

Annex B

Terms of Reference for provision of Technical Assistance services to the Danish Energy Agency Energy Country Programs and Projects

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ARTIKEL II. ABBREVIATIONS AND ACRONYMS

DE	Development Engagement
DEA	Danish Energy Agency
DEPP	DEA Energy Partnership Program
DKK	Danish kroner
EDK	Embassy of Denmark
EE	Energy efficiency
ENERGINET	The Danish TSO ENERGINET
HRBA	Human rights-based approach (to development)
PM	Particulate matter
LTA	Long-term advisor
MEUC	Danish Ministry of Energy Utilities and Climate
MoFA	Ministry of Foreign Affairs of Denmark
MPN	Mission preparation note
RE	Renewable energy
TA	Technical assistance
TOR	Terms of reference
TSO	Transmission service operator
NREAP	National Renewable Energy Action Plan
NEEAP	National Energy Efficiency Action Plan

1. BACKGROUND AND CONTEXT

The Danish Energy Agency Country Programs and Projects will provide technical assistance combined with policy dialogue, in promotion of Renewable Energy (RE) and Energy Efficiency (EE) – aiming for low carbon development and reduced CO₂ emissions. The Programs and Projects will build capacity with the current partner countries which include Ukraine, Turkey, Indonesia, Ethiopia, India, China, Vietnam, USA, UK and Germany and future partner countries and projects to i) provide convincing input for governmental energy, climate/low carbon policies, strategies and plans and ii) deal with implementation aspects of EE and of high shares of variable RE in the national power and heating/cooling systems in a cost-efficient manner.

The programs and projects in the current partner countries are ongoing but are at different phases of implementation and are expected to run for the next 3-4 years. The experiences from ongoing activities in the programs and projects, as well as the technical assistance provided by the Danish Energy Agency (DEA) will provide input for the future activities. The aim is to unite the earlier interventions with future activities utilising the Danish experience with energy transition, while continuing the Government-to-Government element with the partner institutions in the current partner countries as well as with future potential partner countries. There are a number of development engagements (DEs) and focus areas in each current program and project country that supports the development objectives at country level and long-term goals at program and project level.

1.1. Ukraine

The objective of the development cooperation among the parties in Ukraine is to strengthen the enabling environment for sustainable energy investments. The cooperation will also contribute to the Ukraine's green transition and thus to the Paris Agreement on Climate Change.

The following key current objective, outcome and outputs have been selected for the 3 (three) year program period (2018-2020):

Engagement title	Ukraine-Denmark Energy Centre (UDEEC) II: Strengthening the enabling environment for sustainable energy investment.
Engagement objective	The enabling environment for investment in sustainable energy strengthened, assisting Ukraine in achieving its renewable energy, energy efficiency and energy independence targets.
Outcome	Ukraine supported in increasing the share of renewable energy in total energy consumption by 2020 and reducing the climate and environmental impact of the fossil fuel based energy sector.
Output 1	Monitoring system for New Energy Strategy of Ukraine till 2035 developed and implemented.
Output 1 indicator	➤ Status of the monitoring system.
Output 2	System for short and long-term forecast modelling and software developed in accordance with international best practice.
Output 2 indicator	➤ Status of introduction and implementation of the short- and long-term forecast modelling system.
Output 3	Tools for integration of Renewable Energy, a system for short-term forecast of production from wind and solar PV and support to development of wind measuring infrastructure, as well as general support

	to Ukraine's efforts to converge its electricity market regulation to that of the EU.
Output 3 indicator	➤ Tools and methodologies developed to support integration of renewables in the Ukrainian electricity system including the need for flexible thermal generation and hydro storage capacity to facilitate integration of RE.
Output 4	“One stop shop” project development platform supported under the umbrella of SAEE with Ukrainian-Danish expertise.
Output 4 indicators	Support provided to SAEE on: <ul style="list-style-type: none"> ➤ Identification of energy efficiency and renewable energy projects (information on potentials for new projects and successfully implemented projects, information and promotion of state support programs) targeted toward potential project developers and investors through seminars and workshops. ➤ Development of technical feasibility studies for a few selected municipal and large-scale commercial energy efficiency, renewable energy, and waste-to-energy projects. ➤ Development of new financial models as input for cooperation with IFU in order to increase the share of renewables in final gross energy consumption; selected technical feasibility studies and business cases facilitated by UDEC for further consideration by stakeholders interested in projects funding. ➤ Raising awareness of municipalities on state policy, strategic energy planning, energy efficiency and potential usage of renewable energy in regions of Ukraine, through seminars and workshops. ➤ Further development of the already established web-platform UAMAP.
Output 5	Support for implementation of current National Renewable Energy Action Plan (NREAP) till 2020 and development of new NREAP till 2035 with its implementation stages.
Output 5 indicators	<ul style="list-style-type: none"> ➤ Progress in the establishment of the regulatory framework, feasibility studies and incentive structures for the development of renewable energy market. ➤ Development of new incentives for stimulation of combined heat and electricity production from renewable energy sources and waste. ➤ Strategic energy planning on local level, development of pilot projects. Recommendations on district heating planning and project proposals related to networks rehabilitation/expansions.
Output 6	Support for implementation of current National Energy Efficiency Action Plan till 2020 (NEEAP) and support for development of New NEEAP till 2035.
Output 6 indicator	<ul style="list-style-type: none"> ➤ Development of the new National Energy Efficiency Action Plan supported, considering the requirement of Energy Community and recommendations made on development of monitoring and reporting system on implementation of National Energy Efficiency Action Plan. ➤ Incentives schemes developed to stimulate energy intensive industry for improved energy efficiency and renewable energy usage, support for energy audits, and pilot projects implementation.

