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“Water and energy for sustainable development”

NVE’s Vision

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EDITOR IN CHIEF: Sverre Sivertsen
EDITOR: Ane Hobæk Ose
COVER PHOTO: www.veer.com

All photos by NVE unless otherwise stated
ADVICE AND DESIGN: Neue Design Studio
PRINT RUN: 500
PRODUCTION: Fladby Grafisk rådgivning og produksjon as

THE REPORT IS AVAILABLE FROM: www.nve.no
In the spring of 2008 the Norwegian Water Resources and Energy Directorate (NVE) was notified that from January 2009 it would be assigned greater responsibility for the prevention of damage caused by landslides. This involves providing help to local authorities in the form of expertise and resources in risk mapping, spatial planning, warning and contingency planning. The proposal was based on the need for a more comprehensive, effective and concentrated effort to achieve the goals of safer local communities. We therefore spent a lot of time on preparing for this important task in 2008. However, the fact that NVE now has greater responsibility in relation to landslides does not change the local authorities’ responsibility in taking into account landslides in spatial planning and when considering building applications.

**Licensing a High Priority**

Licensing is an important means of achieving the political goals of a high level of security of supply and the realisation of renewable energy. Licensing grid strengthening measures has had the highest priority. We have also prioritised hydropower, district heating, and wind power. At the end of 2008 far more wind power projects were being considered than there are room for in the national grid. Therefore, in cooperation with the Ministry of Petroleum and Energy, we have chosen to prioritise the projects we believe are expected to be the best and least controversial projects. The increase in our budget in 2008 gave us an opportunity to improve our processing capacity in the area of licensing, the full benefit of which will be seen in 2009.

**Record High Production**

Total electricity production in Norway was 142.4 TWh in 2008. This is the highest level of production since the record year of 2000, when production was 142.8 TWh. The primary reason for this was the fact that afflux in 2008 was 11 TWh above normal. Despite higher electricity prices in 2008 than in 2007, electricity consumption in Norway was record high – 128.6 TWh – which is 0.7% higher than in the record year 2007.

NVE actively participates in extensive cooperation with Nordic and European regulatory authorities. While the Nordic energy cooperation is focused on grid investments, harmonising regulations and a common end-user market, surveys conducted by the EU Commission show that the competition in the European electricity market is not working satisfactorily. The EU’s third energy package is a response to this challenge. One of the proposals in the package is to establish an agency for cooperation between energy regulators (ACER). Throughout 2008 NVE worked to achieve its goal of being represented on the board of ACER with full rights and obligations.

**Supervision Cooperation**

Supervision and contingency planning work within the administration of water resources and energy are high on NVE’s agenda. In 2008 we established a close supervisory partnership with the Directorate for Civil Protection and Emergency Planning (DSB) concerning the supervision of the energy companies.

**Knowledge-Based Organisation**

NVE is a knowledge-based organisation with highly qualified staff. Its work is highly complex and continuously presents us with new important tasks and challenges. The average workday is characterised by a high tempo, and a high degree of complexity. We are also experiencing a generational change characterised by staff turnover. That means that we need to put more effort on the transfer of vital competence on an active senior policy and target recruitment. Our competitive edges include exciting work, good professional and working environments, and many interesting career opportunities.

Agnar Aas
Director General

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**Dear reader**

In the spring of 2008 the Norwegian Water Resources and Energy Directorate (NVE) was notified that from January 2009 it would be assigned greater responsibility for the prevention of damage caused by landslides. This involves providing help to local authorities in the form of expertise and resources in risk mapping, spatial planning, warning and contingency planning. The proposal was based on the need for a more comprehensive, effective and concentrated effort to achieve the goals of safer local communities. We therefore spent a lot of time on preparing for this important task in 2008. However, the fact that NVE now has greater responsibility in relation to landslides does not change the local authorities’ responsibility in taking into account landslides in spatial planning and when considering building applications.

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Agnar Aas
Director General
The Norwegian Water Resources and Energy Directorate (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.

NVE’s mandate is to ensure integrated and environmentally sound management of the country’s water resources, promote efficient energy markets and cost-effective energy systems, and contribute to efficient energy use. The directorate plays a central role in national flood contingency planning and bears overall responsibility for maintaining national power supplies.

NVE is involved in research and development (R&D) and international development work within its fields and is the national centre of expertise for hydrology.

A CHANGING ORGANISATION

NVE is constantly developing and in recent years has experienced continuous organisational development in line with its changing general conditions and new, prioritised tasks. During 2008 NVE adapted its organisation – with effect from 1 January 2009 – based on two factors. Firstly, the government decided to assign responsibility for coordinating landslide prevention tasks to NVE, including surveying, communication, land monitoring and protection measures. Secondly, the need to further strengthen licence processing, in order to achieve a reduction in the time it takes to process applications, received a lot of political attention.

