The International Section

Activities and projects

NORWEGIAN WATER RESOURCES AND ENERGY DIRECTORATE

NVE`s vision:

"Water and energy for sustainable development"

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Content

Preface

Although essential for economic sustainable development, a large number of people in developing countries have hardly any access to energy in general and to electricity in particularly. Electricity is an essential factor for getting people out of poverty, and renewable Energy is needed to ensure that the development taking place is environmentally sustainable. Renewable Energy will reduce the pressure on deforestation and desertification and reduce CO_2 emissions.

Clean Energy is one of the key pillars in Norwegian development assistance. The main programme is the Initiative for Clean Energy in Development which promotes sustainable environmental, economic and social development by contributing towards meeting the huge need for renewable energy in developing countries. NVE, as one of the key partners in this programme, has for more than 30 years shared its competence and experience in sustainable management of renewable natural resources with governmental institutions around the world.

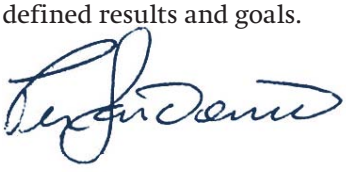
NVE's international capacity building is organised and coordinated through the International Section which manages and coordinates the programmes together with partner institutions. The major part of the professional work is carried out by staff from the various departments and sections within NVE, who draw on updated technical knowhow seen from a public management perspective. The foreign activities of NVE are always linked with the corresponding competencies required and used in Norway. While respecting each country's right to make its own policy/strategy decisions – and indeed having a genuine ownership to them – the experiences and "best practices" gained by NVE can also be brought to bear abroad.

The organization of the energy sector in our partner countries is often different from Norway and some of the partner institutions are responsible for electricity production, transmission and regulation, a so called "vertically integrated" institution. In order to provide relevant assistance to NVE partner institutions, we have increased our knowledge base with several framework agreements with consultancy firms, network and distribution companies and training institutions whom we draw upon when NVE lacks capacity for areas outside of its key mandate.

Although renewable energy has in general low operational costs, it can have large upfront capital costs. Financial resources in many of NVE's partner countries are limited, and facilitation of private investments in the electricity sector through an enabling legal framework and reduction of risks is often relevant. Based on the request from our partner institutions NVE can assist in the following aspects in the development of more renewable energy:

- Assessment of renewable natural resources (in particular water resources) in general and project specific feasibility studies.
- Development of legal framework and regulations
- Development of general and project specific licensing conditions and processes.
- Provide technical, financial and legal assistance to governments discussing specific projects with investors.
- Compliance monitoring for projects under construction and operation.

In total NVE assists our partner institutions in setting up a predictable and sustainable framework to attract investors, taking into account professional management of water and energy resources securing a sustainable development. The overall priority for all programmes is that NVE involvement makes a difference through long-term partnerships, with focus on achieving defined results and goals.



Per Sanderud

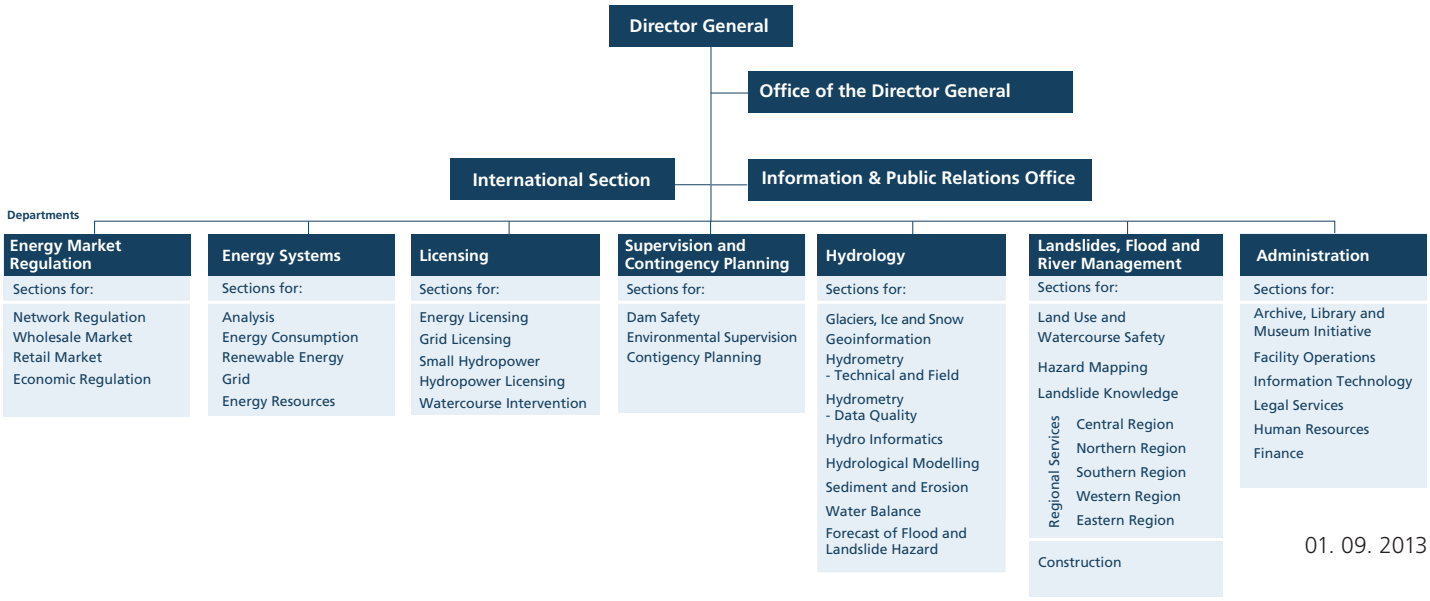
Director General
Norwegian Water Resources and Energy Directorate

Organisation of NVE

Established in 1921, the Norwegian Water Resources and Energy Directorate (NVE) is a directorate under the Ministry of Petroleum and Energy (OED) with the responsibility for overall management of Norway's water and energy resources. In short, NVE's mandate is to ensure an integrated and environmentally sound management of the country's water resources, promote efficient energy markets and cost-effective energy systems, and contribute to the economic utilization of energy. NVE is Norway's national centre of expertise for hydrology and plays a central part in national flood contingency planning. The overall responsibility for maintaining national power supplies is also vested with NVE.

The mandate and functions of NVE have to be understood in the context of Norway's legal and executive system; - authority is substantially delegated to semi-autonomous directorates like NVE, and as a regulatory authority NVE is no longer directly responsible for the commercial and production related interests – neither private nor state owned – in the water and electricity sectors.

NVE is based in the capital city of Oslo, has five regional offices in Norway and a total of about 580 employees.



01. 09. 2013

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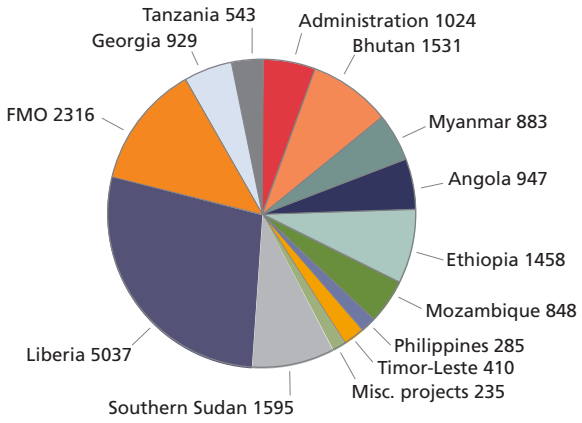
Overview of Activities and Time Consumption

