

**Capacity Development for Energy Sector Planning
Department of Energy**

**Development Engagement Document
Annex E to
Energy Partnership Programme between South Africa and Denmark
Development Engagement 1**

Draft April 28th 2017

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1 INTRODUCTION

The present development engagement (DE) document details the objectives and management arrangements for the development cooperation concerning “Enhancement of the energy sector planning” with Department of Energy (DoE) for the period from July 2017 to June 2020 as agreed between the parties specified below. The development engagement document is an annex to the Bilateral Agreement with the Implementing Partner and constitutes an integrated part hereof together with the documentation specified below. This DE with DoE is part of the support provided through the Energy Partnership Program between South Africa and Denmark. The Partnership Programme with South Africa is embedded in the Danish Energy Agency (DEA) Energy Partnership Programme (DEPP) supported by the Danish Climate Envelope focusing on four countries including also China, Mexico and Vietnam.

2 PARTIES

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and

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3 DOCUMENTATION

The partner documents that support this intervention are:

1. National Development Plan 2030
2. Integrated Energy Plan (IEP) from 22 November 2016.
3. Integrated Resource Plan (IRP), 2010-30
4. Integrated Resource Plan (IRP), 2010-50 update from November 2016.
5. DoE Strategic Plan 2015-2020.
6. DoE Annual Performance Plan 2016/17.

4 BACKGROUND

In 2014 South Africa was denoted as the 15th largest emitter of CO₂ in the world. South Africa has relatively high emissions, both measured per capita and by emissions per unit of GDP. The power sector is the single largest emitter of CO₂ in South Africa, accounting for 50 % of total carbon emissions. This is due to a high reliance on coal for electricity generation. The Government recognises that the high use of fossil fuels is contributing to climate change and regards climate change as one of the greatest threats to sustainable development. This is clearly stated in the *National Climate Change Response White Paper* published by the Government in October 2011 and in the *Integrated Resource Plan (IRP), 2010-30*.

In its Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change, South Africa has committed to a peak in greenhouse gas (GHG) emissions between 2020 and 2025 at a level between 398 and 614 Mt CO₂-equivalents. South Africa has in recent years taken significant and positive steps to support its low carbon transition and has ratified the Paris Agreement at the 21st meeting of the Conference of Parties. Policy instruments under development include a carbon tax, emission reduction targets for sectors, company level carbon budgets, as well as regulatory standards and controls for certain GHG emitters.

As a growing economy, South Africa focuses on balancing the need for continued economic growth with its social needs and the protection of the natural environment. The National Development Plan 2030 defines South Africa's main goals as eliminating poverty and reducing inequality by 2030. Among 'enabling milestones' are the need "to produce sufficient energy to support industry at competitive prices, ensuring access for poor households, while reducing carbon emissions per unit of power by approximately one-third". To achieve this, the plan outlines a range of significant energy infrastructure investments: procuring at least 20,000 MW of renewable electricity by 2030; importing electricity from other countries; decommissioning 11,000 MW of ageing coal-fired power stations and; stepping up investments in energy efficiency. (The current IRP 2010 – 2030 has a target of app. 17,000 MW subject to future IRP update).

The IEP provides the national energy roadmap for the future energy landscape of the country which guides energy infrastructure investments and policy development. This DE relates to four of the eight key objectives of the IEP, namely ensure the security of supply; minimise the cost of energy; diversify supply sources and primary sources of energy; and minimise emissions from the energy sector.

The IRP forms the basis of South Africa's power generation capacity expansion programme, and ESKOM, in its function as the national system operator, assist DoE through provision of modelling results for the IRP.

The IRP and the IEP are key planning documents for long range policy and planning and were recently updated (in November 2016) including an extension of the time horizon to 2050. The Minister of Energy is mandated to develop, and on an annual basis review and publish the IEP. The IEP rests with the Energy Planning Directorate and the IRP process with the Electricity Directorate at the DoE.

