

Final report:

# End-Review of the Norwegian Support to the Non-Petroleum Energy Sector in Angola with a focus on 2002-2006 and Identification of Opportunities for Future Cooperation

NORAD COLLECTED REVIEWS 5/2008

SAD-ELEC (Pty) Ltd, Rivonia, South Africa

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***Final Report:***

**End-Review of the Norwegian Support to the  
Non-Petroleum Energy Sector in Angola  
with a focus on 2002–2006  
and  
Identification of Opportunities for Future  
Cooperation**

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## **1 EXECUTIVE SUMMARY**

The specific objectives of the review were:

- a) Assessment of the results of the co-operation with Angola in the energy sector (excluding oil and gas) and the degree of achievement of the defined objectives, with particular focus on the period 2002-2006 of the Angolan Electricity Sector Co-operation programme; and
- b) Based on this assessment, identify and discuss priorities and opportunities for a possible continuation of co-operation in the energy sector (excluding oil and gas) for the period 2007-2010.

### **1.1 Assessment of Achievements: 2002-2006**

This review finds that the combination of institutional support and physical (infrastructure) rehabilitation support in the Norwegian support programme is generally viewed as very important and meaningful at a time when the rest of the Angolan economy was in a very difficult situation. However, both parties acknowledge that progress and achievements fell below expectations due to a variety of factors.

The combination of Norway's 2004 development assistance policy change and the concurrent changes in Angolan priorities have caused the Norwegian programme to have become 'marginal' to both parties, a situation that may be the root cause of lower than hoped for delivery, particularly concerning the National Energy Sector Management (NESMA) follow-up components and the programme outputs (and lack thereof) over the past few years. Annual budgets and work plans are generally found to have been lacking in detail and realism and do not appear to have been used as effective programme management tools by either side. Capacity constraints in MINEA/DNE also constrained the closer monitoring and control of implementation that could have resulted in more timely delivery, less budget under-spend and more coordination of effort for achievement of results.

In general, NORAD recognises that 'institutional cooperation' is in itself difficult, and this is compounded when the focus is on transfer of key principles and their application, as was the intention of the design for the Norwegian support programme to the Angolan non-petroleum energy sector. NVE was not actively involved in the formative stage, and it appears that the project design did not sufficiently consider the capacity and capability of institutions such as NVE to contribute and to deploy the best and most relevant competencies and personnel when required – this has not been the case over the past few years.

The view that the resourcing approach could have been different (i.e. more and longer-term Norwegian presence in Luanda) is shared by MINEA/DNE and NORPLAN, the latter with particular reference to the institutional support provided to EDEL. Similarly, the difficulties encountered due to limitations on available Angolan counterparty human resources were also under-estimated, particularly for the MINEA/DNE components of the programme. This is considered to have been a key impediment, and the work plan for the NESMA sub-project has been implemented only to a very limited degree. This key risk could have been mitigated – at least in part – by sustained in-country support.

It is noted that the 2001 review recommendations were only implemented to a limited extent, particularly concerning the inadequacy of support through infrequent short visits by NVE and/or its contracted consultants. NVE appears to see itself generally as a custodian to safeguard adherence to agreed principles set out in country and project agreements. Moreover, as NVE appears not to be well informed about ongoing and more recent Angolan developments, little or no modification and closer alignment of the programme to the rapidly changing environment in Angola appears to have taken place. The current review re-emphasises the need for sustained facilitator presence and on-the-ground support to

MINEA/DNE senior personnel – but within the context of the rapidly changing environment, e.g. less emphasis on institutional capacity building, but more on project development.

There is consensus that the MIS component has struggled throughout the programme, and there appears to be a fundamental mismatch of expectations by the two parties concerned: the NVE and its contracted consultants had envisaged and planned for the provision of advisory services, whereas MINEA/DNE may have expected a populated and functioning MIS. The 2001 review strongly recommended that “the need for the MIS should be reassessed, based on mapping of the actual needs of MINEA”. The more recently renewed consultant presence is potentially encouraging, but user requirements (and therefore data input needs) still do not appear to be clearly defined. The establishment of a functioning MIS system is still considered important by MINEA/DNE, but it is questionable if this initiative will be sustainable: while consultants can provide guidance, it is MINEA/DNE who has to assume ‘ownership’ of the content of the database and the outputs required of it. MINEA/DNE will also need to get ‘buy-in’ by sector stakeholders for the MIS to become a truly functioning tool to assist policy making and sector development in the future. Assuming that the DNE is able to identify the user requirements and develop a comprehensive user specification, the sustainability of the MIS questionable due to uncertainty concerning the availability of input data from numerous entities, as well as maintenance of database integrity thereafter.

Despite difficulties and set-backs, EDEL considers NORPLAN assistance to have been relatively successful. It is also generally agreed that the impact of the support to EDEL could have been improved through more continuous and sustained presence in Luanda by the Norwegian service provider. It was also noted that EDEL appears to be more satisfied with the support received at sub-project level, particularly support of a more ‘technical’ nature. Although the EDEL project was reasonably on track until March 2003, NORPLAN’s view is that the long interruption in service provision as a result of the E-CO bankruptcy did negatively impact on EDEL’s interest as recipient to continuation of services. Such a risk had not been considered, thus ‘damage control’ measures could not be implemented immediately. A further aspect that could have received more consideration is that language is a constraint and reduces the impact of the institutional support work, as well as slowing down work due to the need for translators/translation of outputs. A somewhat broader base is seen for sustainability in EDEL with positive impact in terms of asset management, network planning, and language capabilities. NORPLAN also believes that the establishment of contact and ‘partnership’ with Electricidade de Moçambique (EDM) will assist to reinforce the improvements achieved to date in EDEL, and that this will serve to support sustainability. English training undertaken is viewed by all parties as a key area for building improved sustainability of the Angolan electricity sector on a broader basis.

The provision of spare parts is generally considered a successful element of the programme and a very timely intervention during a most difficult period for EDEL and ENE. Given the prevailing circumstances in post-war Angola, planning of priority or routine repair and maintenance took the back seat to addressing emergency situations and, hence, a significant portion of the spares was applied to restore supply on an emergency basis. However, although fault statistics may provide some indication, the programme was not targeted at specific geographical areas and, hence, there is not sufficient basis for an objective assessment of the impact of the Norwegian support in this area. The spare parts component was clearly regarded as “urgent emergency assistance” and sustainability aspects came into consideration only subsequently. Although no quantitative indication is available of improvements, there is no doubt that ENE, and especially EDEL, were able to put in place measures that provided a breathing space in which to take stock of longer term requirements to move towards acceptable levels in quality of supply. This is indicated by a more structured approach being implemented to plan improvements, as well as the identification of needs for enhanced systems and associated training.

In summary, questions can be raised about how well the outputs of the programme and its various components have been ‘institutionalised’ in the Angolan counter-part institutions.

While this is always a challenging aspect of institutional co-operation, the particular Angolan situation and difficult operating environment during the period under review have certainly not assisted in this regard. To this extent, sustainability of results may be limited to a handful of key individuals that have had extensive exposure to the Norwegian support programme.

In general, NVE's programme administration role has been despatched reasonably well, but would have benefited from more frequent and longer visits to Angola by NVE personnel. There were also shortcomings in communication and project monitoring by the Norwegian entities involved. NORAD is generally of the view that there is no need for the Embassy in Luanda to have in-house professional competence on each sector when the necessary technical and competency inputs are to be provided by the Norwegian partner - in this case NVE. However, as it appears that NVE did not have much engagement with the Embassy during the course of the support programme, and there was limited professional input and involvement by both NVE and NORAD, the appropriateness of limited Embassy involvement is questionable. NORPLAN's working relationship was also with NVE and not direct with NORAD, and NORPLAN had only limited contact with the Embassy. In hindsight, it is now generally agreed that closer interaction may have been beneficial, particularly as communication with MINEA/DNE was a key problem.

## **1.2 Opportunities for Possible Future Cooperation**

The significant increase in government revenue from the petroleum sector - and to a lesser extent diamond mining - is expected to have a positive impact on investment activities in the non-petroleum energy sector. At this stage government's priorities appear to be generation and transmission developments, with lesser attention being paid to distribution system rehabilitation and expansion. Current government policy, priorities and plans in the non-petroleum energy sector are detailed in the "Plano Director Para a Processo de Reforma do Sector Eléctrico" (the national masterplan for electricity sector reform), published in March 2006. Despite the indicated 3-5 year horizon for the reform agenda, the comprehensive reform envisaged represents a long-term view which will take time to implement. This includes agreeing on a new institutional structure of the sector, including the role of both existing entities such as ENE, EDEL and GAMEK (the latter responsible for the Capanda hydropower project and further developments on the Middle-Kwanza River) and new entrants (from the private sector).

The SIDA financed support programme to MINEA, undertaken by ECON Analys AB, has been important in accelerating and firming up on government's reform agenda by providing support to government policy formulation, developing and/or updating necessary sector strategies, including an overall energy sector reform strategy and a more focused rural electrification strategy and plan, and defining various renewable energy initiatives. A semi-autonomous Reform Implementation Unit (UIR) and the electricity sector regulator IRSE were established during 2006. The formalisation of INEL (the national electrification agency) and FUNEL (the national electrification fund) are in progress and both entities are expected to be operationalised during 2007. It is envisaged that Phase 2 of the SIDA support programme (with commencement during December 2006) will provide certain external support and capacity building to the UIR, although it is acknowledged that UIR in addition to the SIDA support also requires at least one full-time external adviser to further facilitate execution of the UIR mandate. IRSE has also been well supported by the SIDA programme, and it is expected that Phase 2 of the SIDA programme will provide continued assistance to IRSE.

Angola's future energy sector developments will not take place in a national vacuum. Angola has significant energy resources that could make a major contribution in the broader regional context of the SADC (Southern African Development Community) and the NEPAD<sup>1</sup>

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<sup>1</sup> New Partnership for Africa's Development.

initiatives. To this extent consideration is required as to Angola's engagement with the Southern African Power Pool (SAPP) initiatives and the Energy Pool of Central Africa (PEAC). However, at this stage, Angola has no high-voltage transmission interconnections with any of the neighbouring countries.

The SADC Secretariat, located in Gaborone, Botswana, has the responsibility to coordinate major sectoral developments at the regional level. (Norway has offered support to SADC Secretariat/Energy Sector). The actual regional level planning and operating aspects are carried out under the umbrella of the SAPP. Angola is a particular focus for the SAPP's ambitious plan to develop a 'western corridor' through an integrated network linking the Democratic Republic of Congo (DRC), Angola, Namibia, Botswana and South Africa. To this end, the national power utilities concerned have already established Westcor, a company dedicated to the promotion and realisation of this 'corridor'. This is one of the priority NEPAD initiatives in the energy sector. The utilities have also undertaken a number of studies and are considering various implementation options. The options include power generation developments in Angola as well as the integration of Angola's three systems, and could involve developing up to 6,000 MW of hydropower capacity in Angola, with a significant portion of this being exported to Angola's southern neighbours (in particular South Africa). While the techno-economic merits of Westcor are intriguing, the political, financial, legal, regulatory and risk aspects of this initiative should not be underestimated, implying that Westcor at best will be a long-term development. Hence, Angola may more constructively focus on realising energy sector developments based on its own needs in the short- to medium term. This could include large scale energy developments aimed at supplying energy intensive industrial and minerals projects in Angola.

Another regional initiative of more near term importance to Angola is the Regional Association of Energy Regulators (RERA), also loosely organised under the SADC umbrella. The RERA's membership comprises national electricity sector regulators with the objective of knowledge transfer and, particularly, gradual progress towards harmonisation of regulation and regulatory principles and practices between the member states. Thus, the RERA is a forum where matters directly impacting investment decisions at both national and regional levels are deliberated. Angola (through IRSE) is about to become a member of RERA and could benefit from linking with various RERA initiatives and activities to accelerate the development of its sector regulatory frameworks. With Angola's excellent potential for both small-scale and large-scale hydropower developments, development of appropriate regulatory frameworks to facilitate such developments would be a particular useful regulatory initiative that could be taken forward with the support and/or collaboration of RERA.

Over the past few years there has been a reduction in the number of countries engaged in bilateral energy sector co-operation with Angola, but there is still significant support being provided by foreign parties. This includes SIDA (Sweden), the People's Republic of China, USAID and USTDA (United States), as well as Portugal and Russia. Only limited engagement is currently taking place with the traditional co-operating partners such as the World Bank, the African Development Bank and various European bilateral agencies. In addition, MINEA/DNE and the Angolan government also benefit from certain other support initiatives, e.g. Portugal, through EDP-Internal (the Portuguese national power utility's international arm), is supporting ENE in developing master plans for distribution system rehabilitation and expansion in 15 Angolan cities. Another key player with increasing 'appetite' and involvement in the Angolan non-petroleum energy sector is Russia.

A particular area of government focus is Angola's hydropower potential in support of general economic and social development. To this extent, mapping has been undertaken of a large number of potential sites for mini and micro-hydro plant, with several of these sites going through formal pre-feasibility study investigations. Further large-scale hydro developments are also high on government's priority list, particularly on the Kwanza River system, downstream of Capanda. Russia has played a key role in supporting GAMEK in the implementation of the Capanda project, and is also supporting the first Angolan IPP – Hidro-



Chicapa – a joint venture between a Russian diamond mining company (Alrosa) and ENE. It has also been reported that recent high-level political discussions between Russia and Angola have resulted in a Russian interest in and commitment to support major hydropower developments in Angola.

Norwegian parties are also currently taking an interest in both large-scale developments and mini- and micro-hydro initiatives in Angola.

### **Norsk Hydro's plan for large aluminium smelter and hydropower plant**

This includes:

- Construction of a large aluminium smelter in the Lobito area, with commissioning targeted for 2013;
- Development of a large hydropower plant on the Kwanza River (downstream of Capanda), with a targeted installed capacity of 1,600 MW, of which 1,000 MW would be dedicated for supply to the aluminium smelter (while the rest could be made available to the national system for general consumption); and
- The hydropower plant would be connected to the smelter through two 400kV transmission lines, one of which would be a direct connection and the other connected to the ENE national transmission grid.

Should this project be approved in principle by the Angolan government, with such decision being sought early 2007, Norsk Hydro envisages a two year negotiation process with the government and other concerned and interested parties, to be followed by a one year technical planning phase (post negotiation). The most optimistic timetable would see construction to start towards end of 2009, with commissioning of the plant from 2013.

With Norway's extensive experience with hydropower development in support of industrial development initiatives, not least through Norsk Hydro's own history in this regard, it would appear that Norway could have a lot to contribute to facilitate the realisation of this and similar initiatives. However, it is clear that the Norsk Hydro initiative would trigger the development of missing frameworks required for serious private sector investor interest to be realised, not least in terms of long-term concession, fiscal, commercial and environmental frameworks required to ensure a bankable project. Careful consideration would need to be given to any conflicts of interest that may arise as part of any Norwegian support arrangements.

It should be noted that the Norsk Hydro initiative faces competition from other foreign initiatives along similar lines, not least from Chinese and Russian sources. Further, some individuals appear to consider the Norsk Hydro concept to be too limited in terms of the power and energy it would provide to the national grid system.

### **Micro-hydro concept**

This initiative is based on containerised micro-hydro solutions, to be deployed for distributed generation solutions in areas otherwise not expected to be reached by the national grid system for a sustained period. It is aimed at providing an environmentally friendly and sustainable localised energy supply solution for locations with access to water (drawing on Norwegian experience with hydropower solutions). The concept is based on prefabrication of a micro-hydropower station (typical capacity 500kVA), encapsulated in a container. The containerised generation solution requires access to water. The basic concept is to ensure a simple solution from a construction / implementation perspective. Several containers may be connected to provide for larger solutions. The initiative has strong support from MINEA/DNE.

The micro-hydro power concept appears to have considerable merit, but any assessment of potential Norwegian support must take into consideration that the realisation of a scheme will

depend to a large extent on the resolution of the same issues as for the large-scale Norsk Hydro initiative.