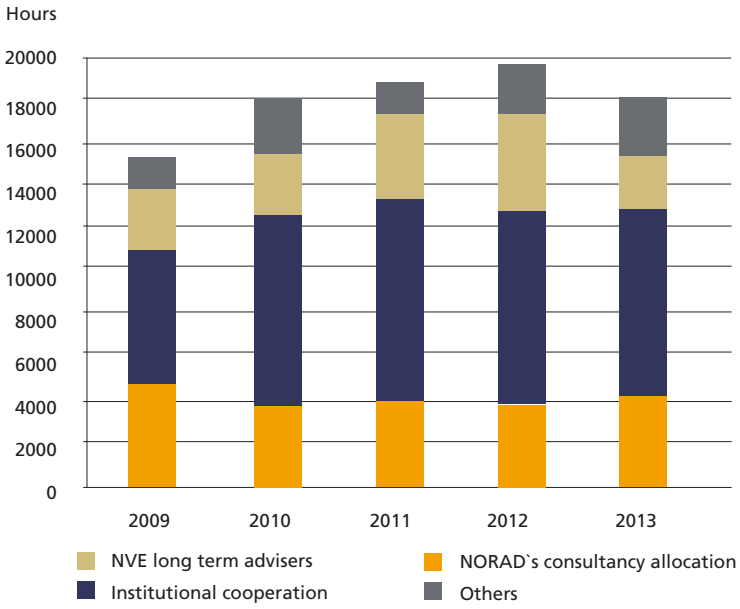
The International Section with its 7 employees manages and coordinates the programmes together with partner institutions and carry out cost and quality control of projects and programmes during implementation. The major part of the professional/ technical work is normally carried out by staff from the various departments and sections within NVE. During 2013 a total of 61 officers from NVE were involved in the international cooperation activities, compared to 55 in the previous year. The volume of activities in 2013 was recorded at 12,9 person-years (one person-year being 1400 effective working hours), compared to 14,1 person-years in 2012. The international work draws on key expertise in NVE. It is important to find a balance in the organization as a whole between national and international responsibilities. The current international volume is considered to be a good balance for NVE and this activity level should be pursued given that the high activity level is requested from our partners.

Private consultants and professionals from other directorates and research institutions are sub-contracted to assist NVE in cases when NVE either lacks competence or temporarily is short of capacity.

Time Consumption 2013

(hours)





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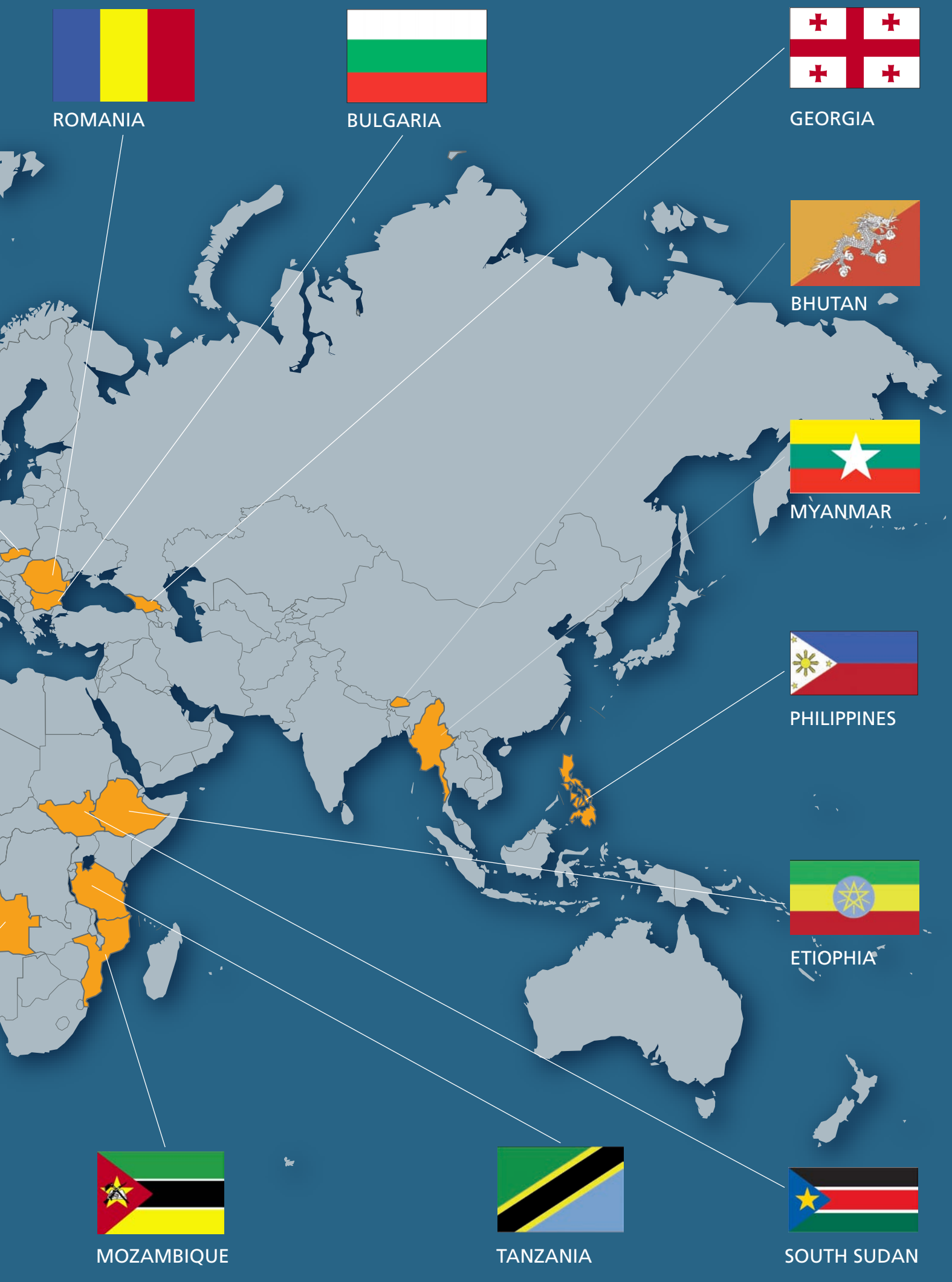
NVE around the World


ROMANIA
BULGARIA
GEORGIA
BHUTAN
MYANMAR
PHILIPPINES
ETIOPHIA
MOZAMBIQUE
TANZANIA
SOUTH SUDAN

Assignments for Norad and Ministry of Foreign Affairs

The Norwegian Agency for Development Cooperation (Norad) is Norway's principal government agency for international development cooperation. Being organized as a directorate under the Ministry of Foreign Affairs (MFA), its main tasks are to provide advisory services to the Ministry, to embassies in developing countries and to multilateral development organizations. Norad is occasionally carrying responsibility, delegated by MFA, for organizing the implementation of projects and programmes. This is carried out through agreements with foreign governments and in some cases combined with contractual services by institutions like NVE. According to its strategy, Norad aims at maximizing the effectiveness of its work by placing a focus on quality and results.

NVE has, through a framework agreement, assisted Norad's engagements in the fields of water resources management and energy development. The specific tasks have varied from project identification, appraisals of projects and evaluation for reports, to planning and preparatory work for new projects, and to monitoring or comprehensive management of water resources Such assistance, however, is now more frequently organized directly between NVE and the various embassies.

In addition, NVE is assisting MFA – EEA/Norway Grants under a separate contract with Financial Mechanisms Office in Brussels in the implementation and coordination of the programme for specific countries.

During the last years there has been an increased focus on gender, and how the gender perspective is included as a cross-cutting issue in all project activities. This is reflected in the various project descriptions, depending on how "old" the projects are. The gender focus will also vary from one country to another, depending on cultural differences. Based on internal and external discussions with our partners, International Section has worked out a gender policy for NVE's international programs, se page 44.

Technical Assistance to the Angolan Ministry of Energy and Water

NVE International Section

Background:

Norway has a long record of cooperation in the energy sector in Angola, which started already in 1987, with several programmes having been implemented to date. In a letter to the Royal Norwegian Embassy in Luanda (RNEL) dated 28 February 2011, MINEA again requested assistance in the fields of electricity and water.

After a programme development phase, the programme document was approved in the fall of 2012. The Technical Assistance Programme started in January 2013.

Activities:

The programme covers three areas of cooperation:

- Renewable energy, covering development of a strategy and action plan and a relevant legal framework.
- Energy Efficiency. Initially a survey of electricity use in Luanda has been carried out. Further activities will be planned based on the findings.
- Hydrology, focussing on supporting the building up of a newly established national institute for water resources.