The DoE is the governmental agency responsible for modelling and developing scenarios reflecting the policy options of the government. This DE focuses on strengthening the planning and modelling outputs of the DoE in particular to help achieve the renewable energy (RE) targets in the power sector. DoE recognizes DEA as an appropriate partner to help strengthening the capacity of the planning function of the DoE including through continued support to the Renewable Energy Database and Information System (REDIS), now under the responsibility of the Planning Directorate while also involving other Directorates e.g. Clean Energy and IT office. Also the previous support from Denmark supported DoE with energy end-use modelling and DoE has in this regard requested further support to strengthen the capacity on energy end-use data collection and modelling.

The modelling processes that this DE intends to strengthen with more reliable data input is related to four sets of energy modelling tools managed by the DoE: The Energy Demand Modelling tools (i) determine the amount of energy required due to economic growth, and the Infrastructure Modelling Tools (ii) computes the required new electricity capacity and related investment needed. The South Africa General Equilibrium Model (iii) is used for macro-economic impact assessment. To get to the final energy planning, the Multi-Criteria Decision Analysis (iv) process is conducted. This is done with assistance from energy experts from the public and private sectors, such as the Council for Scientific and Industrial Research (CSIR) and the University of Cape Town. For the IEP and IRP, ESKOM provides data and helps shape assumptions for the modelling exercises.

In addition to the above modelling tools run by DoE and fit for purpose of planning for the IEP, the PLEXOS[®] Integrated Energy Model on the electricity sector is run externally at ESKOM and informs the IRP. The DoE will benefit significantly from an increased capacity to more independently analyse the outputs of the PLEXOS[®] model both in its accuracy and its interpretation into the planning documents.

Climate change mitigation and related energy policies and implementation strategies in Denmark are based on comprehensive analysis of future development paths integration of renewables into the energy system, including based on modelling work by the DEA. Danish expertise and best-practice including DEAs offers deep insights into efficient data collection, the use of accurate models and ways to communicate the results of highly complex and comprehensive methodologies etc. Therefore, DEAs support to DoE through a peer-to-peer cooperation including the posting of an international Long Term Advisor (LTA) is considered a good match, reflecting both DoE's request for support and Danish core competencies in the field of energy planning. In addition, the engagement is designed to address special needs of DoE, where other development partners are currently not providing support.

5 DEVELOPMENT ENGAGEMENT OBJECTIVE

The objective of the wider Energy Partnership Programme between South Africa and Denmark is to assist South Africa in moving to less carbon-intensive electricity production including through expansion of RE generation capacity. This objective is in alignment with South Africa's National Development Plan 2030. The particular objective for this DE is to facilitate the development of a less carbon intensive electricity sector by working with the DoE "to develop more comprehensive energy planning capabilities that include the efficient deployment and integration of renewable energy and energy efficiency technologies".

The planning and policy goals of the IEP foresee an increase of RE in the future power supply mix, and the IRP outlines possible scenarios and attached investments. This DE will contribute to the reduction of the carbon intensity of the economy and indirectly contribute to the reduction of GHG emissions in support for the Nationally Determined Contributions.

The DEA will base the actual support on progress attained in the implementation of the engagement as described in the documentation. Progress will be measured through the

DoE's monitoring framework, the Climate Change Envelope (CCE) indicators, and some specific indicators developed for this DE.

6 THEORY OF CHANGE

The Theory of Change is that by informing policy dialogues and decisions on energy sector development in South Africa through the use of accurate policy implementation scenarios and long range forecasts of the energy and power system, policymakers can make decisions with greater certainty about key issues of concern around RE-integration in the power mix, for example concerns over costs and security of supply.

If the support from DEA is successful, DoE will get better data on the actual penetration of RE and the factual contribution of RE to the power supply mix, better data on the state-of-the-art of conventional- and RE technologies, including realistic present-day technology costs. Further, DoE will have increased capacity to utilize the modelling tools, the assumptions and the scenarios that are translated into planning and policy goals as stated in the IEP and in the IRP. This will lead to robust modelling results either consolidating existing or suggesting revised implementation pathways for achieving the policy objectives of the South African Government. This will in turn inform recurrent policy dialogues including the extensive stakeholder consultations inherent in the IRP and IEP processes in South Africa. For this eventually to lead to changes needed, if any, of the enabling environment conducive for the RE-implementation pathway to materialise, again depends on actual policy making as well as other factors beyond this DE, not least the wider political and economic context.