The people and the organisation

NVE is a knowledge-based organisation with highly qualified staff. We are always seeking to enhance the competence of our employees to ensure they are ready to meet the strategic challenges we face. Professional courses, exercises, managerial conferences and introduction programmes for new employees are arranged regularly.

FACTS

PERSON-YEARS AND TURNOVER

By the end of the year our 469 employees had worked 455 person-years. 447 were in full time positions and 22 were on temporary contracts. There were 321 fulltime employees and 17 on temporary contracts at the head office. There were 3 apprentices. The regional offices had 126 fulltime employees and 5 on temporary contracts. NVE has employees from more than 20 different nations. 48 people left in 2008. 50 job adverts were published and 71 positions filled, plus around 15 positions in order to build up an expert landslide environment. Turnover has been calculated at 10.2% (compared to 11.7% in 2007). The average age is 45.4 years.
NVE’s regional services

NVE is located in Oslo and has regional offices in Tønsberg, Hamar, Førde, Trondheim and Narvik.

The regional offices carry out a number of tasks within NVE’s administration of river systems and prevention of damage from flooding and landslides, including:

- Commenting on and making suggestions with respect to municipal land use plans and providing other advice in matters relating to river system environments, hydrology and protection against flooding, erosion and landslides.
- Deciding whether or not river system measures are subject to a licence pursuant to the Water Resources Act and otherwise helping with licensing river system measures.
- Supervising the environment and safety in connection with river system developments.
- Providing assistance with respect to the planning and implementation of protection measures against flooding, erosion and landslides, and environmental measures in river systems.
- Assisting the police, local authorities and county governors with expert river system and landslide advice during contingency planning and crisis situations.
- Flood inundation mapping.

All of the regional offices except Southern Region have their own construction units that execute measures in river systems.

NVE’s organisation

![Diagram of NVE's organisation structure]

**ADMINISTRATION**

is responsible for the directorate’s personnel and organisational development, financial administration, information system, legal advice and quality assurance, as well as joint services (library, archive, service centre, etc).

**ENERGY**

sets the framework-parameters for the country’s energy system within production, sales and energy use, and supervises and monitors safety and contingency planning requirements.

**LICENSING**

processes licence applications in accordance with the Energy Act/water resources legislation and fulfills the public sector’s supervisory responsibilities for dam safety and environmental supervision.

**HYDROLOGY**

carries out hydrological measurements, surveys and analyses for the administration, and is responsible for the national flood warning service. The department carries out a substantial amount of research and assignment activities.

**LANDSLIDES, FLOOD AND RIVER MANAGEMENT**

works to prevent damage caused by flooding and landslides by monitoring land use planning, surveying and protection measures. The department bears overall responsibility for NVE’s regional services, including construction activities.
2008 highlights

**JANUARY**

- NVE wants to improve the contingency planning in power supply.
- Flooding in Southern and Eastern Norway, 16 and 17 January.

**FEBRUARY**

- Nordic and European regulatory cooperation “the EU’s third energy package”.
- NOK 30 million in grid support to 14 distributing companies.
- Large surplus of precipitation in Southern Norway.

**MARCH**

- Government believes there is a need for more comprehensive, effective and improved assistance in landslide protection from the state.

**APRIL**

- Two new directors are in place and NVE appoints its first female regional manager.
- Cooperation with the Norwegian Pollution Control Authority (SFT) on analyses and models for improving the directorate’s analysis of questions relating to energy and emissions of climate gases.
- Snow map shows record amounts of snow in the mountains.

**MAY**

- Spring flooding – busy time for flood warnings.
- Government proposes strengthening licensing and environmental supervision in NVE by a total of NOK 13.5 million.
- Error in transmission subsea cable over Oslo Fjord.

**JUNE**

- The river park at the Norwegian Forest Museum in Elverum opens.
- Proposal for Nordic harmonisation and balance management circulated for comments.
- Online environmental overview for all water in Norway at: [http://vann-nett.nve.no](http://vann-nett.nve.no)
Amended regulations governing local energy reports.
Revised guidelines for planning and developing in flood-prone areas along river systems.
Full capacity in Skagerrak 3 cable to Denmark, which has been out of commission since August 2007.

The newly appointed Minister for Petroleum and Energy, Terje Riis-Johansen, visits NVE.
Record high power consumption in second quarter of 2008 – beats the record set in 2005.
Parts of Eastern and Southern Norway experience more than 200% of normal precipitation for the month.

NVE assigned national administrative responsibility for the prevention of landslide accidents from 1 January 2009.
Strong wind and precipitation hit the counties of Østfold and Vestfold, probably due to the remnants of Tropical Storm Laura.
Proposed Advanced Metering and Management System (AMS).

