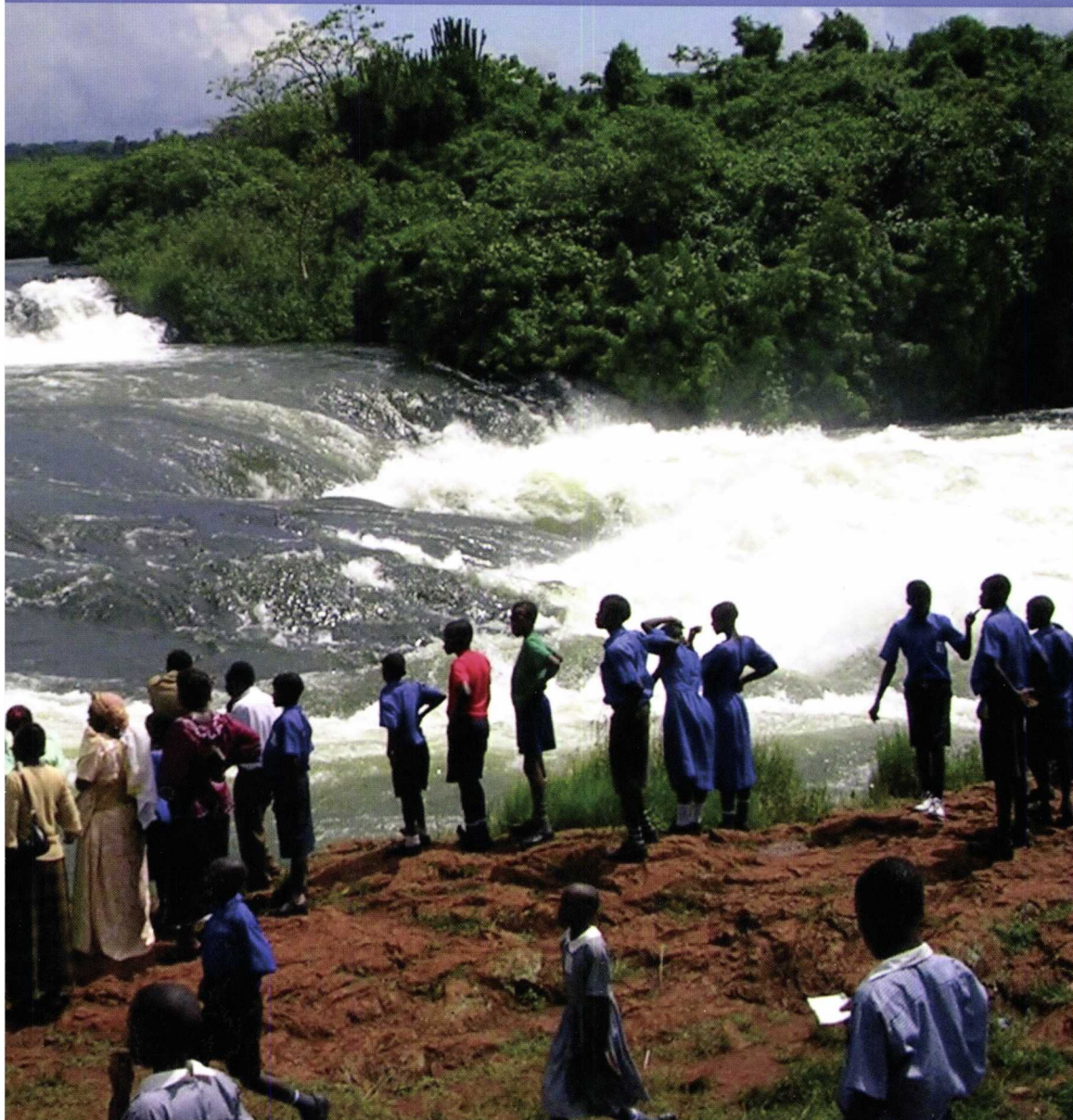




# Annual Report 2004

The co-operation between NVE and NORAD





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## Appendix I

Total invoiced NORAD/Ministry of Foreign Affairs.

## Appendix II

Participation in international research and co-operation  
with other international institutions.

# Introduction

## Background

The Norwegian Water Resources and Energy Directorate (NVE) has been involved in development assistance financed by Norway through NORAD for more than 30 years. The involvement has been within the work areas of water and energy in concrete projects, as well as support to similar government institutions in developing countries. The development assistance is now formalised in a co-operation agreement between NORAD and NVE. The agreement sets the conditions for advisory services directly to NORAD and the Ministry of Foreign Affairs, as well as the framework for NVE's contracts on institutional co-operation. The present annual report is prepared in accordance with a requirement of the agreement, and shall serve as a basis for an Annual Meeting between the NORAD and NVE.

## Contributors to NVE's development assistance

The development assistance is organised and co-ordinated through the International Section, which through most of 2004, has consisted of 6 persons. The tasks of the International Section are to prepare projects, and to co-ordinate and carry out the required cost and quality control of projects and programmes during execution. Some projects require posting of advisers on location, and resident advisers have in 2004 been posted in Angola, Uganda, Mozambique and Timor-Leste. The major part of the professional work has, however, been carried out by various staff of NVE, and during 2004 altogether 42 persons have been involved in the assistance. In addition, several private consultants and professionals from other directorates and research institutions have been sub-contracted to assist in the work in cases where either NVE lacks speciality competence or capacity during certain periods.

Oslo, March 2005

Agnar Aas  
Director General



Staff of the International section.  
From left to right: Espen Lier, Kjell Repp, Egil Skofteland,  
Astrid Nærum (Head of section from 1 February 2005),  
Aud Skaugen, Lisbeth Karijord, Terje Gimming



# Organisation of NVE

Established in 1921, the Norwegian Water Resources and Energy Directorate is a directorate under the Ministry of Petroleum and Energy and is responsible for the management of Norway's water and energy resources. Our mandate is to ensure an integrated and environmentally sound management of the country's water resources, to promote efficient energy markets and cost-effective energy systems and to work to

achieve a more efficient use of energy. We are Norway's national centre of expertise for hydrology, and we have a central role in the national flood contingency planning. NVE also has the overall responsibility for maintaining national power supplies. NVE is based in Oslo and has five regional offices in Norway and a total of 400 employees.