With Angola's proven hydropower potential of more than 14,000 MW, Norway's long and extensive experience with hydro resource management and granting of concessions for hydropower developments and operations would be of significant value to assist and facilitate sustainable development of Angola's hydropower resources. To this extent, relevant Norwegian competence exists in all the required areas, but would have to be carefully considered against the modus of application in the Angolan context.

A combination of contributions to investments and building of the necessary frameworks could be the basic concept around which any Norwegian support might be built. The review of the Norwegian 'Stipendiatorndning' (conducted two years ago with a focus on Tanzania) made the important observation that the value contributed by long-term Norwegian involvement in project planning, tender preparation and award, construction supervision and control – in close cooperation with the client organisation – has created good sustainability impacts. From an investment perspective though, it would be necessary to identify and assess what support arrangements would be required to entice Norwegian industry to engage in the Angolan context.

### **Other observations**

With an envisaged unbundling of ENE and the possible creation of a national transmission company (based on ENE's current transmission business), combined with the prospects of major new hydropower developments with involvement by the private sector, Angola will need to develop a framework for transmission access and pricing of transmission services that will be conducive to support expected future sector developments. This is an area where Norway has particularly strong competencies and experience to offer. A development such as the proposed Norsk Hydro aluminium and hydropower development would definitely require a well-defined framework for transmission access and pricing to be put in place, as an example.

While an improving government fiscal situation is encouraging in terms of future sector development and improved sustainability, the Angolan non-petroleum sector's overall financial requirements remain huge in the short term – to address much needed repair and rehabilitation of existing infrastructure as well as financing expansion of supply to meet a rapidly growing demand for electricity and energy. At this point, government's focus appears to be on investments in the generation and transmission part of the industry, with distribution system expansion and tackling of the rural electrification challenge receiving much less attention. Hence, any potential financial support should preferably target rural electrification initiatives, e.g. linked to mini- and micro-hydro developments and associated mini-grid systems.

Further, there is an undisputed potential for making use of environmentally related financing mechanisms in support of energy sector investments. Angola's energy resource base of hydropower and natural gas leans itself favourably towards use of the Clean Development Mechanism (CDM) and other similar financing arrangements, although the institutional framework in Angola is still lacking in this regard, with no competent authority in existence to accredit CDM type projects. This is an area where potential Norwegian support could make an impact – not least in terms of realising Angola's renewable energy potential, and particular where linked to micro-hydro solutions.

Another area where Norwegian competence and experience could be brought to bear is the introduction of effective planning frameworks and tools to support major rehabilitation and expansion required of the Angolan power networks, not least to cater for the very rapid growth of the networks in and around Luanda, particularly in Luanda South, where numerous mini-grid developments are taking place in parallel under both ENE and EDEL auspices, as well as driven by private third party players.

Given Angola's improved financial situation, the justification for traditional development assistance to the electricity sector is not strong, and Norwegian development co-operation with Angola may be phased out over the period 2007-2010. In this light, it may not be prudent or possible to engage in any new support programmes requiring longer-term sustained presence. However, Norwegian comparative advantage in the energy sector may open the way to limited Norwegian donor support to facilitate private Norwegian investments and public-private-partnerships. The USTDA model of co-financing initial investigation by a potential investor, or the involvement of the Norwegian Export Credit Agency (GIEK) in such pilot initiatives, would appear to have significant merit – particularly in the case of potential mini-hydro developments.

However, a key impediment to the realisation of any of the above potential is Angola's dire shortage of human resources capacity for effective energy sector management, with extensive dependence on a few individuals. While the current institutional support programme has benefited from having a very competent Angolan counterpart in overall charge of the programme, severe capacity constraints exist at the levels below. A broadening of the skills base and focused training of energy sector managers are critical activities for a more sustainable future. Hence, any potential continued Norwegian support may have to be built around shorter-term and focused interventions on the one hand, e.g. related to support for the development and implementation of hydropower concession frameworks and best practice environmental management, combined with support for longer-term capacity building in the country, e.g. through support to the tertiary education system in developing targeted programmes and initiatives aimed at sustainable energy sector development, including the active involvement of the local private sector.

In these areas there seems to be scope for co-operation with other financing institutions and ongoing and planned energy sector programmes and initiatives. The most interesting ones from a Norwegian perspective appear to be the SIDA support programme and NORAD regional support to RERA developments. Collaboration with USAID may also be useful to maximise capacity building in energy economics, currently supported by USAID through the Catholic University in Luanda.

In summary, Norwegian development assistance should not be ruled out, but should be carefully considered against Norway's longer-term strategic intent in Angola. Any potential support and interventions should preferably make a contribution to developing investment, regulatory and operational frameworks that could incentivise the Norwegian private sector to engage with Angolan energy sector developments. Any continuation of Norwegian support to Angolan energy sector entities should not be based on the traditional institutional co-operation model, but should adopt a more pragmatic approach. This could include the deployment of a long-term advisor to the UIR, complemented with certain focused and targeted interventions in areas where Norway has specific competencies and experience to contribute to capacity building in energy management in Angola. Furthermore, successful development of the Angolan energy sector will depend on building appropriate and sustainable regulatory capacity. Hence, including Angola in already existing Norwegian support to RERA would also appear meaningful, e.g. through development of certain RERA initiatives of particular relevance to the Angolan reality.

## **2 BACKGROUND**

### **2.1 Introduction**

NORAD appointed SAD-ELEC (Pty) Ltd (SAD-ELEC) to undertake an End-Review of the Norwegian assistance to the Angolan electricity sector during the period 2002-2006 and to identify possible areas of future co-operation.

This End-Review complements an earlier review of the period 1996–2001, dated April 2002, undertaken by Sivilingeniør Mørkrid AS. Apart from assessing experiences and learning from the programme, with particular emphasis on the period 2002-2006, the End-Review also covers an assessment of opportunities for potential continued Norwegian support beyond completion of the current programme. The agreed Terms of Reference (ToR) for the End-Review are attached as Annex 1.

### **2.2 Background**

Norway and Angola initiated development co-operation in the energy sector in 1987. The Norwegian support during the period of assessment was based on an addendum signed in 2000 to an original 1996 country agreement between Norway and Angola, and was implemented under the auspices of a co-operation agreement between the Norwegian Water and Energy Administration (NVE) and the Angolan Ministry of Energy and Water (MINEA).

The programme over the 2002–2006 period consisted of the following components:

- Follow-up of the NESMA (National Energy Sector Management) process, including implementation and operationalisation of a Management Information System (MIS) for Direcção Nacional de Electricidade - DNE;
- Institutional strengthening of EDEL;
- Provision of spare parts to Angolan power utilities (i.e. Empresa Nacional de Electricidade - ENE and Empresa de Distribuição de Electricidade - EDEL);
- Language courses for executives in the energy sector;
- Programme administration; and
- Miscellaneous support<sup>2</sup>.

The Norwegian support programme to the Angolan energy sector for the period 2002–2006 has a total budget of NOK 52 million. The allocated budget was originally intended to cover the period 2000–2002 only, but due to various delays related to both start-up of the programme and implementation of the various programme components, the programme as at December 2006 was still not fully completed.

A summary of the budget allocations and disbursements towards the various programme components is provided in the table below, with the numbers for 2006 based on the annual work programme and budget agreed at the latest Annual Meeting that took place on 4 July 2006 in Luanda, Angola:

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<sup>2</sup> The addendum signed in 2000 originally included provision for support for a pre-investment study for the rehabilitation of the Cazenga sub-station in Luanda. This programme component was subsequently removed as it was funded separately by NORAD under a different arrangement.

Activity	Budget (NOK '000)	Actual Expenditure (NOK '000)					Unspent (NOK '000)
		2000-02	2003	2004	2005	2006 (plan)	
1. NVE administration	1,947	2,165	215	582	340	296	-1,651
2. NESMA follow-up	5,759	1,930	224	1,126	614	734	1,131
3. EDEL institutional strengthening	18,242	11,774	1,235	3,371	344	1,519	-1
4. Cazenga sub-station	770	0	0	0	0	0	770
5. Provision of spare parts	21,000	8,824	6,174	7,481	0	2,755	-4,234
6. English training	660	0	0	0	0	0	660
7. Logistics in Angola	990	252	0	0	0	0	738
8. Contingency	2,632	0	0	0	0	47	2,585
8. Resident adviser	0	0	0	0	0	0	0
<b>Total Programme</b>	<b>52,000</b>	<b>24,945</b>	<b>7,848</b>	<b>12,560</b>	<b>1,298</b>	<b>5,351</b>	<b>0</b>

A few observations can be noted from the above table:

- A significant portion (48%) of the overall budget was spent during the first two years (2001 and 2002, with a small amount only having been spent in 2000 due to commencement of the programme only towards the end of 2000);
- Overspending on NVE programme administration (with the entire budget allocated already spent by end of 2002);
- Under-spending on the NESMA follow-up activities;
- Extra spending on the spare parts programme based on programme management decisions to utilise underutilised funds from the Cazenga sub-station item (financed otherwise by NORAD), Logistics in Angola and Contingency items;
- Problems encountered with the EDEL institutional strengthening programme in 2003 had a negative impact on programme progress during this year; and
- A very low level of programme activity in 2005 (reasons not clearly understood).

Based on discussions in Norway and Angola, it does not appear as if the remaining budget will be spent in 2006, with certain activities expected to carry over into 1<sup>st</sup> half of 2007, in particular the completion of the MIS support activity (part of the NESMA follow-up item). It is also uncertain whether the planned spare parts purchase budget for 2006 will actually be utilised, although it was not possible for the Review Team to obtain any firm confirmation of what activities (if any) are actually envisaged under this budget item for 2006.

## 2.3 Purpose and Scope of the End-Review

The specific objectives of the assignment were the following:

- c) Assessment of the results of the co-operation with Angola in the energy sector (excluding oil and gas) and the degree of achievement of the defined objectives, with particular focus on the period 2002-2006; and

- d) Based on this assessment, identify and discuss priorities and opportunities for a possible continuation of co-operation in the energy sector (excluding oil and gas) for the period 2007-2010.

In terms of objective b) above, it is noted that the Norwegian support to the Angolan energy sector started to be phased out already in 2004. The period 2007-10 is therefore to be considered a 'sun-down' period in terms of closure of the traditional development co-operations with Angola. Hence, it cannot be taken for granted that any continued co-operation would be agreed to, even if the needs, motivation and proposed modalities of co-operation otherwise would be acceptable.

The detailed Terms of Reference are provided in Annex 1.

## **2.4 Approach and Methodology**

The SAD-ELEC Review Team commenced its work by reviewing various documentation provided by NORAD, the Royal Norwegian Embassy in Luanda and other Norwegian parties involved in the programme – in particular NVE and NORPLAN. This initial phase included a visit to Norway by Mr Tore Horvei, the SAD-ELEC Project Responsible, during the week of 23 October 2006. This visit to Norway was followed by a visit to Luanda, Angola by the SAD-ELEC Review Team during the period 4-11 November 2006, during which the Review Team met with the Norwegian Embassy, MINEA, various Angolan stakeholders and other parties involved in non-petroleum energy sector support in Angola. Apart from Mr Horvei, the SAD-ELEC Review Team consisted of Mr Fernando Julião and Ms Judi Koncz.

A debriefing note was submitted and discussed with the Royal Norwegian Embassy in Luanda prior to the team's departure from Angola, with subsequent comments having been received from the Embassy in respect of the debriefing note. The debriefing note (both in Norwegian and Portuguese) was also provided to NORAD in Oslo and to MINEA.

An assessment of the achievements over the period 2002–2006 is set out in the following section (Section 3), with reference to the various objectives for the end-review as set out in the ToR. An analysis of potential future co-operations opportunities and a motivation for such possible co-operation follows in Section 4 of the Review report.

A list of the documents examined is provided in Annex 2, while a list of personnel interviewed and their parent entities is given in Annex 3.

### 3 ASSESSMENT OF ACHIEVEMENTS: 2002-2006

Specific observations based on the assessment of the different programme components are set out below. For ease of reference, the parameters given in the ToR have been followed in describing the results of the assessment.

No.	Issue	Comments and Observations
1.	Quality of preparation of the project	<p>In general, NORAD recognises that ‘institutional cooperation’ is in itself difficult, particularly in terms of getting full host country/client commitment, but also in ensuring timely access to relevant institutional knowledge and experience among the Norwegian institutional counterparties. The difficulty is compounded when the focus is on transfer of key principles and their application, as was the intension of the project design for the Angolan Electricity Sector Co-operation programme. With hindsight, it can be questioned whether, for the period under review, the ‘pure’ institutional cooperation under the NVE umbrella has given the same results as the previous period (managed by a private contractor, Norconsult, on behalf of NORAD), which appears to have adopted a more hands-on approach. However, it is also acknowledged that the previous model of ‘outsourced’ co-operation may have become too conserving (for Norconsult), thereby limiting the value and results of the co-operation.</p> <p>It is fairly evident that the approach of many short visits does not appear to work, particularly not in a place such as Angola where there is a need to establish working relationships over a sustained period. To some extent this was brought out in the previous review of the period 1996-2001, but does not appear to have impacted in any significant way on the design of the programme undertaken over the 2002-06 period. This opinion is supported by NVE’s own view that its contributions were more important during the first phase, when its personnel spent relatively longer periods in Angola. In this context, the project design did not sufficiently consider the capacity and capability of institutions such as NVE to contribute and to deploy the best and most competent personnel when required – this has not been the case over the past few years. The view that the resourcing approach could have been different (i.e. more and longer-term presence in Luanda) is also shared by MINEA/DNE and NORPLAN. The need for language competency was also not sufficiently anticipated, and has also hampered delivery in that it impacted direct communication as well as caused a need to translate all paperwork into Portuguese.</p> <p>The difficulties encountered due to limitations on available counterparty human resources were also under-estimated, not least for the MINEA/DNE components of the programme. Similarly, the risk of loss of competent people by the key sector institutions was not given sufficient recognition. The low availability of MINEA/DNE personnel in particular has been a recurrent theme throughout the programme and is emphasised by all parties concerned, as is evidenced also in all reports reviewed. This is considered to have been a key impediment, and underscores the observation that this key risk could have been mitigated – at least in part – by sustained in-country support.</p> <p>NVE was not actively involved in designing the institutional support programme, and NVE appears to see itself generally as a custodian of the agreed programme in order to safeguard adherence to agreed principles set out in country and project agreements. However, this suggests an element of inflexibility, particularly as NVE appears not to be well informed about more</p>

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		<p>recent Angolan developments, e.g. the progress made under the SIDA support programme to MINEA<sup>3</sup>, progress with the establishment of IRSE<sup>4</sup> as the electricity regulator and decisions related to the creation of other sector institutions such as INEL (national electrification agency) and FUNEL (the national fund for electrification). As such, little or no modification and closer alignment of the programme to the rapidly changing environment in Angola appears to have taken place.</p> <p>Also impacting MINEA/DNE is the thorny issue concerning the MIS component of the programme. There is a general perception in the Norwegian entities that the MIS project did not duly consider the local reality and was not properly understood, with various institutional aspects not well thought through, e.g. the missing link to GEPE (the MINEA Planning Directorate) in terms of designing, developing and implementing a functioning MIS system for MINEA/DNE. Started some 6 years ago, the MIS was intended primarily to assist MINEA by providing a decision-making tool for energy sector planning. The planned work included the development of routines and processes for information collection to populate the database and to generate energy balances to be used for analysis and simulation of policy change and sector developments. However, it is now recognised that the emphasis on the actual implementation of a MIS as a solution might not have been correct: it might have been more important to focus on the quality of input data/information, and more use could have been made of systems, procedures and experiences to develop a simpler and more practical model to respond to the actual needs of DNE in terms of analysing and planning sector developments.</p> <p>Although the EDEL project started almost a year late (i.e. only towards end of 2000), it was reasonably on track until March 2003 when the E-CO Partner bankruptcy issue resulted in a total loss of at least 12 months of progress. NORPLAN's view is that the long interruption in service provision as a result of the E-CO bankruptcy did negatively impact on EDEL's interest as recipient to continuation of services. As such a risk had not been considered, 'damage control' measures could not be implemented immediately. Irrespective of this unfortunate turn of events, a better solution might have been to have more people based for longer-terms in Luanda, as this might have resulted in better engagement with the client, particularly in the finance/commercial area. A further aspect that could have received more consideration is that language is a constraint and reduces the impact of the institutional support work, as well as slowing down work due to need for translators/translation of outputs.</p> <p>With the delays experienced and only limited progress on several of the areas of support, NVE consider it an important positive factor that sufficient flexibility had been built into the programme in terms of allocation of funds; as a result, unused funds could be reallocated to areas where the chances of making an impact was better, e.g. to the spare part fund. The spare parts component</p>

<sup>3</sup> Advisory services to MINEA in developing a modern and economically efficient power sector, carried out by ECON Analysis AB, in particular focused on supporting the Angolan Government in developing and implementing a reform agenda for the electricity sector.