Glaciers still retreating.
The Norwegian National Police Directorate’s annual Taurus Exercise this year took place in the area around Storfjorden in the county of Møre og Romsdal.

More than 50,000 customers change electricity supplier in the third quarter.
Storms in the mountains before Christmas cause snow chaos and closed roads.
NVE assigned greater responsibility for landslides

From January 2009 NVE was assigned greater responsibility for the prevention of damage caused by landslides. The goal is to create safer local communities and increase civil protection by reducing the risk related to landslide accidents.

NVE has worked on preventing damage from flooding and landslides along river systems for many years. The approach used by NVE in this work is suitable for dealing with all types of landslides including rock-falls and snow avalanches.

NVE’s regional offices play a key role in spatial planning, planning and implementing protection measures, and contingency planning situations.

OVERALL LANDSLIDE RESPONSIBILITY

NVE’s greater responsibility for landslides entails giving assistance to local authorities and the rest of society in risk mapping, spatial planning, protection measures, monitoring, warning and contingency planning. In 2009 NVE will prioritise its work on hazard mapping and guidance to local communities in spatial planning.

NVE was assigned greater responsibility for landslides because of the need for a more comprehensive, effective and improved effort in this area. An important part of the work will be to enhance public awareness on risks connected to natural hazards like landslides in avalanches and floods.

NVE’s new responsibility for landslides does not alter the responsibilities local authorities have in taking into account natural hazards like landslides, spatial planning and when considering building applications. The Norwegian Public Roads Administration and the Norwegian National Rail Administration still have an independent responsibility to protect new and existing infrastructure such as roads, tunnels and railway lines.
Supervision and reactions

**NVE’s supervisory activities span many subjects**

*NVE* supervises licence holders, grid companies, local authorities and other actors. The supervision carried out in 2008 covered all the important aspects of *NVE’s* regulation of the water resources and energy sector.

*NVE*’s supervision involves concrete checks of compliance with the regulations and reactions in the event of any deviations. The supervision is primarily conducted through audits and inspections. Other methods are also used including surveys that simultaneously target multiple actors with the aid of questionnaires and by comparing documentation.

**Important topics in *NVE*’s supervisory activities in 2008 were:**

- Grid companies calculation and investment contributions from customers
- The maintenance and modernisation of distribution systems
- TSO responsibility
- Delivery quality in the power system
- Safety requirements for river system installations
- The duty of distribution companies to act neutrally and provide information
- The internal control system requirements and environmental requirements for measures in river systems
- Technical and financial reporting from grid companies and other actors with sales licences
- Contingency planning
- The energy labelling of household appliances

**Facts**

**126 onsite inspections**

126 onsite inspections were carried out in 2008. In addition to these, 779 inspections and audits were conducted. These resulted in 324 remarks/observations and 448 deviations were uncovered. Common findings were deficient documentation, deficient internal control systems and a lack of exercises.

**Facts**

**Prioritised areas**

A list of priority areas for further mapping is available on *NVE’s* website: [www.nve.no/flomsonekart](http://www.nve.no/flomsonekart)

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*NVE has spent ten years on the Flood Inundation Mapping Project producing detailed maps of the flood zones of selected river stretches that could cause major damage in the event of flooding.*

The project was concluded in 2008, but the mapping has continued as part of *NVE’s* risk mapping programme. A total of 120 river stretches have been mapped.

The flood inundation maps provide local authorities with a better basis for spatial planning and contingency planning. The maps are used to identify areas in which building should not take place and in which risk reducing measures might be necessary if development cannot be avoided.

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1 Åkneset in Sunnøyfjord in Sunnmøre, western Norway is under surveillance.
2 Landslide in Signadalen valley in Troms, northern Norway. Photo: Knut Stalsberg, NGU.
3 Photo: Fotograf Jonassen.
4 Photo: FotoNor.
Record number of licences

In 2008, NVE issued 31 licences for district heating, which is equivalent to around 1 TWh of heat production. In addition, NVE issued licences for 1.74 TWh of new power production.

In addition to energy projects NVE considers applications for other types of measures in river systems and groundwater extraction. In 2008, we focused on dealing with water extraction for fish farming facilities to ensure that such extraction does not conflict with important environmental interests.

Grid Licensing has a high priority

Licensing is a prioritised task in NVE and a great deal of attention is being paid to improve NVE’s administrative procedures.

A robust power grid is vital for the security of supply and opportunities for establishing new production. Grid licensing therefore has the highest priority. NVE has also prioritised hydropower, wind power and district heating. Central Norway has been a prioritised region with respect to security of supply. Licensing is an important means of achieving the political goals of a high level of security of supply and the realisation of renewable energy.