## Contacts in International Section, as per. 01.02.2005:

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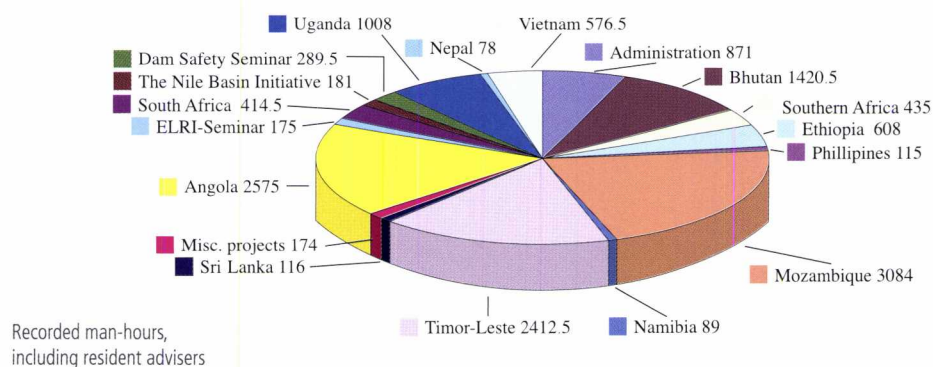
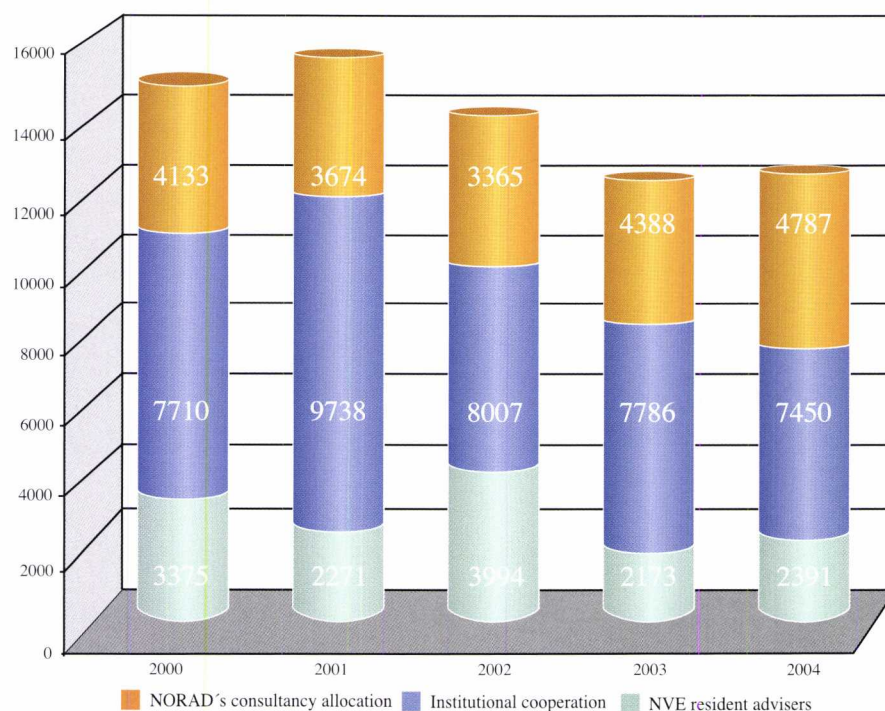


# Overview of activities and time consumption

The volume of activities in 2004 was recorded at 10.4 man-years (one man-year being 1400 effective hours). This is nearly the same as last year (10.2 man-years). From the bar diagram it will be seen that the institutional co-operation has slightly decreased, with a corresponding small increase in

the time spent on direct work for NORAD and time spent by resident advisers.

Overall, it will be seen that the total activity has stabilized around 10 man-years per year.







Garden party for the dam safety inspection course participant

# Assignments for NORAD

## Ministry of Natural Resources and Environment (MONRE), Vietnam

NVE has assisted MONRE in the preparation of a Project Document regarding licensing of hydropower projects according to the new Water Resources Act. The project may be seen as a natural follow up of the National Hydropower Plan study, financed by NORAD and Sida, where NVE acts as adviser to the Client of the study, Electricity of Vietnam.

### Achievement:

- Draft Project Document

## Dam safety inspection course

12 participants from 7 countries in Africa and Asia participated in the one week course. Following lectures on theoretical aspects and dam safety guidelines, there was a field trip with actual inspections of three dams, one concrete dam and two rock fill dams. At the end of the course two participants presented cases from their home country.

### Achievement:

- Basic competency on dam safety inspections
- Manual on dam safety inspections

## Planning of institutional co-operation with Department of Electricity Development (DoED), Nepal

In 2003 Norway entered into an Agreement with Nepal to provide financial support for feasibility studies of 5-10 small and medium size hydropower projects. In accordance with the Agreement, NVE shall provide Technical Assistance to DoED, which is the implementing institution for the studies. The studies will be subject to bidding by Nepalese consulting companies. A Contract between DoED and NVE was prepared and the contract was signed in December 2004

### Achievement:

- Contract for institutional co-operation between DoED and NVE prepared and signed

## Sri Lanka

### Sri Lanka power sector review.

Late 2003 NORAD requested NVE to carry out a study on different aspects of the Sri Lankan power sector due to the sector's current problems. The power sector has been suffering from shortage of electricity, and the shortage has been increasing over the last 5-10 years. Installation of auto-diesel plants has reduced the shor-



tage, but has at the same time led to a serious increase in electricity tariffs. The study, taking place in the beginning of 2004, aimed to pay particular attention to institutional matters, development of renewable resources, as well as rehabilitation and repair of deteriorating hydropower assets.

The situation calls for development of a National Power Sector Master Plan. The Asian Development Bank (ADB) was going to publish an assessment of the need for such a plan in April 2004. Further possible Norwegian support has to be carefully co-ordinated with the activities of ADB.

**Achievement:**

- Report with a review of the power sector in Sri Lanka

## Malawi

### Assessment of hydropower accident.

In March 2003 a hydropower station on the Shire River in Malawi, operated by ESCOM Malawi, was completely flooded. Due to this accident, the power station was out of operation for three months. Because of the great importance of the hydropower generation for the country, the Malawian Government requested the Norwegian Embassy for funds to investigate the circumstances of the incident. NORAD then requested NVE to organize the assessment. The scope of the study was to:

- identify the causes and potential risks
- to evaluate operation and maintenance of the power station
- to evaluate the effectiveness of the restoration
- to evaluate the support from the suppliers.

The investigation, carried out through assistance of a consultant, concluded that ESCOM Malawi could not have predicted or avoided the accident, that the quality of operation and maintenance was good, and that the restoration had been effective. Furthermore, it was concluded that the support from the original supplier had been disappointing, but that other suppliers in South Africa had provided appropriate support.

**Achievement:**

- Report on the accident and restoration works

## The Philippines

### Flood Control Master Plan, Mindoro

The Provincial Government of Oriental Mindoro in the Philippines submitted in May 2003 a request for funds to NORAD, in order to develop a Flood Control Master Plan for a flood-prone area on the island. In 2004, NVE was asked to contribute to the further development of a project proposal under the general agreement between NVE and NORAD.



The NVE hydrologist was well received at Mindoro

The Flood Control Master Plan includes interventions both in upland and floodplains. In the upland, where indigenous people are living in inaccessible forests, watershed protection and management, like measures to avoid erosion, is a vital component. Likewise, social preparation and livelihood programs for the dwellers are critically important in the process. In the floodplain, construction of protection dikes, clearing of the outlets into the sea, dredging of the rivers and embankment protection and upgrading are important parts in the process. Even dam constructions for developing reservoirs and controlling the river flow are considered. An important tool in the evaluation of the different interventions is the simulation model, which is planned to be developed as part of the project.

The project area was visited by NVE in December 2004, after which the project proposal was revised and a tentative budget worked out, based on actual findings during the field visit.

**Achievement:**

- Revised project proposal

### Seminar on regulation of distribution network

In June 2004 a seminar mainly for institutions with co-operation agreement with NVE was arranged in Oslo. The seminar was also open for participants from other developing countries.

