

**Danish Energy Agency Energy Partnership Programme (DEPP),
Phase II**

with

Mexico, China, South Africa and Viet Nam

2017 - 2020

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Abbreviations

CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CENACE	National Centre for Control of Energy (Mexico)
CNREC	China National Renewable Energy Center
CO ₂	Carbon Dioxide
CONUEE	National Commission for Energy Efficiency (Mexico)
CREO	China Renewable Energy Outlook
DANIDA	Danish International Development Assistance
DE	Development Engagement
DEA	Danish Energy Agency
DEPP	Danish Energy Agency Energy Partnership Programme
DFID	Department for International Development – United Kingdom
DKK	Danish Kroner
DOIT	Department of Industry and Trade (Viet Nam)
EDK	Embassy of Denmark
EE	Energy Efficiency
ERAV	Electricity Regulator Authority Viet Nam
ESMAP	Energy Sector Management Assistance Program
EU	European Union
EOR	Energy Outlook Report
FFSR	Fossil Fuel Subsidy Reform
FYP	Five-Year-Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	Agency for International Cooperation (Germany)
HRBA	Human Rights Based Approach
IEA	International Energy Agency
INDC	Intended Nationally Determined Contribution
INECC	National Institute of Ecology and Climate (Mexico)
LTA	Long Term Adviser
MEUC	(Danish) Ministry of Energy, Utilities and Climate Change
MFA	(Danish) Ministry of Foreign Affairs
MOIT	Ministry of Industry and Trade (Viet Nam)
NAMA	National Appropriate Mitigation Action
NDC	Nationally Determined Contribution
NDRC	National Development and Reform Commission (NDRC)
NEA	National Energy Administration (China)
NEA	(China) National Energy Administration
NECC	National Energy Conservation Centre (China)
NERSA	National Energy Regulator of South Africa
NGO	Non-governmental organisation
OECD-DAC	Organisation for Economic Co-operation and Development -Development Assistance Committee
OHCHR	Human Rights Office of the High Commissioner (United Nations)
RE	Renewable Energy
SEMARNAT	Ministry of Environment and Natural Resources (Mexico)
SENER	Ministry of Energy (Mexico)
TA	Technical Assistance
TOR	Terms of Reference
UNEP-DTU	United Nations Environment Programme – Danish Technical University
USA	United States of America

1 Introduction

To address the global challenge of climate change, the Danish Climate Envelope was established in 2008 to support climate change mitigation and adaptation activities in developing countries. The Climate Envelope has since 2012 financed energy and climate related programs in Mexico (DKK 45 million), Viet Nam (DKK 65 million) and South Africa (DKK 40 million). In addition, the Danish Energy Agency (DEA) has provided technical assistance (DKK 40 million) to these three countries and China. Hence, total level of previous support amounts to DKK 190 million. The assistance is acknowledged by partner countries to add value to their ongoing efforts to pursue renewable energy and energy efficiency improvements, and significant results have materialized.

With the prospect of creating results for the longer term and building on the existing momentum, Denmark has allocated DKK 115 million from the Climate Envelope 2017 to cooperation with the four countries when the current programs come to an end by June 2017.

The new 3-year programme, the DEA Energy Partnership Programme (DEPP) Phase II, will be more focused as fewer funds are available. It will furthermore be an integrated programme to cease the previous separation of bilateral programs in Mexico, Viet Nam and South Africa from the technical assistance support from DEA.

The intention is to assist the four countries with their transition to a low carbon economy and support them in implementation of the Paris agreement. The support is based on Denmark's long standing experience on energy transition away from a fossil fuel economy. Also, the DEPP builds on a well-tested government-to-government modality of cooperation featured by: A Memorandum of Understanding outlining shared government goals for the cooperation; provision of technical advisory support including from the DEA and the Danish power system operator and offering counterparts wider access to acquaint with Danish experience, expertise and technology solutions; daily programme presences in-country through Denmark's embassy and through the posting of international Long-Term Advisors with key-partner institutions and; wider anchoring of programme objectives and results through high-level participation in programme steering and high-level policy dialogues.

This document will first put the DEPP into the context of Denmark's development policy and summarise key-results and lessons learned from the previous programs that have informed the design of the new program. The rationale, justification and the Human Right Based Approach for the DEPP and how it is aligned with other development partners is then presented followed by the theory of change for the programme setting out the overall objectives and key associated risks envisioned. Hereafter follows the four country summaries with the particular country objectives and objectives of their associated Development Engagements. The final chapters outline the management and organisational set-up and overall DEPP budget.

Each country programme document includes annexes on: Partner brief description; Budget at Output Level and Development Engagement Documents – all of which are available upon request.

2 Summary of the DEPP Context

2.1 Denmark's development framework

Inclusive, sustainable growth - and development is one of the strategic objectives of Denmark's Strategy for Development Cooperation and Humanitarian Action. Economies in transition and emerging economies are considered key players to achieve the global Sustainable Development Goals. The development strategy underlines the importance of providing support for their sustainable development, as they demand expertise, knowledge, technologies and investments to make appropriate

strategic choices. Energy is in this regard a priority sector where Denmark has particular knowledge, resources and interests. The strategy also points to the relevance of building strategic partnerships and government-to-government cooperation to promote common agendas such as climate change. The four DEPP partnership countries appears in the development strategy among the countries where partnership initiatives and government-to-government cooperation is particular relevant.

The DEPP is well in line with the strategy as well as with the Danish Climate Envelope guiding principles, both in terms of overall development goals and in terms of engagement modality. The guiding principles of the Climate Envelope, aiming to reduce greenhouse gas emissions in developing countries through strengthened policies and planning frameworks; by scaling up climate-relevant technologies, infrastructure and markets; as well as through a more consolidated, effective and ambitious international climate architecture, has informed the programming and design of the DEPP.

As also encouraged by Denmark's Strategy for Development Cooperation and Humanitarian Action and the Danish Export Strategy on Energy, the DEPP will by improving framework conditions in the partnership countries help open and expand markets for renewable energy and energy efficiency solutions. This will provide opportunities for the Danish private sector.

2.2 The four partnership countries

Based on Denmark's development priorities and achievements from existing engagements it has been decided to continue the energy and climate cooperation with China, Mexico, South Africa and Viet Nam. They are emerging economies and important players in the global energy landscape, representing almost one third of global greenhouse gas (GHG) emissions. Each of the countries have forecasted significant increases in energy consumption, and are currently facing key, strategic energy-related choices that may determine their energy future for decades to come. All countries have presented strategies and policies to reach ambitious climate and energy targets.

The partnership countries are, as indicated in the table below, very different in size, population, economic capacity and carbon emissions and renewable energy in their energy mix. Nevertheless, a general perception is that Mexico and China are comparable with strong institutions working on renewable energy and energy efficiency. South Africa and Viet Nam are also comparable with relatively younger institutions and with moderate capacity to work on renewable energy and energy efficiency. It should be noted, however, that South Africa and Viet Nam are used to traditional development cooperation and that Denmark has a long-term presence in this regard to build upon¹.

¹ These perceptions are also reflected in the Human Development Index which measures three basic dimensions of human development. The index ranks Mexico and China at the relatively same, high level and ranks South Africa and Viet Nam at a lower level.

Table 1 Demography and socioeconomic figures in partnership countries

	Mexico	China	South Africa	Viet Nam
Population	120,286,655	1,355,692,576	48,375,645	93,421,835
Area [km ²]	1,964,375	9,596,961	1,219,090	331,210
Population density [persons/km ²]	61.2	141.3	39.7	282.1
Life expectancy [years]	77	75	57	75
Infant mortality rate [per 1.000 live births]	11.3	9.2	33.6	17.3
GDP [USD million] ²	1,143,793	11,007,720	314,572	193,599
GDP [USD/capita] ³	9,509	8,120	6,503	2,072
Corruption perception index [rank out of 176] ⁴	123	79	64	113
People living below the poverty line [% of total] ⁵	53.2	n.a.	53.8	13.5
Human development index [0-1]	0.756	0.727	0.666	0.666
CO ₂ emissions [ton/capita] ⁶	3.95	7.55	8.86	1.7
Renewable energy [% of total final energy consumption] ⁷	9.80	17.09	16.59	36.2

Achievements of previous programmes with the four countries

The existing programmes (in effect from 2012, except for Mexico where programme implementation started in 2014), has made some significant contributions⁸.

The programs in China, Mexico and Viet Nam have been successful in introducing *holistic long-term energy planning*. Key achievements in this regard include contribution to the central Chinese renewable energy planning (the 13th Five Year Plan, the main planning instrument in China) and high level energy policy dialogues taking point of departure in the China Renewable Energy Outlook report based on extensive analysis and scenarios developed with assistance from DEA. In more general terms, the China National Energy Centre (CNREC), established in 2012 with support from Denmark, has contributed significantly to professionalize policy research in China and in advancing specific policy agendas on renewable energy development and deployment.

The *introduction and training in additional energy modelling tools and the translation of modelling results* into policy dialogue inputs has also proven successful in Mexico and expected to be in Viet Nam before the existing programme terminates, though there has not yet been opportunities for the partner institutions to feed them into the recurrent energy planning process in the two countries, as is the case with China. However, Mexico's Intended Nationally Determined Contribution (INDC) submission to the United Nations Framework Convention on Climate Change and again the subsequent ratification by the Congress of the Paris agreement was informed by modelling results generated with Danish technical assistance (TA) support.

² World Bank Data 2015

³ Calculated based on 2015 GDP data; hence indicative

⁴ http://www.transparency.org/news/feature/corruption_perceptions_index_2016

⁵ World Bank Data 2015 <http://data.worldbank.org/topic/poverty>

⁶ <http://data.worldbank.org/indicator/EN.ATM.CO2E.PC>

⁷ <http://data.worldbank.org/indicator/EG.FEC.RNEW.ZS?locations=CN>

⁸ Individual programme focus and activities have varied and the below is not a comprehensive description of results obtained. More information on activities and results is found in the country summaries in chapters 4-7

Reliable and robust data input are key elements to long term modelling and planning and has one way or another been successfully incorporated in the programs in all four countries. In South Africa and Mexico also through supporting wind measurements with the purpose of creating a level playing field for independent power producers engaged with wind power generation, and further in South Africa through piloting a database for renewable energy generation data accessible online.

The technical cooperation between the Mexican and the Danish power system operator has led to development of four *grid codes*, and has enabled the Mexican system operator to build their own *forecasting model* in order to forecast wind and solar in real time. In South Africa, work with the National Energy Regulator on grid codes is ongoing and Denmark has furthermore successfully built *capacity with local distribution control centres* to strengthen their ability to foresee the impact of variable renewable energy generation on the operation of distribution networks.

The programs in Mexico and Vietnam have addressed *energy efficiency improvements in buildings and industrial sectors* with some remarkable results including tangible GHG-emissions reductions and - particular important in Viet Nam - with associated lower level of pollutants due to displacement of coal. In Viet Nam, an innovative support scheme for low carbon investments in small and medium enterprises (the Green Investment Facility), developed and financed with Danish funds has been instrumental for these results. In Mexico, the Danish programme has been instrumental for the federal governmental agency on energy efficiency, to work with local level governments to *strengthen and comply with building regulation* in two states as well as to work with large industries to demonstrate the merits of Energy Management Systems, which has also materialized in tangible energy savings. Finally, there are footprints of the Danish support in the now adopted Energy Transition Law including with regard to *development of incentives schemes for energy efficiency investments in large industries* inspired by Danish regulatory experience.

Lessons learned and experience gained

The programme design is informed by lessons learned, reviews conducted and experience acquired during the past 4-5 years of programme execution.

The existing country programs initially tested out many areas of support leading to somewhat fragmented and scattered programme, for example in Mexico, and leading to high transaction cost and risk in relation to the sustainability of the activities. It is now time to *consolidate and focus*, also induced by fewer funds for the coming period. Some areas of activities in existing programmes will therefore not be continued with funds from the new programme including notable: wind measurements in South Africa and Mexico; budget support to Viet Nam and the Green Investment Facility. In addition, some areas that will continue have been down-scaled while others have been expanded duly reflecting priorities as well as capacity of partner institutions, momentum of the existing programs and with considerations on how the DEPP can be most impactful, and not least based upon review recommendations and experience gained. Accordingly, there are few, focused outcomes at the country level and at the wider DEPP level, focus areas are now centred on *energy efficiency* in buildings- and industrial sectors; *long-term modelling and planning* for renewable energy and climate change mitigation; and *efficient integration of renewable energy* into power systems including *power plant operational flexibility*.

As also highlighted by reviews, the present decision-management, planning/coordination, reporting and monitoring structures of the 3 bilateral programs (Mexico, South Africa and Viet Nam) vis-a-vis the equivalent structures of DEAs associated assistance have proven complex and challenging. This combined with perceived somewhat unclear roles, responsibilities and functions of various programme participants for the present programs calls for a new *fully integrated design with clear responsibilities, well defined management system and integrated results monitoring*, hereby eliminating the present separation in

bilateral programs and DEA associated assistance program. With one single, integrated programme there is furthermore certainty about DEAs support till the end of the programme period as opposed to previous where the programs were not designed as synchronous programs. At the individual country level there is additional lessons learned with regard to decision-making and management set-up, and the country particular arrangements are accommodated accordingly in order not to alter structures that partners are familiar with and have proved to work well, for instance in China.

In-country programme presence on a daily basis through international long-term advisors well acquainted with Denmark's energy transition experience is believed to have been instrumental to the success of the China and Mexico cooperation. The review in Mexico noted that the presence of long-term advisers (LTA) has ensured continuity and coherence in the program; established a close connection between the local and Danish parts of the programs; and been able to guide and advise the short term inputs on the institutional context. In the new program, there will be international LTAs posted with key-partner institutions in all four countries. It was also concluded that the cooperation has created entry points and led to wider benefits in terms of Mexican institutional and political commitment to the programme objectives that are beyond what could have been achieved by a traditional cooperation model.

Reviews have pointed to the *efficiency of more central procurement modality* used in Mexico and the challenges of the modality used in South Africa with many small contracts and multiple levels of decision-making. Going forward, the major part of the short term TA-input will be acquired through central procurement managed by the DEA.

2.3 Justification for the DEPP

The DEPP targets transformation of the energy system and the justification is the same for all four countries, namely essentially that the partnership countries requests support for low carbon transitioning of their energy sectors and that Denmark can add value to this with experience and expertise from the development path in Denmark away from a fossil fuel economy in particular through energy efficiency improvements and high shares of renewable energy in the supply mix.

