporting, UPR, and other relevant gender assessments?	**X**		Different reports were consulted during the preparation of this assessment and reference was made to CEDAW, UPR and accepted UPR recommendations.
Identify opportunities/constraints for addressing gender equality issues	**X**		Low female staff members holding relevant positions in the implementing partners.
Describe key strategic interventions to promote gender equality within each thematic programme?	**X**		Ensuring the involvement of female staff members in the on and off the job trainings.
Explain how gender specific purposes with be reached, which strategic approach, what activities are planned	**X**		Ensuring the involvement of female staff members in the on and off the job trainings.
Define expected outputs.			N/A
Identify gender equality indicators aligned with national targets on gender if possible.			N/A

ANNEX 11 PROCESS ACTION PLAN (PAP)

Time line	Programme	Documentation
March 17 2016	Approval by the Programme committee	Programme committee meeting Minutes
June 2016	Formulation	Programme document
Mid - June to Mid-July 2016	ToR for appraisal developed	ToR
	Request for Expression of Interest based on ToR shared with consultants	Request for Expression of Interest and ToR
	Selection of consultants for appraisal	Contract
Mid July 2016	Appraisal started	Programme Document, annexes and Development engagement Documents
August 2016	Appraisal process finalised	Appraisal Report, recommendations summary
End of September 2016	Programme Document with appropriation cover sheet forwarded to KFU for publication on Danida Transparency	Programme Document, annexes and Development engagement Documents
October 2016	Presentation to the Under-secretary	
November 2016	Signing of legally binding agreements (commitments) with partner(s)	Government-to- Government agreement(s) and/or other legally binding agreements
November 2016	Register commitment in MFA's financial systems within budgeted quarter.	
November 2016	Implementation Engagement one started Detail Planning for Engagement two	
December 2016 to March 2017	Inception period for Engagement Two	
April 2017	Implementation of the main phase started	