Contact: Jonas Sandgren, josa@nve.no

ANGOLA

Capital: Luanda

Population: 18,565,269 (July 2013 est.)

Total installed capacity: 1,160 MW (2009 est.)

Main Energy Sector Authorities:
Ministerio do Energia e Agua
Instituto Regulador do Sector Energia

Queve River

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Overall Project Data

Client: The Royal Norwegian Embassy in Luanda

NVE Mandate: Technical Assistance to the Angolan Ministry of Energy and Water (MINEA) in three areas: Renewable Energy & Rural Electrification, Energy Efficiency and Support to the National Water Resources Institute.

Contract Value/Duration: MNOK 24

Type of Activities: Technical assistance aiming at capacity building.

Institutional Strengthening of the Water Resources and Power Sectors

NVE International Section

Institutional strengthening and human resources development for electricity sector; Support to the Electricity Regulator of Bhutan (BEA); Support to the Department of Hydro-Met Services for sustainable data provision to accelerated hydropower development; Studies of hydropower potentials.

Background:

The Goal/Impact of the Programme is to facilitate the accelerated and sustainable development of the hydro-power resources of the country thereby leading to socio-economic development and poverty reduction in pursuit of Gross National Happiness. The Purpose/Outcome of the Programme is to increase institutional capacity of the energy sector and attract potential investors for implementation of hydropower projects.

The specific purpose of the Norwegian supported Programme component is to ensure availability of local expertise for planning the development of hydropower resources and strengthening of regulatory capacity in the energy sector. Phase IV of the energy sector work supported by Norway is covered by the bilateral agreement signed in May 2012. Immediately afterwards, a contract was entered into between DHPS and NVE, in July 2012, for continued institutional cooperation.

BHUTAN

Capital: Thimphu

Population: 725,000 (July 2013 est.)

Total installed capacity: 1,510 MW

Main Energy Sector Authorities:
Department of Hydropower and Power Systems, www.moea.gov.bt/doe
Bhutan Electricity Authority, www.bea.gov.bt
Bhutan Power Corporation, www.bpc.bt/

BHUTAN

NVE visit to Department of Energy

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Overall Project Data

Client: Department of Hydropower & Power Systems (DHPS), Bhutan

NVE Mandate: To support a focussed institutional development and capacity building aspects within the energy sector in Bhutan to help it efficiently carry out its ambitious programme of accelerated hydropower development and to support further private hydropower investment both from national and international sources.

Contract Value/ Duration: 28 MNOK/ tentatively 3 years from mid- 2012.

Activities:

An overview of programme activities carried is given below, theme by theme.

- Human Resources Development
- Support to BEA to meet the Challenges of Accelerated Hydropower Development
- Support to the Department of Hydro-Met Services for
- Sustainable Data Provision to Accelerated Hydropower Development and Other Users
- Hydropower studies including:
- Prefeasibility Studies of Medium/Large Hydropower Projects
- Detailed Project Report (DPR) of one Hydropower Project
- NVE Support in procurement and contract negotiation and report review hydropower studies

Contact: Morten B. Johnsen, mbj@nve.no

Energy Efficiency and Renewable Energy

NVE International Section

Advisory services in support of program and project developments and implementation.

Background:

The EEA Grants are funded by the EEA countries, namely Norway, Iceland and Lichtenstein as a contribution to reducing economic and social disparities in the European Economic Area and to strengthening of bilateral relations. As a result of negotiations, it was decided that funds would be distributed to 15 EU countries in Eastern and Southern Europe, - to be spent on 32 different program areas. In the Memorandums of Understanding (MoU) with the individual countries the actual allocation is determined, including which among the 32 areas will benefit. In the MoU it is also determined which Norwegian authorities will be the DPP for the countries' respective programs.

In Bulgaria NVE is the DPP for a program covering renewable energy and energy efficiency. In addition, NVE is also the project partner in a related, so-called pre-defined project. This will deal further with the establishment of a well functioning electricity market within the framework of EU regulations;

- a follow up to work undertaken earlier by MEET and NVE.

BULGARIA

Capital: Sofia
Population: 6,981,642 (July 2013 est.)
Total installed capacity: 10,010 MW
Main Energy Sector Authorities:
Ministry of Economy, Energy and Tourism

The Bulgarian Parliament

Activities:

The work in the first part of 2012 was mostly related to preparatory activities in connection with negotiations and programme development. Preparation of a draft program for the energy efficiency and renewable energy initiative progressed well and helped building a good working relationship between MEET and NVE. The draft program was completed February 2012 and was submitted to FMO. After that there have been meetings and discussions on indicators, bilateral funds and other parts of the proposal. The program agreement was signed in May 2013.

The program is divided into 4 areas: a) Small hydro power plants in water supply systems; b) Measures for energy efficiency in public buildings; c) Biomass plants producing wooden chips and pellets, and; d) Competence building for state and local officials regarding energy efficiency and renewable energy (modest part of budget).

The pre-defined project on electricity market design will be built on phase I of the project financed by grants from the former EEA financial mechanism (ref. project description in the 2010 Annual Report). The recommendations from this project were aimed at initiating a project to establish a national physical market for electric power sales in Bulgaria. The project will start up as soon as plan, budget and activities are agreed with NVE and the project application approved by the program operator. The concluded phase I and subsequent discussions identified that establishing a power exchange based on the Day Ahead Market concept would benefit greatly from a market coupling with Romania.

Visit of Bulgaria's energy ministry. Fuel from biomass to Oslo Airport Gardermoen district heating systems

Overall Project Data

Client: Financial Mechanism Office (FMO) of EFTA. FMO controls the EEA Grants funds on behalf of the Ministry of Foreign Affairs, Norway. The regulator, SEWRC, is client for a predefined project under the program.

NVE Mandate: NVE is Donor Program Partner (DPP) to the Program Operator (PO) in Bulgaria, MEET. NVE is also Project Partner (PP) to the PO on a predefined project under the program.

Contract Value/ Duration: Program budget of € 13,260,000 is at the disposal of the PO. NVE's expenditures as DPP are covered by a separate contract with FMO. For the predefined project NVEs expenditures are covered by the project budget. Program and project periods last until early 2016.

Contact: Bjørn Aulie, aul@nve.no

Institutional Cooperation for Feasibility Studies of Mandaya & Beko-Abo Multipurpose Projects

NVE International Section

Advice on and development of project management capabilities; support to hydrological services; training for related capacity building.

Background:

Norway has provided assistance to Ethiopia for studies of two multipurpose projects on the Abay River (the Blue Nile within Ethiopia, the largest tributary to the Nile River), namely the Mandaya and Beko-Abo Multipurpose projects. Being the responsible authority for study of hydropower in Ethiopia, MoWE is Executing Agency for the feasibility studies.

The Ministry is in need of capacity strengthening to help it fulfil its obligations under the projects, and Ethiopia therefore requested additional assistance from Norway towards institutional strengthening and capacity building with the dual purpose of being able to manage the feasibility studies and enhancing the institutional capacity to manage similar tasks in the future.

Activities:

An overview of programme activities carried out is given below, theme by theme.

Project management:

The feasibility studies have been put on hold by the Royal Norwegian Embassy pending the outcome of discussions on the future of the studies in the light of the implementation of the Grand Ethiopian Renaissance Dam project.

Hydrological services:

Continuation of institutional cooperation programmes; training within hydrological data collection and analysis, site

Overall Project Data

Client: Ministry of Water and Energy (MoWE), Ethiopia

NVE Mandate: Advisory services and capacity building of executing agency MoWE in: i) Implementation of two feasibility and EIA/SIA studies, and; ii) Capacity building of MoWE in project management, as well as in procurement and hydrological services.

Contract Value/Duration: MNOK 17.463 from the Norwegian Ministry of Foreign Affairs, with duration from June, 2010 for two years, now extended until further notice

ETHIOPIA

Capital: Addis Ababa
Population: 93,877,025 (July 2013 est.)
Total installed capacity: 2,060 MW
Main Energy Sector Authorities:
Ethiopian Ministry of Water & Energy (MOWR) www.mowr.gov.et
Ethiopian Electric Power Corporation (EEPCO) www.eepco.gov.et

Dowsing with holy water under festival of Epiphany in Addis Abeba, Ethiopia

visits, hydrological systems planning and flow measurements and sediment measurements in the Blue Nile river;

Training for capacity development:
Updating of training needs assessments, related to project management and hydrological services; training within project management and procurement; advising on staff training and stakeholder workshops; participation in stakeholder workshops and meetings; training in dam safety issues.