The engagements selected in the partner countries are – in accordance with the OECD-DAC criteria – highly relevant and have been chosen for their ability to create a genuine impact and transformation, just as partners and structure for implementation have been selected with effectiveness and efficiency in mind. All elements of the DEPP are considered to be highly prioritized by partner countries and the programme is anchored with partners with capacity well-known to the DEA and by and large, institutionally robust partners.

Below is presented a summary of the linkages between the DEPP and the OECD-DAC criteria.

Relevance: Climate change threatens to reverse progress towards sustainable development, and transition to less carbon intensive energy systems, is necessary to meet increasing global energy needs and at the same time keeping global warming below irreversible damage levels. The DEPP is a relevant response to the global climate change challenge as well as to the four partnership countries' particular challenges in achieving sustainable economic development. It is relevant for the partner countries efforts to comply with their target of peaking GHG-emissions as per their NDCs to the Paris agreement as well as for them reaching national policy targets. Moreover, the DEPP will contribute to a range of the Sustainable Development Goals, including in particular goal number 7 on access to affordable and clean energy.

Effectiveness: Countries with emerging economy and/or with energy economy in transition are where interventions will be most impactful because i) technology choices to meet expanded energy demand

may lock-in the demand and energy generation system for decades; ii) energy production in many cases is highly carbon intensive and opportunities for cost-effective and less-carbon intensive energy generation considerable and; iii) the untapped potential for cost-effective energy efficiency improvements/energy savings is often rather significant. Priority of the DEPP is given to interventions where cost-effective GHG-emissions abatement can be achieved through better and more stable framework conditions for renewable energy and energy efficiency investments and where partner countries have already started to implement reforms. Priority is furthermore given to interventions where the Danish support to government agencies is deemed to potentially be catalytic for wider changes and for attracting additional implementation support and investments contributing to achieve the objectives of the DEPP. Through policies and associated regulatory framework, renewable energy and energy efficiency markets in the partnership countries will be enlarged and as framework conditions for renewable energy are strengthened, incentives for direct private sector investments but also the incentives to leverage funds from international climate finance mechanisms such as the Green Climate Fund, will increase. Also, stable framework conditions will provide better opportunities for investments through Danida Business Finance and the Investment Fund for Developing Countries. Effectiveness in reaching objectives is also expected due to coordination of each country programme with the activities of other donors, ensuring that Denmark's support adds value and is closing a gap in the market and finally because the Development Engagements largely are on areas directly linked to the partner institutions own work plans and budgets.

Efficiency: All but one Development Engagement are a continuation of the partnerships/cooperation established since 2012/14, ensuring that the approaches and methodologies are driven by partner demand, and have already been tested and deemed fit-for-purpose. This will lead to reduced establishment costs and provide additional benefits in terms of economies of scale. The partnership approach, where an international Long-Term Advisor is posted with a key partner institution and where DEA experts and other short term technical advisors on each assignment is directly paired with a peer in the involved institutions, has been highlighted by partners as the preferred option for Denmark's technical support under the DEPP. This is due to the fact that the approach allows for a flexible and tailor-made assistance that to a high degree can address the specific needs and challenges of partner institutions.

Impact: The DEPP is responding to the need for supporting the partnership countries with implementation of the Paris Agreement. It is expected to contribute to GHG-emissions reductions on the longer term derived from a greener energy mix and less energy intensive economy in partnership countries whose energy sectors altogether accounts for around on third of global GHG-emissions. Except for Viet Nam, the countries expect to peak their CO₂/GHG-emissions during the period of 2025-30 according to their NDC. Tangible results of GHG-emissions reductions is anticipated from the DEPP also on short term as the programme supports with particular implementation aspects in some of the partnership countries, where results are within reach of the DEPP period. Indirectly, the DEPP is also expected to contribute to the creation of jobs and other business opportunities in the renewable energy and energy efficiency sectors as well as a range of indirect benefits in terms of lower levels of air pollution, improved health and improved livelihood as access to sustainable and affordable modes of energy.

Sustainability: The DEPP will support the development of strategies and policies for renewable energy and low carbon development. This is expected to inform and influence decision making in partner countries by demonstrating the opportunities from investing in sustainable low carbon solutions. The impact from the DEPP is considered to be long-lasting. By enabling decision makers to assess and compare the costs and benefits of various energy types, partner countries may be able to avoid committing to long term investments in expensive and non-sustainable solutions. Likewise, the

specific technical advisory components of the DEPP are expected to provide lasting capacities on renewable energy and energy efficiency in partner countries. Finally, it should be noted that the DEPP is environmentally sustainable including due to the indirect health benefits mentioned above stemming from displacement of fossil fuel based energy generation, which in particular is a compelling strategic concern in China and Viet Nam.

2.4 Human Rights Based Approach and Gender

As part of the development of the DEPP, major human rights analyses for the four partner countries have been consulted. This includes in particular the most recent Universal Periodic Review and relevant HR analyses from the United Nations (OHCHR) and the European Union. In the broader perspective significant progress has been made in recent years, however considerable challenges remains in all four countries.

The DEPP has been developed with a clear view to the human rights challenges identified. For example, the programme design includes specific interventions to consult with - and invite civil society actors in partner countries to participate in policy dialogues to ensure, transparency, non-discrimination and accountability. No rights holders are excluded from involvement in the programme and results from the DEPP will be made publicly available in English and other languages as necessary.

In addition, the overall objective of the programme is expected to contribute directly to public good creation closely related to the long-term HR situation in partner countries such as climate change mitigation, air quality and access to sustainable energy. The programme will furthermore contribute to good governance and improved framework conditions for renewable energy and energy efficiency.

Indirectly, the programme is also linked to poverty alleviation, employment and economic growth. Among other things, this is due to the fact that renewable energy, compared to other energy types, is the single largest contributor to employment. As partner countries increase their capacity to improve energy intensity and generate electricity from renewable energy, jobs are expected to be created at all levels of the value chain leading to a stronger macroeconomic outlook and increased economic growth.

Gender

Regarding gender, the equal rights of women are enshrined in the constitution of all four partner countries. Nevertheless, significant challenges remain. The most recent CEDAW reporting in the four countries identified a range of challenges, including for example the direct and indirect discrimination against women, domestic violence and violation of sexual and reproductive rights. The scope of the challenges varies across partner countries.

The DEPP will contribute to alleviating these challenges by encouraging the participation and representation of women in relevant decision making processes and activities such as training and workshops under the DEPP and all reporting will to the extent possible be aggregated by gender.

2.5 Alignment and division of labour with other development partners

The DEPP is unique in its partnership approach where the TA on each assignment is directly paired with a peer partner in the institution of the Development Engagement. With the relatively limited resources provided by the DEPP, and based on experience from the current programme, partners have expressed the peer-partnership set-up of TA to be the preferred option, because it generates flexibility, it is tailor-made to the institutions specific needs and it provides direct input to their daily work. This is unlike the major development partner's in the sector: GIZ (in all four countries), DFID (in Mexico), USA (in Mexico), EU (in Viet Nam); UNDP (in South Africa) and the World Bank (in Viet Nam). Their contribution is primarily focused on larger research and development products and mobilisation of funds for infrastructure implementation delivered as service provision to the institutions.

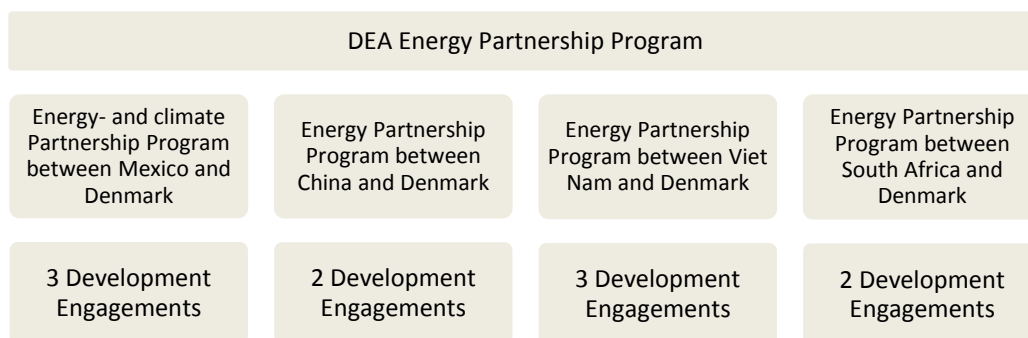
The two approaches are instead complementary. DEPP is well aligned with the partnership institution needs and, develop and reveal opportunities for larger interventions by the other development partners; e.g. more focused research and development of larger “think-pieces” to be developed by GIZ leads to opportunities for better DEPP guidance to peer-partners. Furthermore DEPP support to development of strategies, policies and plans for implementation of NDCs could lead to a platform for World Bank investments and for DFID opportunities to facilitate private sector finance and leverage funds for actual implementation of the plans. Other policy support will facilitate implementation of EU and World Bank investment in energy efficiency.

Development partner coordination in the DEPP partnership countries is presently not formalised. However, in Viet Nam the Viet Nam Energy Partnership Group is being established on the initiative of the EU Commission. It is to be led by the Vietnamese Government. Hence Viet Nam will be the only partnership country with formal and Government-led donor coordination. In China the Embassy of Denmark has taken initiative to establish an informal working group of the few international organisations that work with energy sector reforms. In South Africa meetings between development partners are held at irregular intervals to share information, and in Mexico the government takes own initiatives to coordinate between development partners. The DEA support will participate in coordination efforts in the sector and will take own initiatives with relevant development partners to coordinate through regular meetings and by invitation to participate in meetings, workshops etc.

Denmark is active on the international climate and energy agenda. Bilateral engagements, as this program, is a key part of the Danish Ministry of Energy, Utilities and Climate (MEUC) general strategic priorities to advance the energy transition in the major emerging economies, which is crucial for a cost effective implementation of the Paris Agreement. This is complemented with targeted multilateral engagements in key global multilateral energy fora, in particular the Clean Energy Ministerial, the International Energy Agency (IEA), the International Renewable Energy Agency, the World Bank (ESMAP), UNEP-DTU and Sustainable Energy for All (SE4ALL). DEPP will give specific strategic priority to strengthen synergies between the Danish bilateral engagements and the multilateral engagements in order to maximize the effect. This is vital since this approach can leverage support from other global players and thereby potentially increase the impact on the ground significantly. Successful examples of such synergies include multilateral projects supported by the Danish Climate Envelope e.g. the IEA’s activities on renewable energy and energy efficiency; such as the 4E-programme and GIVAR-project “Next Generation Wind and Solar Power”, as well as The World Bank’s ESMAP activities on energy efficiency and renewable energy in India and Ukraine (“FFSR-swap”).

3 The overall DEPP summary

Following the Danida Aid Management Guidelines, the DEPP has been structured as follows:



The DEPP has been developed in dialogue with the partnership institutions and in consultation with stakeholders in each of the four partnership countries. At country level it has a few and focused outcomes agreed with the individual Development Engagement⁹ partners as the intended end result, when the engagements terminate in 2020.

At the overall level, the DEPP will in summary provide TA to build capacity with partnership programme participants i) to provide convincing input for governmental energy, climate/low carbon policies, strategies and plans and ii) to deal with implementation aspects of energy efficiency and of high shares of variable energy in the national power systems in a cost-efficient manner.

Expertise and experience derived from Denmark's transitioning away from a fossil fuel economy will form the backbone of the DEPP and be activated in a Government-to-Government cooperation between the DEA and the partnership institutions. Partnership institutions in the four countries are either government agencies with a comparable remit or function to the DEA in fields of provisioning of climate- and energy related policy, planning and regulatory input for governmental decision making, or they are national equivalents to the Danish power system operator to which they will be paired in a peer-to-peer learning through the DEPP.

As an integral part of its government-to-government modality, the DEPP will provide for international Long-Term Advisors to be posted with the key-partnership institutions. This is combined with advisory support from DEA specialists experienced with Danish and international energy sector public planning and regulation. Through DEA, the partner institutions will furthermore have networking opportunities to access other Danish institutions and expertise including through delegation visits, study tours and internships. Cross-fertilisation, sharing of lessons learned between the four partnership programmes and south-south dialogue opportunities and needs will be pursued and facilitated by DEA as well as synergies with and coordination within multilateral initiatives and fora where Denmark participates.

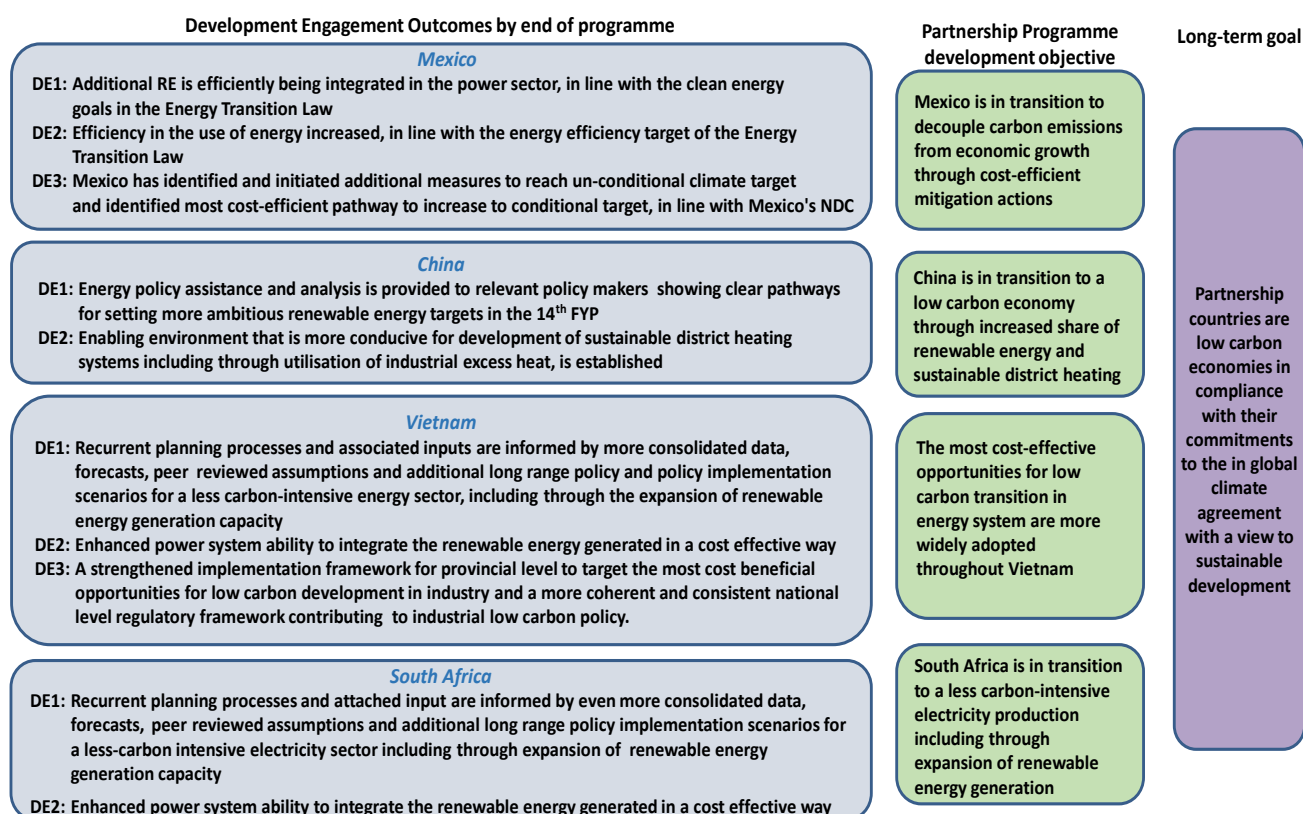
In addition, by supporting enabling framework conditions, the development of larger renewable energy and energy efficiency markets is anticipated in the four partner countries, and could hence benefit Danish private sector companies who specialize in green energy solutions. During the implementation of DEPP, Danish companies will have frequent opportunities to engage with relevant stakeholders in partner countries to showcase green solutions and products. Danish representations in partner countries will engage in dialogue with Danish private sector companies in order to assess market barriers and feed this information into the ongoing activities of the programme. At the same time, the private sector will be informed of developments in the sector that may be of commercial interest.