1.2. Turkey

The Turkish Ministry of Energy and Natural Resources and the Danish Ministry of Energy, Utilities and Climate have identified the following area where Danish experiences and lesson learned can support the Turkish governments low carbon transition objectives:

- **Efficient and low-carbon supply of heating and cooling**

The objective of the Danish-Turkish Strategic Sector Cooperation program (SSC program) will be as follows:

To assist the Turkish government in developing relevant policies, strategies and solutions to enable a low carbon transition of their energy sector, achieve the governments' long term objectives for energy efficiency and district energy and increase the capacity of implementation of the planned new legislation on heat supply.

Purpose, results, outputs and indicators:

Purpose

The overall purpose of the SSC between Denmark and Turkey is to increase efficiency of supply as well as the use of local low-carbon sources for heating and cooling. The SSC will thereby assist Turkey in its endeavour to fulfil the UN Sustainable Development Goals, in particular no. 7 (affordable and clean energy), 9.1 (reliable and sustainable infrastructure) and 11.6 (improved urban air quality).

Result

The SSC has provided a strong analytical basis as well as an assessment of potential and needs and also strong capacity to draft and later on implement strengthened legislation for heat supply.

Result indicators

- A national mapping of viable potential for low-carbon supply of heating and cooling has been developed.
- Danish/EU tools for cost-benefit analyses of heating and cooling supply systems have been introduced, and a selected tool has been transferred to Turkey.
- GDRE has been capacitated to draft effective regulation on supply of heating and cooling.
- Number of Turkish experts having been capacitated to train local planners to undertake municipal planning for supply of heating and cooling.
- The capacity of the private sector, local authorities as well as university and research institutions to implement cost-effective low-carbon solutions to heat and cooling supply has been increased.
- At least one concrete pre-feasibility study of low-carbon supply of heating and/or cooling to a specific urban area has been undertaken and a business plan has been drafted.

Means of verification:

- Yearly progress reports presented for the Steering Committee.

- Minutes from Steering Committee and working groups.

Outputs and output indicators

Output 1	Energy mapping and forecasting of heating and cooling demand undertaken
Output 1 indicators	<ul style="list-style-type: none"> • A mapping and forecasting of the demand for heating and cooling in the residential, industrial and commercial sectors has been undertaken for the purpose of informing the drafting of a heat supply regulation. • YEGM has been capacitated to update the mapping and forecasting in the future
Output 2	A gap analysis of current regulation has been performed
Output 2 indicators	<ul style="list-style-type: none"> • Assessment of gaps of related primary and secondary legislation has been reported • Assessment of capacity gaps in institutions and agencies potentially responsible for drafting and implementing heat legislation
Output 3	A cost-benefit analysis tool has been developed together with a technology database
Output 3 indicators	<ul style="list-style-type: none"> • An MS Excel based cost-benefit analysis tool has been prepared on the basis of similar European tools, adjusted to Turkish conditions • A technology database (technology catalogue) has been developed including key technical and economic features applied for cost-benefit analysis • Cost-benefit analyses have been performed for different relevant supply alternatives for at least 5 (five) generic cases
Output 4	Danish and international experience of heating and cooling supply has been shared to relevant Turkish stakeholders
Output 4 indicators	<ul style="list-style-type: none"> • Study tours to Denmark to learn about relevant Danish regulation as well as practical implementation • A workshops held in Turkey on Danish and EU regulation of heating and cooling supply
Output 5	Draft heat supply law has been provided
Output 5 indicators	<ul style="list-style-type: none"> • Draft primary law drafted • Number of secondary law texts outlined • Workshop held with key stakeholders to provide feed-back on draft regulation
Output 6	Capacity increased to regulate the heating and cooling sector and to implement low-carbon solutions
Output 6 indicators	<ul style="list-style-type: none"> • Number of people trained • Number of workshops and site visits • Capacity building rated satisfactory by partner institutions

Output 7	Pre-feasibility study of concrete heating and/or cooling supply projects performed
Output 7 indicators	<ul style="list-style-type: none"> • A pre-feasibility study completed to identify high-potential projects • Capacity is developed in preparing feasibility studies and business plans

1.3. Indonesia

The objective of the Strategic Sector Cooperation (SSC) between Indonesia and Denmark is to assist Indonesian government agencies and other relevant stakeholders in developing relevant strategies, policies and solutions to improve the electrification rate and to achieve the government's long-term RE and EE objectives. The program is a three-year program from 2016-2018 and is expected to be prolonged with a three-year period until 2021.