Contact: Kjell Repp, kre@nve.no

Sediment laboratory

Institutional Cooperation between Ministry of Energy of Georgia and Norwegian Water Resources and Energy Directorate

NVE International Section

Hydrology, GIS and Energy Information sharing on the energy and water resources sectors in the two respective countries.

Background:

During a high-level government visit to Georgia in November 2011, NVE was encouraged by the MFA to initiate an institutional cooperation between the two countries. The Ministry of Energy and Natural Resources in Georgia expressed high interest in such cooperation, but based upon strict priorities. In May 2012 the MFA decided to allocate the necessary funds for developing a framework for cooperation, after which an institutional cooperation program was developed and approved by MFA in April 2013.

GEORGIA

Capital: Tbilisi
Population: 4,560,000 (July 2013 est.)
Total installed capacity: 4,538 MW
Main Energy Sector Authorities: Ministry of Energy

Overall Project Data

Client: The Royal Ministry of Foreign Affairs of Norway (MFA) Section for Russia, Eurasia and Regional Cooperation.

NVE Mandate: To initiate and facilitate an institutional cooperation between the Norwegian Water Resources and Energy Directorate and the Ministry of Energy and Natural Resources of Georgia.

Contract value/Duration: NOK 13.680.000 - started in June 2013 and ends in June 2016.

Signing of agreement between Ministry of Energy and NVE (Minister of Energy, Mr. Kaladze and Mr. Sanderud, Director General, NVE)

David Gareja, a monastery on the border between Azerbaijan and Georgia, founded in the 6th Century

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Activities:

The following activities are planned during the period 2013 - 2016:

- Signing of cooperation agreements and start-up seminar
- Digitalization of all hyd./met. data and purchase of PCs
- Identify needs for expansion of, and procurement and development of neces sary computer tools
- Quality control of all hyd./met. data
- Establishment of digital terrain model and land use data
- Computation of runoff map using hydrological model
- Estimation of hydro power potential
- Final workshop and presentation
- Project management and coordination

Contact: Kjell Repp, kre@nve.no

Strengthening of the Water Resources and Power Sectors Overall Project Data

NVE International Section

Institutional development/ capacity building (e.g. legal framework, rural and renewable energy). Water resources management (e.g. hydrology services, monitoring systems). Promotion of gender aspects and women's empowerment.

Background:

Fifteen years of civil war seriously affected the county's physical and human capital, also leaving institutional capacities severely curtailed. The new Government of Liberia (GOL), established in 2006, faced serious challenges which have subsequently been addressed in a systematic fashion. The GOL has prepared and endorsed programs in support of the recovery process.

The electricity supply was among the adversely affected sectors; - the country's main generating plant (Mount Coffee Hydropower Plant) was damaged and out of operation. Since 2006, the GOL has provided diesel generators to supply emergency power for essential public services in Monrovia. The rest of the country is however virtually without electricity supply.

In April 2007 Norway entered into an agreement with Liberia with the aim of increasing electricity production in Monrovia, and NVE has conducted several visits to Liberia since January 2008 funded by NORAD.

The contacts established between NVE and the various energy and water resource sector authorities have enabled NVE to become familiar with Liberia's development agenda and with the sector specific issues in particular.

Liberia requested that the cooperation with Norway within the power sector be extended, and a positive response was given.

LIBERIA

Capital: Monrovia
Population: 3,989,703 (July 2013 est.)
Total installed capacity: 200 MW
Main Energy Sector Authorities: Ministry of Lands, Mines and Energy (MLME)

A Project Document was finalized in 2010 at the request of MLME, outlining the various activities to be included in a 5-year institu-

Overall Project Data

Client: Ministry of Lands, Mines and Energy (MLME), Liberia

NVE Mandate: Assistance to MLME and the related agencies Rural and Renewable Energy Agency (RREA) and Liberian Hydrological Services (LHS); - development of monitoring and management systems for water and electricity resources in Liberia, with associated institutional support.

Contract Value/ Duration: MNOK 51.42, covering period November, 2010 – end of 2015. The estimated cost of NVE's services MNOK 32.428 (including 3 long-term NVE advisers and the South African consulting company Aurecon).

NVE's Director General, Per Sanderud visiting our cooperation program in Liberia, accompanied by NVE's permanent representative, Mr. Terje Lysfjord

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tional cooperation programme between NVE and the MLME.
Thereafter an Institutional Agreement between MLME and NVE was signed later during 2010. The focus is on assistance to the development of monitoring and management of the water and energy resources, with special attention to institutional strengthening.

Activities:

The following cooperation areas have been defined for the institutional cooperation:

Cooperation area 1: Preparation of a Legal and Regulatory Framework for the Power Sector

Objective: Existing laws and regulations in the power sector and water resources sectors to be revised if required, and new regulations and laws proposed, including licensing procedures for new hydropower projects

Cooperation area 2: Capacity Building in the MLME and relevant Agencies

Objective: Increased professional level and knowledge of the staff at MLME, and sufficient capacity to reach the goals set in the National Energy Policy. Increased professional level, knowledge and capacity at other departments and agencies under the MLME, like LHS and LEC.

Cooperation area 3: Generation Coordination

Objective: Assist the MLME in ensuring that sufficient, low cost and timely generation is made available

Cooperation area 4: Upgrading of the National Hydrometric Network and Database

Objective:
A minimum hydrometric network for high-quality data established. The data, which is necessary for all integrated water resources management, will be provided to all relevant users of such data, including data for design purposes.

Cooperation area 5: Rural and renewable energy

Objective: To promote renewable energy and modern energy services to rural areas.

Cooperation area 6: The gender aspects and women's empowerment

Objective: Contribute to women being direct and indirect beneficiaries of the development of the power sector in Liberia, particularly developments associated with Norwegian development assistance to the sector.

Contact: David A. Wright, daw@nve.no

Development of a Programme for Institutional Cooperation between the Mozambican Ministry of Energy and the Norwegian Water Resources and Energy Directorate

NVE International Section

Formulation of an agreed PD and contract documents for an Inception Phase.

Background:

The Mozambican Minister of Energy visited Norway in June 2012, holding talks with several relevant Norwegian institutions, specifically NVE and Statnett. Based on these talks the Ministry sent a request to the Norwegian Embassy in Maputo suggesting possible areas of cooperation with the two Norwegian institutions. Based on this request, Norad commissioned NVE to develop a Project Document for an Inception Phase for an institutional cooperation. The institutional cooperation programme will be funded by the Embassy in Maputo, which has set aside funds for cooperation in the Energy sector in Mozambique over the next 3-5 years period.

The Ministry of Energy (ME) was established by Presidential Decree 13/2005 on February 4th and has the overall responsibility for the power sector, renewable energy, energy efficiency, and downstream fuel supply and distribution in Mozambique. The ME consists of three national directorates; for electrical energy, new and renewable energy, and combustible fuels, respectively. It further counts on a General Inspection, a directorate for studies and planning, as well as a number of units and administrative departments.

Activities:

The work consist in development of a Programme Document for an Inception Phase, where a detailed work programme will be developed, and technical assistance to an ongoing legal review.

MOZAMBIQUE

Capital: Maputo

Population: 24,096,669 (July 2013 est.)

Total installed capacity: 2,430 MW

Main Energy Sector Authorities: Ministerio do Energia

Based on request for assistance and the discussions during the planning phase, the following activities have been identified as key areas of cooperation in the planned future programme:

- Integrated planning: Develop a planning methodology and identify a data basis for strategic planning of the energy system in Mozambique.
- Legal and regulatory framework: Create a comprehensive enabling framework for private participation in the Mozambican energy system, including an efficient and effective licensing system
- Developing capacity in the regulator: Establish the necessary regulatory function and capacity under the updated legal framework. Other potential areas for cooperation will also be investigated during the Inception Phase, namely Effective ICT, General Training and Public management of down-stream use of natural gas.