22 participants from 7 countries and various organisations participated in the seminar, which focused on the restructuring of distribution, the private sector's participation in the electricity sector, and regulation of rural electrification.

The seminar was arranged in co-operation with the Norwegian consultancy company ECON.

A similar seminar is planned in June/July 2005, where the focus will be on regulation of monopoly services.

**Achievement:**

- Seminar conducted with 22 participants



# Institutional co-operation

**ETHIOPIA**  
Co-operating Institution:  
Ministry of Water Resources

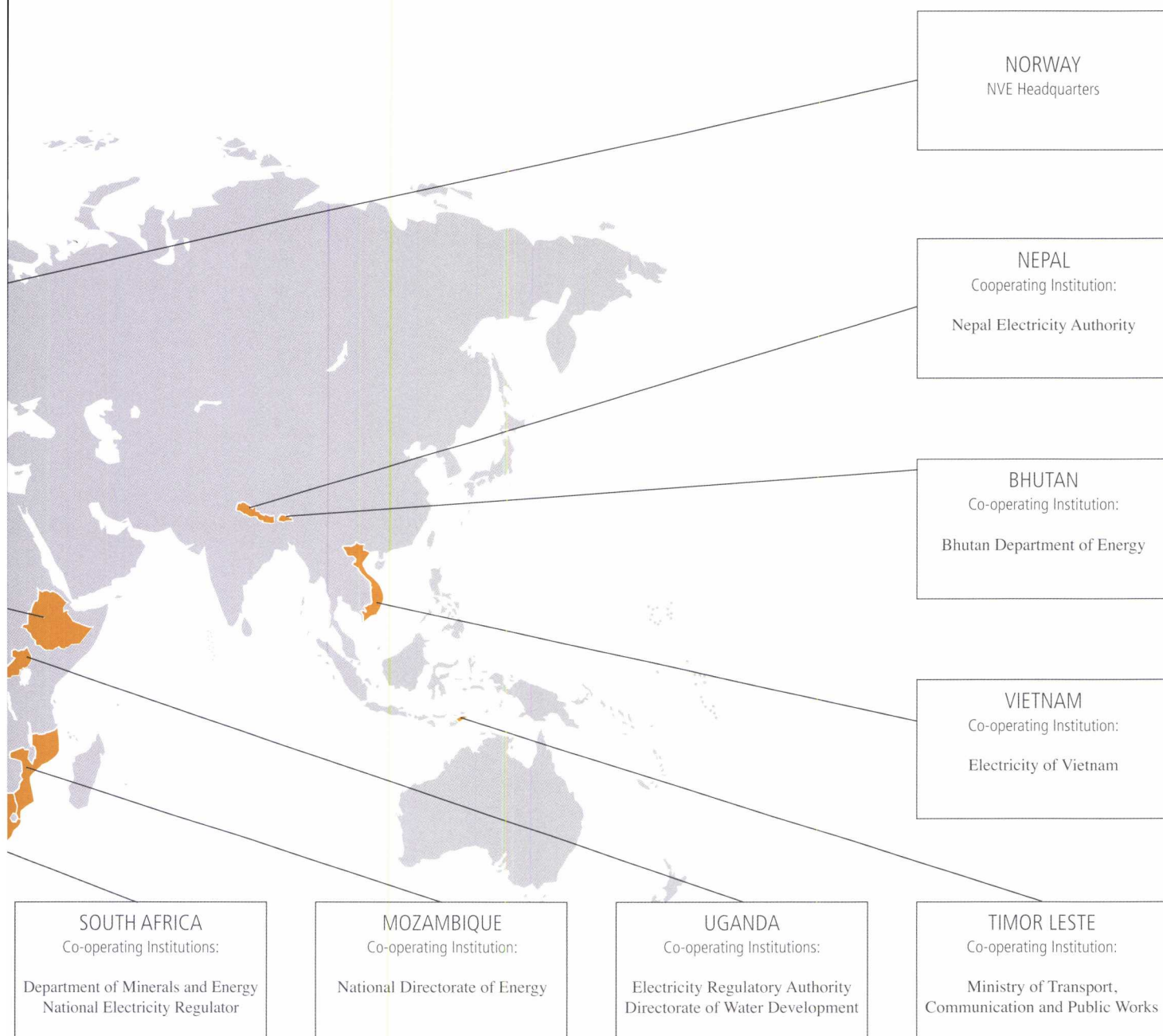
**ANGOLA**  
Co-operating Institutions:  
Ministry of Energy and Water Affairs,  
National Directorate of Energy  
Ministry of Energy and Water Affairs,  
National Directorate of Water

**NAMIBIA**  
Co-operating Institution:  
Ministry of Mines and Energy

## The following institutional contracts have been in force:

Country	Co-operating institution for NVE	Project period	Total budget (NOK 1000)	Budget for NVE institutional co-operation (NOK 1000)
Angola	National Directorate of Energy	2000 - 2004	52,000	4,500
Angola	National Directorate of Water	2001 – 2004	15,000	7,500
Bhutan	Directorate of Energy	2003 – 2007	15,000	8,900
Ethiopia	Ministry of Water Resources	2003 – 2006	40,000	1,300
Mozambique	National Directorate of Energy	1998 – 2005	36,700	13,700
Namibia	Ministry of Mines and Energy	1999 – 2004	13,600	6,500
Nepal	Nepal Electricity Authority	2004 – 2005	10,000	1,500
South Africa	Department of Minerals and Energy	2002 – 2004	2,700	700





Country	Co-operating institution for NVE	Project period	Total budget (NOK 1000)	Budget for NVE institutional co-operation (NOK 1000)
South Africa	National Electricity Regulator	2001 – 2004	9,400	2,500
Timor-Leste	Ministry of Transport, Communication and Public Works	2003 – 2009	21,000	7,000
Uganda	Electricity Regulatory Authority	2001 – 2004	14,500	5,500
Vietnam	Electricity of Vietnam	2003 – 2006	38,000	1,900
<b>TOTAL</b>			<b>267,900</b>	<b>61,500</b>

The table shows that on average 23 % of the project funds are spent on activities directly linked to institutional co-operation with NVE, which besides the NVE fees and reimbursable expenses, include training in various forms. The remaining, (on average 77 %) is spent on assignments to consulting companies, either in direct contract with the co-operating institution or with NVE.

# Angola

## Ministry of Energy and Water Affairs (MINEA), National Directorate of Energy (DNE)

The co-operation between MINEA and NVE dates back to 1996. The latest contract was signed in 2000 and includes six components:

- Follow-up of the NESMA (National Energy Sector Management) process, including follow-up of MINEA's Management Information System (MIS).
- Institutional strengthening of EDEL (Luanda Electric Utility), phase 2, implementation.
- Provision of spare parts to Angolan power utilities.
- English language courses for key personnel in the energy sector.
- Programme administration and co-ordination
- Logistics in Angola.

The overall goal is to promote economic development of the country through sustainable and efficient use of the country's energy resources. The purpose is to strengthen the competence and decision making basis at MINEA and (EDEL) through training in technical, economic and administrative fields, and to improve the reliability of electricity supply in the country by making available a fund for purchase of spare parts.