The support to DoE to make above changes happen will be the provision of long- and short-term advisory support provided by DEA and external consultants who will work closely in a peer-to-peer relationship with South African government officials. Furthermore, exchange visits to Denmark of key people involved in planning and policy modelling, on-line publication of key South African RE data, and targeted workshops will be organized to strengthen the capacity of relevant project partners and to disseminate information to civil society and private stakeholders and thereby also validate modelling inputs and outputs.

Successful achievement of the outcomes rests on the assumption that the government of South Africa retains its commitment to a less carbon-intensive electricity production including through expansion of RE generation capacity, and that this commitment is reflected in key planning documents. For the capacity building to be successful, a key assumption is also that DoE makes available adequate staff resources and that staff trained remains in posts long enough to take up results from the cooperation and to carry through change. It is also an assumption that DEA is able to provide relevant experts and technical assistance in a timely manner as per agreed work plans.

7 RESULTS FRAMEWORK

For Danida's reporting purposes the following key outcome and output indicators have been selected to document progress. Detailed indicators for each output will be revisited and potentially refined as part of the inception, where the baselines and targets, will be adjusted with reference to prevailing knowledge and the Climate Change Envelope guidelines for monitoring:

Outcome		Recurrent planning processes and attached inputs are informed by even more consolidated data, forecasts, peer reviewed assumptions and additional long range policy and policy implementation scenarios for a less-carbon intensive electricity sector including through the expansion of RE-generation capacity.	
Outcome indicator		Number of policy or planning inputs for the recurrent IEP and IRP process incorporating merits obtained as a result of the Danish support and subject to dialogues with right holders and duty bearers (including government stakeholders, academia, civil society, private sector investors and other relevant stakeholders).	
Baseline	Year	2017	None
Target	Year	2020	At least two policy or planning inputs by DoE with traceable merits to the Danish support, and subjected to dialogues with right holders and duty bearers.
Output 1		DoE has strengthened capacity for energy sector modelling Recurrent modelling by DoE relies on quality data maintained by the DoE and validated through extensive stakeholder consultations. Long range policy implementation scenarios are developed and peer reviewed through a public consultation process encompassing relevant stakeholders and interested parties, as well as through high-level policy dialogues	
Output indicator 1.1		Disaggregation of electricity demand by sectors and end-uses, subjected to stakeholder consultation and used as input data for DoE forecasting	
Baseline	Year	2017	Disaggregated data as per project start
Target	Year 1.5	2019	Disaggregated data for at least one additional sector completed
Target	Year 3	2020	Disaggregated data for at least two additional sectors completed
Output indicator 1.2		Number of energy technologies updated data, verified through consultative process ("technology catalogue approach"), and used as input data for DoE planning	
Baseline	Year	2017	Technology data as per programme start
Target	Year 1.5	2019	Stakeholder consultation completed on energy data for at least one technology
Target	Year 3	2020	Stakeholder consultation completed on energy data for at least one more additional technology
Output indicator 1.3		Number of long range policy implementation scenarios additional to- or modifications of the scenarios in IEP 2016	
Baseline	Year	2017	No additional scenario
Target	Year 1.5	2019	At least one additional scenario with updated data completed
Target	Year 3	2020	At least one more additional scenario with update data completed
Output indicator 1.4		Number of roundtables/seminars where results from the programme translated into policy advice, are disseminated, and forms basis for policy dialogue with stakeholders	