Output 1	Awareness and knowledge raised with Indonesian authorities on modelling and long-term energy planning
Output 1 indicators	<ul style="list-style-type: none"> • Workshop and seminar evaluations indicates that data teams from MEMR, NEC and PLN have increased knowledge on analytical approach to model design • A 2050 scenario analysis developed by NEC and MEMR based on knowledge from Chinese and Danish lessons learned • Indonesian incentive schemes on RE and EE reviewed • Relevant energy data consolidated, improved and used by Indonesian modelling teams in the long-term energy planning • Generic guideline on regional strategic energy planning developed
Output 2	Awareness and knowledge raised with Indonesian authorities on renewable energy integration
Output 2 indicators	<ul style="list-style-type: none"> • Knowledge raised within PLN planning team on regulation, operation of electricity network, and implementation of wind power plants through 1 workshop and 1 study tour to Denmark • Capacity improved within PLN and guidelines developed on assessment of wind power projects • Technical input (5-10 specialist trainings and workshops) to increase knowledge within PLN on power system reliability through a combined series of integrated activities
Output 3	Awareness and knowledge raised with Indonesian authorities on energy efficiency
Output 3 indicators	<ul style="list-style-type: none"> • Peer review of MEMR current energy efficiency regulation in industry • Knowledge increased with MEMR on regulatory framework within energy efficiency in the industry sector • Draft Energy Efficiency Obligation Scheme (EEO) developed with MEMR

1.4. Ethiopia

The objective of this program is to strengthen the institutional capacity of the Government of Ethiopia (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.

Engagement title	Accelerating Wind Power Generation in Ethiopia (AWPGE program): Supporting an enabling environment for development and integration of wind power in the power mix of Ethiopia.
Engagement objective	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 in place
Output 1	IPP framework developed and validated.
Output 2	IPP tender documents for the first auction finalised and roadmap for two coming auctions developed accordingly.
Output 3	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
Output 1	Effective planning and operational procedures developed and approved.
Output 2	Document with an updated list of least-cost investments in transmission capacity developed and approved.
Output 3	At least 424 MW wind power integrated into the energy-mix.

1.5. India

In May 2017, an application for an SSC program in India was launched by the Danish Energy Agency. As of end September 2017, the application for a preparation project has not received final approval from the Ministry of Foreign Affairs of Denmark. The scope of the preparation project has, however, been approved.

Possible focus areas of the Energy Cooperation are

1. Long-term, holistic energy planning with 2030/2050 goals, related modelling and analysis of scenarios, integration of environmental and financial costs etc.
2. Transition from a fossil fuel based energy system towards renewable energy (RE), especially wind and biomass.
3. Integration of fluctuating renewable energy into the grid, establishment of the required electricity grid flexibility.
4. Energy efficiency (EE) in industries with a focus on energy management and use of excess heat.

The preparation project is planned to have approx. 7 (seven) months duration from inception and is expected to produce an SSC Project Document governing the subsequent full SSC project. The timeline is currently unknown, but expected to fall within the 2017-2020 timeframe.

1.6. Energy Governance Partnership (Germany, UK and USA)

The overall objective of the Energy Governance Partnership - Export of the Danish Energy Model 2017-2019 is to share Danish experiences of renewable energy, energy efficiency and district heating systems with authorities, namely central, national, regional/state governments and/or municipalities in Germany, UK and the US. Thereby enhancing the markets for energy technologies and know how leading to increased export opportunities for Danish companies to the three countries. This is in alignment with the new Energy Export Strategy, which aims at increasing export of Danish energy solutions and know-how and thus contributing to economic growth and employment in Denmark.

In each country the aim is to increase the market for innovative Danish technical solutions by inspiring selected authorities with the Danish Energy Model, including lessons learned, experiences with political framework conditions and regulations. This will be achieved through a program of authority-to-authority cooperation and facilitating enhanced exposure to Danish energy technology and knowhow, strengthened people networks and general cooperation with authorities, business associations and relevant private companies in the three countries.