### Achievements:

- Two NVE missions to Luanda have taken place to follow up ongoing activities and to discuss continued co-operation in a possible new programme period
- Increased competence and developed tool for energy management and decision making
- The institutional strengthening of EDEL started after a short break, and has since proceeded according to plans
- The Angolan power utilities have purchased spare parts for the electricity sector

## Ministry of Energy and Water Affairs (MINEA), National Directorate of Water (DNA)

When Angola became independent in 1975 after Portuguese colonial rule, the country immediately entered a 30 year long civil war. Government power supply deteriorated, water management practically stopped, and the national hydrological station network ceased to operate. Since 2002, NVE has co-operated with DNA in order to strengthen the water management of Angola. Improved water management will mean safer water supply and irrigation, better plans for hydropower development, and a beneficial co-operation



The hydrology team of DNA





Bananas on the way to the market

with neighbouring countries regarding protection and utilisation of shared water resources.

During the project period, NVE has provided a resident adviser, permanently located at the DNA headquarters in Luanda. Several other NVE staff members have worked for shorter periods in Angola.

**The main results at the end of 2004 are:**

- Plans are developed for a modern hydrological station network. Historical discharge data have been quality checked, and 36 field stations are in the process of being rehabilitated. Eleven of these are fully operational, several of which are located in international rivers.
- DNA staff has received education and training in English, hydrological field work, and data processing. The education has been given through regular schooling (in South Africa), on the job training, as well as in the field. DNA has recently recruited several staff members with water-related qualifications.
- Angola has adopted a new Water Act, and NVE assisted in developing regulations to the act.
- A “Rapid Water Resources and Water Use Assessment for Angola” has been carried out by the consultants SWECO Grøner AS. This study collected available information on the renewable water resources of Angola, and made assessments of expected water use.





From Thimphu, capital of Bhutan

## Department of Energy (DOE), Phase II

Following the completion of the 3 year phase I programme, the contract for phase II was signed in December 2003. The new programme will last 4 years, and carries a total budget of NOK 15.0 million. The overall goal is the development of human resources and capacity building of the energy sector, thereby bringing out efficiency in the sector and providing the Department and the regulatory body with the necessary tools for effective and transparent monitoring of the sector. The activities of the programme and the work carried out in 2004 include:

### Human resources development

With the assistance of the Royal Institute of Management, DOE has prepared a Training Needs Assessment report, which following consideration and commenting by NVE, has been submitted to the Civil Service Commission for endorsement - and thereafter adopted for the various training to be carried out under the programme. The programme has a total budget of NOK 6.5 million and during 2004 the following training was undertaken/commenced:

- Masters degree in power system planning (Canada), 1 person
- Masters degree in energy economics (Netherlands), 1 person
- Course on Development Management, 26 days, 2 persons
- Electricity regulation seminar, 1 week, at NVE, 2 persons
- Course on dam safety inspection, 1 week at NVE, 2 persons

#### Achievements

- Training carried out (as listed above)
- Training Needs Assessment report

## Development of the Electricity Regulator

The development of Bhutan Electricity Authority will be met through institutional strengthening projects funded by Asian development Bank and NORAD. The part funded by NORAD started in phase I of the DOE/ NVE institutional co-operation, and continues in phase II. Under phase II the major components include:

- Principles and procedures for tariff determination
- Model license contracts
- Compliance monitoring system
- Collection system for fees, charges and royalties

During 2004 a report on principles and procedures for tariff determination has been prepared, discussed with DOE, and redrafted. A manual for financial reporting and tariff calculation was also carried out.

#### Achievements

- Report on Principles and procedures for tariff determination.
- Manual for financial reporting and tariff calculation

## Geographical Information System (GIS) for the energy sector

The activity includes the establishment of a GIS section in DOE, with the required hardware, software and training of personnel. The project started in the third quarter with the visit of a GIS expert from NVE, collecting information about the mapping and projection systems used in Bhutan, the available personnel, hardware and software, and the needs to be covered by the GIS. A report will be prepared from the visit, which will result in a proposed strategy, plan and budget for the GIS.

#### Achievement:

- GIS-related information collected



## Management Information System (MIS) for the energy sector

The intention is to develop a system that will provide key information to enable the management to take decisions based i.a. on reliable data available on the MIS. The main activities will be the definition of key data, level of detailing of data to be included in the system, updating frequency and necessary quality assurance measures. An initial report on the set-up of the MIS was submitted in February and discussed with a DOE working group. Subsequently, a report with a concrete proposal was submitted in September for consideration by DOE.

### Achievement:

- Reports with proposal for establishment of MIS

## Further development of the hydro-meteorological network

The work under phase I revealed a need for supplementary hydrological stations to cover tributaries to the main rivers (that are not snow fed), which will provide information for the planning of water supply, irrigation and small hydro projects. Additionally, there was a need to increase the amount of meteorological stations, and to upgrade some of the existing stations. Together with DOE personnel, the NVE hydrologist identified locations for 10 new hydrological stations, and prepared a report with recommendations regarding the installations and equipment to be procured.

Towards the end of the year, plans were prepared for the installations and procurements to be carried out.



GIS is presented to DOE

### Achievements:

- Report with recommendations regarding new hydrological stations
- Draft specifications of equipment to be procured

## Co-ordination and backstopping by NVE

In addition to regular co-ordination internally among NVE personnel and with the DOE co-ordinator, the activity includes cost and quality control, preparation of quarterly reports, assistance to DOE in the preparation of the annual report to NORAD – and participation in the Annual Meeting between DOE and NORAD.



Annual meeting between the Governments of Bhutan and Norway





# Ethiopia

The Baro project area

## Ministry of Water Resources (MOWR),

The two projects, Baro and Karadobi multipurpose projects, are parts of the Eastern Nile Subsidiary Action Programme within the Nile Basin Initiative. Under an agreement between the governments of Ethiopia and Norway signed in June 2003, Norway will finance a feasibility study for the Baro project and a pre-feasibility and feasibility study for the Karadobi project. Both projects are large projects, which in addition to hydropower shall be designed to accommodate other needs, in particular irrigation and flood control. The cost frame of the agreement is NOK 40 million. The Baro project is situated on a tributary to the White Nile, whereas the Karadobi project is located on the Blue Nile. Under a separate agreement between the countries, NVE shall assist the MOWR in their task of being Client for the two studies. Bidding documents were prepared in 2003 and during 2004 the feasibility study for Baro and pre-feasibility study was tendered as one contract. NVE assisted MOWR in the evaluation of the proposals received, and in the contract negotiations. Subsequently, NVE has carried out reviews and comments on the reports prepared by the joint venture of the consultants doing the studies.

### Achievements:

- Signed contract for the studies
- Inception report
- Two progress reports



Negotiations of the consultancy contract



# Mozambique

## National Directorate of Energy (DNE)

Phase 1 of the institutional co-operation between DNE and NVE covered the period 1998 – 2002 and carried a budget of NOK 16.7 million. Phase 2 started in 2002 with a budget of NOK 20 million, and will be completed by the end of 2005. Planning of a phase 3 from 2006, has been initiated.

Established in 1996, DNE is still a young institution. It has a central role in the energy sector of Mozambique, and the overall goal of the institutional co-operation with NVE is to improve the energy sector management, in order to promote the social and economic development of the country. Thus, the long term objective is to enable DNE to perform as a competent and credible power sector authority.