Baseline	Year	2017	None
Target	Year 1.5	2019	At least 2 roundtables/seminars successfully completed.
Target	Year 3	2020	At least 2 additional roundtables/seminars successfully completed.
Output 2		DoE has strengthened capacity to peer review external modelling input DoE maintains expertise to define the assumptions and analyse the results of the external modelling done with the PLEXOS® model for DoE planning purposes and translates verified results into planning outputs.	
Output indicator 2.1		Relevant and accurate data used for modelling	
Baseline	Year	2017	EPRI technology data (Electric Power Research Institute) is used for PLEXOS® modelling informing the IRP
Target	Year 1.5	2018	RSA technology data – qualified through consultative process with right-holders and duty bearers is in place for input for PLEXOS® modelling informing the IRP.
Target	Year 3	2020	No additional update expected
Output indicator 2.2		IRP scenario with updated data	
Baseline	Year	2017	Not applicable (as updated data is not available from project start)
Target	Year 1.5	2018	Not applicable (as updated data is not available to have scenario ready in 2018)
Target	Year 3	2020	One IRP scenario with updated data
Output 3		DoE has strengthened capacity for collecting, processing and reporting on RE data REDIS is deployed and based upon lesson learnt, the concept is replicated to support the wider DoE' planning function.	
Output indicator 3.1		Number of data sources, RE-technologies and RE-resources for which RE-data is compiled, processed and made public available online through REDIS	
Baseline	Year	2017	Data sources, RE-resources and attached technologies covered by REDIS as per programme start
Target	Year 1.5	2019	REDIS covers one additional RE-resource and attached technologies compared to baseline situation.
Target	Year 3	2020	REDIS covers two additional RE-sources and attached technologies compared to baseline situation and data comes from additional sources compared to the baseline.
Output indicator 3.2		Proof of concept of REDIS in terms of in-house capacity in place for continued updating of data and in terms of feed-back from public and private sectors stakeholders in RE-data including academia, civil society and private sector investors	
Baseline	Year	2017	REDIS is in initial test phase.
Target	Year 1.5	2019	REDIS in pilot phase and gets good feedback from stakeholders.
Target	Year 3	2020	Staff competencies and allocations are in place to maintain REDIS and regular update underlying data

		without further support from DEA.
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8 RISK MANAGEMENT

The major risk related to successful implementation of the DE is that:

As part of energy mix, alternate clean energy sources such as nuclear, hydro and clean use of coal gets in the way of development of renewable energy. Current policy push from highest level is in favour of nuclear and tender procedures for nuclear are in process of being developed. The base case in the draft IRP suggests that nuclear would only be in place at the earliest by 2036, but a 3rd scenario based on an accelerated nuclear build program is being promoted.

The programme may be impacted by this and DoE and ESKOM would divert resources toward nuclear and decisions to promote renewable energy could be delayed slowing down expansion of renewable energy integration into the grid. Continue dialogue with Government and support to engagements on renewable energy, modelling scenarios showing benefits on integrating renewable energy and that a long-term sustainability and that a low carbon path is economically feasible may mitigate the long-term impacts. The short-term risk remains high during the programme implementation period.

If electricity generation from coal and nuclear emerges as the significant part of the energy mix for South Africa's energy policies, it may reduce the impact of this DE's effort to promote renewable energy. At the same time, however, it may also attract attention towards the fact that Denmark is providing significant assistance to renewable energy in a context where coal and nuclear remain the significant part of the energy mix. The Embassy of Denmark will follow closely the trends and developments around the energy sector in South Africa, including particularly key political discussions. This will allow for a timely and clear communication of risks and potential mitigation measures to be taken by the DEA and will serve to reduce this residual risk to minor.

External economic dislocations or crises: Such crises or internal financial disruption (inflation, foreign debt, currency crisis etc.) are possible because, although the economic situation is generally stable, foreign debts are high and increasing. If an economic shock were to occur, planning and budgeting would be made difficult, but with the power sector being important to continued development of the country the likelihood of significant disruption to the programme is seen as being relatively small.

There are no other major risks identified that have not been mitigated as part of the design, but risks will be monitored closely throughout implementation and measures will be carried out accordingly.