<sup>4</sup> Instituto Regulador de Sector Eléctrico.



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		<p>of the programme was an intervention that has been well received in general. However, EDEL and ENE are of the view that a three-year period may have been too short a period in which to realise measurable impact. Further, the project design did not include adequate support for implementation at a time when the Angolan institutions concerned operated in an emergency mode and thus had no plans and few systems in place to provide a framework for prioritised implementation. A further aspect not considered was that EDEL and ENE also lacked sufficient human resources, vehicles and tools for the operational side to increase the opportunity to optimise the spares made available.</p> <p>It is also noted that the rather general application of the funds made available for spare parts procurement has made it difficult to assess in any detailed and objective manner the real impact of the Norwegian support in this area. A more focused approach, targeting provision of spare parts to specific projects and/or clearly delineated parts of the EDEL and ENE systems may have yielded a more tangible and sustainable impact of this programme component.</p>
2.	Follow up of 2001 review recommendations in the design of the last phase of the project	<p>NVE representatives interviewed had no collective memory about what the 2001 review focused on and what its conclusions and recommendations included. It is noted from minutes of meeting between MINEA, NVE and the Embassy held in May 2005 that the 2001 review conclusions and recommendations in many instances, particularly where critical towards NVE and/or MINEA, were not found to be valid and/or important and hence no particular action was required or merited.</p> <p>Concerning the <i>spare parts component</i>, it was envisaged that ENE and EDEL would prepare lists of requirements prioritised according to predetermined criteria and would submit such lists to MINEA/DNE for approval. MINEA/DNE would control the spare parts fund, and would be responsible for allocating funds for both the “ordinary annual” and the “emergency” procurement. It was further envisaged that “emergency” procurement would be highest in the first year. Tendering and supplier selection were defined as those applied by the World Bank (Guidelines for procurement under IBRD loan and IDA credits), and the processes were implemented along the lines proposed in the NORPLAN report “Fund for procurement of spare parts to Angolan utilities – Assistance to prepare guidelines and control routines” (August 1998), adjusted according to information and experience gathered during the visit to Luanda in March/April 2000.</p> <p>The Guidelines developed for procurement under the Spare Part Fund did not work very well initially and were generally found too complex and bureaucratic. NVE also stated that it was never intended that NVE’s role should be to oversee procurement of technical equipment – hence NVE did not want to get involved in the detailed operation and control of this portion of the programme. The 2001 review highlighted the disregard of existing local procurement practices, although both EDEL and ENE had “historically embedded” rules and requirements to be followed to ensure transparency, multiple tender invitation, evaluation processes, etc (but inspection was outside of ENE’s and EDEL’s jurisdiction). In particular, the 2001 review emphasised that the entire supply chain management should be undertaken by ENE and EDEL who should also be party to a revision of the procurement processes. NVE’s opinion as expressed during this end-review appears to be that the criticism raised by the 2001</p>

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		<p>review could have been heavily influenced by the timing of the review, as this coincided with one particular dispute between NVE and MINEA/EDEL/ENE on a particular purchase under the spare part fund. Although the finally agreed requirements for the procurement process took more cognisance of prevailing practices in Angola, the recommendations were not implemented in general. However, statements by ENE and EDEL indicate that a number of modifications had taken place in practice, which resulted in a more consultative and inclusive process with the utilities concerned. Nevertheless, the required processes imposed considerable administrative burdens on the organisations' already stretched resources.</p> <p>The <i>MIS initiative</i> floundered from the start, and the 2001 review strongly recommended that “the need for the MIS should be reassessed, based on mapping of the actual needs of MINEA”. NVE’s view was that DNE wanted the MIS installation, not least because of Angola’s participation and key role in a regional SADC initiative on the creation of energy planning tools and databases. NORPLAN questions whether DNE can fulfil its obligations and mandate without proper access to a functioning energy information system, and is of the view that the value of a working MIS application is not well understood among the staff in DNE (apart from the National Director of Energy who has expressed a clear wish for the MIS to be implemented). Due to lack of understanding, the enthusiasm and commitment among DNE staff have been found to be low and has hampered project progress. The 2001 report warned that “If that [mapping of the actual need in MINEA] is not done, the MIS activities will once again only be an academic exercise, with very limited value compared to the money invested”. This recommendation appears to have been disregarded in designing the continuation of support for the period 2002-06. Instead, the lack of any meaningful progress has been attributed to various other factors such as low staffing in DNE (the most commonly quoted constraint), software problems, discontinuity due to poor communication with/by the consultant, hardware requirements due to relocation of DNE. In reality, the problems persisted – and are likely to persist – because the actual MINEA/DNE requirements are still not properly established and document. DNE expressed its frustration with the lack of progress to date and the non-availability of consultant support during the entire past year. The more recently renewed consultant presence is encouraging, but leaves little room for optimism if the 2001 recommendations for a fundamental reassessment are not followed, and user-friendly systems and processes are not put in place for maintenance of the MIS. MINEA/DNE will also need to create ‘buy-in’ by sector stakeholders for a MIS system to become a truly functioning tool to assist policy making and sector development in the future.</p> <p>Concerning arrangements for <i>institutional strengthening (of EDEL)</i>, the 2001 review made no specific recommendations for EDEL, but recommended the deployment of a facilitator/advisor to MINEA/DNE. The review emphasised that the approach of many short visits does not appear to work, particularly in view of the severe capacity constraints existing in MINEA/DNE where dedicated support over a sustained period was seen as vital. Moreover, as the present review has found, the DNE’s experience is that consultants on short-term visits place emphasis on (time consuming) interaction with heads of functions (“the chief”) as otherwise the “consultant feels that he has not done his job”. However, such interaction is limited to the management level, whereas interaction at the operational level would be far more mutually beneficial. The 2001 review also highlighted the need for the Norwegian parties to be well informed about ongoing Angolan developments concerning the electricity sector and for</p>

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		<p>“continuous evaluation” in order to maintain alignment between them and the programme objectives and components to maximise resource use and impact. In this context, the review pointed out that lack of dedicated resources in both MINEA/DNE and NVE were a key obstacle, but recommended that NVE adopt a more active role to jointly arrive at solutions for higher achievement in the difficult circumstances. The review further recommended that the ‘facilitator’ model successfully adopted for EDEL should be considered also for MINEA/DNE, but with the possible substitution/augmentation of NVE by a large utility with requisite experience in the application of the principles imparted by NVE. The review further emphasised the need for a practical approach for rapid improvement in power generation, transmission and distribution.</p> <p>It is noted that the 2001 review recommendations were not implemented, while the same need as previously identified was echoed by MINEA/DNE in the present review, particularly concerning the inadequacy of support through infrequent short visits by NVE and/or its contracted consultants. To this extent the current review has emphasised the need for sustained facilitator presence and on-the-ground support to DNE senior personnel – but within the context of the rapidly changing environment, e.g. less emphasis on institutional capacity building, but rather more on project development.</p>
3.	Project results achieved	<p>Norwegian support to the energy sector is generally viewed as very important and meaningful at a time when the rest of the Angolan economy was in a very difficult situation. The combination of physical (infrastructure) support and institutional support is viewed in Norway as meaningful, and this view appears to be shared by Angola.</p> <p>However, when questioned about the reasons for an overall 3 to 4 year delay in completion of the current programme (originally targeted for period 2000 to 2002, although it only really commenced late 2000), NVE highlighted the following:</p> <ul style="list-style-type: none"> <li>• Communication has been difficult – NVE has struggled with getting responses from MINEA (and NORPLAN has been struggling with communication with EDEL) and hence it has been difficult to progress matters in a timely manner [<i>Note: NVE’s attitude appears to some extent to have been one of ‘sit back and wait’ rather than pro-actively trying to engage the Angolan counterparties, particularly after initial attempts of communicating having failed.</i>]</li> <li>• Lack of clarity between NVE and MINEA in terms of envisaged support in the area of concessions and technical regulations. In NVE’s opinion it appears as if MINEA never considered this a key area where Norway could/would contribute. MINEA also appears to have seen this as part of the process of establishing the Electricity Regulator (IRSE). Support to IRSE was never explicitly included in the programme, but was also never raised as a request by MINEA at any of the Annual Meetings. [<i>Note: From the meeting with representatives of UD (both having previously been based at the Norwegian Embassy in Luanda) it also appears that MINEA never informed Norway officially about the SIDA support programme, where support to the IRSE establishment is a key element.</i>]</li> </ul> <p>There is general consensus that Angolan human resource constraints have severely hampered the effectiveness of the support programme - particularly the MINEA components. Consequently, the work plan for the NESMA project has been implemented</p>

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		<p>only to a very limited degree. Annual meetings always made reference to human resources constraints and very limited progress was achieved (the personnel transferred from SADC did improve the situation somewhat, but was not necessarily the exact type of resource that MINEA/DNE required). In MINEA/DNE the problem was compounded by the dependency on one person (Mr Talino, the National Director of Energy) in all aspects of the support programme, a situation made additional difficult as he is also the key person in DNE for all other ongoing sector activities. As a result, the Norwegian partner had a very limited interface in MINEA.</p> <p>Despite difficulties and set-backs, EDEL considers NORPLAN assistance to have been relatively satisfactory. In Phase 1 completed in 1996/97, Norconsult conducted an overall diagnostic and capacity building assessment with fairly far reaching implications/scope including the full spectrum of customer service and commercial aspects. In Phase 2, E-CO Partner<sup>5</sup> was the main contractor, in partnership with NORPLAN. NORPLAN took over the project responsibility after the E-CO Partner bankruptcy in 2003. The bankruptcy situation negatively impacted on the EDEL support programme and caused a minimum 12-month interruption in services, with resulting loss of interest and motivation from EDEL's side. Nevertheless, the EDEL engagement is generally considered relatively successful where the most useful aspects of the support appear to have been training in commercial management (customer focus etc), some improvement in financial and accounting areas, specific initiatives related to network planning, English language training of EDEL professionals, fixed asset evaluation, including modelling tool for future use by EDEL, and the development of the 2000-2002 strategic plan framework. It is also generally agreed that the impact of the support to EDEL could have been improved through more continuous and sustained presence in Luanda by the Norwegian service provider. It was also noted that EDEL appears to be more satisfied with the support received at sub-project level, particularly support of a more 'technical' nature.</p> <p>There is consensus that the MIS component has struggled throughout the programme. It appears from views expressed during discussions, as well as from the documentation reviewed, that there was, and possibly still is, a fundamental mismatch of expectations by the two parties concerned. The NVE and its contracted consultants (Norconsult originally and thereafter Norplan) had envisaged and planned for the provision of advisory services, whereas MINEA/DNE may have expected a populated and functioning MIS.</p> <p>The MIS was originally defined and designed by Norconsult under the first phase of the Norwegian support (period 1996-99). In the initial phases MINEA/DNE was physically dispersed in 3 different locations, which presented particular design challenges – especially within the constraints of the poor state of telecommunications of 6 years ago. A subsequent relocation also resulted in disruption. A more recent decision will see MINEA/DNE move to the EDEL building (expected early 2007), and this has again posed a delay as the hardware/physical systems will be installed only after the move.</p>

<sup>5</sup> NORPLAN's project partner was Oslo Energy Consult, which changed its name to E-CO Partner subsequent to signing of contract.

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		<p>Under a separate contract that commenced in 2003, NORPLAN's scope was to populate the Norconsult designed database (programmed in Microsoft Access) and train DNE staff in database management. However, the database application originally designed and implemented by Norconsult was found not to be operational and had to be reinstalled. Also from inception, problems were encountered concerning data to be collected to populate the database. Without explicit requirements from the users, the consultant developed a database using assumed information fields and extensive but possibly not relevant available data.</p> <p>The project was also negatively impacted by lack of resources in MINEA/DNE (only recently improved with transfer of people from the former SADC-TAU, with the key MIS responsible having been deployed for two years to SADC in Botswana on a SADC regional energy planning initiative). He returned to MINEA only some 3-4 months ago. The DNE stated that no NORPLAN consultant was in Luanda at all during the last year, but, following a number of unsuccessful attempts by DNE to communicate directly, a consultant was in Luanda late October 2006 and is now trying to revitalise the MIS project.</p> <p>NORPLAN's role is perceived to be limited to assist DNE staff in the verification process (as soon as input has been received from sector entities) and to develop certain routines and processes for DNE to follow in the future. Concurrently, GEPE is working with Portuguese consultants on modelling / simulation of point of supply for tariffs design, but this is "not quite what DNE wants from the MIS", although it is recognised that a lot of common data input is collected, collated and used. In the meantime, training in Access applications is taking place in conjunction with local company (CYSTEC), with six people attending the course. Phase I of the training is completed; Phase II will be on site and on the database in the new DNE office. Also participating in the training are staff from MINPET, Institute of Statistics, ENE, EDEL and GEPE. However, a number of related core issues remain, and were summarised by a DNE staff member as: "The real problem is the database: it is not populated". The situation still appears to persist where user requirements (and therefore data input needs) are not clearly defined, hence possibly irrelevant data is being collected and entered, which will undermine the intended purpose and usefulness of the MIS.</p> <p>The component concerning the provision of spare parts, generally considered a successful element of the programme, is explored in sub-section 5 of this chapter of the end-review report.</p>
4.	Sustainability of achievements	<p>UD and NORAD expressed concerns about limited sustainability of the programme due to the human resource constraints experienced on Angolan side, particularly in MINEA/DNE. NVE is also sceptical to institutional sustainability – both with respect to MINEA/DNE and EDEL. In EDEL the most sustainable results in deemed to be in the technical areas and from language training, but with only limited impact on more sensitive strategic, financial and commercial areas.</p> <p>Capacity constraints in MINEA/DNE have hampered the follow-up on the NESMA process considerably, e.g. related to the envisaged scholarship programme that never materialised. It was not possible to implement the scholarship programme due to</p>