Outcome	Danish experiences with shaping political framework conditions, regulations and systems promoting cost-effective low emission renewable energy, energy efficiency as well as district energy systems solutions have been shared with central and local government partners or/and other relevant stakeholders in Germany, UK and the US. Thereby enhancing the markets for energy technologies and know how as well by exposing relevant stakeholders in the three countries to Danish technical solutions.
Outputs for Germany	<ul style="list-style-type: none"> • Strengthened market position for Danish companies in the German market and increased awareness of Danish solutions. • Regulatory assistance on comprehensive heat planning and regulation has been provided and relevant stakeholders have been inspired by Danish solutions. • Danish regulatory experience and technical solutions have inspired the German energy efficiency policies and measures in industry and existing building stock. • New relations with German authorities as well as other stakeholders, associations or companies. • Improved access to German market information for Danish companies.
Outputs for UK	<ul style="list-style-type: none"> • Positively influenced the development of district heating regulation in Scotland and encouraged the adoption of district heating regulation in England and Wales. • Directly intervened to increase the market for Danish district heating technology. • Support the technical and commercial capacity of selected municipalities to develop district heating, and collection of UK district heating market intelligence for the benefit of Danish companies.

Outputs for USA	<ol style="list-style-type: none"> 1. US partners have increased awareness of relevant Danish regulation and/or solutions in the fields of district heating, energy planning, energy efficiency and wind. 2. Increased awareness among Danish companies of the US market and business potential for offshore wind and district heating in cooperation with business associations. 3. Investor risks reduced through optimization of framework conditions and technical standards for OSW.
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1.7. China Thermal Power Transition project

The Chinese and Danish governments have initiated a co-operation on Thermal power plant flexibility through China National Energy Administration (NEA) and Danish Ministry of Energy, Utilities and Climate as implementing partners. The partners have identified the following areas of co-operation:

1. Sharing mutual knowledge regarding development of flexibility and the transition of the thermal power plant sector towards a low carbon energy system.
2. Developing policy proposals regarding the regulatory and economic framework promoting thermal power flexibility on a large scale.
3. Developing incentive mechanisms for flexibility in the thermal power sector.
4. Improve thermal power plant production and fuel flexibility coupled with supporting power market reforms focusing on the transition of the thermal power plant sector to a low carbon future.

Background

China is on the horizon of a new round of power market reform. Establishing a competitive wholesale market out of the existing highly-regulated market is a very important task. The outline of the power market reforms has specified that China should have a sound pricing mechanism in which the market power plays a decisive role, rational and transparent pricing regulation as well as the long-time regulation on the power prices should be relaxed and reduced to a minimum by 2020.

Outcome and indicators:

Outcome	<p>China supported in their extensive power market reforms and contribute to the targets in the 13th five-year plan as outlined below.</p> <ul style="list-style-type: none"> • Develop market reforms supporting the flexibility enhancement of 220 GW thermal capacities. • Solve the wind and PV curtailment challenges and enable the power market to integrate increased wind and solar capacity to a <i>minimum</i> of respectively 210 GW and 110 GW by 2020. • Fully explore and increase the power system’s peak load regulation potential. • Gradually reform the whole-sale power market through market-oriented reforms that give full play to the role of the market in the power dispatch - and development of a spot power market by 2020.
Output 1	Supporting the design and creation of the necessary dispatch framework and economic incentives to enable increased generation side flexibility.

Output 1 indicators	<p>Make overview and key learnings from short term and balancing markets in countries with competitive market and high VRE levels and provide learnings on the development, interlink and coexistence between Spot market, balancing market and long-term contracts.</p> <p>Support the Chinese transition from a regulated dispatch to a more dynamic, real-time market-based dispatch through delivering input and policy proposals to NEA on dispatch mechanism and regulation supporting the use of enhanced thermal flexibility and a dispatch setup with better ability to integrate VRE.</p>
Output 2	Support power market reforms by describing possible transitional paths for the power sector towards increasing shares of renewable energy.
Output 2 indicator	Provide insight into and report on possible development direction and path of a future market-based whole sale Spot market in China supporting cost-efficient dispatch including better utilization of VRE production in the mid and long term.
Output 3	Contributing to the creation of incentives and robust monitoring system for increased biomass use (substituting coal).
Output 3 indicators	<p>Investigate existing Chinese biomass co-firing situation, the supporting policies from local governments and investigate the status of biomass co-firing in Europe including the existing subsidy mechanism and how biomass co-firing participates in carbon market.</p> <p>Assist in the formulation of appropriate policies targeting the development of more biomass based power production instead of coal based production (focusing on biomass co-firing).</p>

The current budget for China Thermal Power Transition project is only for the period July 2017 to July 2018.

Overall target:

- New or revised policies aimed at improving the dispatch regulation, rules and VRE prioritization in the dispatch before end 2018.
- By end of 2018 the number of provinces in the three northern regions with red flag hindering continued VRE development should be reduced from 8 (eight) to 5 (five).
- Average curtailment rate for 2018 should be lower than 10% (compared to 17% in 2016)
- VRE curtailment reduced from around 15-20% (17% in 2016) to around 5% by 2020.
- At the end of 2020, 220 GW thermal power plant capacity will have achieved enhanced flexibility.
- New or revised policies aimed at improving the substitution of coal with biomass before end 2018.