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Contact: Jonas Sandgren, josa@nve.no

Overall Project Data

Client: Norad

NVE Mandate: To assist the Mozambican Ministry of Energy (ME) with the preparation of a Programme Document (PD) for institutional cooperation.

Contract Value/ Duration: MNOK 1.46

Institutional Strengthening of the Water Resources and Power Sectors

NVE International Section

Advisory services, incl. coordination and management of consultants; institutional development and capacity building, incl. staff training and education programmes for institutions.

Background:

The power sector in Myanmar has not taken part in this international development to improve hydropower standards due to sanctions, and has a strong wish to catch up with the international community in these areas. The development of the institutional programme between MOEP/MOECAF and NVE is a result of an ongoing energy dialogue between the Norwegian Ministry of Foreign Affiars and the Government of Myanmar. The government of Myanmar request Norwegian assistance in 2013 in developing their electricity sector and NVE carried out a fact finding mission to Myamnar in June 2013. This was follow up by a revisit by a delegation from Myanmar to Norway in August 2013.

The plan is that MOEP/MOECAF and NVE jointly develop a complete programme document describing the full scope of an institutional cooperation within 2013 which is submitted to the Norwegian Embassy in Myanmar for approval. Pending on approval by the Embassy the institutional cooperation is likely to start up first half 2014. A set of start-up activities has been identified for immediate implementation until a full institutional cooperation is in place. These start-up activities are coordinated with Norad.

Activities:

Advisory services, incl. coordination and management of consultants; institutional development and capacity building, incl. staff training and education programmes for institutions.

Project Components:

Based on meetings and discussion between MoEP/MOECAF and NVE the following working areas have been identified:

Technical Assistance to Ministry of Electric Power

MYANMAR

Capital: Nay Pyi Taw

Population: 55,167,330 (July 2013 est.)

Total installed capacity: 1,710 MW

Main Energy Sector Authorities: Ministry of Electric Power

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CA 1: Hydropower Development

Tentative Area 1 Goal: "MoEP has increased its know-how and capacity in developing hydropower projects according to international standards either internally or through Public Private Partnerships"
CA 1 consists of three components:

- Design and Engineering Services to MoEP for specific projects
- Construction Management for specific MoEP projects
- Feasibility Studies of two hydropower projects according to international Best Practises

CA2: Capacity Building and Training

Tentative Area 2 Goal: Qualified professionals are able to cope better with the growing demand in hydropower development
CA 2 consists of two components:

- Short-term training (courses, workshops, seminars)
- Long-term training (scholarships for BSc and/or MSc-studies)

CA3: Electricity Law and Regulation

Tentative Area 3 Goal: To provide advice and support to MoEP in updating the Electricity Law and development of relevant regulations in the implementation of the updated law."

Revision of the Electricity Law is to be carried out by MoEP with assistance from ADB. NVE will provide comments to the draft law and process and assist MoEP with development of relevant regulations based on the revised law.

CA4: Hydropower Standards

Tentative Area 4 Goal: "Updated modern standards are established for best-practise planning of hydropower projects for sustainable implementation."
CA4 has four components:

- Technical Hydropower Standards
- Environmental and Social Safeguards Standards
- Standard Hydropower Concession Conditions
- Compliance Monitoring of Hydropower Project under implementation and operation

CA5: Strengthening of hydrological network and database for hydropower development

Tentative Area 5 Goal: "Strengthen and improve the hydrological services in DHM and MoEP to become cooperating entities that can fulfil the data requirements of hydropower development in Myanmar."
CA5 has three components:

- Upgrading and modernisation of MoEP and DMH river gauging network
- Modernisation and integration of hydrological and meteorological database
- Improvements to Hydrological Analysis Methods and Skills

Contact: David A. Wright, daw@nve.no

Overall Project Data

Client: Ministry of Electric Power (MOEP) and Ministry of Environment, Conservation and Forestry (MOECAF)

NVE Mandate: Define potential cooperation areas for long term cooperation between NVE and Ministry of Electric Power (MOEP) and other relevant institutions in Myanmar in the areas of clean energy development and the functioning of the energy system.

Contract Value/ Duration: Required funds not identified. It is expected that the long term institutional cooperation will commence in 2014 and last for four years.

Strengthening Capacity on flood Monitoring

NVE International Section

Scoping and planning for strengthening the current hydrological data observation network system at DMH; Capacity building in flood monitoring: – Data collection, quality and analysis including training of relevant key personnel at DMH in use of "river surveyor" type of equipment.

Background:

Myanmar is vulnerable to several natural hazards, such as earthquakes, cyclones, floods, tsunamis and landslides. From 1990 to 2008, Myanmar has been impacted by 21 natural disasters. Those disasters severely impacted its people and the overall economy of the country. Rainfall induced flooding, is a recurring phenomenon across the country. Among all the disasters, floods have been the most prevalent. The flash flood which occurred on 25 October 2011 killed 106 people and washed away 2,123 houses, more than 26,000 persons lost their houses and belongings. The great cost of floods in property damage and loss of human life in Myanmar necessitates the close monitoring of floods and their potential impact.

The Department of Meteorology and Hydrology (DMH), under the direct supervision of the Ministry of Transport, has been tasked with providing information on public weather services, aeronautical services, marine meteorological services, climate and agro-meteorological services, seismological conditions, and others, to reduce disaster risk.

This project will help DMH to strengthening the current hydrological data observation network and improve the flood monitoring systems and flood information processing to provide accurate, reliable, timely flood-related information and timely warnings for assisting government and communities to respond to flood events so that losses due to flood can be minimized and preventive actions can be taken.

Project Components:

1 Scoping, gap-priority needs assessment and planning for strengthening the current hydrological data observation network system

1.1 Research and Literature review of historical flood disaster characteristics

1.2 Organization of the meeting and visiting with DMH hydrology department and stakeholder -consultation for discussing gaps & needs and presenting project activities

MYANMAR

Capital: Nay Pyi Taw

Population: 55,167,330 (July 2013 est.)

Total installed capacity: 1,710 MW

Main Energy Sector Authorities: Ministry of Electric Power

Photo L/R: River surveyor training course

1.3 Field visit and investigate the representative water basin for hydrological data and flood monitoring.

1.4 National consultative workshop to identify gaps & improvements for flood monitoring network (ADPC)

2 Flood monitoring – Data collection, quality and analysis

2.1 Training of relevant key personnel at DMH in use of "river surveyor" type of equipment (in Norway)

2.2 Field training on "river surveyor" type of equipment in Myanmar

2.3 Advanced field training on "river surveyor" type of equipment, Myanmar

Contact: David A. Wright, daw@nve.no

NVE
International
Section

Overall Project Data

Client: Department of Meteorology & Hydrology (Ministry of Transport), Myanmar through Asian Disaster Preparedness Centre (ADPC), Bangkok

NVE Mandate:
NVE's assignment is a component of sub-theme 5 - Technical support to Myanmar for strengthening of human resources and institutional capacity to deal with the threat from natural disasters (Hydrological Component) funded by Royal Norwegian Ministry of Foreign Affairs and implemented by Asian Disaster Preparedness Center (ADPC), Bangkok, Thailand. NVE shall provide technical support needed to ensure strengthening capacity on flood monitoring and forecasting in Myanmar.

Contract Value/ Duration:
NOK 1.29 million

Flood Forecasting and Warning System for Magat Dam and Downstream Communities

NVE International Section

Rehabilitation of hydrometric network; development of a hydrological information system and procedures for use of data for flood forecasting/ warning systems; associated training.

Background:

The Cagayan river basin is the largest in the Philippines, encompassing the provinces of Nueva Viscaya, Isabela and Cagayan. The basin is affected by recurring floods due to tropical cyclones and the northeast monsoon. To mitigate adverse effects of flooding in the basin, the Philippine Government established the Cagayan Flood Forecasting and Warning System (FFWS) in 1982. The FFWS was upgraded in 1992 with the inclusion of a warning system for operation of the Magat Dam; -multipurpose dam for irrigation of 102,000 hectares and for power production. The system has encountered further problems since its upgrading, including breakdown of the telemetry system and some of the monitoring stations. The ability to warn people downstream and to operate the spillways of the Magat Dam satisfactorily at times of floods has therefore been reduced.