NVE has a resident adviser working with DNE in Maputo. The co-operation also involves a multi-disciplinary advisory group in NVE to secure advisory services from all relevant departments in NVE, including short term visits to DNE by NVE advisers.

Emphasis is given to management and organizational aspects, training, development of a computer network, energy planning, energy efficiency, and the development of regulations under the Electricity Law (1997).

### The activities in 2004 included:

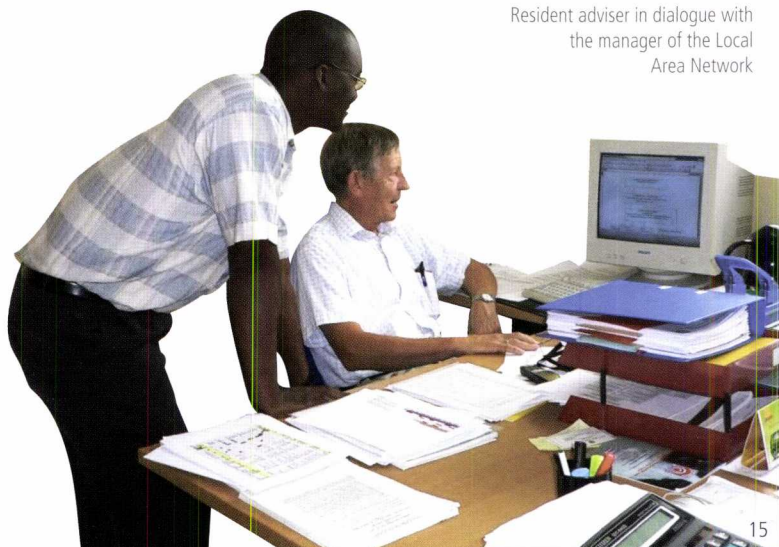
- The final draft regulations on system operation, production, transmission, distribution and supply of electrical energy were completed and submitted to the government for approval. The regulations are expected to be approved in early 2005, which will constitute a major achievement in the development of DNE. The draft regulation on tariffs is yet to be completed. The development of new electrical standards has started, but the progress has been slow.
- Following the purchase of computer hardware and software in 2003, the installation of a Local Area Network (LAN) was completed in 2004. A back-up generator was purchased and installed. The project was started by a Norwegian consultant (Eurotech).
- Short term advisers from NVE's Section for Information Technology assisted in the installation, configuration, and training. Training in LAN management has been provided for in NVE, Oslo, and in Maputo 15 DNE staffs have joined a Microsoft Office course. This training will continue in 2005. It is expected that further training and maintenance as well as further development of the network can be provided by companies in Maputo.

- Under energy efficiency, there has been a close co-operation with the university, and practical work has been performed in various industries in Maputo. A round table meeting with relevant industries was organized 2 September, and a follow up seminar was organized 6 – 7 October, assisted by a short term adviser from NVE.
- A seminar on licensing procedures and tariffs for DNE and provincial staff was organized 22 – 26 March, with the participation of short term advisers from NVE. A follow up course for the same group was organized 18 – 22 October on power system planning and granting of concession for electrical installations.
- Training has been organized as courses and workshops in Mozambique and Swaziland, and also as parts of study tours to Norway and Denmark. One study tour took place in April focusing on grid planning and system planning, and one took place in June focusing on local energy planning.

### Achievements:

- The final draft regulations on system operation, production, transmission, distribution and supply of electrical energy were completed and submitted to the government for approval
- A modern Local Area Network in DNE was completed and is fully operational
- Various training and educational activities have been carried out for the DNE central and provincial staff. This has included management, accounting, information technology, licensing procedure, energy efficiency, system and energy planning, and English language training
- A first Draft Project Document has been prepared, with a proposal for a phase 3 of the institutional co-operation 2006 – 2009

Resident adviser in dialogue with the manager of the Local Area Network





# Namibia

## Ministry of Mines and Energy (MME)

The co-operation between MME and NVE has been running since 1994 and the collaboration has emphasised assistance to the Electricity Control Board (ECB) after this was established in July 2000.

The objective of the co-operation has been to establish relevant legislation and institutional framework and training of the staff.

The MME – NVE co-operation has been a part of an energy programme which also includes co-operation between MME and the Norwegian Directorate for Petroleum Development.

Altogether 4 persons from NVE (engineers, economist and lawyer) were posted in Namibia as resident

advisers during the period 1997 – 2003. The co-operation is now in its last stages and is expected to be completed during 2005. The activity in 2004 has been low. The assistance has focused on a training course for ECB personnel in Oslo in June, and facilitation of assistance from a Norwegian consultant to review the Namibia Grid Code.

### Achievements:

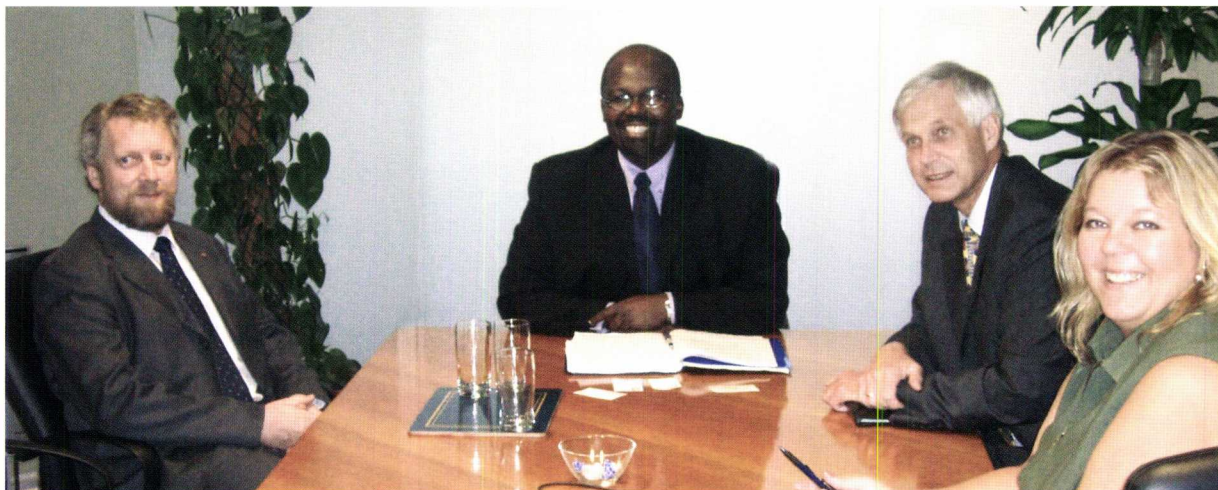
- Course for ECB personnel on distribution system regulations
- Review of the Namibia Grid Code



Ruacana Water Fall on Cunene River. Further hydropower developments on the Cunene are among the main alternatives considered by MME.



# South Africa



Meeting with Chief Executive Officer, NER

## National Electricity Regulator (NER)

NVE has co-operated with NER in South Africa since February 1999. The co-operation has focused on developing a regulatory framework to accommodate a restructured Electricity Supply Industry in South Africa. NER and NVE entered into a second phase of the co-operation in June 2001. The objective of the co-operation is to provide technical assistance to NER and to build competence through exchange of experience.

During 2004 the focus has been the development of a reporting system from the utilities to the NER. This work started in 2003 and was completed in 2004.