1.8. Vietnam

In October 2017, an application for a program funded by the Children's Investment Fund Foundation in Vietnam is expected to be submitted by the Danish Energy Agency. Possible focus areas of the Energy Cooperation will be focused on energy system modelling and could be:

- RE potentials refinement
- More work on disaggregation of transmission system – and international connections
- Fuel price forecasts
- Demand forecast
- Demand response potentials
- Technology costs
- Analysis of policy measure impacts – and a holistic ‘checklist’/guidelines of what Vietnam would need to do to successfully integrate X % share of RE (with a very practical / tangible focus)

2. SUPPORT FOR ENERGY AND GREENHOUSE GAS ANALYSES

For some of the outputs and activities suggested above there will be a need for energy and GHG emissions data and modelling tools (e.g. STREAM, TIMES, Balmorel, DHAT) enabling the DEA to conduct analyses relating to energy and climate change mitigation, e.g. modelling of energy scenarios, identification of GHG emission reduction potentials by country and sector, assessment of cost-efficient policies at national levels, and analyzing different scenarios of global climate agreements.

Hence, this tender includes a request of a description of the energy models that will be used to provide data and analyses:

- a. The type of model
- b. Main inputs and assumptions
- c. Examples of output/results of the model
- d. Data sources
- e. Time horizon for projections
- f. Countries/regions included
- g. Sectors included
- h. Greenhouse gases included
- i. Mitigation options/technologies included: specify scope and level of detail for EE and RE measures sector by sector
- j. Examples on how the output/results can be presented and illustrated

The specific tasks/activities that will be requested are not yet specified. They involve providing data and/or modelling tools enabling the DEA to conduct analyses within the area of energy and climate change mitigation in emerging economies. The analyses will focus on individual emerging economies and developing countries, however valuable, if it can be put into a global context (e.g. by assessing the sensitivity of the results to different energy price scenarios).

Potential future analyses by the DEA are (without being an exhaustive list):

- *Mitigation potentials*: Analyses of GHG emission reduction potentials by sector, i.e. using or deriving Marginal Abatement Cost Curves (MACCs). The identification of cost-efficient GHG mitigation potentials is valuable for identifying “low hanging fruits” and for setting sector specific mitigation targets in emerging economies and developing countries.
- *Costs*: Detailed analyses of the costs of GHG emission reductions (total costs, marginal abatement cost, investment needs etc.) by sector for different political scenarios, e.g. current pledges for future GHG emission reductions or increased GHG mitigation ambitions.
- *Technologies/options*: Identification of cost effective mitigation technologies/options. Important to have a rather detailed description of various energy efficiency (EE) and renewable energy (RE) options across various sectors.
- *Baseline comparison exercises*: Comparing and assessing baselines for national projected GHG emissions of emerging economies and developed countries in order to provide transparency about the method and assumptions undertaken.
- *Energy analyses*: Modelling of energy scenarios (e.g. alternative projections for energy prices, supply, demand, and technological development; alternative policies and targets for EE, RE and nuclear; or various forms of behavioral regulation like subsidies and taxes).
- *Robustness*: Valuable to have an underlying model that allows for running several scenarios or in other ways being able to provide useful information on the robustness of the results and recommendations.
- *Benefits*: Useful to describe and include benefits associated to climate and energy policy (e.g. green growth, reduced air pollution etc.).
- *GHG mitigation instruments*: Analyses on concrete GHG mitigation instruments, including the mitigation effect, total abatement costs and marginal abatement costs (examples of instruments are taxes on GHG emissions, subsidies to renewable energy, implementation of energy efficiency standards, and the phasing out of fossil fuel subsidies)

A number of requirements for the data/analyses/modelling tools are listed in the following:

- Time horizon for projections: The energy model used to produce projections and conduct analyses should stretch to 2050.
- Disaggregated data:
 - a) Sectors: As a minimum, the following sectors should be covered by the model: Industry (and subsectors), power generation, power transformation, residential, service, and transport (divided into road, marine, and aviation). Further, agriculture, waste and international bunker fuels must be addressed.
 - b) Greenhouse gasses: The projections for GHG emission, abatement potentials, etc. should cover, as a minimum, Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), and valuable if also Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulphur hexafluoride (SF₆) are covered somehow.
 - c) Technologies/options: It is important that the model provides a rather detailed description of various energy efficiency and renewable energy options across various sectors

3. IMPLEMENTATION ARRANGEMENTS

Technical assistance for the country programs and projects will be provided in 6 different ways:

1. Long-term advisors present in some of the countries. In these cases, the Supplier is to work closely with the advisors.
2. DEA experts – experts provided by DEA to support the program and development engagements.
3. Consultancy framework agreement – international and national consultants provided through a framework agreement for consultancy support to the country programs and projects (i.e. the agreement covered by this tender).
4. Some funds are set aside for specific partnerships between transmission service operators (TSOs, through ENERGINET i.e. not covered by this tender).