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		<p>lack of local candidates (despite many meetings with the MINEA HR Manager on this issue). The only area where it was possible to engage constructively in terms of training was on English training. Other training interventions were limited to 3 MINEA/DNE Directors.</p> <p>The establishment of a functioning MIS system in DNE is still considered important, but it is questionable if this initiative will be sustainable, particularly in light of limited commitment from DNE's side. There is no clear champion for this initiative internally in DNE. The task of getting the MIS to be operational is optimistically seen to be solved "very soon": "It can be quickly set up. The first step is done already. We are attending the Access data management course. After one or two weeks the system will be in place. It should be possible to get to current data in 2-3 months".</p> <p>However, the most concerning aspect is the apparent lack of appreciation by the DNE's appointed MIS management personnel of what data is required and for what purpose? Statements such as "we have started already with 1990 data", indicates an alarming misjudgement of what information is relevant to inform planning and decision-making in the current situation. Collection of historical data would be a pointless academic exercise: such information is incomplete at best, and historical trends are irrelevant in the country's fundamentally changed situation. While consultants can provide guidance in this respect, ultimately it is DNE who has to consider and agree the MIS database content.</p> <p>Assuming that the DNE is able to identify its user requirements and develop a comprehensive user specification, the next challenge is how, if at all, the input data is to be obtained. ("The main problem is how to get the data".) MINEA started to collect information only recently, and will rely on inputs from a wide range of sources e.g.: MINPET, Institute of Statistics, ENE, EDEL, GEPE, etc. It is optimistically assumed that data acquisition from other sector entities will follow a simple untroubled process: "the Energy Minister will request the other Ministers to appoint persons and, thus, the DNE we will have a specific contact person in all the other Ministries for inputs (data/information provision) to the MIS". Coordination of this initiative with GEPE is essential due to its planning competencies within the Ministry, as well as in recognition of the prevailing human resources constraints facing MINEA/DNE.</p>
5.	Relevance of spare parts to Angolan power utilities	<p>The provision of spare parts is generally considered a successful element of the programme and a very timely intervention during a most difficult period for EDEL and ENE. A significant portion of the programme funds (comprising some 40%), this was aimed at very specific and important /urgent emergency assistance. The report "Ministério da Energia e Águas, Direcção Nacional de Energia, NORAD Spare Parts Fund Report July 2005" gives a comprehensive overview of the arrangements concerning the spare parts fund. NOK 7 million per year was provided for a three-year period, i.e. a total of NOK 21 million, for the procurement of spare parts for ENE and EDEL.</p> <p>The equipment to be purchased was intended to cover the most urgent "ordinary annual procurement" of recurrent needs, although a significant portion was also included for the purchase of non-stock items on an "emergency" basis. The purchase</p>

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		<p>through the fund of equipment for system expansion was precluded, but the situation was complicated by a major change in the country situation post 2002, with massive economic growth and rapid development in the Luanda area in particular, and hence rapid growth in EDEL's customer base (particularly related to the development of Luanda Sul). Hence, the spare parts programme came under pressure in terms of trying to use the funding to purchase equipment for expansion of EDEL's (and ENE's) system, rather than to support and improve the performance of the existing systems – as was the original intention of the programme. Given the prevailing circumstances in post-war Angola, planning of priority or routine repair and maintenance took the back seat to emergency situations and, hence, a significant portion of the spares was applied to restore supply on an emergency basis. Despite certain initial difficulties related to the procurement process, the provision of spare parts was undertaken in an acceptable manner and records of receipts and application were similarly maintained.</p> <p>The impact of the programme is difficult to measure clearly due to the broad-based nature of the spare part programme. Although fault statistics may provide some indication, the programme was not targeted at specific geographical areas and, hence there is not sufficient basis for a meaningful assessment of impact: EDEL provided some information from time to time concerning e.g. supply interruptions, energy losses, but ENE could not. ENE stated that because there was no continuity, the overall impact of spares provision is/was impossible to assess. Further, ENE has no system in place for assessing quality of supply.</p> <p>ENE hoped that the assistance would be continued for a further 2 years or more, and states that it still needs similar commodity assistance to undertake ongoing repairs and rehabilitation. The intention is that from this year (2006) ENE will develop annual refurbishment plans and prepare associated budgets for spares and equipment. But, according to ENE, the poor quality of supply is not only due to a lack of spares. Hence, to ensure sustainability, ENE in particular would need associated technical assistance (advisory and especially training) in supply chain management - including enhanced computerised systems for stock management, as well as training of emergency teams. Moreover, both utilities, but particularly ENE, need training to improve the management of fault statistics and ways to measure the performance of the impact to identify what set of variables caused (or did not cause) the improvements.</p>
6.	<p>Management of projects by:</p> <ul style="list-style-type: none"> <li>• Implementing institutions (in Angola)</li> <li>• Technical consultants (from Norway)</li> </ul>	<p>The Norwegian development cooperation effort through institutional cooperation (based on twinning) has been internalised in the Norwegian organisations involved in such effort. However, constraints were experienced in the ability of the Norwegian institutions to actively contribute relevant competence at the right time. The lack of ability (in this case by NVE) to have a continued presence in Angola was clearly a negative factor (due to both availability of personnel from NVE's side, but also the inability of the Angolan system to handle necessary aspects e.g. facilitation of timely approval of work permits etc).</p> <p>In terms of the bilateral cooperation with Angola, NVE views itself as a process manager and quality controller of the assistance, advising the client on quality of services provided by consultants and other third parties and being accountable in relation to the NORAD/UD. The NVE Coordinator responsibility was vested in different persons over the 2002-2006 review period - a fact that to some extent may have contributed negatively to more effective management of the programme. Communication with</p>

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		<p>MINEA/DNE has been a key problem. In general, NVE's programme administration role has been despatched reasonably well, but would have benefited from more frequent and longer visits to Angola by NVE personnel.</p> <p>To the extent that it was realised the NVE as an institution did not have the 'right' resources to support the programme, consideration could have been given to identifying a local coordinator employed by NVE to be deployed full time in Luanda. This could have significantly increased the effectiveness of the Norwegian support programme (and could be considered as a model for any future cooperation).</p> <p>NORPLAN's working relationship has been with NVE and not direct with NORAD (nor with the Norwegian Embassy in Luanda). Its only problem experienced with NVE was in relation to the bankruptcy case where NVE's position did not help in resolving the problem expeditiously<sup>6</sup>. The lengthy process to resolve this matter compromised the project. The Angola project was a joint venture between NORPLAN and E-CO, with E-CO assuming the contractual responsibility. However, one invoice in process at the point of bankruptcy became impacted – total value of NOK 1.7 million (three-parts payments to E-CO Partner, NORPLAN and Ernst &amp; Young, the latter for sub-contracted services). This fact triggered a process that ended up with subsequent invoices from NORPLAN also remaining unpaid for a sustained period of time. Consequently, NORPLAN decided (and had no real choice) to stop work. The total impact was an interruption in project work for about 12 months. This had a clear negative impact on the client relationship and made it difficult to continue afterwards. NVE had noted problems in the relationship between EDEL and NORPLAN, but confirmed that it had pursued a very light-handed engagement with EDEL only, in trying to resolve the issue.</p> <p>NORPLAN had only limited contact with Norwegian Embassy in Luanda. In hindsight, it is generally agreed that closer interaction may have been beneficial.</p> <p>The MINEA/DNE Annual Reports reviewed are considered to be perfunctory at best, and bear little resemblance to the standard and level of detail generally found elsewhere in similar bilateral cooperation arrangements. The Minutes of the Annual Meeting of 8 April 2003 (Clause 5) comments that "The reports should be prepared in such a way that makes easy to compare the results against the milestones and budgets of related programs and projects", but review of subsequent reports indicate that no substantive change in reporting occurred. It is concluded that the capacity constraints existing in MINEA/DNE prevented closer monitoring and control of implementation, that could have resulted in less budget under-spend and more coordination of effort for achievement of results.</p> <p>The comment applicable to the Annual Reports can also be made with regard to annual budgets and work plans – these are generally found to be lacking in detail and realism and do not appear to have been used as effective programme management</p>

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<sup>6</sup> In the initially stage, this was due to NVE's lawyers fearing a potential legal case against NVE.



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		<p>tools by either side.</p> <p>A specific reporting requirement concerned the spare parts. In order to provide ongoing assessment of the spare parts fund's contribution to the improvement of reliability and stability of power supply, MINEA/DNE were to report semi-annually during 2000-2003 on the following:</p> <ul style="list-style-type: none"> <li>• Stock management of “ordinary annual” and “emergency” procurement: type of equipment, quantity, supplier, date received, utilisation, as well as summary of total procurement to date and balance on fund.</li> <li>• Fault statistics: <ul style="list-style-type: none"> <li>- Number of faults 2000, 2001, 2002, 2003;</li> <li>- Time without power for each fault (period from breakdown to recovery);</li> <li>- Number of customers affected per customer group: industry, business and public administration, general public;</li> <li>- Assessment of improvement in reliability of supply.</li> </ul> </li> </ul> <p>The main stores in ENE and EDEL handled the stock management system. It is clear from the report “Ministério da Energia e Águas Direcção Nacional de Energia NORAD Spare Parts Fund Report July 2005” that the stock management aspect was reasonably well controlled and the annexes to the report provide details of receipts and application. However, other documentation provides only summaries of payments and budget balances; no fault statistics or any even qualitative assessment of improvements, if any, are mentioned.</p> <p>Reporting requirements were included to assess the level of improvement resulting from the provision of the spare parts through the fund. ENE and EDEL introduced a Microsoft based stock management systems, and both utilities claimed to have satisfactory fault statistics and supplied such information to MINEA/DNE. The only detectable signal of concern about insufficient reporting is contained in the Annual Progress Report 2002 in the last paragraph of clause 5.4: “The Guidelines states that MINEA shall report to NVE semi-annually on the effects of the spare parts program based on a) fault statistics from the utilities and b) the stock management systems”. This statement is not elaborated further, but the matter was repeatedly raised in subsequent documentation reviewed, without any apparent satisfactory resolution.</p>
7.	<p>Monitoring of the project by:</p> <ul style="list-style-type: none"> <li>• Norwegian Embassy, Luanda</li> </ul>	<p>NORAD is generally of the view that when there is a Norwegian partner providing professional support, there is no need for the Embassy to have in-house professional competence on each sector. Hence, reliance was put on NVE to provide the necessary technical and competency inputs. However, it appears that NVE did not have much engagement with the Embassy during the course of the support programme. This, in the context of very limited professional input and involvement by NORAD, raises the question about the appropriateness of only limited involvement by the Embassy in Luanda. In theory, the Embassy would use</p>

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	<ul style="list-style-type: none"> <li>Norad, Oslo</li> </ul>	<p>NORAD's competencies to oversee, supervise and assess the programme results and outputs and to advise when programme delivery deviates substantially from plans. In this case this particular arrangement does not appear to have functioned satisfactorily.</p> <p>It is noted that NORAD recently (September 2006) concluded a major reorganisation: the three previous professional departments have been reorganised into six new departments, one of which includes Environment, Infrastructure and Energy. In light of the above, combined with major changes in personnel in NORAD as a result of previous senior energy experts having retired, there were few NORAD representatives with any significant knowledge about the support programme to the Angola energy sector available to meet with the Review Team during its visit to Norway. Furthermore, it also became clear that significant parts of the project documentation post-2001 were not available at NORAD, but only from NVE and the Norwegian Embassy in Luanda.</p> <p>As the Embassy in Luanda operates with a very small compliment, Ms Vibeke Skauerud (a local recruit and long-term resident in Angola) has become responsible by 'default' for the management of the Norwegian support programmes for the electricity and water sectors in Angola. However, she emphasizes that she is not experienced in the sector, and is frequently absent for long periods (of +/- 6 months). Mr Ekman, First Secretary, has been in Angola for just over a year and is not too familiar with the historical aspect of the assistance programme. However, he will take forward current/residual Norwegian support activities, as well as any future initiatives that may arise.</p> <p>Since Norway's 2004 policy change concerning support to the energy sector, there has not been much emphasis on the agreements and their timelines and modus. Concurrently, Angolan priorities have also changed, so the Norwegian programme has become 'marginal'. The Embassy's view on the reporting provided by MINEA/DNE was that it was of a generally poor quality and on the brink on what could be accepted. However, in light of the capacity constraints facing MINEA/DNE, it was decided to focus more on ensuring that the programme could move forward than on the specifics and quality aspects of the reporting requirements.</p> <p>The Embassy, already stretched, has found its monitoring process to be difficult, e.g. it is still struggling to get the final audit report. The 2002-2006 plan was based on the assumption that MINEA would experience a doubling of professional staff. This did not materialise. The Angolan institutions lack support in management, rather than the technical content/focus (the same situation exists in the Water sector and in Statistics), and there may also have been a 'limit to entry' by outsiders (i.e. the Norwegian service providers) into the local managerial activities/areas (e.g. planning, commercial and financial).</p> <p>On the Norwegian side, the provision of technical support in these types of managerial aspects was constrained by limited resource availability, especially in NVE who was not always able to deliver on the task due to NVE experts not being available when required from an Angolan perspective due to other priorities. This is viewed as a reflection of NVE's limitations in terms of dedicated personnel to provide international support, not least due to an ever-increasing workload on NVE in terms of its</p>

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		priority tasks and obligations in Norway.
8.	Influence on project implementation of the Norwegian decision to phase-out support to the electricity area	<p>UD/NORAD do not perceive the influence of the 2004 Norwegian policy shift to have been particularly difficult or controversial in respect of the Angolan co-operation programme, as there was no need to terminate any existing contracts and programmes. NORAD is no longer directly responsible for bilateral co-operation (this has been taken over by the Norwegian Ministry of Foreign Affairs, through the respective Norwegian Embassies). As a result, NORAD's role is mainly in quality assurance/quality control (on a bilateral, multilateral and humanitarian basis), and NORAD's focus is increasingly on communication of results.</p> <p>From NVE's perspective, the new Norwegian government policy direction and focus caused some consternation in respect of the support to Angola (which resulted in the decision by the Embassy in Luanda that water and energy would be phased out upon completion of ongoing contracts, and focus would be directed to education and good governance instead). Prior to the 2004 decisions, the Norwegian institutions involved in the programme had been planning to recruit personnel who would be placed on long term (2-3 year contracts) in Angola, with one Norwegian entity in particular actually having employed a person for this purpose, thereby incurring unnecessary costs.</p> <p>Although clearly viewed as a negative and regrettable development, NORPLAN also had not perceived any significant impact on the ongoing projects.</p> <p>As stated in section 7 above, the combination of Norway's 2004 policy change and the concurrent changes in Angolan priorities have caused the Norwegian programme to have become 'marginal' to both parties, a situation that may be the root cause of lower than hoped for delivery, particularly concerning the NESMA follow-up components and the programme outputs (and lack thereof) over the past few years.</p> <p>EDEL and ENE thought it likely that the spare parts component of the programme would have been extended if the Norwegian policy had not shifted away from energy. With the experience gained during the three-year period 2001-2003, it is very likely that a far greater impact could have been achieved. Further, it is likely that supporting aspects such as planning and supply chain management systems would have been strengthened the process, with consequent improved prospects for sustainability of these areas.</p>
9.	Sustainability of results of programme components	<p>The Norwegian entities are of the view that sustainable results appear limited to a handful of people in DNE/MINEA. The establishment of a functioning MIS system is still considered important, but sustainability of the MIS is a concern. Although consultants can assist to identify data requirements, MINEA/DNE need to assume 'ownership' of the content of the database and the outputs required of it. Equally importantly, MINEA/DNE needs to recognise that no consultant can reduce the effort and obstacles associated with data acquisition in the operationalisation and maintenance of the MIS.</p> <p>A somewhat broader base is seen for sustainability in EDEL with positive impact in terms of asset management, network</p>

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		<p>planning, and language capabilities. NORPLAN also believes that the establishment of contact and ‘partnership’ with Electricidade de Moçambique (EDM) will assist to reinforce the improvements achieved to date in EDEL, and that this will serve to support sustainability.</p> <p>English training undertaken is viewed by all parties as a key area for building improved sustainability of the Angolan electricity sector on a broader basis.</p> <p>Questions can be raised about how well the outputs of the programme and its various components have been ‘institutionalised’ in the Angolan counter-part institutions. While this is always a challenging aspect of institutional co-operations, the particular Angolan situation and difficult operating environment during the period under review have certainly not assisted in this regard. To this extent, sustainability of results may be limited to a hand-full of key individuals that have had extensive exposure to the Norwegian support programme.</p> <p>The spare parts component was clearly regarded as “urgent emergency assistance” and sustainability aspects came into consideration only subsequently. Although no quantitative indication is available of improvements, there is no doubt that ENE, and especially EDEL, were able to put in place measures that provided a breathing space in which to take stock of longer term requirements to move towards acceptable levels in quality of supply. This is indicated by a more structured approach being implemented to plan improvements, as well as the identification of needs for enhanced systems and associated training.</p>

#### 4 OPPORTUNITIES FOR POSSIBLE FUTURE COOPERATION

Identified priorities and opportunities for a possible continued co-operation in the non-petroleum energy sector are discussed below. For ease of reference, the parameters given in the ToR have been followed.