In June 2008 Norad asked NVE to assist PAGASA preparing a proposal for the rehabilitation and upgrading of the system. A field visit including an assessment of the station network was conducted by NVE officials in November 2008. As an agreed follow-up, NVE prepared a proposal in close cooperation with PAGASA on how to structure potential Norwegian support for the rehabilitation and upgrading of the Cagayan FFWS. Upon submission, the proposal was approved by Norad and by the Norwegian Embassy in Manila. The agreement between the Embassy and the Department of Science and Technology was signed in late December, 2009, while the Institutional Agreement between PAGASA and NVE was signed in November, 2010.

During the first project meeting in late April 2011 it was found that the premises for the project had changed, and

Overall Project Data

Client: Department of Science and Technology, Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA).

NVE Mandate: To assist and advice PAGASA with implementation of the flood forecasting and warning system project.

Contract value/Duration: MNOK 10.700; - started in November 2010 and will end in 2014.

THE PHILIPPINES

Capital: Manila
Population: 105,720,644 (July 2013 est.)
Total installed capacity: 16,320 MW

the project document had to be changed accordingly. This caused a delay of the full project start, with completion expected only in late 2014 or early 2015. The hydrometric network had deteriorated further, and the prioritizing of necessary activities as well as selection of hydrometric equipment had to meet stricter criteria.

Cooperation Areas:

The following cooperation areas had been defined for the institutional cooperation:

- Replacement of existing monitoring FFWS facilities
- Installation of additional monitorin stations within the Magat watershed and along the major tributaries of the Cagayan river
- Enhancement of the FFWS telecommunication system
- Conduct researches and develop models on rainfall, inflow and flood forecasting
- Establish an internet-based flood forecasting and dam operation decision support system for Magat dam and downstream communities
- Establishment of an Appropriate Early Warning System
- Training and capacity building
- Conduct intensive public information drives for stakeholders and the public

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NVE
International
Section

Renewable Energy

NVE
International
Section

Advisory services in program development and implementation.

Background:

The EEA Grants are funded by the EEA countries, namely Norway, Iceland and Lichtenstein as a contribution to reducing economic and social disparities in the European Economic Area and to strengthening of bilateral relations. As a result of negotiations, it was decided that funds would be distributed to 15 EU countries in Eastern and Southern Europe, - to be spent on 32 different program areas. In MoUs with the individual countries the actual allocation is determined, including which among the 32 areas will benefit. In the MoU it is also determined which Norwegian authorities will be the DPP for the countries' respective programs.

In Romania NVE is DPP for a program regarding renewable energy, especially hydropower. The program budget is proposed to be disposed to small scale hydro power plants, for both new ones and/or upgrading and extension of existing plants.

Parallel to this, it is in the same program a budget of 4 million Euros for geothermal heat. Here the Icelandic authority OS is the DPP. During the program period there will be a close cooperation between the OS and NVE.

Activities:

The work is related to preparatory activities in connection with negotiations and programme development. The preparation of

ROMANIA

Capital: Bucharest

Population: 21,790,479 (July 2013 est.)

Total installed capacity: 20,850 MW

Main Energy Sector Authorities:
Ministry of Economy, Commerce and Business Environment

Rumanian delegation to Norway, March 2014

Palace of the Parliament, Bucharest

a draft program for renewable energy initiatives progressed well and helped building a good working relationship between EFA and NVE.

Contact: Bjørn Aulie, aul@nve.no

Overall Project Data

Client: Financial Mechanism Office (FMO) of EFTA, Brussels. FMO controls the EEA Grants funds on behalf of the Ministry of Foreign Affairs, Norway.

NVE Mandate: NVE is Donor Program Partners (DPP) to the Program Operator (PO), the Environment Fund Administration (EFA).

Contract Value/ Duration: Program budget of 4,000,000, at the disposal of the PO. NVE's expenditure is covered by a separate contract with the FMO. The Memorandum of Understanding (MoU) was signed in March 2012. The program period will last until early 2016.

Adaptation to Climate Change

NVE International Section

Advisory services in support to program development and implementation.

Background:

The EEA Grants are funded by the EEA countries, namely Norway, Iceland and Lichtenstein as a contribution to reducing economic and social disparities in the European Economic Area and to strengthening of bilateral relations. As a result of negotiations, it was decided that funds would be distributed to 15 EU countries in Eastern and Southern Europe, - to be spent on 32 different program areas. In MoUs with the individual countries the actual allocation is determined, including which among the 32 areas will benefit. In the MoU it is also determined which Norwegian authorities will be the DPP for the countries' respective programs.

In Slovakia NVE is the DPP (together with DSB) for a program that addresses the need for adaptation to climate change. Spending of the EEA Grants is based on a former comprehensive National Climate Change Program. The program aims to reverse a negative trend of more drying of landscapes and larger floods. Structures made of stone and wood have been built in streams and rivers to retain and slow the water flows, to store flood water and to regulate the flows going into the major rivers.

The specific EEA Grants funds are allocated for two regions, as well as separate measures in two cities and the "Blue Schools project" all over the country.

Overall Project Data

Client: Financial Mechanism Office (FMO) of EFTA, Brussels. FMO controls the EEA Grants funds on behalf of the Ministry of Foreign Affairs, Norway.

NVE Mandate: NVE and the Directorate for Civil Protection and Emergency Planning (DSB) are Donor Program Partners (DPP) to the Program Operator (PO), the Governmental Office in Slovakia.

Contract Value/ Duration:
Program budget of 12,463,000 is at the disposal of the PO. NVE's expenditure is covered by a separate contract with the FMO. The Memorandum of Understanding (MoU) was signed in June 2011. The program period will last until early 2016.

SLOVAKIA

Capital: Bratislava

Population: 5,488,339 (July 2013 est.)

Total installed capacity: 7,860 MW

Water-retention measure, small structure made of wood

Water-retention measures, structures made of stone and wood. NVE together with Slovakian authorities

Activities:

The work is mostly related to the preparatory activities in connection with negotiations and programme development. The preparation of a draft program for adaptation to climate change initiative progressed well and helped building a good working relationship between NVE and the Governmental Office.

Contact:

Bjørn Aulie, aul@nve.no

Capacity Building in the Ministry of Electricity and Dams

NVE International Section

Formulation of an agreed Programme Document, procurement of consultants, support for development of legal framework and licensing procedures.

Background:

Norway has a long record of cooperation on the humanitarian side with Southern Sudan and was one of the first countries to open an embassy in the newly formed Republic of South Sudan. The Government of the Republic of South Sudan requested assistance in the energy sector, and Norway responded positively as this is a prime concern as regards sustainable economy, as well as a key issue in the development of infrastructure to serve the new State. NVE has been tasked with addressing the institutional and capacity related aspects of the energy/electricity sector. The work is closely related to the development of the Fula Rapids hydro power project, which is driven by Norfund and its partners.

Activities:

A Programme Document has been prepared and appraised by Norad. Draft contract documents have been submitted to The norwegian Embassy in Juba.

The Programme is structured as follow:

Area 1 – Sustainable resource development and sector management

This area aims at developing the legal and regulatory framework and work processes in the ministry.

SOUTH SUDAN

Capital: Juba

Population: 11,090,104 (July 2013 est.)

Total installed capacity: 12 MW
(Ref: South Sudan Electric Corporation)

Hydrological station at Juba

Component 1 Legal and regulatory framework
Component 2 Licensing processes
Component 3 Resource assessment, preparations
Component 9 Sector planning

Area 2 – Transmission and distribution
This area is aimed at promoting development of the physical power sector in the short term and strengthening the utility SSEC:
Component 4 Distribution system studies
Component 10 Governance and management of SSEC

Area 3 – Administration and financial support
The area consists of 4 components:
Component 5 Resident adviser
Component 6 Training
Component 7 Programme administration
Component 8 Procurement of a Transaction Adviser for Fula Rapids

Overall Project Data

Client: Norad, in conjunction with Ministry of Electricity and Dams (MED).