The present TOR only refers to the technical assistance provided through the framework agreement for consultancy support to the country programs and projects (point 4 above). The provider is hereinafter referred to as the ‘Supplier’.

4. DECISION MAKING PROCESS FOR TECHNICAL ASSISTANCE UNDER THE CONSULTANCY FRAMEWORK AGREEMENT

- The country program and/or country projects Working Group(s)¹ will develop annual work plans for the Development Engagement(s) outlining planned assignments, define technical assistance needs and present a technical assistance procurement plan.
- The country program Steering Group(s) will approve the annual work plans and technical assistance procurement plan
- Short-term experts (including from the Supplier) will be requested based on demand for technical assistance within the context of the annual work program for each Development Engagement.
- The Working Group(s) will develop, finalise and approve detailed TOR for each assignment. The TOR will describe in detail the expertise required incl. contribution from local consultants, the nature of the project, the expected timelines for deployment, duration of the project, location, expected outputs and deliverables, reporting, logistical support if necessary and a budget.
- An assignment may require wider input than input from the Supplier for instance in-kind input from the Development Engagement partner institution, DEA, the Long-Term Advisor etc. as will be detailed in the assignment TOR.
- Where, the TOR for a wider assignment require inputs from the Supplier, the TOR including budget are sent to the Supplier who must then respond to the Working Group by presenting candidates for the Supplier assignment, either the curricula vitae (CV) for expert(s) from the pool of key technical consultants or a minimum of 3 (three) curricula vitae (CV’s) for each consultant position identified and proposed rates. The Working Group will then decide for each position whether to go ahead with one of the candidates presented or request others under the consultancy framework agreement.

¹ Working Group will be defined and specified in the specifies Terms of Reference for the individual assignments.

- If the candidate for the Supplier assignment is a key technical consultant from the pool, no alternative CV is required unless expressly requested by the Working Group.
- The procedures used for identifying consultant candidates for assignments must be transparent and based on pre-defined criteria that include professional qualifications and experience.
- Once approval is given by the Working Group(s) for the CV's of the positions, the consultant assignment can be launched and the Supplier can start to make the necessary inputs.
- Upon identification of the candidates or project team the Supplier must deploy the experts no later than the 11th Working day after a letter or e-mail of approval from the Working Group is received by the Supplier, or on the dates otherwise specified in the relevant TOR.
- TOR can also be developed for administrative, financial, linguistic and logistical support, where necessary as well as for workshops, study tours, exchange visits and internships.
- DEA will act as the Working Group(s) contact point to the supplier unless otherwise decided.

5. OBJECTIVE OF THE CONSULTANCY FRAMEWORK AGREEMENT

The objective of the consultancy framework agreement is that:

Specialist technical expertise is provided on demand to ensure that the implementing agencies can access the most appropriate knowledge and skills and benefit from the expertise and experience of international and local know-how and resource base in the country programs and projects.

The specialist technical expertise is provided in such a manner that capacity of partner institutions in the program countries is enhanced including through peer-to-peer learning modalities as relevant.

6. SCOPE OF WORK AND ACTIVITIES

The Supplier can expect a series of assignments each governed by a specific TOR specifying activities and deliverables.

A consultant assignment requiring field work in a partner country or project must, as a minimum, have the following elements:

- **Mission Preparation Note (MPN).** The international consultant or team leader (if the Supplier's team has more than one consultant) will prepare a short mission preparation note to reflect on the TOR and present any preparatory work. The MPN will serve as a process document to inform all stakeholders about the purpose and expected results of the mission, proposed meeting schedules, etc.
- **Debriefing Note-** Before the international consultant/team leaves the country, a debriefing note should be prepared and presented to the Working Group or a representative of this group. The debriefing must also include information on steps still to be taken in order to comply with the TOR.
- **Assignment reporting - fulfilment of TOR** - The consultant (or team leader if more than one consultant is involved) chosen for the assignment will be responsible for fulfilment of the TOR. Supervision will be provided by the Working Group which will also have the authority to approve or not approve that the TOR have been complied with. Upon completion of each

assignment the consultant/ team leader must prepare a report on how the assignment has met the TOR requirements.

In each case, the TOR will specify the nature of the report to be provided (it could be very brief depending on the nature of the assignment). The TOR may require a draft report to be submitted for comments from the Working Group before completion. If so, the consultant/team leader must take account of the comments in the final report. Reports must be short, operational, results oriented and to the point. Where relevant and stipulated in the TOR, evidence should be provided of the capacity developed, including know-how and skills transferred.