No.	Issue	Comments and Observations
1.	Current government policy, priorities and plans in the non-petroleum energy sector	<p>The “Estratégia de Desenvolvimento do Sector Eléctrico de Angola”, published in 2002, describes government’s strategic intent for the sector. The strategy document is currently being updated to reflect developments since 2002, especially regarding investment priorities. Significant revision of the investment priorities is already reflected in the 2004 “Carteira de Investimentos” issued by MINEA as a guide for foreign investors and donors. Furthermore, the “Plano Director Para a Processo de Reforma do Sector Eléctrico” (the national masterplan for electricity sector reform), published in March 2006, provides more details of government’s reform initiatives (section 3, page 10: Objectivos Estratégicos do Sector Eléctrico), with an indicative timeframe of 3 to 5 years to implement a set of defined reform initiatives.</p> <p>Government’s key strategic objective is to increase household access to electricity and reduce asymmetries in access between provinces/regions. Long-term objectives are to promote:</p> <ul style="list-style-type: none"> <li>• The development of the electricity supply systems necessary to guarantee economic growth at least cost to society, while adequately protecting the environment;</li> <li>• Economic efficiency through a price policy that ensures competition in the sector and reflects the real cost of supply;</li> <li>• Exploitation of Angola’s natural resources, particularly through the use of hydropower and natural gas, to satisfy internal demand as well as realise export opportunities;</li> <li>• Local initiative and participation of local entities in the development of the electricity sector; and</li> <li>• The participation of private investment in the development of the electricity sector, while safeguarding the public and national interests.</li> </ul> <p>The strategy calls for:</p> <ul style="list-style-type: none"> <li>• Unbundling of production, transmission and distribution and allowing new entrants to the sector;</li> <li>• Open access to the transmission system;</li> <li>• Regrouping and rationalisation of distribution, permitting competition between distributors;</li> <li>• Transparency regarding the relationship between quality of service and tariffs, and a fair remuneration for the investor; and</li> <li>• Effective regulation of the electricity sector.</li> </ul>

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		<p>Despite the indicated 3-5 year horizon for the reform agenda, the comprehensiveness of the reform envisaged clearly represent a long-term view which will take time to implement. This includes agreeing on a new institutional structure of the sector, including the role of both existing entities such as ENE, EDEL and GAMEK (the latter responsible for the Capanda hydropower project and further developments on the Middle-Kwanza River) and new entrants (from the private sector). To this extent, the government has yet to decide on ENE's final structure. One option currently under consideration is to retain ENE as a state-owned transmission entity, but separate out generation and distribution activities, with each of these potentially broken up into a number of separate generation and distribution companies, with a view to their eventual privatisation and/or inclusion in new public-private partnerships with the private sector.</p> <p>With significant increase in government revenue from the petroleum sector, and to a lesser extent diamond mining, government's financial position has changed significantly. This is expected to have a positive impact on investment activities in the non-petroleum energy sector. On the government's budget for 2007, an amount of US\$500 million has been allocated to major investment projects, not least aimed at rehabilitation of key generation and transmission infrastructure, as well as expansion of the main transmission system to unlock new generation developments (including the effective integration of Capanda into the ENE power system). At this stage government's priorities appears to be generation and transmission developments, with lesser attention being paid to distribution system rehabilitation and expansion. However, the prospects of general elections in 2007 (or shortly thereafter) may see an increase in investment activities in the distribution part of the industry.</p> <p>The SIDA financed support programme to MINEA, undertaken by ECON Analyse AB, has been important in accelerating and firming up on government's reform agenda, not least in terms of finalising the reform master plan approved by Cabinet in March 2006 as the government's official statement of its reform intent. This was followed by the approval of a semi-autonomous Reform Implementation Unit (UIR) towards the end of 2006, currently being staffed by a group of senior professionals drawn from both within and outside of government. It is envisaged that Phase 2 of the SIDA support programme (with commencement during December 2006) will provide certain external support and capacity building to the UIR.</p> <p>While long coming, significant progress has also been achieved with the establishment and operationalisation of IRSE as the electricity sector regulator during 2006. Again, this has been well supported by the SIDA support programme. IRSE is now in the process of being staffed, with a Board appointed and a budget approved for its first year of operation. Again, it is expected that Phase 2 of the SIDA support programme will provide continued assistance to IRSE.</p> <p>The SIDA programme is also aimed at general energy policy support to government, not least in terms of developing and/or updating necessary sector strategies, including an overall energy sector strategy and a more focused rural electrification strategy and plan, and defining various renewable energy initiatives. Linked to this is support in the formalisation of INEL (the national electrification agency) and FUNEL (the national electrification fund) – both entities expected to be operationalised during 2007.</p> <p>A particular area of government focus is to realise Angola's hydropower potential in support of general economic and social</p>

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		<p>development. To this extent, mapping has been undertaken of a large number of potential sites for mini and micro-hydro plant, with several of these sites going through formal pre-feasibility study investigations.</p> <p>Further large-scale hydro developments are also high on government's priority list, not least on the Kwanza River system, downstream of Capanda.</p>
2.	Ongoing and planned co-operation with other partners in the (non-petroleum) energy area	<p>While there has been a reduction in the number of countries engaged in bilateral energy sector co-operation with the government over the past few years, there is still significant support being provided by foreign parties. This includes SIDA (Sweden), the People's Republic of China, USAID and USTDA (United States), as well as Russia and Portugal. Only limited engagement is currently taking place with the traditional co-operating partners such as the World Bank, the African Development Bank and various European bilateral agencies.</p> <p>A brief summary of some of the ongoing and planned co-operation initiatives identified is set out below.</p> <p><b><u>SIDA / Sweden:</u></b></p> <p>SIDA perceived a need for sector restructuring in key infrastructure sectors and wants to see (non-petroleum) energy, telecoms and water as focus areas. MINEA and the government view Sweden as a good, reliable partner – based on positive experience and dialogue in the past. To some extent it appears as if SIDA saw a gap opening with the 2004 decision by Norway to phase-out support to the Angolan non-petroleum energy sector.</p> <p>The current SIDA support programme has a three-pronged focus: MINEA, IRSE and the UIR. Some limited technical and engineering support is also provided to planning and implementation of certain key priority investment project.</p> <p>The time-frame for the ongoing Phase II support to MINEA is 2006-2008. The scope of work includes:</p> <ul style="list-style-type: none"> <li>• Assistance with operationalisation of the Power Sector Reform Master Plan, including technical assistance to the UIR;</li> <li>• Advisory support to MINEA on finalisation of the statutes and institutional set-up of INEL and FUNEL;</li> <li>• Guidelines for expanding access and rural electrification (pending an energy policy, a renewable energy policy and a rural electrification strategy);</li> <li>• Analysis and advice on the cost structure of the sector, as input to investment project prioritisation and future tariff reform;</li> <li>• Support to IRSE operationalisation; and</li> <li>• Limited engineering support to analysis, project development and monitoring of selected priority investment projects.</li> </ul> <p>While the current SIDA support is of considerable importance to MINEA and the government, Sweden is also going through the</p>

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		<p>process to scale down bilateral development co-operation, with increased focus rather on regional initiatives and other mechanisms for development support. Hence, SIDA appears open-minded to consider collaboration with other donor agencies in resourcing key initiatives and programmes, including in the energy sector. SIDA is, however, cognisant of the limited recipient capacity at the Angolan side, with a degree of caution being exercised against defining and supporting too ‘aggressive’ programmes that would go beyond the absorptive capacity of MINEA and the various energy sector institutions.</p> <p>Having said this, as an example, if Norway needed it, Sweden would in principle be willing to consider joining and co-financing technical assistance to the electricity regulator (e.g. on environmental aspects), particularly where such support would be too big for Sweden to take on alone<sup>7</sup>.</p> <p>Swedish energy sector support is currently largely provided through SIDA’s KTS ‘window’. However, SIDA has indicated that it is restructuring and reviewing cooperation where KTS is ‘merely’ a component, with the general view being that KTS support takes a lot of human resources – far too scarce as it is. Compared to ‘traditional’ assistance, KTS places more emphasis on social good than on infrastructure per se – where electricity is a means, supporting capacity development for other applications and outcomes. KTS is also a useful tool for providing interchange between Swedish companies and Angolan counterparties.</p> <p>Sweden has also re-initiated support to key technical developments in the electricity sector. To this extent, Sweden is currently providing support to some priority ENE transmission projects through SWECO International AB, including undertaking a feasibility study for a 220kV overhead transmission line Cambambe-Gabela-Quinelle to Benguela). The Swedish support includes assistance with mine clearance and line route mapping. The Embassy is currently topping up and adding to ENE’s requirements as a re-start of a previous close relationship with ENE. SWECO’s report is currently awaited to inform any decisions on future support in this area.</p> <p><b><u>People’s Republic of China:</u></b></p> <p>Since a 2004 breakthrough in terms of establishing co-operation with China, very rapid progress has been made in this regard. The Chinese impact is very much felt as the driving force in most new infrastructure developments in the country. China is currently clearly the dominant player in infrastructure development in the electricity sector where, in effect, China has become an alternative source of credit.</p> <p>China uses its foreign aid as a means to promote opportunities for private investment, and China and Angola have agreed that</p>

<sup>7</sup> It must be noted that NVE is of the view that there is very limited co-ordination at present between SIDA and NORAD in terms of support to the Angola energy sector, and NVE confirmed that it has hardly any information about the SIDA support programme to MINEA. NVE’s interest (or lack thereof) in this matter is clearly influenced by the 2004 Norwegian Government decision to phase out bilateral cooperation on the energy side in Angola. Significant more dialogue appears to take place at Embassy level.



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		<p>Chinese construction companies would build numerous infrastructure projects, financed by oil-backed credit that comes with few conditions in comparison with Western banks and international development financing agencies such as the World Bank and others.</p> <p>Two major transmission lines are under construction with Chinese support:</p> <ul style="list-style-type: none"> <li>• Capanda – Kavango; and</li> <li>• Cambambe – Luanda.</li> </ul> <p>China is also supporting various rehabilitation projects throughout the country, as well as distribution system expansion in certain parts of EDEL's network in the greater Luanda area. China is also in discussion regarding financing of new hydropower developments – both in terms of major projects and smaller scale initiatives such as Lucala.</p> <p>Detailed information about the scope and scale of Chinese support to the Angolan non-petroleum energy sector is generally lacking, with limited transparency only. In general the Chinese projects are financed by Eximbank, with the projects being executed on a turnkey basis: design, build, commission and hand over, at which point the Chinese input stops and Angolans operate thereafter. No Chinese involvement is planned in management of the sector, etc. Although the importance of balancing institutional capacity with infrastructure development is acknowledged, the need for support in these areas is not considered a priority from the Chinese side.</p> <p>While the Chinese support officially is provided through Eximbank, a significant portion is channelled via the Angolan Cabinet for National Reconstruction – an entity directly accountable to the State President. The official value quoted for Chinese support to Angola (across all infrastructure sectors) is currently about US\$3bn. However, when the support provided directly through the Cabinet for National Reconstruction is taken into account, the total value of Chinese infrastructure support appears to be approaching US\$7bn. How much of this relates to non-petroleum energy infrastructure is not known, but the contributions to this particular sector are considered very significant. An indication was provided by the Angolan Minister of Energy and Water after a recent visit to China, where agreements for a further US\$190 million support to the electricity sector were signed.</p> <p>As far as maintenance and spares/replacement are concerned, plant and equipment being installed consist of international brands</p>

<sup>8</sup> The first US\$100 million grant was used for Dondo and Luanda rehabilitation and some support to EDEL.

<sup>9</sup> Focus now is on the Huambo-Bié area, agriculture and the water sector in general. Norwegian involvement up to 2004 in water supply has had sustainable results, and the World Bank is very impressed with the depth of local knowledge resulting from deliberate knowledge transfer initiatives under the auspices of the Norwegian technical experts deployed.

<sup>10</sup> In the future, Luanda Sul will become another municipality and will also encompass Kilamba Kiaxi.

<sup>11</sup> BFA allocates 5% of earnings to its corporate responsibility programme.

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		<p>and/or solutions that are compatible with internationally branded equipment. The turnkey contracts commonly include a training component, generally in the form of short courses (some taking place in China, but most in Angola), coupled with on-the-job training. The focus of the training is very specific on operation and maintenance of Chinese provided equipment and systems.</p> <p>The representative interviewed spoke very little English, but was fluent in Portuguese. From the interview it became very clear that the Chinese involvement in Angola is based on a comprehensive strategy, and that ‘competition’ does not pose a threat.</p> <p><b><u>World Bank:</u></b></p> <p>In 2002 the Angolan government’s most urgent priority was infrastructure rehabilitation and development: to this extent electricity was identified as a key priority. Phase 1 of a World Bank support programme kicked in<sup>8</sup> but the second phase never followed for various reasons. However, it is now expected that the World Bank “will hopefully do Phase 2”.</p> <p>Unsurprisingly, DNE is frustrated with the four-year process without any real action on the ground, especially when considering that the objective of the World Bank support was “emergency assistance”. Legitimate questions are accordingly raised about how government can rely on this type of assistance, particularly when the pressure is building on government to deliver rapidly and in a highly visible manner.</p> <p>The World Bank is sympathetic to the DNE view and acknowledges that progress was frequently derailed due to new issues/problems identified. A further factor to impede progress was a policy change within the Bank resulting in emphasis on social investment rather than investment in infrastructure.</p> <p>In general, the World Bank is getting power back on the agenda after a hiatus of several years, but does not know what involvement could result in Angola. Electricity is a component of the present multi-sector arrangement, but does not constitute much (water is part of the US\$100 million programme and is a much bigger focus area<sup>9</sup>).</p> <p>In the past 11-12 years the Bank’s forté was to lend large amounts. Now, China has assumed this role. While the Chinese finance the heavy infrastructure, the Bank would probably in parallel be interested in the management of the sector and operations for sustainability. Focus is more likely to be institutional aspects and capacity building, but the Bank has not decided as yet on the direction it wants to take, and currently has very limited staff allocated to Angola. Compounded by a general poor relationship with Angola, this does not indicate that any significant involvement will take place in the non-petroleum energy sector in the short to medium term.</p> <p>A further consideration for the Bank is that Angola has graduated from IDA, but is not yet creditworthy for IBRD lending operations. There also outstanding transparency issues and concerns raised by the IMF which may pose further obstacles.</p> <p>The Bank’s influence on bilateral agencies’ decisions to finance the sector (either to constrain or promote) is questionable. The</p>

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		<p>bilaterals' reaction to the World Bank is mixed. The Bank would probably send a "negative" message if it did not participate, but most bilaterals' programmes are driven by national needs, policies and priorities. Thus, the Bank has some influence, but is also struggling with feelings/perceptions of arrogance. As a result, serious doubts can be raised with respect to the other donors being willing to align themselves with the Bank. A Consultative Donors' Meeting held on 9 November 2006 was expected to give an indication of the degree to which efforts are aligned in Angola. However, the outcome of this meeting is not known to the Review Team.</p> <p>A separate initiative where the World Bank is taking an interest is the much announced Westcor initiative whereby hydropower from Inga in the DRC and Angola is envisaged to be made available to the Southern Africa region (in particular South Africa) through a direct current (DC) transmission system traversing Angola. While the prospects of such project may be exiting, the project concept is inherently very risky and challenging, with a very long time frame to realisation (if at all). Successful development of Westcor will require legal and regulatory alignment of the electricity industry frameworks in five countries (DRC, Angola, Namibia, Botswana and South Africa) – not a small challenge in light of the countries involved belonging to 3 different legal traditions and speaking 3 different languages. Hence, a fair amount of realism should be exercised when evaluating the Westcor initiative. To the extent that large-scale hydropower developments in Angola is forthcoming, it may be better to prioritise use of such electricity production in support of industrial and economic development in Angola, rather than exporting electricity to the rest of the region.</p> <p><b><u>USTDA:</u></b></p> <p>DNE is currently negotiating with the United States Trade and Development Agency (USTDA) concerning two mini-hydro pilot projects in the provinces of Moxico and Cuando Kubango respectively (integrated generation/distribution projects). The ToRs for these pilot projects have been agreed with DNE. The DNE is of the view that this kind of project has tangible, physical outputs and that Norway should consider following the same approach as USTDA.</p> <p><b><u>USAID:</u></b></p> <p>USAID's starting position when considering support is broad based economic development and participatory democracy. USAID has two involvements currently in the energy sector in Angola: a new electrification programme in two areas of greater Luanda (Kilamba Kiayi and Viana municipalities), and the compilation of an inter-agency report on energy. USAID was previously involved in water and sanitation, and Kilamba Kiayi is the first/pilot project in electrification, where a key driver is to define and develop strategies and initiatives aimed at addressing up to a 15% annual population growth in defined areas<sup>10</sup>.</p> <p>Viana will be the second project, and has come about through participation by Banco de Formento Angola (BFA) who has</p>