Other activities include two seminars on regulatory functions, and on-the-job-training through a visit to NER by NVE personnel.

### Achievements:

- Seminar in Oslo on the regulation of grid activity for 6 NER personnel
- Energy seminar in Oslo in June 2004 for the NER management. The seminar was organised back-to-back with the NER – NVE annual meeting
- On the job training on the determination of tariffs and other professional issues. (October 2004)

## Department of Minerals and Energy (DME)

In February 2002 NVE entered into a contract with the DME of South Africa. The contract focuses on capacity building of DME, in order for DME to meet the challenges of the foreseen restructuring process in the country.

Four persons from DME participated in the training programme for regulators (ELRI) arranged in Oslo in June. A strategic review of the direction of the power sector reform process in South Africa was undertaken in September/October 2004. The objective of the review was to provide an evaluation of whether alternative models would better suit the Government's objectives. A team of Norwegian consultants was contracted for the assignment.

### Achievement:

- Report on the power reform process in South Africa



# Timor-Leste

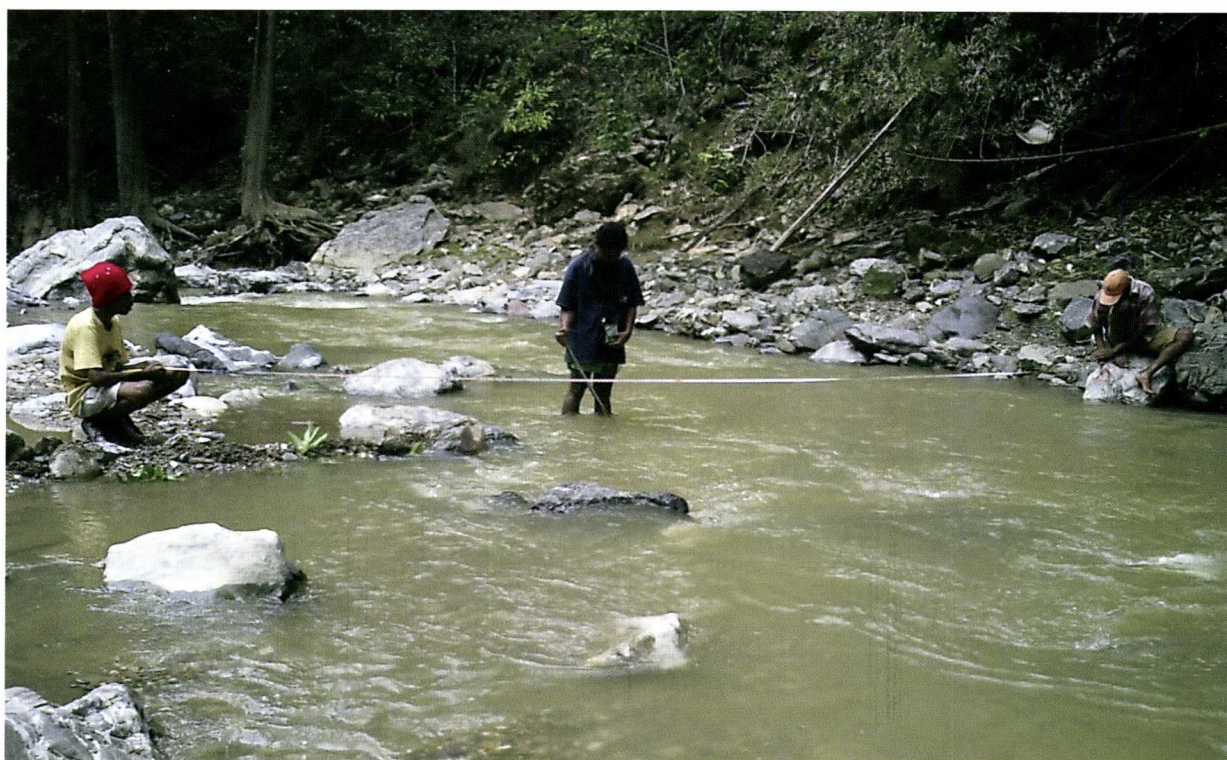
## Ministry of Transport, Communication and Public Works (MTCPW)

An agreement between Timor-Leste and Norway, regarding assistance in developing the management of the power sector in Timor-Leste, was signed in February 2003. The Institutional Co-operation Contract between the MTCPW and NVE was signed in February 2003 with an addendum in July 2003. The Contract comprises two phases, whereof the first phase (max NOK 6 million) should be completed by the end of 2004, and the second phase (max NOK 15 million) by the end of 2009.

The overall goal of the Project is to contribute to the economic and social development of the country through improved management of the power sector.

### **The activities during 2004 included:**

- A workshop on hydrology in Timor-Leste, and practical training in the field both in Timor-Leste and Norway, has been carried out.
- New gauging stations have been constructed, and a hydrological co-ordinating committee has been established.
- A Timorese Project Team has been established to work within the power sector.
- One member of the Project Team participated in a 3 weeks course in "Hydropower and Environment" at ICH in Norway.
- The Timorese Secretary of State for Electricity and Water attended a course on Rural Electrification in Norway, and attended a programme in Norway designed specifically for his purpose.
- 10 staff members from Dili and Lospalos who have regular contact with English speaking countries, have attended English language training.
- The resident adviser has provided advice to MTCPW on power sector issues throughout the year.



Streamgauging on Lacro River





Informing the local residents about plans for hydropower development

- An NVE lawyer spent 3 weeks in Timor-Leste to familiarize himself with the legal system for hydropower, water supply, irrigation etc. Important input was given on sector issues.
- The Consultant doing the feasibility studies for 3 hydropower projects has completed many tasks and the work is proceeding according to schedule.
- The Consultant has given the local staff valuable training within hydrology, geology, land survey and transmission line planning. A good relationship was established with the local villages and with the local administration within the project areas.
- Important contacts with other institutions, like the World Bank, Asian Development Bank, different Ministries, NGOs etc have been established.

Good working premises are now available for the Project Team, which improves the efficiency of the work.

#### **Achievements:**

- Phase I completed as planned, and within the budget
- Planned training for the local staff carried out.
- The Project Team is established
- The Hydrological Co-ordinating Committee is established
- NVE input within legal system is in good progress
- Contacts and meetings with other institutions within the power sector are carried out, and a good co-operation has been established



# Uganda

## Electricity Regulatory Authority (ERA)

ERA of Uganda was established in 2000 as a result of the enforcement of the Electricity Act of 1999. NVE initiated technical support to ERA from the very beginning, based on available funds in the Ugandan power sector. The agreement regulating a broad co-operation between these two institutions was signed in March 2001. NOK 14.5 million was allocated to the project, which was originally designed to last for three years, but has been extended until the end of 2005.

ERA has prepared a comprehensive training programme tailored for each of the staff members. During 2004, training of ERA employees in different aspects of regulation of the electricity sector, took place in several countries, among them Uganda, Kenya, South Africa, Great Britain and USA.

A co-operation between ERA and other electricity regulators/authorities has been initiated. In 2004, meetings with relevant authorities in Kenya, Tanzania and Namibia took place. In addition, ERA is an effective member of AFUR, the African Utility Regulatory umbrella body.