- **Additional deliverables** – As per the specific TOR, the Supplier may be responsible for deliverables additional to the above mentioned including deliverables in writing. This may include technical reports (analysis, studies, capacity needs assessments etc.), workshop and study tour reports, training material etc. The TOR may require such reports to be submitted in draft and that comments to this from the Working Group must be taken into account.

Where TOR demand inputs not only from consultants under the consultancy framework agreement, but also from national partner institutions, and/or from DEA etc., the responsibility for ensuring delivery of the assignment as a whole will be with the team leader designated in the TOR and with each input provider in so far as its own input is concerned.

Inputs from DEA will be included in final delivery as reflected in the specific TOR, but the consultant/ team leader is not responsible for DEA inputs.

Areas of expertise: Section 10.2 provides a preliminary outline of the expected areas of specialist input skills required across the different outputs of the Development Engagements under the current country programs.

7. SPECIFICATION OF THE INPUT BY THE SUPPLIER

7.1. PROJECT COORDINATOR AND CONTACT PERSON FOR THE FRAMEWORK AGREEMENT

General Qualifications:

- Higher academic degree in engineering, environment, economics or a related field

Adequacy for the Assignment:

- A profile with significant technical assistance, capacity development and project management experience, including management of short term specialist inputs on a demand basis
- Experience in monitoring projects, results based management and reporting
- Professional experience with one or more of the areas outlined in Section 10.2
- Familiarity with Danish and international experience in the areas in section 10.2, in particular the most important aspects of Denmark's experience with the green energy transition away from a fossil fuel economy to be based on renewable energy and an energy efficient society.

Language and experience in the region:

- Broad international experience, including experience from medium income countries is an advantage
- Proficiency in spoken and written English

7.2. POOL OF SPECIALIST INPUTS

The tenderer must present a pool of eight key technical consultants drawn from internal resources.

The pool of consultants should reflect the areas of expertise across the program as outlined in section 10.2.

The tenderer is free to associate with sub-contractors incl. local consultants, public institutions and others - however no exclusive sub-contracting arrangements will be allowed. In addition to presenting the 8 key technical consultant CV's, the tenderer must present a CV for the proposed Project Coordinator as well as describe its resource base and network and how it will ensure access to a range of specialist resources incl. local consultants in the DEA program countries and projects (see Appendix 3a, 3b and 3c to the Framework Agreement).

The total extent of short term inputs is not fixed as it will depend on demand. Section 10.2 shows an outline of the expected areas of specialist inputs required.

Section 10 also gives a budget allocation estimate as a guidance to the likely volume of inputs required. It should be noted, that this is an estimate and the winning Tenderer is not guaranteed this volume. The actual amounts will depend on demand and there is no minimum guaranteed amount under this contract.

General Qualifications for specialist staff:

- Higher academic degree in engineering, environment, economics or related field

Adequacy for the Assignment:

- A profile with experience of providing technical assistance, capacity development and management of the delivery of short term inputs responding to partner demands
- Professional experience with the areas outlined in Section 10.2
- Familiarity with international and Danish experience in these areas, in particular the most important aspects of Denmark's experience with energy transition away from a fossil fuel economy

Language and experience in the region:

- Broad international experience, including experience from medium income countries
- Proficiency in spoken and written English

8. FINANCIAL PROPOSAL

The tenderer's financial proposal should present:

- A daily fee rate for international consultants (key personnel as well as consultants from resource base) in each of these 2 (two) categories:
 - I (at least 10 years of experience – senior consultants) and

- II (at least 5 years of experience – junior consultants).
- See also Appendix 2a and 2b to the Framework Agreement.

It should be noted, that reimbursement of Suppliers expenses related to execution of assignments as per specific TORs shall only take place against documentation from a third party. Only expenses defined in section 10 of the Framework Agreement shall be reimbursed.

8.1. OTHER COSTS

- The annual audit costs.

9. BACKGROUND DOCUMENTS

a. Necessary background information that the tenderer must be familiar with (these documents will be provided to all tenderers):

1. Development Engagement Document (DED) Ukraine-Denmark Energy Centre (UDEC) II (2018-2020): Strengthening the enabling environment for sustainable energy investment, 2nd Revised draft 18 September 2017
2. Strategic Sector Cooperation Denmark/Turkey, signed 29 March 2017
3. Energy Governance Partnership – Export of the Danish Energy Model. Result framework.
4. Implementing Partnership Arrangement between the Ministry of Water, Irrigation and Electricity of the Federal Democratic Republic of Ethiopia and the Danish Energy Agency signed 3 February 2017.

b. Optional additional background reading:

1. The Danish Energy Model: https://ens.dk/sites/ens.dk/files/contents/material/file/the_danish_energy_model.pdf
2. DEA Ukraine country cooperation: <https://ens.dk/en/our-responsibilities/global-cooperation/country-cooperation/ukraine>
3. DEA Ethiopian country cooperation: <https://ens.dk/en/our-responsibilities/global-cooperation/country-cooperation/ethiopia>
4. Energy Governance Partnership (Germany, UK and USA) https://ens.dk/sites/ens.dk/files/Globalcooperation/samarb_eksport_energiteknolgi.pdf
5. The Indonesia/Danish SSC program: <https://ens.dk/en/our-responsibilities/global-cooperation/country-cooperation/indonesia>
6. The China Thermal Power Transition program (May 2016): https://ens.dk/sites/ens.dk/files/Globalcooperation/china_thermal_power_transition_publication_new.pdf

10. EXPECTED CONSULTANT SKILLS AREAS

10.1. ESTIMATE OF EXPECTED BUDGET AVAILABLE FOR CONSULTANCY SERVICES:

Estimate of consultancy inputs	Outline budget - DKK million
	International and national consultants
Ukraine	5,0
Indonesia ²	1,5
Turkey ³	0,7
Ethiopia ⁴	1,2
India ⁵	0,6
Energy Governance partnership (Germany, UK and USA)	1,3
China Thermal Power Transition project ⁶	1,0
Vietnam	4,7
Total	16,0
Note: Actual amounts will depend on demand and with considerations to below country specific footnotes.	

10.2. CONSULTANT SKILLS REQUESTS

All the listed skills are required by the Supplier as the Framework Agreement covers all the Countries. Thus, the list of countries added in the right column is only an indication of which countries are currently requesting the specific skills.

Areas of expertise	Country of relevance (expected)
Energy Policy and Planning:	
Externalities (pricing/dispersion/models)	Ukraine, UK, USA, India
Biomass and biogas	Ukraine, UK, USA, Germany, India, China
Energy Demand forecasting	Ukraine, UK, USA, Germany, India, Vietnam
Electricity demand disaggregation by sectors and end-use	Ukraine, Vietnam
Energy data base development & management	Ukraine
Energy technology catalogues	Ukraine, India, Vietnam

² The SSC program has a very small consultancy budget, but additional funding is being persuaded so this number might be higher.

³ The technical assistance should include the possibility of engaging universities in university-to-university co-operations

⁴ Other cost that could potentially partially be used for consultants

⁵ Scope for external consultants for SSC Preparation Project (7 months duration) within the 4 identified themes is 100,000 DKK and for the full SSC Project (3 years duration) 500,000 DKK (estimate).

⁶ The budget might be adjusted due to possible engaged consultants from Chinese side.

Electricity market regulation and dispatch	Ukraine, India, China, Vietnam
Short term power market design and power exchanges	China, Ukraine
Technical feasibility studies, financial models, business cases and communication activities	Ukraine, UK, USA, Germany, Indonesia
Energy Efficiency and Renewable Energy Action Plans	Ukraine, Vietnam
Investments in Energy Efficiency and Renewable Energy Projects	Ukraine, Indonesia
Socio-economic cost-benefit analysis	USA, UK, Germany
Renewable Energy Integration in Power Systems:	
Power systems and power plant flexibility	Ukraine, Ethiopia, Indonesia, India, China
Financial incentives for balancing services	Ukraine, Indonesia, India, China
Distribution level integration, operation of variable generation	Ukraine, Ethiopia, India
Forecast of production from wind and solar PV and development of wind measuring infrastructure	Ukraine, India
Energy Efficiency:	
Energy Efficiency modelling, Energy Efficiency data handling	Ukraine, Vietnam
Energy Efficiency potential analysis and energy audits in industry/individual plants	Ukraine, Germany, Indonesia, India
Industry data collection and validation, benchmarking	Ukraine, India
Incentive schemes in industry	Ukraine, Germany
District heating (combined heat and power production, grid analysis/optimization, resource evaluation)	Ukraine, Germany, UK, USA
Strategic energy planning at local/regional level	Ukraine, Germany, UK, USA, Indonesia, India
Real-life implementation of building regulation	Germany
Energy Efficiency in buildings (retrofit)	Germany, USA, UK, Indonesia
District energy feasibility studies	Germany, UK, USA
District heating (planning, operation and optimization of district heating production facility and network)	Germany, UK, USA
Heating and cooling supply planning and legislation:	
Energy mapping and forecasting of heating and cooling demand and supply	Turkey, Ukraine
Drafting of heating- and cooling supply legislation	Turkey, Ukraine
Preparing of prefeasibility studies of concrete heating and/or cooling supply projects	Turkey, Ukraine
Climate Change Mitigation Policy and Planning:	
GHG-emissions scenarios and models	USA, UK, India
Cost-benefit analysis	USA, UK, Germany, India
Financing mechanisms and international climate finance	India