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		<p>committed to co-fund the Viana electrification project as part of its corporate responsibility programme<sup>11</sup>. The value of the total project is US\$6.4 million, including BFA's contribution of US\$1.2 million. Viana is also a high growth area, but currently has more business activity than Kilamba Kiayi. Hence, policies concerning electrification in this area will have to be somewhat different to those applied in Kilamba Kiayi.</p> <p>An MOU between EDEL and USAID is in place. Although the relationship with EDEL was problematic at first, EDEL appears to have recognised the equal/mutual gains the project can bring. EDEL's CEO demonstrates his total buy-in to the electrification projects, e.g. he participates in joint planning activities with USAID. But staff did not demonstrate the same level of commitment, and misunderstandings on both sides nearly derailed the project at an early stage.</p> <p>Planning of the electrification projects is now undertaken jointly with EDEL, but EDEL's mapping system is obsolete (non-existent). Implementation is done jointly by the Academy for Educational Development (AED) and CARE International, the latter undertaking the associated community work, including the vital aspects of communicating information concerning initiatives planned for the affected communities' areas. These implementing agencies are well established in Angola and are finding areas of collaboration with EDEL.</p> <p>USAID also managed to facilitate a partnership between EDEL and Brazilian utility COELBA. A visit by EDEL staff to Brazil provided valuable opportunity to gain insight into lessons learnt in similar electrification initiatives in the Bahia State. A second visit is in the pipeline, and will include exposure to GIS as a key tool for planning of electrification schemes, and subsequent management of service provision.</p> <p>USAID is facilitating the technical information/experience forums to harmonise and get best solutions reflected in Angola (on Kilamba Kiayi and Viana projects). USAID is now placing more emphasis now on customer service aspects (including prepaid metering), and is also bringing in the concept of local councillors for mediation in disputes (to support effort to promote recognition of the dual responsibility of the service provider (EDEL) and the customer. Through such initiatives USAID is trying to change not only systems but also behaviour, thereby being within the context of one of USAID's objectives, i.e. to promote and facilitate democratic governance.</p> <p>USAID is also engaged in a municipal development programme started in 2006, which will continue until 2011. The programme will cover five municipalities in five provinces. The prime focus will be on decentralisation of decision making. Once again, the prime implementing agent is CARE. Involvement of various companies in USAID's Angolan activities includes Chevron (one of the prime supporters of the municipal development programme), LKI (diamond company), Exxon, Odebrecht and Coca Cola (who will also support other parallel Kilamba Kiayi and Viana initiatives).</p> <p><b><u>Other support programmes:</u></b></p>

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		<p>In addition to those ongoing and planned support programmes described briefly above, MINEA/DNE and the Angola government also benefit from other support initiatives.</p> <p>As an example, Portugal through EDP – Internal (the Portuguese national power utility’s international arm) is supporting ENE in developing master plans for distribution system rehabilitation and expansion in 15 Angolan cities. The Review Team did not have access to any details about this programme, but it appears as if the initiative is delayed.</p> <p>Another key player with increasing ‘appetite’ and involvement in the Angolan non-petroleum energy sector is Russia. Russia has played a key role in supporting GAMEK in implementation of the Capanda project. Russia is also supporting the first Angolan IPP: Hidro-Chicapa – a joint venture between a Russian diamond mining company (Alrosa) and ENE.</p> <p>More recently, it has been reported that high-level political discussions between Russia and Angola have resulted in a Russian interest in and commitment to support for major hydropower developments in Angola. This interest appears to compete with potential Norwegian interest in the same area, see further discussion below.</p>
3.	Potential Norwegian support related to realisation of major hydropower developments	<p>An area with potentially strong Norwegian interest is the realisation of Angola’s vast hydropower potential – both in terms of large-scale developments and mini- and micro-hydro initiatives. Norwegian parties are currently taking an interest in both these types of hydropower developments in Angola, as set out below.</p> <p><b><u>Norsk Hydro’s plan for large aluminium smelter and hydropower plant:</u></b></p> <p>Discussions with Norsk Hydro’s representative in Angola, as well as discussions with various Norwegian stakeholders during the Review Team’s visit to Norway revealed that the following potential development opportunity is currently being pursued by Norsk Hydro:</p> <ul style="list-style-type: none"> <li>• Construction of a large aluminium smelter in the Lobito area, with commissioning targeted for 2013;</li> <li>• The smelter would result in several thousand jobs being created (maybe as many as 15,000 during the construction phase);</li> <li>• A pre-feasibility study undertaken by Norconsult has been completed on a large hydropower plant on the Kwanza River (downstream of Capanda), with a targeted installed capacity of 1,600 MW, of which 1,000 MW would be dedicated for supply to the aluminium smelter (while the rest could be made available to the national system for general consumption);</li> <li>• The hydropower plant would be connected to the smelter through two 400kV transmission lines, one of which would be a direct connection and the other connected to the ENE national transmission grid;</li> <li>• The hydropower plant (and associated transmission infrastructure – at least the part that would be considered as dedicated to supply the smelter) is envisaged owned by Norsk Hydro with 50%. The remaining 50% would be envisaged split between an</li> </ul>

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		<p>additional private investor and a competent Angolan entity (based on its experiences from the oil industry in Angola, Norsk Hydro would welcome Sonangol's participation in the project), with a potential small stake also being offered to the IFC; and</p> <ul style="list-style-type: none"> <li>Norsk Hydro would need to retain operational control over the power plant to safeguard its interests as the main off-taker of the electricity.</li> </ul> <p>A number of key considerations have been identified that will require satisfactory resolution to underpin the potential investment decisions. This includes, but is not necessarily limited to:</p> <ul style="list-style-type: none"> <li>Creation of a bankable and appropriate framework for sale of power to the general grid system;</li> <li>Agreement on bankable and reliable transmission integration arrangements for the project, including construction, ownership and operations;</li> <li>Award of a long-term concession to Norsk Hydro for development and operation of the hydropower plant and associated infrastructure;</li> <li>Agreement on a satisfactory tax regime for the project;</li> <li>Agreement on a suitable ownership structure of the project, including an acceptable arrangement for Angolan participation; and</li> <li>A satisfactory environmental solution for the project (which would fall under newly approved environmental legislation, as well as a new legal and regulatory framework for the water sector).</li> </ul> <p>In terms of environmental impact and necessary environmental management and mitigation arrangements, it is noted that the proposed hydropower project would only result in limited inundation as well as limited downstream impact on agricultural activities. On a positive note it is expected that the project would have a positive impact in terms of realising an increase in the capacity of the downstream Cambambe hydropower plant.</p> <p>Should the project be approved in principle by the Angolan government, a decision being sought early 2007, Norsk Hydro envisages a two year negotiation process with the government and other concerned and interested parties, to be followed by a one year technical planning phase (post negotiation). The most optimistic timetable would see construction to start towards end of 2009, with commissioning of the plant from 2013.</p> <p>From the above it is clear that the Norsk Hydro initiative to become a reality would challenge a number of established Angolan sector frameworks. It would also trigger development of missing frameworks, required for serious private sector investor interest to be realised, not least in terms of long-term concession, fiscal, commercial and environmental frameworks required to ensure a bankable project. With Norway's extensive experience with hydropower development in support of industrial development</p>

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		<p>initiatives, not least through Norsk Hydro's own history in this regard, it would appear that Norway could have a lot to contribute to facilitate the realisation of this and similar initiatives. Careful consideration would however be required not to create any conflicts of interest as part of any Norwegian support arrangements.</p> <p>From discussions in Angola, the Norsk Hydro initiative is facing competition from other foreign initiatives along similar lines, not least from Chinese and Russian sources. To this extent it is noted that the Norsk Hydro concept by some individuals appears to be considered too limited in terms of what it offers in terms of power and energy being provided to the national grid system.</p> <p><b><u>Micro-hydro concept:</u></b></p> <p>At the other end of the scale, when compared to the Norsk Hydro initiative discussed above, is another Norwegian hydropower initiative. This initiative is based on containerised micro-hydro solutions, to be deployed for distributed generation solutions in areas otherwise not expected to be reached by the national grid system for a sustained period.</p> <p>The concept is the result of a partnership between 3 Norwegian entrepreneurs, ABB and Energiteknikk. It is aimed at providing an environmentally friendly and sustainable localised energy supply solution for locations with access to water (drawing on Norwegian experience with hydropower solutions).</p> <p>The concept is based on prefabrication of a micro-hydropower station (typical capacity 500kVA), encapsulated in a container. The containerised generation solution requires access to water. The basic concept is to ensure a simple solution from a construction / implementation perspective. Several containers may be connected to provide for larger solutions.</p> <p>The initiative has strong support from MINEA / DNE. The current status is as follows:</p> <ul style="list-style-type: none"> <li>• Contact has been established with the relevant Angolan authorities on the concept – both in MINEA and ENE;</li> <li>• Priority is on implementation of a pilot scheme to demonstrate the viability of the concept;</li> <li>• In cooperation with DNE, Ambriz was identified as a possible pilot location (being a small city with about 7,000 to 8,000 inhabitants, some fishing industry and basic services, isolated from ENE's national grid systems);</li> <li>• Former diesel installation by the oil industry is long gone. Currently, only 2 small diesel generators exist (with a total capacity of 150kVA), of which only 1 is in working order due to poor maintenance and lack of spare parts. The current operational responsibility is with the local authority;</li> <li>• The concept is viewed as an industrial initiative, with a number of potential applications in Angola. MINEA has already mapped a number of potential sites with possible application;</li> </ul>

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		<ul style="list-style-type: none"> <li>• The selection of Ambriz as pilot site may have to be reconsidered as a larger 7 MW mini-hydro project is now being considered for Ambriz;</li> <li>• Two alternative sites with similar characteristics are being considered (one close to Ambriz and another site east of Luanda). Pilot sites are identified based on certain criteria, including being not too far from Luanda and having access by road for the container;</li> <li>• Ownership and operation of the pilot plant is envisaged to vest with ENE initially, but could evolve to create a local utility (with or without assistance by ENE);</li> <li>• NORAD has financed a pre-study (in two phases) to a total value of NOK 500,000. Considerable interest is expressed by the Norwegian Embassy in Luanda;</li> <li>• Discussions have been held with ScandPower and Norfund about financing, ownership and operation of small hydro plants. A MoU has been signed with ScandPower which could allow for Norwegian involvement beyond being a technology provider and supplier of equipment;</li> <li>• Subject to a successful pilot, ABB would establish local presence in Angola to provide technology and engineering support;</li> <li>• The pilot project must address the commercial solutions, i.e. setting up a mini-utility responsible for managing the plant (and associated networks), supplying electricity to customers, billing and revenue collection. Innovation Norway is interested in considering the concept as an IFU project (a Government sponsored R&amp;D project, with IFU funds covering up to 35% of the project costs). The IFU project would not focus primarily on the technical solution, but rather on the concept as such;</li> <li>• The need for donor support/soft financing appears evident – to justify the pilot, but also to create the broader frameworks to roll this out on a broader basis;</li> <li>• Cost estimate for the pilot scheme is about NOK 9 million (excl. civil works), indicating a cost of production of 0.28 NOK/kWh (approx. 0.04 US\$/kWh) for the pilot plant, dropping to 0.18 NOK/kWh if two more containers are installed. This cost excludes financing costs and return on equity;</li> <li>• Current priority is to implement the pilot plant first. Depending on the experiences gained with implementation and operation of the pilot plant, focus will be on creating appropriate frameworks that allows for industrialisation of the concept and more widely use throughout Angola (and beyond); and</li> <li>• Industrialisation should focus on building up local sourcing, manufacturing and support for the technology and concept.</li> </ul> <p>While the micro-hydro power concept appears to have considerable merit, it is interesting to note that its realisation will to a large</p>



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		extent depend on the same issues being addressed as is the case for the large-scale Norsk Hydro initiative. This is considered of interest when assessing potential arrangements for potential Norwegian support.
4.	<p>Relevance of Norwegian competence:</p> <ul style="list-style-type: none"> <li>• Institutional development and strengthening</li> <li>• Electricity generation capacity</li> <li>• Electricity transmission and distribution</li> <li>• Rural electrification</li> </ul>	<p>The government's reform agenda is focused on areas where substantial competence and experience exist from a Norwegian perspective. This encompasses increased access to electricity and rural electrification, institutional reform and development, corporatisation and restructuring of public utilities and introduction of a regulatory regime, to facilitate more effective and efficient sector operations and introduction of new participants in the industry.</p> <p>With Angola's proven hydropower potential of more than 14,000 MW, Norway's long and extensive experience with hydro resource management and granting of concessions for hydropower developments and operations would be of significant value to assist and facilitate sustainable development of Angola's hydropower resources. To this extent, relevant Norwegian competence exists in all the required areas, but would have to be carefully considered against the modus of application in the Angolan context.</p> <p>A combination of contributions to investments and building of the necessary frameworks could be the basic concept around which any Norwegian support might be built. The review of the Norwegian 'Stipendiatorndning' (conducted two years ago with a focus on Tanzania) made the important observation that the value contributed by long-term Norwegian involvement in project planning, tender preparation and award, construction supervision and control – in close cooperation with the client organisation – has created good sustainability impacts. From an investment perspective though, it would be necessary to identify and assess what support arrangements would be required to entice Norwegian industry to engage in the Angolan context.</p> <p>The view tabled by NVE in discussions with the Review Team is that if cooperation is related to a clearly defined project, then long-term presence in country works best. However, for general advisory and support activities this does not work that well and is (in NVE's opinion) not considered good use of resources. [<i>Clearly, this view may be informed by high work pressure on NVE's staff at home, mainly linked to high workload in Norway, and the very limited personnel resources dedicated to international co-operation and support activities.</i>]</p> <p>In an Angolan context, a twinning arrangement in its commonly understood form is not really possible as NVE (on the basis of its resource management and regulatory background) cannot easily twin with a sector Ministry: NVE is not a policy maker, but a regulatory agency and a professional advisory institution. There are also complications in relation to NVE's internal set-up, with only people in the International Department able to travel freely (International Department currently consists of 6 people – although between 8 to 10 NVE person-years are generally spent on NORAD type international assignments), while access to other resources in NVE is difficult.</p> <p>Another contentious issue when assessing potential modalities for Norwegian development co-operation and institutional support is the need to discuss and clarify whether it is fair to expect from NVE that it should compete against the private consulting environment. In NVE's opinion, this should not be the case. NVE regards itself as a key element of energy sector governance and</p>