NVE Mandate: NVE to assist MED with the preparation of a Programme Document (PD) for capacity building in MED (see also Background) and to implement activities that are critical for MED's ability to handle the Fula Rapids hydro power project under development by Norfund and partners.

Contract Value/ Duration:
MNOK 3.6 for preparation of the PD and implementation of critical activities during 2012. An agreement with the Royal Norwegian Embassy in Juba for implementation of the full programme is expected to be signed in 2014.

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Capacity building and emergency repair of existing hydro power plants in Tanzania

NVE International Section

Procurement assistance and facilitation of training for plant maintenance

Background:

TANESCO's hydropower plants are in need of both emergency repair and a scheme of planned maintenance. The programme intends to address this through assisting TANESCO with funds and capacity to conduct the activities.

The Program Document and Institutional Cooperation Agreement for the cooperation project were rewritten, finalised and signed in November, 2011. The following 5 plants are under rehabilitation: Mtera hydropower plant, Kidatu hydropower plant,Nyumba ya mungu hydropower plant, New Pangani Falls hydropower plant Kihansi hydropower plant

Activities:

An overview of programme activities is given below, theme by theme.

Emergency Initiative Management:

- "To assist TANESCO for emergency upgrading and immediate training of the personnel."
- First round of tenders resulted in only 1 bid from an electrical supplier.
- NVE/TANESCO discussed the problem together with Royal Norwegian Embassy. It was decided to split into electrical and mechanical lots, and also powerplant-wise.
- NVE suggested use of an Owner's Engineer to help TANESCO with coordination of the lots.
- RNE agreed to increase project budgets to finance this. Tender was refloated at end of 2012.
- NVE will engaging an Owner's Engineer Consultant on behalf of TANESCO

Overall Project Data

Client: Tanzania Electricity Supply Company Ltd (TANESCO)

NVE Mandate: NVE to facilitate TANESCO in rehabilitation of hydropower plants and training of operation and maintenance personnel.

Contract Value/ Duration: MNOK 23. Agreement signed in November, 2011.

TANZANIA

Capital: Dar Es Salaam/Dodoma

Population: 48,261,942 (July 2013 est.)

Total installed capacity: 840 MW

Main Energy Sector Authorities: TANESCO

Capacity Building in TANESCO

"To increase professional level and knowledge of the staff at TANESCO, and sufficient capacity to reach the goals set in the Power Sector Reform Strategy (PSRS)."

Training needs assessment was finalised and budgets estimated for the various training. Trainings in dam safety were completed in mid 2012. Plans for further trainings were drawn up.

Contact: David A. Wright, daw@nve.no

Water Resources and Energy Management in Norway

Inland waters – lakes and rivers – have since time immemorial been important for the location of settlements and their developments. The first simple "laws" and common rules on water rights date back about 1000 years. Gradually governance of water became legally linked to the economically important forestry, agriculture and transportation sectors – clearly evidenced already from the 17th century. The first Water Course Act dates from 1887, - in anticipation of extensive hydropower development. The revised Act, with provisions for Concessions (i.e. comprehensive Licenses) for hydropower, came into force in 1917. After several amendments, new acts and subsidiary regulations, the current Water Resources Act was adopted in 2003 as the modern legal instrument for governance of water in Norway.

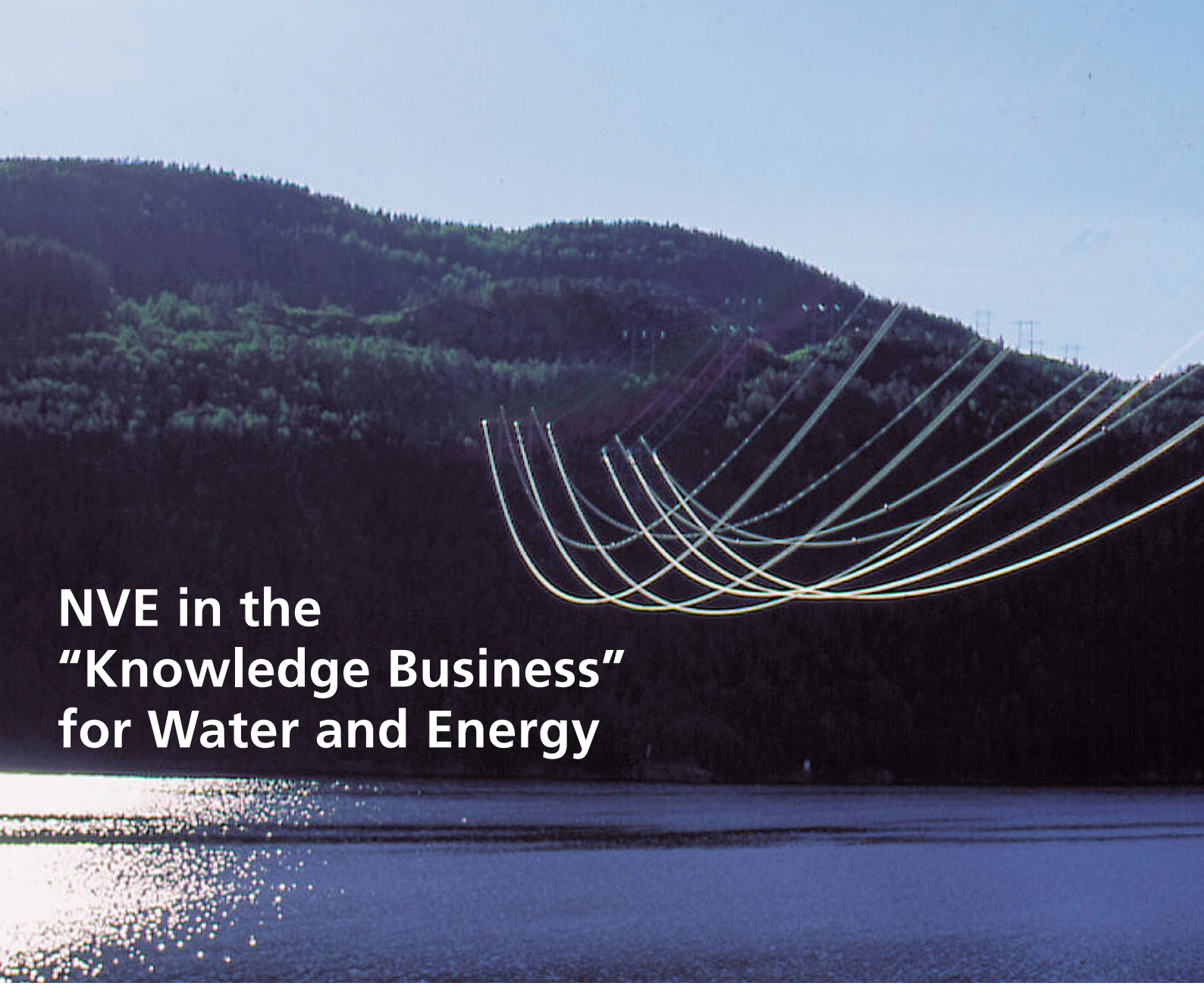
The institutional framework has always reflected the primary "priorities of the time", - starting from transportation (incl. floating of large quantities of timber) via grinding-/ saw-mills to hydropower and increasing focus on the environmental concerns. The present day's NVE, which is now under the Ministry of Petroleum and Energy (MPE) has evolved from the first formal institution in charge of "water matters", initially the Directorate of Canals and Harbours formed in 1804. The Norwegian Water Resources and Electricity Administration was established in 1927. This became the first "NVE" with a similar, although both wider and a less focused, mandate than at present.

During the most intensive period of hydropower development in Norway (1950s – 1970s), NVE was largely a huge "all-in-one" institution with internal directorates responsible for regulation/ licensing, development, and

Bjerkreim River, Norway. Photo: NVE

operation/distribution in relation to electric power. The next major shift came as the Government decided to separate regulatory functions more clearly from the executive (and commercial type) functions in 1986; - the present NVE retained the key regulatory role, along with resource monitoring and inspectorate functions as shown in the organizational chart of NVE. There is now strong focus on independent, knowledge based decision support. The hydropower production and transmission functions were separated and transferred to new State owned enterprises with commercial objectives; - an important aspect of this new regime is extensive outsourcing and exposure to competition (or production targets passed by NVE/MPE).