3.1 Theory of change

The intervention logic of the DEPP relates to the theory of change framework set out in the guiding principles of the Climate Envelope. It suggests that interventions successfully resulting in strengthened policies and planning frameworks and in scale up of climate-relevant technologies, infrastructure and markets will result in GHG-emissions reductions (impact) in support for developing countries achieving low carbon, climate resilient development and being able to implement the Paris agreement, which is also part of the overall goal of the Climate Envelope.

The long term goal that the DEPP will contribute to achieving in 10-15 years is that the partnership countries are low carbon economies in compliance with their commitments to the global climate agreement. The development objectives of the four partnership country programs under the DEPP and the envisaged outcomes of the 10 Development Engagements (DE) are summarised in the below figure.

⁹ Summary of each partnership country programme and associated Development engagements is found in chapters 4-7.



The four countries are embarking on reforms of energy and climate policy, energy/power markets and structures and though the point of departure differs, they all demand knowledge, methodologies, technologies, and resources to efficiently pursue renewable energy and energy efficiency pathways for their energy sector development, as also confirmed through the previous Danish support.

The 10 Development Engagements is strategically anchored mainly with central government institutions and with power system regulators/operators, for the latter to work with them to resolve technical challenges following high penetration of variable renewable energy (such as wind and solar) into the power system.

The theory of change is that *if* Denmark, based on experience and expertise from the transition of Denmark's energy system within renewable energy and energy efficiency improvements in buildings- and industrial sectors, supports with TA and peer learning strengthening the capacity of partner institutions and feeds this into wider policy dialogues, *then* direct partner institutions will be strengthened to: i) generate convincing renewable energy and energy efficiency policy input for decision makers; ii) improve regulation, planning- and implementation frameworks combating barriers for increased use of renewable energy and energy efficiency improvements; iii) to better ensure renewable energy and energy efficiency regulation compliance and iv) to enable cost-efficient integration of variable energy into the national power systems.

The theory of change rests on the assumption that policy makers would be convinced about the merits of energy efficiency improvements and renewable energy compared with alternate sources, and not least would be ready to act accordingly to remove barriers and strengthen the framework conditions for renewable energy and energy efficiency investments. Results obtained from the previous cooperation with Mexico and China in particular supports the change theory suggesting that convincing policy input

generated with support from Denmark can be catalytic for policy making, central planning and strengthened compliance/enforcement of regulation on the ground. It is the assumption that such impact will also materialize in Viet Nam and South Africa. Still, poor political commitment in leadership to retain a low carbon development path through renewable energy and energy efficiency, to approve policy, strategies and plans and not prioritizing the necessary investment to implement the policies and plans, remains a risk in all partnership countries.

3.2 Programme and institutional risks to the DEPP

Following global risks were identified and found to be common across the DEPP. Further and more elaborated country specific risk assessments are found in each of the four country Partnership Programme documents. Also more country specific risks are highlighted in chapters 4 -7:

International fossil fuel prices decline significantly, decreasing the appetite for investing in renewable energy. A significant drop in fossil fuel prices would alter the economic outlook of energy sector investments because the price difference between otherwise competitive RE technologies and conventional fossil fuel based technologies could shift in favor of fossil fuels. The risk for the DEPP is however considered to be minor. This is primarily due to four reasons. First, global fossil fuel prices are already at a historic relatively low level. Second, RE production costs is expected to decrease even further over the coming decades and fossil fuel prices would therefore have to decline more than RE production costs for this to become a risk. Third, due to increased awareness of health associated impacts e.g. from coal combustion there is already a political push for clean air and thereby also clean energy production which may likely increase in some of the partner countries as the middle class is growing and increasingly pushing for clean air, clean water etc. Fourth, all four partner countries have expressed support for the Paris Agreement and its implementation as well as the subsequent need to transition to a low carbon energy sector.

The international economy goes into recession and the domestic economy is weakened. The economic situation is generally stable in all four partner countries, and although an international economic recession would have a significant impact, the DEPP is expected to be fully implemented and able to achieve its objective. The power sector is seen by partner countries to be an important driver of continued development and economic growth. In addition, the DEPP is focusing on cooperation and TA in order to enable a better utilization of the electricity being generated. The need for this will be even more urgent and relevant in a situation where the economic outlook is increasingly poor. Finally, it should be noted that for some partner countries, the financial forecast may be affected by political developments in neighboring countries, adding uncertainty to the overall economic outlook. Changes in this regard, and its impact on the DEPP, will be closely monitored by relevant Danish embassies.

Corruption is not uncommon in the four partner countries, ranked between 64 to 123 out of 176 countries on the Transparency International 2016-Corruption Perception Index. Nevertheless, since the budget of the DEPP will be controlled by Denmark, primarily allocated to the provision of TA, the impact of corruption on the programme is considered to be insignificant. Likewise, a clear explanation of the Danida anti-corruption policy will be part of all development agreements. In the policy dialogue, Danida's zero tolerance to corruption will be stressed as well as audits and programme monitoring will take the risk of potential corruption into account. Still, incidences of corruption associated with key partner institutions may affect implementation in terms of postponing planned activities. In Viet Nam, part of the leadership of Ministry of Industry and Trade, MOIT was accused for abuse of authority and the Minister was dismissed by the Party Central Committee in 2016. In China there is known recent incidences of top-level changes due to excessive use of public funds.

Staff turnovers and resource constraints with partner institutions may effect implementation. Demand is high for TA but some of the partners has high staff turnover, lack resources and/or are busy with other daily high

prioritized tasks with could cause delays in programme implementation. The risk will across the different countries be mitigated through a flexible approach to provision of technical input. The DEPP will continue to reallocate resources towards tasks and where the counterparts have highest demand and capacity to absorb TA-input.

4 Summary of Partnership Programme between South Africa and Denmark

4.1 Strategic considerations and justification

In 2014, South Africa was denoted as the 15th largest emitter of CO₂ in the world and is considered to be a significant global player in the follow-up and implementation of the Paris Agreement. The Government of South Africa recognizes 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. In its Nationally Determined Contribution, South Africa has committed to a peak in GHG-emissions between 2020 and 2025.

South Africa needs to grow its energy supply to support economic expansion. The power sector is the single largest emitter of CO₂, accounting for 50% of total carbon emissions. This is due to a high reliance on coal for electricity generation including through a large fleet of old and inefficient power plants that are coming close to their designed end-of-life cycles. Hence, investments in additional generation capacity are needed and government priority for expansion is to have a diversified power supply mix. The coal sector is important for the economy as reflected in the governmental energy plans and public investment plans, which also points to nuclear expansion and there is presently a political push at highest level for nuclear. While renewable energy does play a role too, in public investment plans and South Africa has launched very successful calls for renewables from independent power producers, there remains some hesitance towards renewables due to concerns over relative costs, displacement of coal-related jobs and security of supply.

Additional push for renewables comes from the local level including from some influential municipalities as well as from non-governmental sectors. Civil society and academia follow closely the developments around the choices for the future energy supply path and is engaging in the public hearings around public investment plans. Private sector energy companies are calling for removal of barriers preventing a level playing field for distributed generation.

Hence, it is interesting political times and Denmark's support could potentially be catalytic for policy choices for increased renewable energy and associated regulatory initiatives paving the way for additional renewable energy investments. The rationale of the partnership programme between Denmark and South Africa is that South Africa requests support for their power sector transition towards higher share of renewable energy in the supply mix, and that Denmark can contribute to this effort with experience and expertise from the transition of the Danish power system. The programme approach followed is on one hand to assist the policy and planning efforts and on the other hand to enable those implementation aspects in power system operation that contribute to a larger share of renewable energy, hence removing barriers and establishing better framework conditions. Danish companies are already engaged in the renewable energy sector in South Africa including with local manufacturing of components. Besides working for improved policy and regulatory framework conditions, the programme may be an entry point for them to demonstrate how Danish technology solutions can assist in the green transition.

The programme between South Africa and Denmark is based primarily on a partnership between the Danish Energy Agency (DEA), Department of Energy (DoE) and the state-owned power company ESKOM, both of which are partners in the existing phase of the Danish-South African cooperation.

The new programme is more focused on renewable energy and it is anchored with DoE in a way to maximize its input to strategic decision making including through the posting of an international advisor at the DoE as requested by the Directorate for Policy Planning and Clean Energy.

The DoE is the governmental agency responsible for national energy planning and inputs for policy making i.e. a comparable remit to the DEA. The agreed area of cooperation is on strengthening long range scenario and planning outputs of the DoE in particular to help develop convincing policy and planning input for renewable energy.

ESKOM is the vertically integrated state-owned electricity company of South Africa and as more variable energy comes on line ESKOM will in its capacity as system operator be challenged with accommodating larger shares of variable energy sources, such as wind and solar. The agreed areas of cooperation include advanced forecasting, thermal power plant flexibility, and how to avoid compromising grid stability when accommodating large shares of variable energy into the grid. These are all areas where Denmark has particular expertise to offer including through the Danish system operator.

In addition, the programme formulation consultations revealed request from government stakeholders for support in fields of grid codes, and other development partners confirmed the relevance of such potential support. Grid codes are technical regulations and one instrument for cost efficient integration of renewable energy and high flexibility of the power system. The National Energy Regulator of South Africa (NERSA) is tasked with proposing grid codes for the Grid Code Advisory Committee approval and the present programme supports NERSA with proposing enhancement of selected grid codes through assistance from the Danish system operator. NERSA did, however, not come on board as partner for a separate Development Engagement for the new programme and it was agreed with DoE to budget with some unallocated funds including for possibly support in fields of grid codes.

The partnership with DoE and ESKOM is on areas where other development partners are also engaged, in particular German support through GIZ, and it is therefore critical important to establish a close coordination with GIZ and maintain a highly flexible modality of the Danish support.

4.2 Results summary

The development objective of the wider partnership programme is that South Africa is in transition to a less carbon-intensive electricity production including through expansion of renewable energy generation. Fulfillment of this long term objective can be measured as the reduction in carbon intensity of electricity delivered to the national grid.

The achievement of the objective will be supported through two Development Engagements as follows:

- 1) Capacity Development for Energy Sector Planning with the DoE
- 2) Renewable Energy Integration into the National Power System of South Africa with ESKOM

DE1: Capacity Development for Energy Sector Planning

The particular objective of the first Development Engagement is the development of a less carbon intensive electricity sector by working with the DoE to develop more comprehensive energy planning capabilities. The targeted outcome is that “Recurrent planning processes and attached inputs are informed by even more consolidated data, forecasts, peer reviewed assumptions and additional long term policy and policy implementation scenarios for a less-carbon intensive electricity sector including through the expansion of renewable energy generation capacity”. The outcome indicator is that by end

of programme at least two policy planning inputs is delivered by the DoE with traceable merits to the Danish support, and subjected to dialogues with government stakeholders, academia, civil society, private sectors investors and other relevant stakeholders.

The Theory of Change is that by informing policy dialogues, and decisions on energy sector development through the use of factual based input, accurate policy implementation scenarios and long range forecasts of the energy and power system, policy makers and stakeholders can make decisions with greater certainty about key issues of concern around renewable energy integration. If the Danish support is successful, then DoE will get better data input for modelling and more comprehensive capacity to use modelling tools. This will lead to updated modelling results, either consolidating present or suggesting revised implementation pathways for achieving the policy objectives of the Government. For this eventually to lead to changes needed, if any, of the enabling environment for renewable energy investments, again depends on actual policy making as well as other factors beyond the programme, not least the wider political and economic context.

DE2: Renewable Energy Integration into the National Power System of South Africa

The particular objective of the second Development Engagement is the development of a less carbon intensive power sector by assisting ESKOM to integrate a larger share of renewable energy into the electricity grid.

The targeted outcome is “Enhanced power system ability to integrate the renewable energy generated in a cost effective way”. In operation of the power system, variable electricity generation such as from wind and solar generators must be given priority over electricity from fossil fuelled thermal power plants when generators are dispatch. Otherwise the renewable energy is lost (known as curtailment). Losses due to curtailment result in stranded costs and investments becoming riskier as producers cannot be sure that they will be able to sell the electricity. The outcome indicator for this engagement is ESKOMs ability to fully integrate all generated renewable energy measured as i) the level of curtailment by end of programme and ii) ability to minimize balancing costs.

The theory of change is that by assisting ESKOM with knowledge and expertise to operate the power system with a higher degree of flexibility and cost-efficiency, and providing tools and methodologies to do accurate renewable energy generation forecasting, then South Africa will be able to integrate larger shares of renewable energy into the power supply in a cost-effective way as new capacities comes on line. For this to materialize, however, changes are required, including: coal power plants needs increased flexibility and protocols needs to be developed for cost-efficient integration of thermal power production in the dispatch operation under conditions of high renewable energy generation; stability issues caused by large share of variable generation are resolved; economic/market incentives exists to support recovery of additional costs of operational flexibility of thermal power plants and; renewable energy is integrated more efficiently at national and municipal level, and in a cost-effective manner.

4.3 Programme and institutional risks in South Africa

In addition to the global risks (ref. chapter 3.3), following risk is particular important to monitor.