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		<p>its competencies and capacity should be used accordingly. Possible future involvement could focus on facilitation of industrial–energy initiatives (e.g. such as Norsk Hydro’s Angola initiative combining establishment of a large aluminium smelter with realisation of a major new hydropower development). This could involve assistance in the design and development of necessary concession frameworks, as well as support to create necessary transmission solutions. NVE support could include the management of tender processes (from an Angolan client perspective) and project implementation, including ensuring compliance with agreed/established frameworks and criteria.</p> <p>With an envisaged unbundling of ENE and the possible creation of a national transmission company (based on ENE), combined with the prospects of major new hydropower developments with involvement by the private sector, Angola will need to develop a framework for transmission access and pricing of transmission services that will be conducive to support expected future sector developments. This is an area where Norway has particular strong competencies and experience to offer. A development such as the proposed Norsk Hydro aluminium and hydropower development would definitely require a well-defined framework for transmission access and pricing to be put in place, as an example.</p> <p>Another area where Norwegian competence and experience could be brought to bear is the introduction of effective planning frameworks and tools to support major rehabilitation and expansion required of the Angolan power networks, not least to cater for the very rapid growth of the networks in and around Luanda, particularly in Luanda South, where numerous mini-grid developments are taking place in parallel under both ENE and EDEL auspices, as well as driven by private third party players.</p> <p>ENE and EDEL’s commercial and customer service performance continue to need attention. This is linked to better customer, accounting and financial management systems that capture and guide improvement in commercial performance. Norwegian experiences from support in these areas to a large number of developing countries and utility environments could be brought to bear, both to assist in sorting out commercial problems vis-à-vis existing customers/operations, and to establish and support the creation of new organisations driving the servicing of a new customer base. However, for these type of support interventions to be successful, it is essential that competent advisors be deployed full-time, working in-house with the host organisations. It is recognised that the risks of this approach may be high, not least linked to the risks of identifying and deploying individual advisers who are not only competent and experienced, but who also have the ability to work and made a difference in a local developing country environment such as Angola.</p> <p>In recognition of the fact that Norwegian development co-operation with Angola is envisaged to be phased out over the period 2007 -10, it may not be prudent or possible to engage in any new support programmes requiring longer-term sustained presence on the ground to be successful. Hence, any potential continued Norwegian support may have to be built around shorter-term and focused interventions on the one hand, e.g. related to support for development and implementation of hydropower concession frameworks and best practise environmental management, combined with support for longer-term capacity building in the country, e.g. through support to the tertiary education system in developing targeted programmes and initiatives aimed at sustainable</p>

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		energy sector development.
5.	Human resource base for sector management and development	<p>The Angolan human resources capacity in terms of effective energy sector management is currently low, with extensive dependency on a very limited number of individuals. While the current institutional support programme has benefited from having a very competent Angolan counterpart in overall charge of the programme, severe capacity constraints exist at the levels below. Hence, a broadening of the skills base and focused training of energy sector managers are critical activities to build a more sustainable future.</p> <p>Under the current institutional support programme, the experiences with training and competency building initiatives have not been very encouraging, with a significant amount of unused resources being the result. While there should be a strong focus on training, this requires that dedicated counterpart personnel be made available from the client's side. With the desperate shortage of skills currently experienced in Angola, it is difficult to get agreement on taking personnel out of their line functions for any sustained period of time. This, combined with the fact that it has proven difficult to identify and deploy long-term foreign advisors to Angola who could provide sustained on-the-job training to local counterparts in their normal working environment, makes energy sector human resource development in Angola a major challenge.</p> <p>Human resource development initiatives in government and the public utilities are also constrained by a major gap in remuneration between the public/parastatal sector on the one hand and the rapidly growing private sector in Angola, with the latter being much better positioned to access and recruit from an already limited skills base. MINEA's resourcing constraints are a clear reflection of this reality.</p> <p>One longer-term strategy could be to focus more on designing human resources development initiatives and programmes in collaboration with the increasing number of private education and training institutions setting up in Angola. Norwegian training resources could then be made available to support and capacitate local training providers.</p> <p>If any continuation of Norwegian support is to be considered, it is important to be realistic about the absorptive capacity of the recipient. In terms of MINEA, the generally held view is that this capacity is very limited. This is a view supported by SIDA ("the present level of support is as much as they can absorb for now"). As pointed out by NVE, it is also important to recognise that the recipient organisations need time to do their normal jobs as well, not only spend time on managing and engaging with foreign support programmes which commonly end up with not being particularly well aligned with the most pressing priorities of the day. Thus, any future support should place emphasis on hands-on job-related training, and limit the more theoretical aspects explored in seminars and courses to what is really of critical importance.</p> <p>While, in theory, Norway has much to offer to Angola in its current situation, the most relevant Norwegian institutional environments (such as NVE) are heavily resource-constrained on their side as well, with very limited resources to deploy. This situation is compounded by the Norwegian Embassy in Luanda also being overworked in light of a steadily increasing workload,</p>

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		not least related to taking on country responsibilities for a number of other neighbouring countries as well as engaging with the rapidly unfolding Angolan agenda.
6.	<p>Potential public / private financing sources for sector development</p> <ul style="list-style-type: none"> <li>• Clean Development Mechanism (CDM)</li> <li>• Combination of public / private financing and CDM</li> </ul>	<p>Angola's fiscal situation is changing rapidly, with substantial revenue increases being experienced due to a combination of rapidly increasing petroleum production and high oil and gas prices, as well as with a thriving diamond industry. Hence, the government's own ability to contribute financial resources towards investment and development of the non-petroleum energy sector is steadily improving, as evidenced by the allocation of US\$500 million towards priority electricity sector investment projects on the current (2007) government budget.</p> <p>While an improving government fiscal situation is encouraging in terms of future sector development and improved sustainability, the overall financial requirements remain huge in the short term – to address much needed repair and rehabilitation of existing infrastructure as well as financing expansion of supply to meet a rapidly growing demand for electricity and energy. At this point, government's priority appears to be on investments in the generation and transmission part of the industry, with distribution system expansion and tackling of the rural electrification challenge receiving much less attention. Hence, any potential financial support should preferably target rural electrification initiatives, e.g. linked to mini- and micro-hydro developments and associated mini-grid systems.</p> <p>The private sector is showing increasing interest in Angola's energy resources, both in terms of hydropower and natural gas. However, without an appropriate investment and energy sector management and regulatory framework in place, major private sector investment may not materialise – at least not in the short term. It is also somewhat difficult to envisage how a major private sector initiative such as Norsk Hydro's proposed aluminium smelter and associated hydropower development can compete against state sponsored initiatives such as those represented by the current strongly articulated Chinese and Russian interest in the Angolan environment. To this extent, the chances of private sector success may be much higher for 'less threatening' initiatives such as the micro-hydro container concept.</p> <p>Private sector investment in the true form may only materialise once key elements of the government's current reform agenda have been successfully completed, including clarifying the roles and responsibilities of ENE and GAMEK, as well as introducing more independent regulation of the sector and progressing tariff reform towards more cost-reflective pricing.</p> <p>There is an undisputed potential for making use of environmentally related financing mechanisms in support of energy sector investments. Angola's energy resource base of hydropower and natural gas leans itself favourably towards use of the Clean Development Mechanism (CDM) and other similar financing arrangements, although the institutional framework in Angola is still lacking in this regard, with no competent authority in existence to accredit CDM type projects. This is an area where potential Norwegian support could make an impact – not least in terms of realising Angola's renewable energy potential (in particular linked to micro-hydro solutions as already discussed).</p>

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		<p>Public – private partnerships could emerge as an important model for new developments in the Angolan non-petroleum energy sector. A limited precedence is already set by ENE partnering with a Russian private company in developing the 18MW Hidro-Chicapa project in the Lunda North province. Experiences from this development could be extracted and potentially used as a basis for a public-private partnership model – not least as the government’s intention appears to be to ensure that there is Angolan participation in all new sector developments. ENE is currently envisaged as the Angolan party in such developments, but this could change as the government’s reform agenda unfolds.</p>
7.	Role and justification of Norwegian development aid financing	<p>Traditional development aid for Angola is generally seen to be declining over the years to come as Angola’s financial situation improves. However, Angola may still benefit from development assistance over a period while the country goes through major transition, during which Angola also needs to resolve its relations to international organisations and arrangements, e.g. the Paris Club of international creditors.</p> <p>The Review Team agrees that the financial justification for potential continued Norwegian support to the electricity sector is not strong. However, the major needs for technical and managerial support should be recognised and should form the basis for any potential future co-operation.</p> <p>In this regard the government’s reform agenda for the non-petroleum energy sector is considered laudable, but will require external support to become a reality – not least due to the current human resources and capacity constraints in Angola. Areas where Norwegian competencies and experiences appear to have potential merit include support for new hydropower developments – both large scale projects and small scale initiatives contributing to the government’s agenda of improving access, in particular in the rural areas. This could at the same time be an opportunity for meaningful involvement of the local Angolan private sector through various capacity building initiatives and support arrangements, thereby increasing the overall sustainability of the Angolan economy in general and the electricity sector in particular. Norway may also have major contributions to offer in terms of introducing environmental management best practices and creating frameworks for use of CDM-type of financing to assist sector developments.</p> <p>While institutional support in its traditional form is not considered appropriate going forward, it is clear that MINEA will require sustained support to realise a successful outcome of the electricity sector reform process that government approved in 2006. While the current SIDA support programme is important in this regard, it does not appear to be sufficient to cover all the short-term needs, in particular related to sustained support to the UIR (the Reform Implementation Unit) over the next 3 year period. What is particularly lacking in the SIDA support programme is provision of a long-term advisor (on a 3-year contract) to act as the day-to-day counterparty to the Manager of the UIR and his key professional staff. The success of such arrangement would be critically dependent on identifying the right individual, preferably with hand-on experience from implementation of major reform processes and fully conversant in the Portuguese language. Potential Norwegian support in this regard could make a major impact on the chances of success for the government’s reform agenda.</p>

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		<p>With an increasing Norwegian private sector interest in Angola, there could also be justification for considering targeted support aimed at creating appropriate frameworks for realising private sector investments in the energy sector (not particularly aimed at Norwegian private sector investment only, but for the creation of more general framework conditions that any private investors would be looking for). This could potentially be supported through UD's private sector initiatives (such as a "sector og bransjestudie") in the terms of assistance with mapping and development of a private sector investment framework for the Angolan electricity sector, including initiatives aimed at improved management of the sector.</p> <p>In summary, Norwegian development aid should not be ruled out, but must be carefully considered against Norway's longer-term strategic intent in Angola. In this context, the USTDA model is instructive where the initial investigation by a potential USA investor is co-financed (up to 50%) by USTDA and is intended to pave the way to public-private-partnerships in the host countries. A Norwegian parallel in terms of e.g. the containerised micro-hydropower concept could have significant merit, not only for deployment in Angola, but also more generally. This could include support for a pilot project, with focus being on addressing not the techno-economic solution, but rather the framework conditions that need to be put in place for successful and sustainable development and implementation of this concept. This would include financing and guarantee requirements (to reduce and mitigate investor risks), tax treatment, a concession framework, a framework for involving the local communities and/or the local Angolan private sector in sustainable operations and maintenance, thereby creating positive employment impacts at local level, etc. Involvement of the Norwegian Export Credit Agency (GIEK) in such pilot initiatives would appear to have significant merit.</p> <p>It is also recognised that in 2006, Norway's Minister of Cooperation re-emphasised energy as being one of two areas of Norwegian comparative advantage. This pronouncement coincided with the presentation in January 2006 of joint study by NORAD and the private sector, which rejuvenated interest in energy. During the current End-Review, UD expressed that consideration could be given to limited Norwegian donor support to unlock private Norwegian investments.</p>
8.	<p>Potential role of regional initiatives in infrastructure development</p> <ul style="list-style-type: none"> <li>• SADC</li> <li>• NEPAD</li> </ul>	<p>Angola's future energy sector developments will not take place in a national vacuum. Angola has significant energy resources that could make a major contribution in a broader regional context. To this extent consideration is required as to Angola's engagement with the Southern African Power Pool (SAPP) initiatives and the Energy Pool of Central Africa (PEAC). However, at this stage, Angola has no high-voltage transmission interconnections with any of the neighbouring countries (although distribution level cross-border connection exist, e.g. with Namibia).</p> <p>In the electricity area, the most high-profile regional initiative involving Angola is the Westcor initiative. This is one of the priority NEPAD initiatives in the energy sector. The national power utilities of DRC, Angola (i.e. ENE), Namibia, Botswana and South Africa have jointly established Westcor as a vehicle to realise power system integration and large scale electricity export from the DRC and Angola to the Southern African region. This could involve developing up to 6,000 MW of hydropower capacity in Angola, with a significant portion of this being exported to Angola's southern neighbours (in particular South Africa). While</p>

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		<p>the techno-economic merits of Westcor are intriguing, the political, financial, legal, regulatory and risk aspects of this initiative should not be underestimated, implying that Westcor at best will be a long-term development. Hence, Angola may more constructively focus on realising energy sector developments based on its own needs in the short- to medium term. This could include large scale energy developments aimed at supplying energy intensive industrial and minerals projects in Angola.</p> <p>The SADC Secretariat, located in Gaborone, Botswana, has the responsibility to coordinate major sectoral developments at the regional level. (Norway has offered support to SADC Secretariat/Energy Sector). The actual regional level planning and operating aspects are carried out in the SAPP. Angola is a particular focus for the SAPP's ambitious plan to develop a 'western corridor' through an integrated network linking the Democratic Republic of Congo, Angola, Namibia and South Africa. To this end, the national power utilities concerned have already established Westcor, a company dedicated to the promotion and realisation of this 'corridor'. The utilities have also undertaken a number of studies and are considering various implementation options. The options include power generation developments in Angola as well as the integration of Angola's three systems.</p> <p>Another regional initiative of more short-term importance to Angola is the Regional Association of Energy Regulators (RERA), also loosely organised under the SADC umbrella. The RERA's membership comprises national electricity sector regulators with the objective of knowledge transfer and, particularly, gradual progress towards harmonisation of regulation and regulatory principles and practises between the member states. Thus, the RERA is a forum where matters directly impacting investment decisions at both national and regional levels are deliberated. Angola (through IRSE) is about to become a member of RERA and could benefit from linking with various RERA initiatives and activities to accelerate the development of its sector regulatory frameworks.</p>
9.	Scope for co-operation with other financing institutions and programmes	<p>In terms of ongoing and planned energy sector programmes and co-operation initiatives, the most interesting ones from a Norwegian perspective appear to be the SIDA support programme and regional support to RERA developments.</p> <p>The possible scope for cooperation with SIDA has already been discussed, with two areas appearing as of particular interest:</p> <ul style="list-style-type: none"> <li>• Complementing the existing scope of Phase II of the SIDA programme by making provision for a long-term (3 year) advisor being deployed to support the work of UIR (the Reform Implementation Unit). The deployment of a long-term advisor was part of the original request from MINEA to SIDA, but was not included in the arrangements for Phase II. Hence, the current lack of continuous on-site external support to UIR is considered to hamper the effectiveness of UIR's work at this important point in time; and</li> <li>• Specific shorter-term initiatives to assist in the development of concession frameworks for power generation developments (both large scale project and a more light-handed framework for mini- and micro-hydro developments). This could be limited to the formal regulatory frameworks required (where Norway has extensive experience to offer – both from Norway itself, but also from long-term development co-operation in a number of Southern and East African countries), but could also include</li> </ul>