During 2004, ERA filled all 22 positions of its organisation chart. ERA also acquired its own office building, which is fully equipped. The staff has improved their professional skills due to training activities. ERA is seen as a credible authority, being asked for advice by



ERA technical staff and the NVE adviser

other authorities and interest organizations. A better understanding of impacts of the tariff level is achieved. ERA has improved its relation to similar institutions in other African countries and to domestic authorities in related sectors. Existing and potential electricity consumers all over Uganda have obtained improved skills in topics within ERA's responsibilities.

### Achievements:

- All positions in ERA have been filled and adequate training carried out
- Information to consumers on electricity supply topics has been improved





Construction site for Son La Hydropower Project. Installed capacity to be 2400 MW.

## Electricity of Vietnam (EVN)

Norway and Sweden have since 1999 provided financial support to Vietnam for the development of the National Hydropower Plan (NHP) Study. Stage 1, which was completed in 2001, comprised 5 priority river basins. From 2004 onwards, the remaining 4 major river basins shall be studied under the Stage 2 of the project. This second stage, also financed by Norway and Sweden, has a cost frame of NOK 19.0 million and SEK 12.7 million, and will be completed early 2006. The scope and main objective of the two studies are to prepare preliminary plans for development of the water resources of the country, with respect not only to hydropower, but also other needs - in particular for flood control and irrigation. Thereafter, these projects will be prioritised and made subject to national ranking. Factors such as technical, economic, environmental and social conditions and impacts related to the projects, will be taken into account. Finally, the hydropower projects shall be considered against other forms of energy in a national energy development plan.

EVN is the Client for the Study and NVE's role is to act as adviser to EVN. In addition to contractual questions, NVE shall review and comment on the work carried out by the Swedish/Norwegian consortium carrying out the consulting services. Furthermore, certain training activities are included in NVE's contract.

### Achievements:

- Comments to Inception (phase I) report
- Comments to phase II report
- Participation of 2 EVN personnel on a dam safety inspection course at NVE



# Regional co-operation in Africa

## Regional Electricity Regulator's Association (RERA)

RERA is an association of Regulators in the SADC region. The objective of RERA is to develop the Electricity Supply Industry (ESI) in the region through enhanced regional integration and trade, and to harmonise and develop a regulatory framework.

The RERA/NVE contract was signed February 2004, and includes the following components:

- Establish a RERA secretariat
- Co-ordinate and harmonise the regulatory framework
- Co-ordinate the legal framework

Subcommittees comprised of key personnel from RERA member countries and NVE will carry out the work. NVE has commissioned the consulting company SAD-ELEC to prepare two status reports to support the upstart of these subcommittees. One report is on the status for the ESI of 14 African countries, and the other report is on the status of the legal framework in the same countries.

### Achievements:

- Input to RERA's annual member meeting
- Presentation on surveillance of electricity markets (by consultant Norpool)
- Commission of consulting firm for status reports



RERA-NVE meeting on work plan for legal sub-committee

## Support to the Southern African Power Pool (SAPP)

12 of the national power utilities in the SADC-region have established a regional power pool, the Southern African Power Pool, SAPP. The objective being to provide a forum for developing a robust, safe, efficient, reliable and stable interconnected electrical system in the region.

A cost based Short Term Energy Market for the region has been established since April 2001, allowing the participants to trade energy on a day ahead hourly basis, in order to take advantage of the short-term surplus of the other participants, and also to profit from its own short-term surplus.

With a financial support from NORAD amounting to NOK 35 mill., SAPP initiated a process in 2004 to develop a competitive real time electricity market, based on a solution similar to the one implemented in the Nordic-countries. A co-operation contract between Nord Pool Consulting (NPC) and SAPP was entered into in January 2004, covering i.a the preparation of specifications for the trading platform, procurement of the necessary soft- and hardware and the provision of specific advisory services.

A contract has also been entered into between SAPP and NVE, whereby SAPP may call for assistance on any professional issue within NVE's formal responsibilities and competence.

An Expression of Interest for the implementation of the trading platform was called for in December 2004. A Request for Proposals will be issued during January 2005, and a contract is estimated to be concluded during the 1st quarter of 2005. The start of the Market Trials will take place during the 4th quarter in 2005, and the Market is planned to be opened during the 1st quarter of 2006.

Two activities necessary for the successful implementation of a competitive market were initiated in 2004:

- A tender for Consultant Services for the development of a long term transmission pricing policy,



implementation procedures and ancillary services market development within the SAPP-region, was launched late 2004. The budgetary frame is SEK 10 mill, financially supported by Sweden,

- A designated satellite based telecommunication system between the SAPP Co-ordination Centre and the three Control Centres in Zimbabwe, Zambia and South-Africa is under implementation.

### Nile Basin Initiative

The ten countries of the Nile basin have agreed to co-operate through the Nile Basin Initiative (NBI), which was initiated by the World Bank and UNDP - and supported by several countries, among them Norway. The Initiative is guided by a shared vision: "to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources". It is lead by the Ministers responsible for the water resources in the ten countries through the Council of Ministers. NBI commenced its activities in 1999.

The Shared Vision Programme (SVP) is a broad based programme of collaborative action, capacity building and exchange of experience in seven areas:

- Nile Transboundary Environmental Action
- Nile Basin Regional Power Trade
- Efficient Water Use for Agricultural Production
- Water Resources Planning and Management
- Confidence-Building and Stakeholder Involvement (Communication)
- Applied Training
- Socio-Economic Development and Benefit-Sharing.

Norway has relevant experience in the development and management of both water and energy resources. A presentation of relevant Norwegian expertise within all the seven areas has been collected,

organised and distributed to the involved parties. The information is available on the internet.

The Nile countries seek to implement their Shared Vision through a Strategic Action Programme, comprising basin-wide projects, as well as the sub-basin joint investment projects ENSAP and NELSAP.

The Eastern Nile Subsidiary Action Program (ENSAP) comprises Egypt, Ethiopia and Sudan. The Nile Equatorial Lakes Subsidiary Action Program (NELSAP) includes Burundi, D.R. Congo, Egypt, Kenya, Rwanda, Sudan, Tanzania, and Uganda.

NVE acted as adviser to NORAD on professional matters connected to power trade in ENSAP, and participated in meetings in the region regarding the preparations of the project.

With respect to the NELSAP programme, NVE has on request from NORAD carried out a desk-study assessment of water management projects for the Equatorial Lakes basins of Kagera, Mara and Sio-Malaba-Malakisi, located in Burundi, Kenya, Rwanda, Tanzania and Uganda. These projects are supported by Sida and NORAD. The project aims to improve a steadily deteriorating situation regarding water quality, sanitation and health as well as environment in general. The study concluded that the mechanism of small-scale investment projects is probably a good approach for addressing poverty alleviation. Such projects include water harvesting, small hydropower, and small-scale irrigation.

#### Achievements:

- Presentation of relevant Norwegian expertise within water resources and energy
- Miscellaneous advice on power trade within ENSAP
- Desk study on NELSAP completed



River Nile. Sunday trip to Bujagali Falls



# Other assignments



The main conference hall, Bonn

## International conference for renewable energies, Bonn

NVE was a member of the Norwegian delegation to the conference in Bonn 1-4 June, which was attended by government representatives of 154 countries. The main results of the conference were a political declaration document, a document on Policy Recommendations for Renewable Energies and an International Action Programme. NVE had a stand in the exhibition hall with personnel informing about renewable energy development in Norway, profiling in particular hydropower as a source of renewable energy.