9 INPUTS/BUDGET

Outputs	Contribution with Danish funds	Partner Contribution in-kind
1. DoE has strengthened capacity for energy sector modelling	3,364	
TA travel costs etc. in DKK '000	214	
Delegations to Denmark in DKK '000	200	
Other costs in DKK '000	70	Venue & Workshop
TA from DEA, in hours	2000	2000
TA from other international experts, in hours	1465	1465
TA from local consultants, in hours	500	500
2. DoE has strengthened capacity to peer review external modelling input	2,049	
TA travel costs etc. in DKK '000	134	
Delegations to Denmark ,in DKK '000	200	
Other costs, in DKK '000	70	Venue & Workshop
TA from DEA, in hours	1500	1500
TA from other international experts, in hours	500	500
TA from local consultants, in hours	487	487
3. DoE has strengthened capacity for collecting, processing and reporting on RE data	980	
TA travel costs etc., in DKK '000	89	
Delegations to Denmark, in DKK '000	300	
Other costs, in DKK '000	70	Venue & Workshop
TA from DEA, in hours	1000	1000
TA from other international experts, in hours		
TA from local consultants, in hours		
International Long-Term Adviser	3,900	Equivalent in terms of man hours
GRAND TOTAL	10,239	

Partner contribution in terms of hours is intended to at least be equivalent to the input from Denmark.

10 MANAGEMENT ARRANGEMENT

The parties have agreed to the following management arrangement with the aim to ensure adequate dialogue and timely decisions regarding this development engagement.

The development engagement is anchored in the DoE that has the overall responsibility for implementation of the engagement. The daily implementation is the responsibility of the Deputy Director General for Policy, Planning and Clean Energy.

A Development Engagement Implementation Group, hereafter called the Implementation Group, managing daily implementation of the development engagement will be headed by a person from the partner institutions and consist of the LTA, a programme officer from the Embassy of Denmark (EDK), the DEA country coordinator/DEA expert and partner specialists as required. The Implementation Group will guide daily implementation and meet on a needs basis, and will: i) develop annual and detailed half-yearly work plans for the DE, matching priorities in the partners work plans, ii) associated with the detailed half-yearly work plan determine need for Technical Assistance (TA) inputs from DEA experts and from national and international TA through development of a TA provision plan; iii) endorse inputs based on TOR prepared at output level; iv) monitor day-to-day progress of DE implementation. The head of the Implementation Group reports on DE outputs to the Management Group.

A Management Group will be established to coordinate and manage the entire partnership programme in South Africa. The Management Group will be co-chaired by DoE and the DEA-country coordinator, and the LTA, an EDK representative and partner specialists participates as relevant. The Management group will meet at least twice per year and have the responsibility to: i) consolidate and check annual and detailed half-yearly work-plans and budgets against DE partners work-plans and TA provision plan; ii) monitor programme progress at output level, using the “traffic light” system; iii) ensure cross fertilisation between engagements. The Management Group reports on programme development to the Steering Committee and acts as Secretary to the Steering Committee. Decisions are made by consensus.

The Steering Committee is established and co-chaired by the Deputy Director General of Department of Energy and the Ambassador of Denmark. DEA participates at high-level in the Steering committee. DE partners are all represented in the Steering Committee at senior management level. The Steering Committee should meet one to twice per year to approve annual work plans and progress reports; discuss and resolve issues related to programme progress, and; decide on any reallocation of resources between DEs, e.g. based on recommendations from the Management Group and from the mid-term review. Decisions are made by consensus.

Implementation arrangements

At implementation level the DE partners are responsible for implementation of the DE with DEA being responsible for providing the necessary and timely resources to deliver the outputs, according to the output-based budget and along the request for TA from the DEs. Each DE partner has, at output level, dedicated partner specialists, assisted by DEA that provide inputs to the annual and bi-annual work-plans, and proposed needs for provision of TA. This includes formulating detailed Terms of Reference and specific TA profiles and time-input required to deliver the outputs. Provision of TA should be based on the principles of a) national TA where relevant; b) DEA experts where peer advice is required and; c) international specialists where dedicated specialist tasks will be needed.

DEA is also responsible for coordination of inputs from Denmark and for advising on implementation, and approving deliverances from external service providers.

In addition to national and international short term TA the partnership programme in South Africa will finance a Long Term Adviser to be placed in DoE. DoE will arrange and finance project office facilities. While the LTA serves as adviser to the entire programme, the LTA will have primary focus on delivering technical advice at output level to DE 1. As programme advisor, the LTA would use any opportunity to encourage partners (as duty bearers) to ensure consultation of relevant DE outputs with right holders – CSO's, private sector investors and other relevant stakeholders. The LTA will also support integrated policy dialogues.