If electricity generation from coal and nuclear emerges as even more significant part of the energy mix for South Africa’s energy policies than suggested presently, it may reduce the impact of the programme. The programme may be impacted by this if the Development Engagement partners divert resources toward these alternate technologies leading to a slowdown in the expansion of renewable energy integration into the grid. Continued dialogue with Government and support to engagements on renewable energy modelling scenarios showing benefits on integrating renewable energy and 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 as central plans (the Integrated Resource Plan for power sector investments) is being updated. At the same time, 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 Danish support and will serve to reduce this residual risk to minor.

4.4 Outcome level budget

Table 2 Outcome budget Partnership Programme between South Africa and Denmark

Development Engagement Outcome	DKK million
DE1: Capacity Development for Energy Sector Planning	10.3
DE2: Renewable Energy Integration into the National Power System	5.2
Unallocated funds	2.7
Total	18.2

It has been decided to dedicate 2.7 million DKK as unallocated funds. These unallocated funds can be activated as appropriate by the Steering Committee established for the partnership programme for interventions that are in alignment with the overall objectives of the programme as agreed with the development partners. This includes for instance supporting capacity building for institutions working on grid codes such as NERSA. Unallocated funds could also be committed to scaling up already planned activities including i) promoting a policy agenda of interest to both Denmark and South Africa such as integration of distributed energy or ii) supporting a strategic intervention to stimulate implementation of a strategy, policy or plan related to the two agreed outcomes for the partnership.

A proposal to activate the unallocated funds should be submitted to the Steering Committee prior to the mid-term review. This would leave at least 1.5 year for implementation. The proposal should be drafted and quality assured by the Management Group before presenting to the Steering Committee for approval. Appraisal of the proposal should follow procedures described in the Danish Aid Management Guidelines.

5 Summary of Partnership Programme between Mexico and Denmark

5.1 Strategic considerations and justification

Mexico is known to be pro-active in international climate and energy dialogues, including in the Latin America and Caribbean Region. Mexico has a wide range of federal climate and energy policies that include targets for energy and for climate change mitigation and are supported by plans and strategies. Since the year 2000, Mexico has published three National Strategies on Climate Change and in 2009 adopted its first Special Programme on Climate Change. In 2012, the General Law on Climate Change was approved, and made Mexico the first developing country to have a comprehensive law on this subject.

Mexico ratified the Paris Agreement in September 2016, and was the first developing country to present its INDC in March 2015. In this, Mexico is committed to reduce unconditionally 22% (below business-as-usual) of its GHG emissions in 2030. Net emissions is stipulated to peak in 2026, thus decoupling GHG-emissions from economic growth and reducing emissions intensity per unit of GDP by around 40% from 2013 to 2030. The commitment to reduce GHG-emissions by 22% could according to the NDC, increase up to a 36% in a conditional manner, subject to a global agreement

addressing inter alia international carbon price, carbon border adjustments, technical cooperation, access to low-cost financial resources and technology transfer, all at a scale commensurate to the challenge of global climate change. The NDC has no specific target for clean energy, but the peaking of net emissions inevitable requires significant mitigation in the energy sector. How the commitment translates into renewable energy and energy efficiency is yet to be analyzed in detail.

The energy sector is the second largest source of GHG-emissions, after transport, not least due to high dependency on fossil fuels. Fossil fuels are the main sources of primary energy supply (91%), and 80% of electricity is generated from fossil fuels.

Mexico has begun a comprehensive reform of the entire energy sector. This includes structural changes in the market and grid, as well as changes of roles of former state-owned companies, and authority among public entities. The wide-ranging reform involves all actors on the energy market and large investments are needed that affect the Mexican energy sector decades ahead.

The Danish support has been catalytic already: Mexican partners were able to commit substantial co-funding to the WindAtlas supported by Denmark and is likely also going to secure domestic funding for the finance for an incentive scheme to spur energy savings in large companies building on merits of the present Danish support. Thirdly, Mexican partners were recently successful in receiving international climate finance for detailed design of an implementation programme for climate change mitigation investments in the Mexican sugar industry, the underlying analysis and funding application prepared under the present program.

As with the present program, the new programme is based on partnerships between the DEA and key Mexican partners Ministry of Energy (SENER) and Ministry of Environment and Natural Resources (SEMARNAT) and selected subordinate entities. The three fields of cooperation continues to be renewable energy, energy efficiency and climate change, but more focused and in areas where there is a need for further support or areas where outputs from the present programme are now moving into actual implementation, which requires another kind of support.

SENER and SEMARNAT are the ministries responsible for policy development and planning aspects in energy and climate. Positive results from present cooperation includes analyses of numerous scenarios serving as input to: Mexico's work with an energy transition strategy; the SENER's Renewable Energy Outlook and; SEMARNAT's work on INDC enabling Mexico to submit its INDC as the first developing country. The work with the key government institutions is agreed to continue to further improve models and modelling input, and further support is planned for the translation of modelling outputs to actual policies, with pilot actions at state level, and dialogues with public and private stakeholders.

The creation of a biomass baseline and roadmap was part of the previous programme period, and will continue, however, more focused and in more detail, in order to improve knowledge of bioenergy resources, and to show that bioenergy resources can also be part of the renewable energy expansion. CENACE (National Centre for Control of Energy) who is responsible for the operation of the transmission system and of balancing supply and demand, and hence the key institution in the integration of renewable energy into the power system, request continued support from Denmark with grid reliability and security of supply, including from the Danish transmission system operator.

CONUEE (National Commission for Energy Efficiency) is the governmental agency responsible for improved energy efficiency and with some comparable remit to the DEA. The existing programme has resulted in some very successful pilots. For buildings, cooperation with three states on enhancing enforcement of building codes and energy efficiency demand is ongoing, and it is agreed to expand this

work under the new programme. The work with larger companies on energy efficiency has resulted in implementation of energy management systems in all participating pilot companies. This will serve as good examples for the roll out of a pilot incentive scheme for energy management system in large companies under the new programme. Data handling and modelling becomes increasingly important, also with respect to energy efficiency, and not least due to the recent governmental energy efficiency target, and the new programme will support CONUEE in collecting and handling data, and prepare and use it in subsequent modelling exercises.

Private sector involvement is obvious in some of the activities foreseen, such as the bio energy activity and the activity with energy efficiency in industry. Both activities will create interest and demand for more efficient technical solutions. First steps to involve Danish private sector has been taken in collaboration with the Danish Embassy in Mexico but more engagement is expected.

The partnership with SENER and SEMARNAT is on areas where other development partners are also engaged, in particular German support through GIZ, but also IEA, UK support and support from the US are present at the Mexican partners. However, most often specific areas of cooperation and implementation modalities differ, but overlaps should be avoided through donor coordination, supported by the highly flexible and demand responsive modality of the Danish support.

5.2 Results summary

The development objective of the wider partnership programme is that Mexico is in transition to decouple carbon emissions from economic growth through cost-efficient mitigation actions.

The achievement of the objective will be supported through three Development Engagements as follows:

- 1) Efficient integration of additional renewable energy in the power sector with SENER
- 2) Increase efficiency in the use of energy with CONUEE
- 3) Support to climate change mitigation measures with SEMARNAT.

DE1: Efficient integration of additional renewable energy in the power sector with SENER

The targeted outcome of the first Development Engagement is that additional renewable energy is efficiently being integrated in the power sector in line with the clean energy goals in the Energy Transition Law. The outcome indicator is the share of clean energy in the energy mix by end of programme at 27%.

The outcome is targeted by assisting SENER in developing more comprehensive energy planning capabilities that encompass the efficient deployment and integration of renewable energy technologies and to pave the way for a potential larger role of biomass in the power supply mix. The Development Engagement will also assist CENACE to integrate a larger share of RE into the electricity grid by (i) developing best practices on transmission grid planning, including technical grid analysis, cost/benefit analysis and investment criteria, and (ii) increase reliability and efficiency in the operation of the electricity system, including enhanced forecasting of renewable energy generation.

The Theory of Change is that by influencing and supporting the policy and planning process of the Government of Mexico and by demonstrating the feasibility of biomass in the power supply mix, renewable energy in the energy mix of the country will increase. Also, by strengthening CENACE's capacity to integrate renewable energy into the grid, developing CENACE's knowledge and capacity to operate the power system with a higher degree of flexibility and cost-efficiently, Mexico will be able to integrate larger shares of renewable energy into the power supply.

DE2: Increase efficiency in the use of energy with CONUEE

The outcome is that efficiency in the use of energy is increased in line with the energy efficiency targets of the Energy Transition Law. This is targeted by assisting CONUEE in: developing and setting-up a long term scheme targeting industrial energy efficiency, and in implementation of a test incentive scheme financed by Mexican resources and based on voluntary agreements with high energy intensity industries; engaging states and municipalities in applying and enforcing EE standards in buildings; and in end-use data acquisition and modelling so that it can suitably inform the political choices in the country.

The Theory of Change is that (i) by targeting the energy use in intensive energy using industries through implementation of a pilot incentive scheme based on implementation of energy management systems through engagement in voluntary agreements, and design and management setup for a long term scheme (ii) by supporting a number of show-case municipalities in applying and enforcing the federal EE codes and laws at local level, (iii) by helping disseminate exemplary cases of EE implementation and lessons-learned to a wider audience in the relevant sectors, (iv) by helping establish some local capacity in the private sector to implement EE measures in buildings, and (v) by strengthening the capacity of CONUEE in acquiring data and modelling end-use EE in several sectors, then a reduction of the energy intensity of the economy can be achieved.

DE3: Support to Climate Change Mitigation Measures with SEMARNAT.

The outcome is that Mexico has identified and initiated additional national and sub-national measures to reach un-conditional climate target and identified most cost-efficient pathway to achieve conditional targets in line with the NDC targets. This Development Engagement targets both the policy level (SEMARNAT), and the modelling tools (models) (at National Institute of Ecology and Climate Change (INECC). At the policy level, enabling conditions are created to achieve the climate change mitigation goals and targets, through development of an implementation plan and subsequently a portfolio of actions that ultimately will show where increased mitigation ambition of the government can be delivered. Some of the selected measures and actions will be tested in selected state(s) to assess real value. The Development Engagement also supports the establishment of the enabling tools (models), the use of appropriate data to define scenarios and calculate costs of the mitigation measures and the elaboration of supporting technical studies at INECC. On the basis of improved knowledge of data and technical studies, communication to selected states and public/private stakeholders on actions and measurement will take place. INECC is under the authority of SEMARNAT, and SEMARNAT will be the responsible development partner.

The Theory of Change related to climate change mitigation with SEMARNAT/INECC is that (i) by supporting the SEMARNAT to increase its ambition level concerning GHG emissions reduction and having an updated National Strategy on Climate Change (ENCC), (ii) by developing a NDC implementation plan and an portfolio of actions and projects for GHG reducing measures, (iii) by ensuring that NDC measures is implemented using quality data, and by testing measures and actions in selected state(s) and engage in direct dialogue with selected states on specific actions and methods, then this Development Engagement can indirectly contribute to the reduction of GHG-emissions as stated in the NDC.

5.3 Programme and institutional risks in Mexico

In addition to the global risks (ref. chapter 3.3), following risk is particular important to monitor.

Presidential election in 2018 might result in the change of the governing party. The risk here is if government commitment for the low carbon development path will diminish following the election. This risk is minor as existing laws that govern the sectors where the DEA intervention takes place and

the commitment to pursue a low carbon development path had the support of all major parties in the parliament. However, a new governing party may result in changes on positions within the institutions partners that presently are highly supportive to the cooperation.

5.4 Outcome level budget

Table 3 Outcome budget Partnership Programme between Mexico and Denmark

Development Engagement Outcome	DKK million
DE1: Additional renewable energy is efficiently being integrated in the power sector in line with the clean energy goals in the Energy Transition Law	12.6
DE2: Efficiency in the use of energy increased in line with the energy efficiency targets of the Energy Transition Law	10.1
DE3: Mexico has identified and initiated additional national and sub-national measures to reach un-conditional climate target and identified most cost-efficient pathway to achieve conditional targets in line with NDC targets.	11.3
Total	34.1

6 Summary of Partnership Programme between China and Denmark

6.1 Strategic considerations and justification

In 2006, China surpassed the U.S as the world's largest emitter of CO₂ and is therefore considered to be the most significant global player in the follow-up and implementation of the Paris Agreement. China has set forth clear targets for both renewable energy and energy efficiency and in its Nationally Determined Contribution, China has committed to peak in GHG-emissions around 2030 and to reduce energy intensity by 60-65% in 2030 compared with the 2005-level. But China is still faces challenges with setting targets that are in line with a 2 degree world scenario.

The power sector is the single largest emitter of CO₂ and manufacturing industries the second largest. This is due to a high reliance on coal for electricity generation and for steam and heat in industrial processes. While the coal sector is important for the economy, air pollution is a strategic concern, and Chinese authorities has put a cap on coal consumption and restricted construction of coal fired production units.

Renewable energy is an important emerging industry for China, but although deployment of renewables are progressing rapidly, efficient utilisation is facing technical and institutional barriers that represent missed opportunities for CO₂ and other emissions reductions as well as an economic loss for the Chinese society. In some government ministries/agencies including departments within the National Energy Administration (NEA) and in some provinces there remains hesitance towards renewables due to concerns over relative costs, displacement of coal-related jobs and security of supply.

Denmark's support could potentially be catalytic for policy choices for increased renewable energy and energy efficiency and associated regulatory initiatives paving the way for additional and more cost-efficient investments. The rationale of the partnership programme between Denmark and China is that China requests support for their energy sector transition towards higher share of renewable energy in the supply mix, and that Denmark can contribute to this effort with experience and expertise from the transition of the Danish energy system. The programme approach followed is on one hand to assist the policy and planning efforts at China National Renewable Energy Centre (CNREC) and the National Energy Conservation Centre (NECC) and on the other hand to enable those implementation aspects that contribute to a larger share of renewable energy and increased investments in energy efficiency, hence removing barriers and establishing better framework conditions. Danish companies are already

engaged in the renewable energy and energy efficiency sector in China including local manufacturing of components. Besides working for improved policy and regulatory framework conditions, the programme may be an entry point for them to demonstrate how Danish technology solutions can assist in the green transition.

The programme between China and Denmark is based primarily on a partnership between the DEA, CNREC and NECC, both of which are partners in the existing phase of the Sino-Danish cooperation. The new programme builds on the successes of the present cooperation, but with a stronger focus on utilization of the models and research methodologies developed with CNREC to perform sector specific analysis and with extended support focusing on local/regional level decision making on renewable energy for heating and utilization of excess heat from industries for district heating with NECC. Additionally, the new programme will provide an international Long-Term Advisor, based at CNREC but working half-time with NECC, to strengthen the programs input to strategic advice on energy efficiency and sustainable district heating.