### **Achievements:**

- Information about NVE and renewable energy in Norway, provided to several hundred persons involved in the energy sector
- Input to Action Programme resulting from the conference

## Directorate for Nature Management, Norway

NVE has assisted the Directorate for Nature Management in its co-operation with the Ministry of Population (MOPE) in Nepal. The goal of the assistance is to strengthen MOPEs capacity to handle Environmental Impact Assessments and licensing procedures for hydropower-projects.

### **Achievements:**

- Prepared input and comments to draft hand-book/guidelines for Environmental Impact Assessments on hydropower Development
- Evaluated ongoing programme



# Planned activities 2005

The time expected to be used on projects in 2005 is estimated at 9 man-years. An additional 2 man-years are expected for resident advisers, totalling 11 man-years. This estimate is based on the schedules of existing projects and assumptions regarding the projects that are in various stages of preparation. The following new projects are foreseen to be started up during 2005:

## Ministry of Natural Resources and Environment (MONRE), Vietnam

A Project Document, regarding licensing of hydropower projects according to the new Water Resources Act, has been prepared. This project is a natural follow-up of the National Hydropower Plan study, where a number of projects are lined up for licensing and subsequent implementation.

## Flood Control Master Plan, Mindoro, the Philippines

The development of a Flood Control Master Plan, for a flood-prone area in the island, is expected to be carried

out by a consulting firm, where NVE's role will be to prepare the Terms of Reference, to assist in contracting the Consultant, and to assess the work carried out.

## Ministry of Energy and Mineral Development (MEMD), Uganda

The co-operation between MEMD and NVE on relevant power sector tasks is in the planning stage. The new programme will cover both the power and petroleum sectors, and will involve the Directorate of Petroleum in addition to NVE. A seminar preparing for the programme was organised in Entebbe in December 2004, and a Project Document will subsequently be prepared.

## Course on consultancy engagements

The course will include preparation of Terms of Reference, other bidding documents, the bidding and evaluation process, and contract negotiations. The course will be held for project personnel at NVE's co-operating institutions.



# Appendix 1

Total invoiced NORAD 2004

PROJ.NO	ACTIVITY	NVE HOURS	FEE	NVE EXP.	CONSULTANTS	TOTAL (NOK)
32001	General assistance	871,00	594 450,00			594 450,00
32001	Trainee, Timor Leste	202,50	136 687,50	11 312,50		148 000,00
32001	Sad-elec consultancy assistance to NVE				200 000,00	200 000,00
32009	Nile basin initiative	119,00	80 940,00	86 436,00		167 376,00
32038	Seminar on reg. on network services and restruct.		175,00	118 965,00	60,00	119 025,00
32048	Nepal. Assistanse to Department of Electricity	20,00	13 500,00			13 500,00
32049	Sri Lanka. Assistance to the energy sector	116,00	78 300,00	43 053,00	115 977,00	237 330,00
32050	Malawi. Power Station Accident	4,00	2 700,00		198 521,80	201 221,80
32051	Dam Safety Seminar	289,50	199 755,00	161 349,00		361 104,00
32053	Evaluation of NELSAP/IWRM-projects	57,00	38 475,00			38 475,00
32054	Philippines. Flood control.	115,00	79 350,00	33 973,00		113 323,00
32055	Vietnam. License for hydropower development	117,00	80 730,00	34 887,27		115 617,27
32056	Nile Basin Initiative. Power trade seminar	62,00	42 780,00			42 780,00
32057	Vietnam. PD for licensing (MONRE)	124,50	85 905,00			85 905,00
32058	Evaluation of Norw. comp. reg. renewables	74,00	51 060,00			51 060,00
32059	Cost estimate hydropower development	39,00	26 910,00			26 910,00
TOTAL		2 385,50	1 630 507,50	140 861,50	514 498,80	2 516 077,07



# Appendix 2

## NVE's participation in international research and co-operation with other international institutions

### Energy

IEA Wind Energy: Participation in IEA Executive Committee for the Implementing Agreement in the research and development of wind turbine systems.

The Council of European Energy Regulators (CEER). CEER's main focus is on reducing barriers to cross-border trade and the realisation of an efficient internal market.

The European Regulators' Group for Electricity and Gas (ERGEG). The ERGEG is an advisory group to the European Commission. Norway and Iceland are observers.

The Forum of Nordic Energy Regulators (FNER). The mission of the FNER is in co-operation – to actively promote legal and institutional framework and conditions necessary for developing the Nordic and European electricity markets.

Nordic Project on "Climate and Energy" funded by Nordic Energy Research. The project has the objective of a comprehensive assessment of the impact of climate change on Nordic renewable energy resources including hydropower, wind power, biofuels and solar energy.

### Water resources

The Hydrology Department has been an important contributor to the textbook "Hydrological drought" which is a textbook for university students, practising hydrologists and researchers.

EnviSnow, an EC-funded project involving 11 partners from four European countries. The aim is to develop and validate new and improved multi-sensor algorithms for retrieval of snow and soil parameters from Earth Observation data for use in global climate studies and hydrology, in particular runoff and flood prediction.

NVE is a participant in a STREP (Strategic Targeted Research Project) project within the EU's 6th Framework programme.

Cooperation with University in Utrecht, the Netherlands, regarding glacier modelling based on meteorological data.

World Glacier Monitoring Service (WGMS), Switzerland. All data sampled from Norwegian glaciers by Hydrology Department is sent to this database.

Global geochemical mapping and sediment-associated flux of major world rivers. The purpose is to delineate the main features of the natural global distributions of various chemical elements, and to derive estimates of land-ocean fluxes of geochemical elements. The project is organized under the auspices of IAHS/ICCE.

Inventory of historical floods in Scotland and Norway:

A study of historical rainfall floods in Norway and Scotland and the link to the atmospheric circulation. The project provides valuable information to climate change studies.

Member of an WMO working group:

National representative in the WMO working group, Gender Focal Point.

United States Geological Survey:

Cooperation about development within doppler technology in river measurements.

Sveriges Meteorologiske och Hydrologiske Institut:

Field course and research in different techniques for river measurements.

Wasserwirtschaftsamt Kempten, Germany:

Exchange program for Hydrologists.

Ott Instruments Germany:

Cooperation about logger technology.

Hydrometeorological Institute Serbia

and Hydrometeorological Institute Montenegro:

Cooperation and projects about Water management in these countries.

CHIN working group:

Report on experience from the Nordic countries on Predictions in ungaged basins.

CHIN Nordic Countries:

Institutional cooperation regarding all aspects in hydrology.

Deltafix Denmark:

Testing and further development of computer program for current meters.

Honorary posts:

Position in "the Ice committee" in IAHR

(International Association of Hydraulic Engineering and Research).

Vice president from 1996, president from 2005 in the International Commission on Continental Erosion (ICCE) of the International Association of Hydrological Sciences (IAHS).

Secretary of the International Commission of Surface Water (ISCW) i IAHS.

WMO: Hydrological adviser to the Permanent Representative of WMO from Norway.





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