At the EDK a programme officer will coordinate programme implementation and facilitate inputs from Denmark. The programme officer will also participate in meetings of the Implementation Group as needed.

11 PROCUREMENT AND FINANCIAL MANAGEMENT

This development engagement will have no cash transferred or disbursed directly to the development engagement partner. Hence, there are no requirements for accounting of funds and financial reporting at development engagement level. However, based on the agreed annual work plan the international and national adviser inputs will be budgeted and agreed in terms of days delivered in country. The bi-annual progress reports will include the actual time spent for each TA input to monitor the use against agreed TA budget.

Procurement of agreed international TA (in any form) will be carried out by DEA and follow Danish procurement rules or drawn from a pool of experts. Final selection of procured TA will be done in close cooperation with partners based on no objection from the Implementation Groups.

Procurement of agreed national specialist TA, not covered by the above, will be carried out by the EDK in consultation with DEA, and follow Danish procurement rules for local procurement of TA. Final selection will be done by in close cooperation with the Implementation Group.

Recruitment of the Long Term Adviser (LTA) follows procedures of the Danish Ministry of Foreign Affairs. Representatives from DoE will be part of the recruitment panel together with representatives from DEA, EDK and MFA.

Study tours by DE partners will be paid for by the partnership programme with South Africa. This includes airfares, accommodation and daily allowances. DEA, through the EDK, will arrange all bookings of airfares, hotels, transport and other practical arrangements. Daily allowances for the entire trip will be paid out by the EDK in cash upon departure following EDK procedures for appropriate documentation. Workshops and seminars in South Africa will be paid for by the partnership programme through EDK, based on appropriate quotations approved by EDK and documented expenses. Sitting allowance for any workshop or meetings will be paid for out of partners own budgets.

12 MONITORING AND EVALUATION

Daily progress will be followed by the Implementation Groups who will report progress towards outputs and outcomes of this engagement through bi-annual progress reporting to the Management Group that consolidate reports across the programme and report this to the Steering Committee at annual or bi-annual Steering Committee meetings. The Management Group will also provide an Annual Progress Report to be approved by the Steering Committee. All reporting should, to the extent possible and when relevant, be disaggregated by gender, area, sector, etc. forwarded to the DEPP Advisory Group in Copenhagen.

Detailed indicators for each specific development engagement output will be revisited and potentially refined as part of the inception, where annual targets, in line with already defined targets will be adjusted with reference to the Danish Climate Envelope guidelines for monitoring. Monitoring towards these targets will be reported through the bi-annual progress reporting using a “traffic-light” system, where:

- “green” is on-track – implementation continues as scheduled;
- “yellow” is partly on-track which needs an explanation by the Implementation Group to the Management Group, including actions taken to get back on-track and closer monitoring of progress by the Management Group;
- “red” is off-track, which needs a detailed explanation by Management Group to the Steering Committee with recommendations of changes to the implementation to get the engagement back on-track. If “red” in two consecutive reporting periods, the Steering Committee may consider reallocation between outputs within or between the development engagements as deemed relevant.

Monitoring of actual time spent by international and national advisers will be reported in the bi-annual progress reports with updated work plan and projection of TA input for the following quarter will be stipulated. Similar reporting will be done for workshops and study-tours.

The Danish MFA shall have the right to carry out any technical mission that is considered necessary to monitor the implementation of the programme, which may include a mid-term review. After the termination of the programme support the Danish MFA reserves the right to carry out evaluation in accordance with this article.

Anti-corruption

No offer, payment, consideration or benefit of any kind, which could be regarded as an illegal or corrupt practice, shall be made, promised, sought or accepted - neither directly nor indirectly - as an inducement or reward in relation to activities funded under this agreement, incl. tendering, award, or execution of contracts. Any such practice will be grounds for the immediate cancellation of this agreement or parts of it, and for such additional action, civil and/or criminal, as may be appropriate. At the discretion of the Danish Government, a further consequence of any such practice can be the definite exclusion from any projects funded by the Government of Denmark.

Prerequisites

This Development Engagement is in accord with xxxx
There are no additional prerequisites.

Signatures

Partner/DEA