Over the years, a set of complementary laws have been passed to cater for all aspects related to governance, development and management/ operation of water resources in Norway. To ensure checks and balances, responsibility for the various acts fall under different Ministries such as the Ministry of the Environment (e.g. pollution control and general spatial planning issues), the Ministry of Health (e.g. water quality) and the Ministry of Fisheries (e.g. inland aquaculture and fish farming), in addition to the portfolio of MPE. In addition, all of these water and energy governance issues entail important roles for local actors, notably the Local Authorities.



NVE in the "Knowledge Business" for Water and Energy

The evolving governance structure for water and energy in Norway provides good lessons for continued refinement and high quality of water resources management within NVE's mandate. These lessons are equally relevant for countries where the water resources/energy sector management is only now gaining momentum, or where highly centralized government structures without separation of the regulatory and executive functions hinder efficiency, transparency and accountability.

In order to execute its mandate in Norway, NVE has to conduct continuous research and development, – both alone, in collaboration with other sector authorities, and by engaging research institutions. NVE is committed to be at the cutting edge on matters pertaining to water resources/catchments (basins), electric energy, concessions/ licensing for the sector, landslides where there are water related risk factors, electric power markets, as well as safety and security (energy supply, damage safeguards, environment)

The NVE mandate requires two different and equally important approaches with a view to conduct a legitimate and competent role in decision-making and promotion of reforms (e.g. the new laws/ regulations):

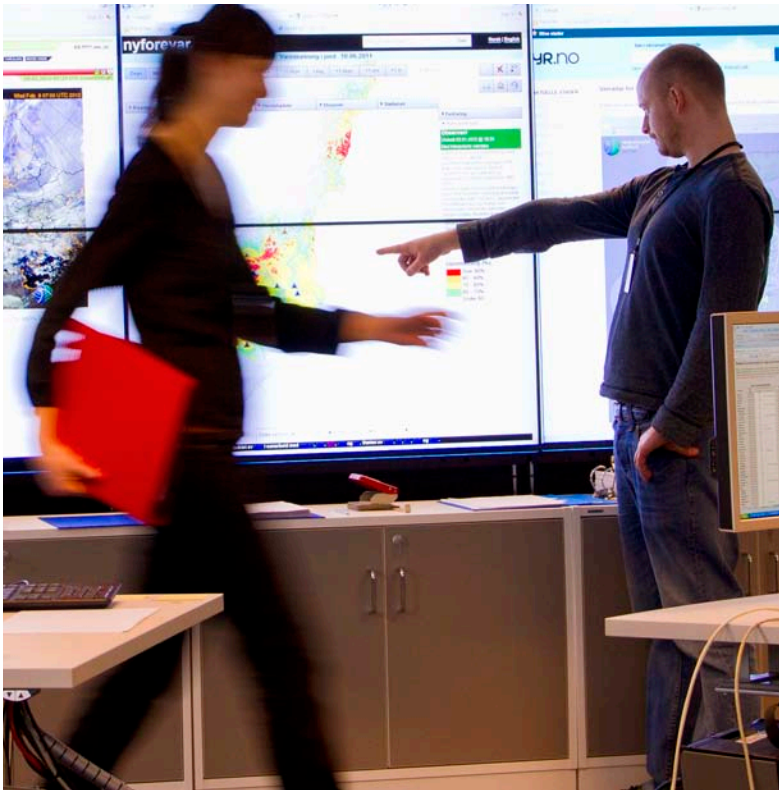
Manage all relevant water resources and energy data; - collection, analyses, reporting and dissemination of findings; - setting agenda for continued and expanded routine work and/or research.

Ensure transparent ways of doing the water/ energy business; - interface with partners, competing actors, central/ local level authorities, and society/ community; organize adequate and transparent hearing processes.

The readers are referred to NVE's web pages for more information. Go to home page: www.nve.no and click on "English" for access to English languages content. The page contains a lot of relevant and illustrative information, reflecting on the professional and scientific duties of NVE. Some links, e.g. "real time hydrological data", will take you to detailed information with text in Norwegian but there are simple vocabularies to help foreign readers. Annual Reports of the International Section are available from 2003 on-wards on: www.nve.no/en/About-NVE/International-work

It is by drawing on the historical, as well as present day's tasks and challenges, that NVE's advice and management of activities in foreign countries can be made relevant and legitimate. In our organization high competence levels and analytical skills are at a premium, and we believe this to be our competitive advantage in our overseas endeavors.

All Photos: NVE



Gender Policy for NVE institutional programs

The Norwegian Initiative for Clean Energy in Development promotes sustainable environmental, economic and social development by contributing towards meeting the huge need for renewable energy in developing countries. NVE as one of the key partners in this programme has for more that 30 years shared it's competence and experience in sustainable management of renewable natural resources with similar institutions around the world. This is mostly based on offering the institutional and technical competence and know-how of NVE experts who are responsible for the sustainable management of water and energy resources in Norway.

The Norwegian Action Plan for Women's Rights and Gender Equality (WRGE) that was launched in 2007 emphasized the importance of gender sensitivity in energy as one of the five priority areas of Norwegian development cooperation. NVE acknowledge that paying attention to both women's and men's roles and needs can contribute to expanding energy access, enhancing impact of such access and meeting energy sector cooperation objectives. NVEs understanding of gender mainstreaming in this respect is that we include gender-aspects as an integrated and natural part of the other programme working areas whenever relevant. NVEs mandate for our international work is to assist our partners within NVE's administrative functions/working areas in Norway, areas where our advisors can draw on updated administrative experience seen from a public management perspective. In this context NVE will include gender aspects whenever relevant adjusted to the local context in our partner countries.

Based on internal and external discussion with our partners we have identified possible entry points for gender aspects in NVE's institutional cooperation's;

- **Legal:** Encourage that both men and women participate in working groups for development of legal framework for the energy and water resources sector, and further highlight the importance of public hearings during the development process. During public hearings special measures may be implemented to safe-guard that both women's and men's opinions are recorded.

- **Hydrology:** Encourage that men and women participate in hydrometreological and hydrological activities including establishment of stations, collecting and analyzing hydrological data etc. Advocate that policies and plans on water resource management duly recognize the interests of both men and women.

- **Licensing:** For general licensing procedures one must emphasize that both sexes should have the opportunity to give their views, and one should consider arranging separate male and female consultations, depending on the local context and the project. NVE should also encourage the institution responsible for the licensing process to have a gender balanced assessment team.

- **Energy analysis and planning:** NVE should encourage gender balanced teams working with this as electricity and other energy carriers

have different influence on the daily life of men and women, and gender must hence be included in any kind of analysis. Where appropriate, input data should be gender-disaggregated, if such data is at all available, so that results may have the potential to point out areas where policies, programmes and actions may need to be gender adapted. Due to the huge difference in energy use in Norway and most of our cooperation countries, NVE will not have in-house expertise on all aspects related to energy use. NVE will strive to identify relevant partners where this is deemed necessary.

Studies for Hydropower:

This is a task normally carried out by external consultants, and NVE promotes gender balanced consultancy teams through setting this as one of the award criteria in the Terms of Reference for the assignment. Project specific gender analysis and gender disaggregated data are also a part of the Social and Environmental Impact Assessment for any project according to the guidelines of the International Finance Institutions. Counterparts from the partner institutions are normally assigned to work with the consultant and NVE encourage that these counterpart teams are gender balanced

Capacity Building:

NVE encourage our institutional partners to include both men and women in capacity building activities through short term courses, participation in workshops and taking higher degrees at universities.

Management and Reporting:

NVE ensures that both sexes within our own organization participate in our institutional work to demonstrate the importance of gender balance. We further report on our gender work in the annual reports to the Embassies and the issues are discussed at all annual meetings.

The list above are the gender entry points NVE and our partners have identified for our institutional cooperation's and lies within the mandate for our work abroad. We are in a continues learning process in this field and are open for input and practical suggestions for additional gender entry points in our international work.

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Water Resources and
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