CNREC is a research centre and think tank for policy research on renewable energy, established in 2012 with support from Denmark. CNREC is part of the Energy Research Institute under the cross-sector planning Ministry – the National Development and Reform Commission (NDRC) - and it provides the NEA with research results for energy planning and energy administration.

NECC has broad influence on energy conservation in China because it is affiliated to NDRC's, Department of Resources Conservation & Environmental Protection directly. So NECC has priority to get national information and data, and also has the power to reflect their research result in the policy suggestions to policy makers. Besides, channels for wider results dissemination and outreach is in place as there are Energy Conservation Centres at provincial level (45), at municipal level (300) and at county level (more than 1700).

The partnership with CNREC and NECC is on areas where other development partners are also engaged, but implementation modalities differs and overlaps are being avoided through coordination and due to the highly flexible and demand responsive modality of the Danish support. Coordination between donors is an integrated part of the overarching research programme of CNREC the Danish support is part of, and donor coordination is furthermore a well-defined task of the Danish Embassy in Beijing.

6.2 Results summary

The objective of the wider Energy Partnership Programme between China and Denmark is that China is in transition to a less carbon-intensive energy sector including through increased share of renewable energy and sustainable district heating. Fulfilment of this objective can be measured as the development in the share of renewable energy in the power supply mix and the energy intensity of sectors targeted.

The achievement of the objective will be supported through two Development Engagements as follows:

- 1) Transformation of the Chinese Energy System with CNREC
- 2) Energy Efficiency with NECC

DE1: Transformation of the Chinese Energy System

The particular objective of this Development Engagement is the development of a less carbon intensive energy sector by working with CNREC to develop convincing renewable energy policy and planning input for Chinese policy makers. The targeted outcome is that: “Energy policy assistance and

analyses is provided to relevant policy makers (NEA, and NDRC) showing clear pathways for setting more ambitious renewable energy targets in the 14th FYP (five-year-plan).” The outcome indicator is that by end of programme CNREC has delivered scenarios and sector specific analysis for the 14th FYP for energy.

The theory of change of DEA’s engagement with CNREC is essentially linked to the Centre’s strategic position and ability to feed into policy development and planning, including power market reform processes in China. If CNREC convincingly advocates the rationale behind increasing renewables shares in the Chinese energy mix; and sets out evidence for sound renewable energy development pathways to NEA and NDRC as the executing agencies; then the high-level decision makers will support increasing renewable energy targets and other necessary policy adjustments to ensure effective integration of variable renewable energy power in the next Five-year-plan, the main instrument in the Chinese policy making process at the national level. The resulting greater use of energy generated from renewable energy will contribute directly to reducing CO₂-emissions.

DE2: Energy Efficiency with National Energy Conservation Centre

The particular objective of the second Development Engagement is the development of a less carbon intensive district heating- and industrial sector by working with NECC to develop a more efficient planning- and implementation framework. The targeted outcome is an: “Enabling environment that is more conducive for development of sustainable district heating systems including through utilisation of industrial excess heat”. The outcome indicator is that by end of program, NDRC has adopted recommendations provided by NECC for district heating planning including utilisation of excess heat from industries.

The theory of change is that by informing central policy decisions through evidence of economic and environmental benefits of more sustainable district heating, NDRC can make decisions with greater certainty about key concerns such as the economic costs of phasing out of coal in district heating and industries, and the environmental costs associated with the sector’s coal consumption.

Furthermore, by strengthening NECCs capacity in generating convincing policy and planning input for sustainable district heating, NECC can successfully influence local level planning frameworks to consider sustainable alternatives for investment decisions. Sustainable district heating solutions will expectedly more often become the preferred solution chosen by local level decision makers for implementation.

6.3 Programme and institutional risks in China

In addition to the global risks (ref. to chapter 3.3) following risk is particular important to monitor.

Lack of ownership to the cooperation from key partner institutions. There is potentially a minor risk of diminished support from Chinese top-level leadership arising from upcoming retirement of key-persons at China's NEA, the NECC and the Energy Research Institute, key-persons who are all strongly supportive of the Sino-Danish cooperation. The risk, however, is considered to be minor, not least because CNREC already has been appointed to undertake specific tasks with regards to the 14th FYP that are also in line with the objectives of this programme. Further, DEA will do targeted work towards anchoring the work and results within the Chinese system. This effort would be increased in case any signs of diminished support are identified.

6.4 Outcome level budget

Table 4 Outcome budget Partnership Programme between China and Denmark

Development Engagement Outcome	DKK million
DE1: Transformation of the Chinese Energy System	19.1
DE2: Energy Efficiency with National Energy Conservation Centre	6.1
Total	25.1

7 Summary of Partnership Programme between Viet Nam and Denmark

7.1 Strategic considerations and justification

Viet Nam has seen an impressive 6.5 pct. average economic growth for 25 years. Political and economic reforms have transformed Viet Nam from one of the poorest nations in the world to a middle-income country within a quarter of a century. Growth has been equitable - with a dramatic reduction in poverty - and social outcomes have improved significantly such as securing electricity supply to almost all households.

Viet Nam is proactively implementing climate change response activities, developing a low-carbon and green economy. National efforts are a reflection of the fact that the Government considers climate change response a crucial issue. Security of supply is also a driving factor for Viet Nam's policies towards reduction of fossil fuel use. Viet Nam has recently become a net importer of coal, oil reserves are being depleted and are expected to drop significantly in the next 5 years and natural gas production has peaked, such that Viet Nam will need to start importing Liquid Natural Gas beginning in 2023.

Viet Nam has ratified the Paris Agreement and in its NDC Viet Nam has committed to a GHG reduction of 8% compared to the business as usual scenario by 2030. The reduction could be up to 25 % if Viet Nam receives international support. Viet Nam believes its contribution is fair and ambitious, feasible and achievable, however especially the target of 8% reduction by own resources is perceived by some observers as relatively modest. At present, expectations based on the current power sector development plan is that the share of electricity output from coal-fired plants (33.4 percent in 2015¹⁰) is expected to increase to 49.3 percent in 2020 and 53.2 percent in 2030¹¹.

The Renewable Energy (RE) Strategy of 2015 constitutes the key policy document on renewable energy promotion. The renewable energy strategy sets overall RE targets to increase the total production and use of RE sources from approx. 25 million tons of oil equivalent in 2015 to 138 in 2050. In addition, the strategy sets a number of technology specific targets for certain RE technologies.

If Ministry of Industry and Trade's (MOIT) proposal to the prime minister on approval of the National Target Programme on Energy Efficiency for the period 2016 – 2020 is approved Viet Nam will set a target to achieve saving aims to at least 7% reduction of energy consumption in energy-intensive industries.

MOIT is already partner in the existing phase of the energy cooperation between Denmark and Viet Nam, and is the governmental agency responsible for state management of industry and trade including the energy sector as a whole and the production and distribution of electricity, renewable energy, oil and gas. MOIT is also responsible for coordination with relevant ministries in issuing norms and

¹⁰ Report on revision of national power development plan for period 2011-2020 with vision to 2030, Institute of Energy

¹¹ Decision No. 428/QĐ-TTg on revision of Power Development Plan VII.

technical regulations on energy use for industries. The partners to DEA for the new programme are as follows:

- The planning department of the General Directorate of Energy at MOIT which has responsibility for updating the Power Development Plan, a mechanism to guide stakeholder input into power policy development;
- The Electricity Regulatory Authority of Viet Nam (ERAV) which has responsibility for “the functions of regulating the electricity activities and power market”; and,
- The Department of Science, Technology and Energy Efficiency at MOIT, which has responsibility for leading the implementation of Viet Nam Energy Efficiency Programme and the energy efficiency and conservation laws, decrees, and regulations on energy use for industries.

DEPP will build on the successes of the on-going cooperation, using experiences on barriers for EE in industry in Viet Nam to strengthen the EE implementation framework in industry, further develop the capacity for energy modelling and planning and as a new component develop the capacity for integration of solar and wind into the power system.

Energy sector is of great interest to several development partners with well-funded programmes on-going and planned. There are more needs in the sector than what is provided by the development partners combined and overlaps are being avoided through coordination. Moreover, the Danish modality of the Danish support is highly flexible and demand-responsive.

7.2 Results summary

The objective of the wider Energy Partnership Programme between Viet Nam and Denmark is that most cost-effective opportunities for low carbon transition in energy system are more widely adopted throughout Viet Nam. This objective is in alignment with Viet Nam’s Plan for Implementation of the Paris Agreement and the Viet Nam National Green Growth Strategy.

The achievement of the objective will be supported through three Development Engagements as follows:

- 1) Capacity Development for long-range energy sector planning
- 2) Capacity Development for Renewable Energy Integration into the Power System
- 3) Low carbon development in the industrial sector

DE 1: Capacity Development for long-range energy sector planning with MOIT, Planning Department of the General Directorate of Energy

The particular objective of the development cooperation among the parties is that Viet Nam’s energy system is more sustainable through implementation of cost-optimized policy and planning by assisting the MOIT energy planning department to commission, develop, and analyse comprehensive long-term energy scenarios. The outcome indicator is that consultations among stakeholders and decision makers on the future development paths of the energy sector are based on the Energy Outlook Report and the comprehensive scenario analyses.

The intended outcome is that “Recurrent planning processes and associated inputs are informed by more consolidated data, forecasts, peer reviewed assumptions and additional long range policy and policy implementation scenarios for a less carbon-intensive energy sector, including through the expansion of RE-generation capacity.” The outcome indicator is that by end of program, long-term cost-optimized scenarios are used for informing policy dialogue and policy preparation on sustainable

energy systems.

The Theory of Change is that if the General Directorate of Energy is capacitated to present evidence-based policy options to decisions makers based upon solid long-term modelling results, more ambitious policies can be implemented as described in the NDCs including more ambitious targets. The results of the analyses will be interpreted in an Energy Outlook Report (EOR) which will be disseminated to stakeholders and constitute a platform for policy dialogue. The outputs will be able to feed into the updates of the Power Development Plan, thus contributing to the implementation of the Renewable Energy Strategy by General Directorate of Energy and potentially facilitate decisions on using subsidies, pricing and other policy measures to ensure that the respective returns on investment in RE and fossil fuel based power matches their socio-economic value including CO2 costs.

DE 2: Capacity Development for Renewable Energy Integration into the Power System with ERAV

The particular objective of the second Development Engagement is efficient integration of renewable energy into the Viet Nam power system by supporting ERAV in strengthening the capacity of National Load Dispatch Centers and Power Corporations to integrate the increasing share of variable RE in the power system. The targeted outcome is “Enhanced power system ability to integrate the renewable energy generated in a cost effective way.

The theory of change related to the Development Engagement with ERAV is that by enabling system operators and power market participants to make more accurate forecast of electricity supply and demand and by facilitating that the power system is flexible they will be able to effectively integrate fluctuating production from wind and solar with regard to the ability to maintain demand and supply in constant equilibrium and hence avoiding blackouts. For this to materialize, ERAV is assisted to build capacity with power system participants for them to develop and implement supportive measures for engaging auxiliary services and for them to do more accurate forecasting.

DE 3: Low carbon development in the industrial sector with MOIT, Department of Science, Technology and Energy Efficiency

The particular objective of the third Development Engagement is that the most cost-effective opportunities for low carbon transition in industry are more widely adopted throughout Viet Nam.

The targeted outcome is “A strengthened implementation framework for provincial level to target the most cost beneficial opportunities for low carbon development in industry and a more coherent and consistent national level regulatory framework contributing to industrial low carbon policy”. The outcome indicator is that by end of programme, revised legal/regulatory instruments (circulars, decrees, Ministerial decisions, guidelines, reporting templates) are issued or pending approval by legislators as required and/or implemented in at least one province.

The theory of change is that if evidence of the cost effective opportunities for energy savings in industry is compiled and combined with a better understanding of the challenges that exists related to enforcement of existing laws and regulations that aims to promote energy savings this will help in generating a consensus among key stakeholders on policy and legislative change needed to support low carbon transition. The consensus will then be used to assist the redrafting of selected, high impact national regulatory instruments that addresses weak spot in the current framework where there is a large potential for energy conservation and to help the General Directorate of Energy work with the target provincial stakeholders to draft legal instruments, guidelines, enforcement strategies and templates that will increase compliance. The piloted regimes can then be adjusted based on initial

results and rolled-out to the rest of the country. This roll-out is achieved by implementing a capacity development plan aimed at the DOIT which is to be executed by General Directorate of Energy. As a result, compliance rates with the legal requirements will increase.

7.3 Programme and institutional risks in Viet Nam

In addition to the global risks (ref. chapter 3.3), following risk is particular important to monitor.

Government of Viet Nam may restructure MOIT and reallocate responsibilities of renewable energy and energy efficiency, or may alter energy efficiency law with less ambitious targets. The Government is in a process of making MOIT more streamlined and fit for purpose. The process is on-going and indications show a continued institutional priority of renewable energy and energy efficiency. Also the Government is in revising the law on energy efficiency, but the outcome is expected to not change policy ambitions immensely. The programme is designed flexible and the outputs and outcomes of the programme will remain valid regardless of institutional anchor. Capacity development is related to functions that would need to be carried out also in a restructured institution. The residual risk is minor.

7.4 Outcome level budget

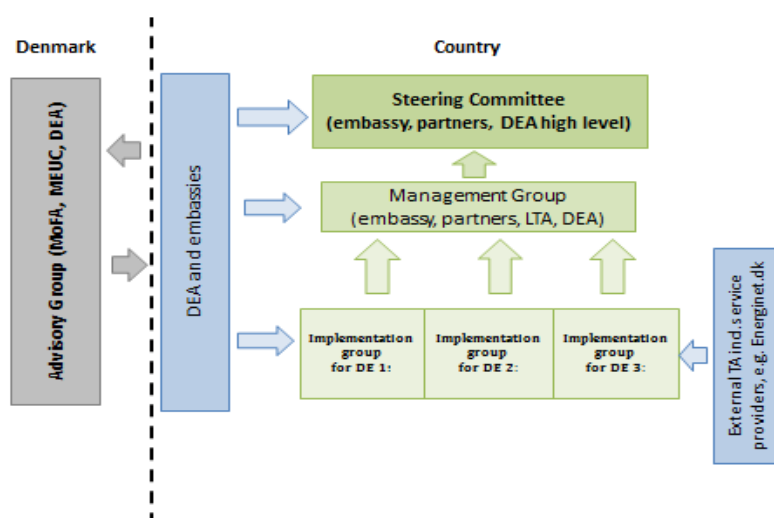
Table 5 Outcome budget Partnership Programme between Viet Nam and Denmark

Development Engagement Outcome	DKK Million
DE1: Vietnamese energy policy and planning is strengthened	8.4
DE2: Enhanced power system ability to integrate the renewable energy generated in a cost effective way	5.9
DE3: Strengthened implementation framework for energy efficiency in industry	7.3
Total	21.6

8 Overview of management and organisational set-up for the DEPP

8.1 Management set-up

For each of the four partner countries, the parties have agreed to a management arrangement with the aim of ensuring an efficient implementation of the partnership programmes and the Development Engagements. The management setup in each country will largely follow the structure presented below, however, there will be deviations.