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		<p>financial support/guarantee arrangements and environmental initiatives. This would require some further discussion with the relevant Angolan authorities (not only MINEA, but also the Ministry of Environment).</p> <p>From the Review Team's discussions in Angola, it is clear that MINEA/DNE would be very favourably disposed to a possible Norwegian interest in complementing and reinforcing the ongoing SIDA project. Any Norwegian interest in this regard would have to be raised with SIDA (Stockholm) as the Swedish Embassy in Luanda has no mandate in this regard. Careful consideration would have to be given to ensuring that any Norwegian support would complement (and not compete with) the SIDA support programme, thereby making the programme more effective and sustainable. With a lot of positive experiences from previous NORAD and SIDA co-operation throughout Southern Africa, this appears to be a workable model.</p> <p>While the SIDA programme is also targeting IRSE as one of its Angolan counterpart institutions, Norwegian support through RERA could make a positive contribution to IRSE's development – both as a regulatory authority from an institutional perspective, but also in terms of accelerating the development of necessary regulatory frameworks that will be required to facilitate reform and development of the Angolan electricity sector.</p> <p>Norwegian competence in energy economics would certainly also be useful to Angola, as a contribution to improve sector decision making processes. Norway is currently providing some limited support to a programme for capacity building in energy economics through the Catholic University in Luanda, which is also being courted by USAID. Collaboration with USAID may be useful to maximise effort in knowledge transfer in a manner that also takes cognisance of cross-cutting issues that may be more directly addressed by USAID.</p>
10.	Potential areas of Norway-Angola co-operation	<p>The Review Team is of the opinion that it would not be merited to continue Norwegian energy sector support to Angola along the lines of the current institutional co-operation programme, for the following reasons:</p> <ul style="list-style-type: none"> <li>Continued broad-based institutional development support to the Angolan utilities (EDEL and/or ENE) does not appear justified, although some limited targeted support within clearly defined areas where Norway may have specially relevant expertise and competencies to offer, could potentially be considered (e.g. linked to improved commercial management);</li> <li>However, financial assistance to ENE and EDEL is hard to justify in a situation with increasing availability of financial resources on the Angolan government side. In this situation it is difficult to argue for grant aid to parastatal companies running at a deficit, particularly when the deficit (at least in part) is caused by the fact that another part of government (in this case the Ministry of Finance) sets prices below cost;</li> <li>Similarly, grant aid cannot be justified to support utility procurement activities in a situation where there is a significant overall fiscal surplus, with the government increasingly able to support utility investment programmes;</li> <li>The institutional co-operation model (through twinning type arrangements) is not considered appropriate in Angola, due to a mismatch between NVE and the Angolan counterpart institutions (although some NVE support to IRSE could</li> </ul>



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No.	Issue	Comments and Observations
		<p>potentially be considered, not least in terms of assisting the development of appropriate concession frameworks for hydropower development and hydro resource management), as well as NVE's limited capacity to engage in a constructive manner with Angola;</p> <ul style="list-style-type: none"> <li>• While it is recognised that MINEA/DNE need continued assistance in operationalising a MIS for the energy sector, the current focus should be on revisiting the need for a MIS system, clearly defining the objectives of such system and clarifying the roles and responsibilities in terms of data inputs, information management practises, etc.</li> </ul> <p>However, based on the Angolan government's decisions in 2006 related to electricity sector reform and restructuring, and the government's expressed commitment to progress the reform agenda through a dedicated Reform Implementation Unit (UIR), the timing may be good for consideration of potential targeted support by Norway. Any such support should preferably also be aimed at nurturing a growing Norwegian private sector interest in the Angolan energy sector.</p> <p>As set out in this Review Report, a potential continuation of Norwegian support should not be based on the traditional institutional co-operation model (as this has proven to have severe limitation in the Angolan context – both from the Angolan and Norwegian side), but rather adopt a more pragmatic approach. This could include the deployment of a long-term advisor to the UIR, complemented with certain focused and targeted interventions in areas where Norway has specific competencies and experience to contribute.</p> <p>Any potential support and interventions should preferably make a contribution to developing investment, regulatory and operational frameworks that could incentivise the Norwegian private sector to engage with Angolan energy sector developments.</p> <p>Furthermore, successful development of the Angolan energy sector will depend on building of appropriate and sustainable regulatory capacity. Hence, including Angola in already existing Norwegian support to RERA, e.g. through development of certain RERA initiatives of particular relevance to the Angolan reality, would also appear meaningful.</p>

## **5 ANNEXES**

### **Annex 1: Terms of Reference for the Assignment**

**TERMS OF REFERENCE  
FOR  
END REVIEW OF  
THE NORWEGIAN SUPPORT TO THE ENERGY SECTOR IN ANGOLA  
WITH A FOCUS ON THE PERIOD 2002 – 2006  
AND  
IDENTIFICATION OF OPPORTUNITIES FOR FUTURE COOPERATION**

#### **1. Objective**

The objectives of the review are to assess the results of the co-operation and to identify and discuss priorities and opportunities for a possible continued co-operation in the energy sector (excluding oil and gas).

#### **2. Scope of Work**

##### **a) The End Review**

The review shall concentrate on the period 2002 - 2006, but where found relevant to the end review, events before this period shall be taken into account and referred to. The report shall cover but not necessarily be limited to the following issues:

1. Assess the quality of preparation of the project including:
  - the realism of the design of the project
  - identification of risk and their mitigation
  - consideration of cross cutting concerns such as gender and environment
  - realism of administrative and reporting obligations in the agreement.
2. Review how the recommendations from the 2001 review were followed up in the design of the last phase of the project, particularly with respect to a) the management of the spare part component and b) the technical assistance, particularly the arrangements for institutional strengthening.
3. Briefly assess the results achieved through the project as compared to their set goals, objectives, output and inputs.
4. Assess the economic, financial, environmental and institutional sustainability of the achievements of the Norwegian support.
5. Briefly assess the relevance and the technical quality and management of the provision of spare parts to Angolan power utilities.
6. Assess the management of the projects (planning, management/implementation and reporting) by the implementing institutions in Angola, and their technical consultants from Norway.

7. Assess the technical and administrative monitoring of the project by the Norwegian Embassy in Luanda and Norad Oslo.
8. Briefly discuss how the Norwegian decision to phase-out support to the electricity area influenced project implementation.
9. Briefly assess the sustainability of the results of the various programme components, including whether the people trained continue to use the technology and management systems developed and transferred.

**b) Identification of opportunities for a possible future co-operation**

1. Briefly describe current government policy, priorities and plans in the non-petroleum energy sector.
2. Briefly describe on-going and planned development co-operation with other partners in the area.
3. Assess and discuss need and opportunities for complementary Norwegian support to Angolan institutions of importance to Norwegian private sector investment initiatives in the hydropower sector.
4. Assess the relevance of Norwegian competence in relation to government priorities and plans, and support forthcoming from other partners of Angola, highlighting institutional development and strengthening, generation capacity, transmission and distribution and rural electrification. The possibility that Norwegian development co-operation with Angola within the energy sector could end in 2010 must be taken into consideration.
5. Briefly assess the human resource base for energy sector management and development.
6. Briefly assess potential public and private financing sources for the development of the non petroleum energy sector including the Clean Development Mechanism (CDM) and their possible combination.
7. Discuss the potential role and justification of Norwegian development aid financing to the sector considering the increase in Angola's own financing capacity and potential interest from private sector to invest.
8. Discuss the potential role of the regional initiatives on infrastructure development for example in the context of SADC and Nepad.
9. Assess the possibilities for co-operation with other financing institutions and programmes.
10. Discuss potential areas of co-operation, taking into account Angolan and Norwegian priorities, including socio-economic, environmental and gender concerns and Norwegian comparative advantages.

**3. Mode of Work**

The work shall be carried out in close co-operation with and through interviewing relevant authorities and companies in Angola and Norway, the Norwegian Embassy in Luanda and Norad. It is important for the team to compare background documentation with the interviews given by the key personnel. The contents of the annual reports should be checked towards previous agreed minutes of meetings and whether the parties have succeeded to follow up the agreements. Angolan and Norwegian institutions and companies important for the Review Team to meet are listed in Annex I.

Field work shall be carried out during two weeks in Angola. Prior to the visit to Angola a systematic desk review of key documents shall be carried out. A list of key documents to be made available by the Embassy and Norad for desk review is provided in Annex II.

#### **4. Competency and Expertise Requirements**

The team shall together command the following competencies:

- Extensive experience in the design, appraisal, implementation and review of infrastructure development and institutional development programmes in Africa.
- Familiarity with the context of electricity sector reforms in Africa.
- Extensive knowledge and experience in assessing the quality of electricity infrastructure equipment.
- Extensive knowledge of the modalities of Norwegian development co-operation.
- Ability to communicate in Portuguese.
- Experience from Angola.

#### **5. Reporting Requirements**

A debriefing note of the team's preliminary assessments and findings shall be presented to MINEA and the Norwegian Embassy in Luanda at the end of the fieldwork, and shall be sent to Norad, Oslo.

A draft final report shall be submitted in English as well as a Portuguese version of the summary of main findings, conclusions and recommendations to the same parties within 10 days after departure from Angola. Any comments to this shall be forwarded to the team within three weeks after submission of the draft.

The final report shall be presented within two weeks after the above, to the same parties.

The final report shall be written both in English and Portuguese and shall preferably not exceed 30 pages plus an executive summary and attachments.

### **Annex I: INSTITUTIONS AND COMPANIES**

#### **In Angola:**

1. The Royal Norwegian Embassy in Luanda
2. The Ministry of Energy and Water (MINEA)
3. Luanda Electric Utility (EDEL)
4. The National Water Directorate (DNA)

#### **In Norway:**

5. Norwegian Water Resources and Energy Directorate (NVE)
6. Ministry of Foreign Affairs
7. Norad
8. ECON
9. Sweco Grøner
10. Norplan

#### **Others:**

11. Sida, Rolf Folkesson

**Annex II: DOCUMENTS**

- a) Agreement between the GOVERNMENT OF THE KINGDOM OF NORWAY and THE GOVERNMENT OF THE REPUBLIC OF ANGOLA regarding Technical support to the electricity sector in Angola, 1996 AGO 013.
- b) BEVILGNINGSdokument BU 02/2000 AGO 0013 – Faglig bistand til Ministeriet for Energi og Vann (MINEA) I Angola.
- c) Project Review of the Norwegian Technical Support to the Electricity Sector in Angola during 1996 – 2001, Sivilingeniør Mørkrid AS (April 2002).
- d) Project review of the provision of spare parts to Angolan power utilities, Mario Fontes (July 2005).
- e) Annual progress and financial reports, audit reports and final reports submitted by Angola.
- f) Energy Policy Review of Angola, International Energy Agency (2005).
- g) Review of the support to the reform process in the energy sector, Sida (July 2006).
- h) Plano Director Para o Processo de Reforma do Sector Eléctrico, República de Angola Ministério da Energia e Águas (Marco 2006).
- i) Reports submitted by Norplan.

**Annex 2: Documents Examined**

- Agreement between the Government of the Kingdom of Norway and Government of the Republic of Angola regarding Technical support to the electricity sector in Angola, 1996 AGO 013.
- Project Document: Plan for continued institutional cooperation between Secretaria de Estado da Energia e Aguas (SEEA) and the Norwegian Water Resources and Energy Administration (NVE) 1996-1998.
- The Ministry of Energy and Water (MINEA); Tentative Work Plan and Budget 2002, Technical Support to the Electricity Sector in Angola, Addendum, Original Programme Period 2000-2002, Draft, February 21, 2002.
- The Ministry of Energy and Water (MINEA); Tentative Work Plan and Budget 2003, Technical Support to the Electricity Sector in Angola, Addendum, Original Programme Period 2000-2002, 31 March, 2003.
- The Ministry of Energy and Water (MINEA); Tentative Work Plan and Budget 2004, Technical Support to the Electricity Sector in Angola, Addendum, Original Programme Period 2000-2002.
- The Ministry of Energy and Water (MINEA); Tentative Work Plan and Budget 2005, Technical Support to the Electricity Sector in Angola, Addendum, Original Programme Period 2000-2002, June 2005.
- The Ministry of Energy and Water (MINEA); Tentative Work Plan and Budget 2006, Technical Support to the Electricity Sector in Angola, Addendum, Original Programme Period 2000-2002, April 2006.
- Agreed Minutes: MINEA/NORAD agreement on technical assistance to the electricity sector, Programme 2000-2002, Annual Meeting 7<sup>th</sup> March 2001.
- Agreed Minutes: Annual Progress Report 2002, Technical Support to the Electricity Sector in Angola, Annual Meeting April 8, 2003.
- Agreed Minutes: Technical Support to the Electricity Sector in Angola, Annual Meeting 30 August 2005, Annual Progress Report 2004, Workplan and Budget 2005.
- Innspill til diskusjon om pilotprosjekt Minikraftverk I Ambriz, 27.2.2006.
- Mandate for the Annual Meeting between Angola and Norway in Luanda on the 4<sup>th</sup> of July, 2006, on Institutional Support to the Electricity Sector.
- Agreed Minutes: Technical Support to the Electricity Sector in Angola, Annual Meeting 4 July 2006, Annual Progress Report 2005, Workplan and Budget 2006.
- Annual Progress Report 2003, Technical Support to the Electricity Sector in Angola, Addendum, Original Programme Period 2000-2002, May 2005.
- Annual Progress Report 2005, Technical Support to the Electricity Sector in Angola, Addendum, Original Programme Period 2000-2002, April 2005.
- Final Project Visit, Review of Activities, April 2006, NORPLAN.
- BEVILGNINGSdokument BU 02/2000 AGO 0013 – Faglig bistand til Ministeriet for Energi og Vann (MINEA) I Angola.
- Project Review of the Norwegian Technical Support to the Electricity Sector in Angola during 1996–2001, Sivilingeniør Mørkrid AS (April 2002).
- Ministério da Energia e Águas, Direccao Nacional de Energia, NORAD Spare Parts Fund, Report July 2005, Mário Fontes (Consultant).
- Report of Auditors, Ministry of Energy and Water Affairs Technical Support to the Electricity Sector in Angola, December, 2003.
- Energy Policy Review of Angola, International Energy Agency, Draft 7 November 2005.

- Review of the support to the reform process in the energy sector, Sida (July 2006).
- República de Angola, Ministério da Energia e Águas, Plano Director Para o Processo de Reforma do Sector Eléctrico, Março 2006.
- Reports submitted by Norplan.
- Angola: Towards an Energy Strategy, International Energy Agency, 2006.
- Preliminary comments by the Norwegian Embassy in Luanda on the [SAD-ELEC] Debriefing Note, November 2006.

### **Annex 3: Entities and Individuals Consulted**

#### **In Norway:**

- Ms Ann-Helen Perez Azedo, UD
- Ms Gunvor Alida Endresen, UD
- Ms Aud Skaugen, Norwegian Water Resources and Energy Directorate (NVE)
- Mr Egil Skoftland, NVE
- Mr Bjørn Stenseth, NORPLAN
- Ms Kristin T. Wæringsaasen, NORAD
- Mr Ørnulf Strøm, NORAD
- Mr Morten Svelle, NORAD
- Mr Tor Morten Sneve, NORAD
- Mr Even Sund, formerly NORAD
- Mr Øistein Glømme, formerly NORAD
- Mr Tor Mikkelsen, TM Management Consulting
- Mr Per-Torstein Høgset, ABB

#### **In Angola:**

- Mr Lars Ekman, First Secretary, The Royal Norwegian Embassy, Luanda
- Ms Vibeke Skauerud, Programme Officer, The Royal Norwegian Embassy, Luanda
- Mr Francisco Talino, National Director of Energy, MINEA
- Mr Orsini Diogo, Deputy National Director of Energy, MINEA
- Mr Adérito de Sousa, National Directorate of Energy (DNE), MINEA
- Ms Sandra dos Santos, National Directorate of Energy (DNE), MINEA
- Eng. Armando João, Director Geral Adjunto p/os Investimentos, Empresa de Distribuição de Electricidade (EDEL)
- Eng. Mr João Simão Manuel da Silva, Director Executivo p/Aprovisionamentos, Empresa Nacional de Electricidade (ENE)
- Eng. Mário Fontes, author of Report on the NORAD Spare Parts Fund, July 2005
- Mr Svein Breivik, Norsk Hydro, Angola
- Maria Cramér, First Secretary, Embassy of Sweden, Luanda
- Yara Fernandes Lourenço, Programme Officer, Embassy of Sweden, Luanda
- Mr Xie, Second Secretary, Trade Commission of the Embassy of the Peoples Republic of China, Luanda
- Mr Romulo Peixoto, DG Project Specialist, USAID Angola
- Mr Lance Morrell, Lead Urban Operations Officer, Water and Urban 1, Africa Region, The World Bank

#### **Others:**

- Ms Therése Hindman Persson, ECON Analys AB