A Steering Committee will be established in each partnership country, except for China. The Steering Committees will be co-chaired between high-ranking official(s) from the Government agency(ies) engaged in the partnership programme and the Danish Ambassador (in South Africa and in Viet Nam)/or the DEA at senior management level with the Ambassador as observer (Mexico). In South Africa the steering committee members will additionally include high-level representation from ESKOM, Treasury; Department of Public Enterprises and DEA. The Steering Committee will meet once to twice per year to approve work plans, budgets and reports, and review annual progress. The Steering Committee should provide strategic guidance to the respective country partnership programme, discuss and resolve issues related to programme progress and decide on any reallocation of resources between Development Engagements in the country. Also the Steering Committee is a forum for high level policy dialogue on matters of relevance to the programme.

A Management Group will be established to coordinate and manage the entire partnership programme in each respective country. The Management Group will consist of representatives from the partner institutions at senior operational level, a DEA representative, EDK representative (in South Africa and Viet Nam) and the Long-Term Advisor. The Management Group follows progress, approve work plans with associate TA procurement plans to be reported to the Steering Committee (annual), advises the Steering Committee and is a forum for technical level policy dialogue. This group is expected to meet on a frequent basis and at least one time per year (varies from country to country) and have the responsibility to: i) consolidate and check annual and detailed biannual work-plans with associated technical assistance procurement plans against Development Engagement partners work-plans and budgets; ii) monitor and report performance progress at output level; iii) ensure cross fertilisation between engagements. The Management Group will report on programme development and acts as secretariat to the Steering Committee.

For each Development Engagement there will be established an Implementation Group to undertake daily management of engagement implementation. It will be composed by representative(s) from the Development Engagement partner, the EDK programme officer (in South Africa and Viet Nam), the international Long-Term Adviser (according to individual TORs for each Long-Term Advisor), and the DEA focal point and/or DEA technical expert(s) and other TA specialists as required. The Implementation Group will meet on a needs basis, and will: i) develop annual and detailed biannual work plans for the Development Engagement matching priorities in the partners work plans, ii) associated with the detailed biannual work plan determine need for national and international technical assistance inputs and develop of technical assistance procurement plans; iii) approve TORs developed and; iv) monitor and coordinate day-to-day progress of implementation.

For China there is no common Steering Committee and Management Group for the two Development Engagements, but each have their own Steering Committee (or equivalent) with high level participation from Chinese partner/stakeholder and DEA/EDK as well as an Management Group (or equivalent) with similar responsibilities as in the other countries including review and approval of annual work programmes and progress reports.

To oversee the overall DEPP implementation an Advisory Group will be established in Copenhagen with representation from MFA and MEUC. DEA will act as Secretary to the Advisory Group. The Advisory Group will meet at regular intervals to discuss programme progress and solicit cross-programme countries experience and to discuss opportunities from learning across partnerships. The Advisory Group will be responsible for decisions to spend unallocated programme funds, if any, based on the criteria set out below in chapter 9.

8.2 Implementation and Financial Management

Identification of TA needs

The parties to the Development Engagement are responsible for implementation of the Development Engagements with DEA being responsible for providing the necessary input contributed by Denmark. The agreed work plans will be executed through Terms of Reference (TORs) for technical assistance input designed to achieve the agreed outputs appearing from the Development Engagement documents. TORs are developed and jointly agreed to by representatives from both parties at the implementation group level.

Besides the input to be contributed by Denmark, including from DEA experts and the Long- Term Advisor(s) as relevant, each TOR will describe the role/responsibilities and in-kind contribution from local counterparts as relevant. For the input to be contributed by Denmark, the TORs will identify the TA needed based on the principles of a) national TA where relevant; b) DEA/experts from the Danish Transmission System Operator where peer advice is required, and; c) international specialists where dedicated specialist tasks will be needed. The TORs will furthermore describe duration of agreed missions/short term stay by international/Danish experts required to execute the assignment.

Accordingly, time spent by Danish TA experts from home-office versus the time spent with direct counterparts will be guided by agreed TORs. The in-country presence at the *overall DEPP level*, counting permanent presence in-country of long-term advisors and time spent with counterparts by DEA experts, will at the onset together amount to 52% (field/home ratio) and progress to 54% over the three year programme period. Deviations would be expected between the four partnership countries reflecting demand and absorption capacity of direct peers in the partner institutions and taken into consideration results of Mid-term reviews. In South Africa, the home/field ratio particular for DEA input during the inception period will be 50%.

TA from DEA and Procurement of TA

Procurement of TA (external to DEAs TA) will be carried out by DEA and follow EU procurement rules. DEA will based on tenders agree one or more framework contracts with international service providers to deliver TA for the programme including from pool of experts as relevant. The tenders will be structured according to thematic areas of service covering one or more of the four country partnership programmes. DEA will decide on number, thematic areas and geographical cover of such framework contracts no later than by end of the inception phase. All external TA including TA called-down from pool of experts will be governed by TORs as described above, and final selection of experts will be based on no-objection at implementation group level.

Procurement of local TA in South Africa and Viet Nam not covered by above will be carried out by the EDK in consultation with DEA and following Danish procurement rules for local procurement of TA. Agreed study tours in relation to the Development Engagements will be paid for by the DEPP. For South Africa and Viet Nam, 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 deposited into the participants' bank accounts by the EDK before following EDK procedures for appropriate documentation. Workshops and seminars in country will be paid for by DEPP through EDK, based on appropriate quotations approved by EDK and documented expenses.

DEA will coordinate own TA input in accordance with agreed work plans for each Development Engagement and derived TORs as described above. This includes arrangement of study tours from partnership countries to Denmark, and to other partnership countries as relevant. DEA experts will

jointly with the Development Engagement partners review deliverances from providers of external TA as basis for final approval of completion according to TORs.

Financial Management

At overall programme level DEA will be responsible for the financial reporting to the Advisory Group following the general financial procedures according to the Danida Aid Management Guidelines.

The Development Engagements in the programme will have no cash transferred or disbursed directly to the local Development Engagement partners. Hence, there are no requirements for accounting of funds and financial reporting at Development Engagement level.

Long-Term Advisors

In addition to national and international short term TA the DEPP will finance Long-Term Advisors to be placed in the relevant partner institutions in each country (two in Mexico) and may be assisted by a local consultant on a needs basis. Each country institution will arrange and finance office facilities. The Long-Term Adviser area of work has been agreed with the specific partner country. The Long-Term Advisor would also use any opportunity to encourage partners (as duty bearers) to ensure consultation of relevant Development Engagement outputs with right holders – Civil Society Organisation's, private sector investors and other relevant stakeholders. The Long-Term Advisor will also support integrated policy dialogues.

Recruitment of the Long-Term Adviser follows procedures of the Danish Ministry of Foreign Affairs (MFA). Representatives from the each partner institution hosting the Long-Term Adviser will be part of the recruitment panel together with representatives from DEA, and MFA or EDK.

Programme officers

In both Viet Nam and South Africa the Embassy of Denmark (EDK) will provide dedicated programme officer that will assist in coordinating and managing the programme implementation and facilitate inputs from Denmark. The programme officer will also participate in meetings of the Implementation Group, when relevant.

Inception phase and Implementation manual

An implementation manual will be developed for the entire management of the DEPP as part of the inception phase (three months) and will detail all levels of decision-making and procedures for implementation.

8.3 Overall monitoring of the DEPP

Daily progress on the Development Engagements will be followed by the Implementation Groups who will report progress towards outputs and outcomes of these engagements through biannual 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. The approved Annual Progress Report will be forwarded to the DEPP Advisory Group in Copenhagen. All reporting should, to the extent possible and when relevant, be disaggregated by gender, area, sector, etc.

Detailed indicators for each specific Development Engagement output will be revisited and potentially refined as part of the inception face, where annual targets, in line with already defined targets will be adjusted. Monitoring towards these targets will be reported through the quarterly progress reporting using a “traffic-light” system (detailed described in each Development Engagement):

As secretariat to the Advisory Board, DEA will consolidate the overall monitoring of progress against targets for each of the Development Engagements in the programme received from the country Management Groups approved by the Steering Committee. DEA will also have the overall responsibility for implementation of the DEPP's overall objective and report to MFA according to the monitoring guidelines for the Climate Envelope across all country engagements.

DEA will maintain an overall overview of the programme implementation across the four countries throughout the programme period, and be responsible for providing i) informing about any delays, deviations, irregularities or similar in DEPP implementation ii) consolidating progress and financial reports from the four countries and submit these to the Advisory Group, iii) activate and coordinate funds allocated for activities above country-level implementation, including mid-term reviews.

The 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 the mid-term review.

After the termination of the programme support the MFA reserves the right to carry out evaluation in accordance with this article.

Exit Strategy

As secretary to the Advisory Board, DEA is responsible for formulating an exit strategy at least six month before the programme ends based on input approved by the country Steering Committees.

8.4 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 Government of Denmark, a further consequence of any such practice can be the definite exclusion from any projects funded by the Government of Denmark.

9 DEPP budget

Table 6 Outcome level budget and overall budget lines

	DKK million	
Mexico		34.1
DE1: Efficient integration of additional renewable energy in the power sector with SENER	12.6	
DE2: Increase efficiency in the use of energy with CONUEE	10.1	
DE3: Support to Climate Change Mitigations Measures with SEMARNAT	11.3	
China		25.1
DE1: Transformation of the Chinese Energy System	19.1	
DE2: Energy Efficiency with National Energy Conservation Centre	6.1	
South Africa		18.2
DE1: Capacity Development for Energy Sector Planning	10.3	
DE2: Renewable Energy Integration into the National Power System	5.2	
Unallocated funds	2.7	
Viet Nam		21.6
DE1: Capacity Development for long-range energy sector planning	8.4	
DE2: Capacity Development for renewable energy integration into the power system	5.9	
DE3: Low carbon development in the industrial sector	7.3	
DEPP global level		16.0
Mid-term review, annual seminar, operational manual	2.5	
Administration	5.5	
Unallocated funds	8.0	
GRAND TOTAL		115.0

The outcome budgets include all costs, incl. TA and travels expenses.

Budget item ‘Administration’ covers: MEUC programme support; (administrative) support by DEA to LTAs (estimated 1.3 MDKK); procurement costs and DEA administration of consultant contracts (2800 hours). The administration budget is an estimated cap, in case of surplus, the Advisory Group will consider reallocations.

Funds have been set aside to a full-fledged mid-term review in accordance with Danida Aid Management Guidelines to assess progress in all engagements and advise on re-allocation at country level of resources between Development Engagements, if needed. The mid-term review should also focus on the level of time spend home and abroad by DEA experts. Furthermore the mid-term review should address the programmes overall ability to be flexible in response to the political context at country level as well as look into the specific results delivered by the overall programme.

It has been decided to dedicate 8.0 DKK million as unallocated funds. The unallocated funds could be activated by having any of the Country Steering Committees submit a proposal to the Advisory Group for approval if one of the following criteria is fulfilled:

- Dissemination of lessons learned across the partnership countries that would stimulate cross fertilisation (south-south dialog).
- Activating partnerships between Civil Society Organisation and academia on e.g. awareness, consultation, analysis, monitoring etc.

- Activities that will address barriers and opportunities to mobilise and leverage of funds from other sources or engage the private sector to be the benefit of both Denmark and the partner country.
- Promote a policy agenda of interest for both Denmark and the partner country e.g. accelerating implementation of a strategy, policy or plan developed as part of a Development Engagement.

A proposal to activate the unallocated funds should be submitted at least prior to the mid-term review. This would leave at a minimum of 1.5 year for implementation. Only proposals encouraged by both the DEA and the Development Engagement partners will be considered. The proposals should be drafted and quality assured by the secretariat to the country Steering Committee (the country Management Group) upon request of the country Steering Committee.

An approved proposal to activate the unallocated funds at overall program level should be submitted for processing and recommendations for the Advisory Groups approval. Unallocated funds could thus be activated at any time during the implementation period. Appraisal of the proposal will follow procedures described in the Aid Management Guidelines.

The application format for the unallocated funds will be developed as part of the inception phase.

Table 7 Technical Assistance delivered through the programme

	DEA	International	National	LTA
Man months ¹⁾	396	201	124	180
DKK Million ²⁾	32.8	32.0	7.1	21.0
% of total budget ³⁾	29	28	6	18

¹⁾ A LTA is assumed to deliver 12 man months per year. For the other types of TA-input, a man month is assumed to be 137.9 hours; ²⁾ Incl. travel and subsistence costs; ³⁾ 115 DKK million.

Annex A Results Framework

Energy Partnership Programme between South Africa and Denmark

Country Programme	Energy Partnership Programme between South Africa and Denmark
Thematic Programme Objective	South Africa is in transition to a less carbon-intensive electricity production including through expansion of renewable energy generation.
Impact Indicator	Tons of carbon dioxide equivalent (tCO ₂ eq.) reduced contributed to by the programme in South Africa

Development Engagement 1

Outcome	Recurrent planning processes and attached inputs are informed by even more consolidated data, forecasts, peer reviewed assumptions and additional long term 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 ¹² and IRP ¹³ 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

¹² Integrated Energy Plan

¹³ Integrated Resource Plan

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 ¹⁴ 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	

¹⁴ Renewable Energy Database and Information System

			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.

Development Engagement 2

Outcome			Enhanced power system ability to integrate the renewable energy generated in a cost effective way.
Outcome indicator			1) Capacity to effectively integrate RE into the grid. 2) RE generation uptake in the supply mix of South Africa.
Baseline	Year	2017	1) Limited capacity available to integrate all generated RE. 2) No significant curtailment with current level of RE integration
Target	Year	2020	1) ESKOM has the capacity to fully integrate all generated RE while at the same time minimizing the costs of the base load needed to balance the variable nature of the resource 2) No significant curtailment with the increased level of RE integration

Output 1			Operational flexibility of the national electricity system is enhanced The national electricity system is well prepared to integrate increased shares of fluctuating RE in the power supply in a cost-effective way, including through additional use of thermal power plants balancing services, dispatch operation under conditions of high penetration of RE generation and grid stability issues.
Output indicator			Ability to operate the power system to serve varying demand as well as supply load
Baseline	Year	2017	ESKOM is operating the power system primarily to serve a varying demand load and are able to integrate most of the produced RE generation at current penetration.
Target	Year 1 1.5	2018	ESKOM has identified tools to operate the power system in a way that may serve increasing amounts of varying demand and supply load when more RE is coming online. Financial incentive needed to integrate even more RE through thermal power plant balancing services is identified in close dialogue with ESKOM.
Target	Year 3	2020	ESKOM is able to operate the power system to serve varying demand as well as supply load as more RE is coming on line. Also, it is known what kind of financial incentive is needed to do this in a cost-neutral way.

Output 2			RE generation forecasting is improved ESKOM uses advanced tools and procedures for RE generation forecasting and dispatch of non-renewable generation.
Output indicator			Ability to do advanced forecasting more accurately
Baseline	Year	2017	ESKOM uses a 24h forecasting (or day-ahead) of the RE generation to plan the dispatch of non-renewable power

			plants.
Target	Year 1.5	2018	ESKOM is able to use hourly forecasting of RE generation based on real-time meteorological data.
Target	Year	2020	ESKOM is able to use hourly forecasting more accurately of RE generation by linking real-time weather data to forecasting models and can dispatch non-renewable generation in a cost-efficient manner.

Output 3		Integration of RE generation at distribution level is strengthened ESKOM's local distribution control centres including centres at municipal levels has developed operational frameworks that can efficiently integrate and operate variable generation at the distribution level without compromising grid stability	
Output indicator		Change in operational strategies as a result of training	
Baseline	Year	2017	Not applicable as training has not started. Small scale embedded generation not captured fully in the existing network
Target	Year 1.5	2018	Centres have developed new or revised their existing operating strategies due to training received. Percentage small scale embedded generation captured in the existing network measured in data acquisition systems
Target	Year	2020	No additional target for 2020, this output is in principle designed to be implemented in the first year of the DE.

Energy and Climate Partnership Programme between Mexico and Denmark

Country Programme	Energy Partnership Programme between Mexico and Denmark
Thematic Programme Objective	Mexico is in transition to decouple carbon emissions from economic growth through cost-efficient mitigation actions
Impact Indicator	Tons of carbon dioxide equivalent (tCO ₂ eq.) reduced contributed to by the programme in Mexico

Development engagement 1

Outcome		Additional RE is efficiently being integrated in the power sector in line with the clean energy goals in the Energy Transition Law.	
Outcome indicator		At least 27% clean energy in mix	
Baseline	Year	2017	20% clean energy in mix
Target	Year	2020	<ul style="list-style-type: none"> Expertise, initiatives and plans in place and providing support to the target for clean energy At least 27% clean energy in the power supply mix.

Output 1		Methodologies are established for renewable energy planning and planning capacity is strengthened. SENER uses improved methodologies in their planning	
Output indicator 1		SENER's planning dept., or a SENER approved entity, runs the energy model including the Balmorel model and is fully equipped to translate policies into model assumptions and vice-versa: to analyse the results of modelling and transform them into policy options.	
Baseline	Year	2017	<ul style="list-style-type: none"> SENER has limited capacity to do energy sector modelling.

			<ul style="list-style-type: none"> • UNAM has some capacity to do energy sector modelling. • REO¹⁵ is developed with support from others
Target	Year 1.5	2018	<ul style="list-style-type: none"> • SENER/UNAM¹⁶ has some capacity to integrate into the energy modelling the RE data with sufficient spatial refinement. • REO is actualized with minor support, and published
Target	Year 3	2020	<ul style="list-style-type: none"> • Model in place that more accurately represents the RE potential and regional distribution in Mexico. • SENER/UNAM integrates RE data with sufficient spatial refinement into the energy model. • SENER/UNAM run the model • REO is updated by SENER and published.

Output 2		MEMLAB established Coordination between institutions enhanced and a common centre for data and model maintenance Mexican Energy Modelling Laboratory (MEMLAB) established	
Output indicator 2		Platform for MEMLAB developed and in use	
Baseline	Year	2017	No platform exists, coordination fragmented
Target	Year 1.5	2018	Plan for MEMLAB, including aim, mandate, and plan for execution, developed
Target	Year 3	2020	MEMLAB established

Output 3		Biomass resources identified and assessed SENER has sufficient capacity to map, plan and deploy biomass resources and technologies for energy usage, within technologies where Denmark has distinctive competences.	
Output indicator 3		Consolidated Mexican biomass roadmap exists, that includes an implementation action plan and feasibility studies as well as a proposal for additional incentives to promote the increase of biomass in the energy mix.	
Baseline	Year	2017	No plan for deployment of biomass usage exists, neither for agricultural residues, such as straw, stalks and manure, nor for mixed organic residues from industries and waste water treatment plants.
Target	Year 1.5	2018	1-2 feasibility studies completed for the most promising selected technologies and biomass resources and an indication of possible, realistic incentives for further deployment is prepared together with SENER.
Target	Year 3	2020	Output indicator achieved

Output 4		Reliability and security of supply with variable RE in the power system improved. CENACE uses best practices developed on transmission grid planning and operation, and are able to effectively integrate variable RE in the electricity system.	
Output indicator 4		CENACE capable to ensure effective integration	
Baseline	Year	2017	CENACE has some capacity for RE integration.
Target	Year 1.5	2018	CENACE has improved its capacity for RE integration.

¹⁵ Renewable Energy Outlook

¹⁶ National Autonomous University of Mexico

Target	Year 3	2020	<ul style="list-style-type: none"> • The installed RE capacity is being exploited (very limited curtailment) • Security of supply at least at same level as situation in 2017 but now with more RE integrated • CENACE has capacity for handling RE integration.
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Development Engagement 2

Outcome	Efficiency in the use of energy increased In line with the energy efficiency targets of the Energy Transition Law.		
Outcome indicator	1.9% annual reduction of the intensity of final energy demand is reached.		
Baseline	Year	2017	Efficiency not measured as per the defined baseline
Target	Year	2020	Expertise at CONUEE, initiatives, plans and agreements in place and support the target for EE. 1.9% annual reduction of the intensity of final energy demand is achieved.

Output 1	Incentive scheme based on voluntary agreements for energy management systems in large energy consuming industries established and used CONUEE has approved voluntary agreement scheme for energy management including incentives for its wider scale implementation - and administrative setup in place		
Output indicator 1	Voluntary agreement scheme for energy management developed and functioning and incentives agreed for long term scheme		
Baseline	Year	2017	<ul style="list-style-type: none"> • Pilot scheme not yet rolled out • Little capacity to develop and administrate a Voluntary Agreement scheme at CONUEE • Information about the benefits of EE not adequately disseminated. • Limited know-how on international energy management systems among Mexican verifiers
Target	Year 1.5	2018	<ul style="list-style-type: none"> • Pilot scheme tested and evaluated • Long term scheme under development • Fiscal incentives analysed and agreed by key stakeholders. • Information about the benefits of EE adequately disseminated. • Training of relevant verifiers and business organizations well underway
Target	Year 3	2020	<ul style="list-style-type: none"> • Long term scheme designed and in place and set up approved by CONUEE • Voluntary agreements signed with at least 40 companies • Access to capable Mexican verifiers and businesses • Fiscal incentives in place.

Output 2	Energy Efficiency requirements for new buildings integrated into building codes and enforced. At least three states/cities enforce the building code		
Output indicator 2.1	At least 3 states/ cities have adopted EE standards in building codes after participating in workshops and training		
Baseline	Year	2017	<ul style="list-style-type: none"> • A limited number of states and municipalities are well in the process of implementing the federal standards at local level. • Limited dissemination of experiences with EE in buildings.
Target	Year	2018	<ul style="list-style-type: none"> • Two additional states and/or municipalities are well in the

	1.5		process of implementing the federal standards at local level.
Target	Year 3	2020	<ul style="list-style-type: none"> • A total of four states and/or municipalities are well in the process of implementing the federal standards at local level.
Output indicator 2.2		At least three states/cities enforce the building code	
Baseline	Year	2017	<ul style="list-style-type: none"> • Local enforcement of building codes still weak. • Not enough architects and engineers aware of EE potential in buildings.
Target	Year 1.5	2018	<ul style="list-style-type: none"> • Local enforcement of building codes in the municipalities that participated in previous programme is in place. • Training of trainers programme in place
Target	Year 3	2020	<ul style="list-style-type: none"> • The local building codes in the cooperating municipalities are enforced. • Through business associations, training of at least 100 relevant trainers - building experts - in applying EE measures in buildings in line with building codes.

Output 3		End-use EE model established and system for data acquisition in place, in areas where Denmark has a specific and unique knowledge, and which is related to other activities of the Partnership Programme. CONUEE uses data and model for reporting on development in energy intensity, as required by law, in selected areas	
Output indicator 3		Reporting takes place regularly	
Baseline	Year	2017	<ul style="list-style-type: none"> • Systematic gathering of EE data only limited • Limited capacity for end-use EE modelling • No regular reporting on energy intensity
Target	Year 1.5	2019	<ul style="list-style-type: none"> • Systems for gathering data designed and agreed • CONUEE has some capacity for EE end-use modelling and reporting.
Target	Year 3	2020	<ul style="list-style-type: none"> • CONUEE gather reliable EE data • CONUEE reports on progress in decreasing energy intensity • CONUEE uses EE end-use modelling and quantify effects of EE measures.

Development Engagement 3

Outcome		Mexico has identified and initiated additional national and sub-national measures to reach un-conditional climate target and identified most cost efficient pathway to achieve conditional targets in line with the NDC targets	
Outcome indicator		Measures supporting NDC identified and initiated	
Baseline	Year	2017	No additional measures in place
Target	Year	2020	Additional measures identified and actions agreed

Output 1		NDC actions defined and updated ENCC are developed to reach the ambition of 36% GHG-emissions reduction. SEMARNAT submitted ENCC and plan for actions developed with and approved by relevant international, national and local stakeholders based on implementation plan and subsequent list of actions and costs	
Output indicator 1.1		Identified and selected actors or areas committed to reduce GHG emissions	
Baseline	Year	2017	NDC exists and approved but no plan for increased ambition to 36% GHG-emissions reductions
Target	Year	2018	Implementation plan finalized and shortlist of areas that are

	1.5		selected for further analyses developed
Target	Year 3	2020	Plan for actions developed including assessment of costs
Output indicator 1.2		ENCC approved and published	
Baseline	Year	2017	ENCC from 2013 and needs to be updated to reflect eg. NDC
Target	Year 1.5	2018	ENCC under way and reflecting priorities of new government
Target	Year 3	2020	ENCC finalized and approved
Output indicator 1.3		Actual actions at state level supported and completed	
Baseline	Year	2017	Some actions at state level, but could be improved through more systematic approach with focus on most cost efficient actions to support the local, low carbon transition
Target	Year 1.5	2018	1 state engaged in planning for implementation of selected actions
Target	Year 3	2020	At least two actions agreed and implemented

Output 2		Modelling of NDC measures established and data quality improved. INECC models NDC and other measures with improved data	
Output indicator 2.1		INECC uses technology catalogues in planning and projections	
Baseline	Year	2017	Technology catalogue for biomass and transport only
Target	Year 1.5	2018	The two technology catalogue on renewable energy for distributed generation under development
Target	Year 3	2020	Technology catalogues developed and in use
Output indicator 2.2		INECC models NDC measures with improved data	
Baseline	Year	2017	<ul style="list-style-type: none"> Cost analyses not finalized Model runs with less reliable data, and with no specific technology paths included
Target	Year 1.5	2018	<ul style="list-style-type: none"> Implementation plan finalized with INECC input
Target	Year 3	2020	<ul style="list-style-type: none"> INECC models measures INECC has procedures for handling and maintaining the improved data
Output indicator 2.3		Identified and selected states, municipalities and other stakeholders committed to reduce GHG-emissions, and their technical capacities for mitigation actions has improved	
Baseline	Year	2017	Three states have been selected to enhance their technical capacities in climate policies and actions
Target	Year 1.5	2018	<ul style="list-style-type: none"> At least six states are engaged in improving Private stakeholders approached and engaged in dialogue
Target	Year 3	2020	<ul style="list-style-type: none"> Six states now have better knowledge and technical capacities for mitigation actions Private stakeholders involved in mitigation actions, with better knowledge of possibilities and implications

Energy Partnership Programme between China and Denmark

Country Programme	Energy Partnership Programme Between China and Denmark
Thematic Programme Objective	China is in transition to a low carbon economy through an increased share of RE and sustainable district heating

Impact Indicator	Tons of carbon dioxide equivalent (tCO ₂ eq) reduced contributed to by the programme in China
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Development Engagement 1

Outcome	Energy policy assistance and analyses is provided to relevant policy makers (NEA, and NDRC) showing clear pathways for setting more ambitious RE targets in the 14 th FYP		
Outcome indicator	CNREC has delivered scenarios and sector specific analysis for the 14 th FYP for energy.		
Baseline	Year	2016	13 th FYP still in force
Target	Year	2020	Draft 14 th FYP due 2020

Output 1	Ambitious RE scenarios and sector specific analysis published in CREO¹⁷ Ambitious RE long-term scenarios for China are generated and published in the CREO that includes identification of main barriers and effects on stakeholders of full RE penetration such as social, economic and environmental effects, and sector specific analysis of main barriers for RE deployment (e.g. RE for heating, offshore wind etc.)		
Output indicator	CNREC uses robust energy models that provide strong evidence base to inform policy making around an increased share of RE		
Baseline	Year	2017	Use of CNREC's model suite extended to analyse longer term scenarios including effects on stakeholders of full RE penetration in China Renewable Energy Outlook 2017.
Target	Year 1.5	2018	Use of model suite extended to analyse longer term scenarios including social, economic and environmental effects in CREO 2018. CNREC analyses specific RE sectors in China and provide policy advice in CREO.
Target	Year 3	2020	CNREC's use of the model suites for long-term forecasts and definition of sector specific targets was included in draft 14 th FYP

Output 2	Thermal Power Flexibility CNREC has presented to NEA and the power sector convincing evidence for a power system that can accept variable inputs without curtailment including suitable incentive systems for thermal plants to manage their output so as to accommodate variable RE inputs; technological and management solutions available to thermal plants to increase flexibility.		
Output indicator	CNREC has additional capacity in analyzing thermal power plants flexibility		
Baseline	Year	2017	Thermal power plants flexibility is not yet a fully developed field of research of CNREC
Target	Year 1.5	2018	CREO 2018 describes incentive systems for thermal power plants to accommodate RE inputs
Target	Year 3	2020	CREO 2019 and 2020 describe technological and management solutions for thermal plants to accommodate RE inputs.

¹⁷ China Renewable Energy Outlook

Output 3		Grid Development Strategies CNREC has established cooperation with grid companies and provides inputs to their grid development strategies using the research methodology and tools developed in the BRE-programme ¹⁸ .	
Output indicator		CNREC and grid companies have established cooperation on development of grid development strategies for RE integration	
Baseline	Year	2017	CNRECs research on grid development is insignificant
Target	Year 1.5	2018	CNREC and grid companies publishes a joint research report on RE integration
Target	Year 3	2020	CNREC has established cooperation with grid companies on their grid development strategies

Output 4		Wider anchoring of research results CNRECs results, presented in the CREOs, are recognized domestically and internationally and CNREC is a recognized center of excellence for research on transition of Chinese power system.	
Output indicator		CREO is recognized as the key publication on RE development in China, nationally as well as internationally.	
Baseline	Year	2017	CNREC has presented CREO 2016 at the International Transition Dialogue in Suzhou in China and at the Berlin Energy Transition Dialogues.
Target	Year 1.5	2018	CNREC has presented CREO 2017 and 2018 at high level national, international and multilateral fora and cooperates with multilateral organisations.
Target	Year 3	2020	CREO 2019 has been accepted as the authoritative source on insight with regards to the development of the energy system in China.

Development Engagement 2

Outcome		Enabling environment that is more conducive for development of sustainable district heating systems including through utilisation of industrial excess heat, is established.	
Outcome indicator		NDRC has adopted recommendations provided by NECC for district heating planning including utilisation of excess heat from industries.	
Baseline	Year	2017	The potential for utilization of low temperature heating from industries is not being realised.
Target	Year	2020	NDRC has issued guidelines for district heating planning that includes utilization of industrial waste heat.

Output 1		NECC has strengthened capacity in district heating planning NECC has additional capacity to advise on sustainable district heating solutions including by means of an assessment tool, and has developed district heating guidelines/policy recommendations.	
Output indicator		Guidelines and planning tools for district heating planning produced and presented to NDRC.	
Baseline	Year	2017	District heating technical requirements exist only, and district heating guidelines and planning tools are absence.
Target	Year 1.5	2018	District heating planning project identified, data and local barriers are analysed serving as input for development of an

¹⁸ Boosting Renewable Energy

			assessment tool ¹⁹
Target	Year 3	2020	Guidelines and planning tools produced and disseminated to local and national stakeholders

Output 2	NECC has expanded its local level district heating engagement NECC cooperates with local level authorities and district heating companies on utilization of excess heat for district heating and the guidelines and tools developed are widely disseminated to NECC local level facilities.		
Output indicator	Local authorities are trained and new district heating assessment model and the guidelines are adopted by relevant stakeholders		
Baseline	Year	2017	No local authorities and/or district heating companies working with NECC on district heating solutions
Target	Year 1.5	2018	Recurrent dissemination of results and sensitizing local authorities to options for excess heat for district heating Local authorities
Target	Year 3	2020	At least 2 of local authorities and/or district heating companies has received training in the guidelines and planning, and is using the capacity obtained.

Output 3	Analysis of stated policies NECC has extended capacity to evaluate stated EE policies related to EE in district heating and this is reflected in guidelines and policy notes that are disseminated to the NDRC and local the ECC's ²⁰ .		
Output indicator	NECC publishes and disseminates guidelines and policy notes		
Baseline	Year	2017	Guidelines and policy notes in need of revision
Target	Year 1.5	2018	Consultation by NECC of draft inputs is ongoing.
Target	Year 3	2020	In priority areas, NECC has a comprehensive suite of policy and guidance documents reflecting best practice.

Energy Partnership Programme between Viet Nam and Denmark

Country Programme	Energy Partnership Programme between Viet Nam and Denmark
Thematic Programme Objective	The most cost-effective opportunities for low carbon transition in energy system are more widely adopted throughout Viet Nam
Impact Indicator	Tons of carbon dioxide equivalent (tCO ₂ eq) reduced contributed to by the programme in Viet Nam

Development Engagement 1

Outcome	Vietnamese energy policy and planning is strengthened Recurrent planning processes and associated inputs are informed by more consolidated data, forecasts, peer reviewed assumptions and additional long range policy and policy implementation scenarios for a less carbon-intensive energy sector, including through the expansion of RE-generation capacity.
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¹⁹ The Danish support is TA on planning methodologies and not financing of components

²⁰ Energy Conservation Centre

Outcome indicator		Consultations among stakeholders and decision makers on the future development paths of the energy sector are based on the EOR and the comprehensive scenario analyses carried out.	
Baseline	Year	2017	Power development policy developed based on low-cost scenarios for conventional fuel sources and preliminary assessment of renewable energy integration in the power system.
Target	Year	2020	Long-term cost-optimized scenarios with integration options for renewable energy are used for informing policy dialogue and policy preparation on sustainable energy systems.

Output 1		Capacity development on integrated, scenario-based long-range modelling of the energy system	
Output indicator		Balmorel model is used in energy planning process in Viet Nam.	
Baseline	Year	2017	Planning Department and institutions involved in power system planning has basic understanding of the use of Balmorel and other models in modelling energy system.
Annual target	Year 1	2018	Detailed demand forecasts developed based on disaggregated demand
Annual target	Year 2	2019	In drafting EOR 2019, the Planning Department demonstrates competence in selection, use and customization of a range of energy planning models.
Target	Year 3	2020	Policy options identified based on long range scenarios

Output 2		Energy Outlook Reports published	
Output indicator		Long-term scenarios of low-carbon energy sector possibilities published in key policy papers and subject to dialogues	
Baseline	Year	2017	First EOR expected to be available with preliminary assessment of renewable energy integration in the power system.
Target	Year 1.5	2019	2nd EOR that includes long-term scenarios of low-carbon energy sector possibilities published and subject to dialogues with right holders and duty bearers (including government stakeholders, academia, civil society, private sector investors and other relevant stakeholders).
Target	Year 3	2020	Policy recommendations include long-term scenarios of low-carbon possibilities.

Development Engagement 2

Outcome		Enhanced power system ability to integrate the renewable energy generated in a cost effective way.	
Outcome indicator		Capacity to effectively integrate RE into the grid.	
Baseline	Year	2017	1) Limited capacity available to integrate the targeted increase of power generated from RE. 2) No significant curtailment with current level of RE integration
Target	Year	2020	1) National Load Dispatch Centres and Power Corporations have the capacity to integrate all generated RE in accordance

			<p>with the ability of power grid while at the same time minimizing the costs of the auxiliary services needed to balance the variable nature of the resource</p> <p>2) No significant curtailment with the increased level of RE integration</p>
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Output 1		Enhancement of capacity in forecasting of load and of generation from fluctuating RE Power system participants manage more accurate short term and medium term forecasting including through use of real time weather data as available	
Output indicator		Progress in execution of capacity development programme established for the Danish support	
Baseline	Year	2017	National Load Dispatch Centers, Power Corporations and relevant stakeholders have basic capacity in short-term load forecasting and forecasting production from fluctuating RE
Target	Year 1.5	2019	Detailed capacity development program developed, and activities initiated including expert-review of adequacy of existing forecasting tools/methodologies/systems.
Target	Year 3	2020	Capacity development program successfully completed and evaluation shows that participants are enabled to do more accurate forecasting

Output 2		Improved capacity for calculating need for and secure availability of ancillary services to ensure stability of the power system as well as power market National Load Dispatch Centres and other relevant stakeholders calculate the power systems needs for ancillary services more accurately. Methods to secure adequate availability of ancillary services are developed as a result of the support, and applied.	
Output indicator		Ability of National Load Dispatch Centres and relevant stakeholders to calculate needs for ancillary services and availability of methods to secure availability of ancillary services are developed.	
Baseline	Year	2017	National Load Dispatch Centres and relevant stakeholders have basic capacity in calculating needs for ancillary services.
Target	Year 1.5	2019	National Load Dispatch Centres and relevant stakeholders have enhanced capacity for understanding methods to identify needs of each kind of ancillary services for ensuring stable operation of the power system and power market.
Target	Year 3	2020	National Load Dispatch Centres and relevant stakeholders assess more exactly the needs for ancillary services and methods to secure availability of ancillary services.

Development Engagement 3

Outcome	Strengthened implementation framework for energy efficiency in industry A strengthened implementation framework for provincial level to target the most cost beneficial opportunities for low carbon development in industry and a more coherent and consistent national level regulatory framework contributing to industrial low carbon policy.
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Outcome indicator		Pending approval by legislators as required, revised legal/regulatory instruments (circulars, decrees, Ministerial decisions, guidelines, reporting templates) issued and/or implemented in at least one province.	
Baseline	Year	2017	The present national regulatory- and local level implementation framework is not sufficiently stimulating release of low carbon potential in industry.
Target	Year	2020	Revised legal/regulatory instruments issued/implemented

Output 1		Proposal for improvement of the national-level low carbon regulatory framework for industry Possibilities for improvements of the national EE policy framework is recognized by GDE ²¹ including an in-depth understanding of the benefits and potentials of low carbon development as well as of the prevailing barriers that prevent or retard such development.	
Output indicator		Tangible inputs for improvement of national-level low carbon regulatory framework addressing weak spot identified and proposing key legal/regulatory instruments to put in place, provided to GDE.	
Baseline	Year	2017	National regulation in need of revision
Target	Year 1.5	2018	Consultation by GDE of draft inputs is ongoing
Target	Year 3	2020	Tangible inputs to a strengthened national regulatory framework provided

Output 2		Development of low carbon legal instruments for industry at provincial level More efficient instruments in place strengthening the local regulatory- and implementation framework and local authority opportunities to enforce including through implementation of new, more specific guidance documents and tools.	
Output indicator		New/revised low carbon regulations and guidance for industry at local level issued	
Baseline	Year	2017	Present-day regulation is not sufficiently powerful
Target	Year 1.5	2019	Final draft of new/revised regulation ready for legislators
Target	Year 3	2020	Improved EE regulations and guidance for local level issued

Output 3		National institutional capacity to ensure implementation of legal instruments is strengthened Building on the preliminary results of output 1 and 2 a detailed plan to be executed by GDE for institutional capacity development at local level to interpret national regulations and skills to design strategies and procedures to implement regulations on the ground is developed.	
Output indicator		Costed Capacity Development Plan developed	
Baseline	Year	2017	No Capacity Development Plan

²¹ General Directorate Energy (at MOIT)

Target	Year 1.5	2019	Inputs from Output 1 and 2 provides sufficient basis for initiating development of Costed Capacity Development Plan
Target	Year 3	2020	Implementation of Capacity Development Plan 1st Year initiated.

Annex B Budget at output level

Output level budget	DKK Million
SOUTH AFRICA	18.2
Outcome 1 Capacity Development of Energy Sector Planning	10,3
DoE has strengthened capacity for energy sector modelling	3,4
DoE has strengthened capacity to peer review external modelling input	2,0
DoE has strengthened capacity to for collecting, processing and reporting on RE data	1,0
<i>International Long-Term Adviser</i>	3,9
Outcome 2 Renewable energy integration into the power system	5,2
Operational flexibility of the national electric system is enhanced	2,8
RE generation forecasting is improved	0,8
Integration of RE generation at distribution level is strengthened	1,6
Unallocated funds	2,7
MEXICO	34.1
Outcome 1 Renewable Energy (SENER)	12.6
Methodologies are established for renewable energy planning and planning capacity is strengthened	3,2
MEMLAB established	0,8
Biomass resources identified and assessed	3,8
Reliability and security of supply with variable RE in the power system improved.	2,94
<i>International Long-Term Adviser²²</i>	2,0
Outcome 2 Energy efficiency (CONUEE)	10.1
Incentive scheme based on voluntary agreements for energy management systems in large energy consuming industries established and used	2.5
Energy Efficiency requirements for new buildings integrated into building codes and enforced.	3.7
End-use EE model established and system for data acquisition in place.	2,0
<i>International Long-Term Adviser</i>	2,0
Outcome 3 Climate change mitigation (SEMARNAT, INECC)	11.3
NDC actions defined and updated ENCC are developed to reach the ambition of 36% GHG emission reduction	2,8
Modelling of NDC measures established and data quality improved.	4.6
<i>International Long-Term Adviser</i>	3,9
CHINA	25.1
Outcome 1 Transformation of the Chines Energy System	19.1
Ambitious RE scenarios and sector specific analysis published in CREO	8,6
Thermal Power Flexibility	3,5
Grid Development Strategies	3,5
Wider anchoring of research results,	1,5
<i>International Long-Term Adviser²³</i>	2,0
Outcome 2 Energy Efficiency with National Energy Conservation Centre	6.1
NECC has strengthened capacity in district heating planning	3,2
NECC has expanded its local level district heating engagement	0,5
Analysis of stated policies	0,5
<i>International Long-Term Adviser</i>	2,0
VIET NAM	21.6
Outcome 1 Vietnamese energy policy and planning is strengthened	8.4
Capacity development on integrated, scenario-based long-range modelling of the energy system	3.0
Energy Outlook Reports published	1.6
<i>International Long-Term Adviser²⁴</i>	3,8
Outcome 2 Enhanced power system ability to integrated the renewable energy generated in a cost-effective way	5.9
Enhancement of capacity in forecasting of load and of generation from intermittent RE	2.9
Improved capacity for calculating need for and secure availability of ancillary services to ensure stability of the power system as well as power market	2,0

²² The LTA contributes to both outcomes 1 and 2.

²³ The LTA contributes to both outcomes in China

²⁴ The LTA contributes to all outcomes in Vietnam

<i>International Long-Term Adviser</i>	<i>1.1</i>
Outcome 2 Strengthened implementation framework for energy efficiency in industry	7.3
Proposal for improvement of the national-level low carbon regulatory framework for industry	2.3
Development of low carbon legal instruments for industry at provincial level	2.3
National institutional capacity to ensure implementation of legal instruments is strengthened	2.3
<i>International Long-Term Adviser</i>	<i>0.5</i>
DEPP global level	16.0
Mid-term review, annual seminar, operational manual	2.5
Administration	5.5
Unallocated funds	8.8
GRAND TOTAL	115