More staff

The licensing work was strengthened with 16 employees in 2008 as a result of political priorities. This presented some exciting challenges, both for former and new employees. In addition to focusing on time-saving procedures we had to prioritise training with the aim of ensuring increased efficiency in the longer term.
Licensing is an extensive process and entails a lot of coordination with other government agencies, meetings with local authorities, public meetings and inspections in which those who are affected by measures receive information and have an opportunity to present their views. NVE emphasises transparent processes and participation. 80 public meetings were held as part of the administrative procedures and we had almost 100 meetings with local authorities and regional authorities. This method of working is intended to ensure that all important aspects are taken account of in the decision-making process and that alternative solutions are considered. NVE focuses on efficiency in its licensing activities, but at the same time stresses that reducing the quality of the administrative procedures is not an option.

DISTRICT HEATING
31 licences were issued on the basis of applications, which will represent around 1 TWh of new heating production if they are realised. This is 8 more licences than in 2007. 13 district heating applications were rejected, of this 3 applications were rejected on the grounds of not being socio-economically profitable.

HYDROPOWER
42 licences were issued for small power stations representing around 510 GWh. NVE has sent its recommendations concerning 30 GWh to the Ministry of Petroleum and Energy. In addition the Ministry issued licences for 226 GWh based on NVE’s previous recommendations. 11 applications for small power stations totalling around 137 GWh were rejected.

In total this represents a reduction of small power station licences in relation to 2007 when 54 licences were issued, while 12 applications were rejected. The primary reason for the reduction is that NVE is experiencing a period of increased staffing and has to expend resources on training. NVE believes that in a few years we will realistically be able to consider around 100 applications per year. During the last five years 200 licences have been issued to small power stations.

WIND POWER
NVE issued 3 licences and rejected 4 applications for wind power stations last year. The projects that got a licence represent an installed output of 435 MW and potential electricity production of 1.2 TWh. Four of the cases were appealed and are going through the appeal process in the Ministry of Petroleum and Energy.

GRID
23 grid licences for around 230 km were issued. In addition 22 installation licences for other grid systems such as switchgear stations, transformers and the like were awarded. One of the larger installations considered was the new transmission line between Sima and Samnanger intended to improve security of supply in the Bergen region.

Regulatory cooperation in the EU and Nordic region

NVE cooperates extensively with other Nordic and European regulatory authorities. The Nordic cooperation takes place through NordREG.

At a European level NVE participates as a full member of the Council of European Energy Regulators (CEER), and as an observer in the European Regulators for Electricity and Gas (ERGEG). ERGEG was established by the EU Commission as an advisory body. In practice CEER and ERGEG are closely integrated.

NORDIC COOPERATION
Much of the work within the Nordic regulatory cooperation in NordREG involves following up tasks assigned by the Nordic energy ministers in their annual meeting. Last year an action plan was adopted that focused on developing transmission system investments from a Nordic perspective and on dividing up the Nordic market into several bid and/or price regions. The ministers also emphasised the work on further harmonising national regulations for those responsible for balance and improving the conditions for borderless trading and a common end-user market.

FACTS

INTERUPTION STATISTICS
In the autumn of 2008 NVE published the interruption statistics for 2007. The statistics showed no significant changes in relation to previous years. The quantity of undelivered energy in relation to delivered energy was 0.13 per thousand. On average all end-users in Norway experienced two interruptions lasting for more than 3 minutes. The total duration of the interruptions was on average 2.4 hours.

FACTS

CHANGING SUPPLIERS
The number of supplier switching in Norway has been high and stable for the last few years. In total around 190,300 household customers changed power suppliers during 2008, which is lower than in 2007 when around 198,600 customers switched supplier. The equivalent figures for business were 21,800 changes in 2008 and 20,400 in 2007.
Assistance to developing countries

The majority of NVE’s work in developing countries involves programmes initiated by either the Norwegian Agency for Development Cooperation (NORAD) or the Norwegian Ministry of Foreign Affairs. Based on those programmes, NVE has signed institutional agreements with a number of countries, mainly within the energy or water sector. During 2008 such agreements were in force with the Republic of South Africa, Vietnam, Bhutan, Nepal, the Philippines and Timor-Leste. In addition NVE has carried out a number of other short to long term assignments for NORAD and the Norwegian Ministry of Foreign Affairs, which may eventually end up in institutional agreements which typically may last for 3-5 years. Such assignments were carried out in Liberia, Tanzania, Azerbaijan, the Philippines, Ethiopia, Ghana, Montenegro, and for the Southern African Development Community (SADC).

There has been a significant increase in activities during the last three years, mainly because of an increased focus on energy in Norwegian aid to the developing world, which is expected to continue. More than 60 of NVE’s employees and a large number of subcontractors have been involved in the work, which includes institutional capacity building, developing legal frameworks, hydrological surveys and monitoring, water resources management, energy regulation and training. Assisting various institutions with their procurement of consultancy services also forms an important part of the work.

The international section produces its own annual report, which is available from: www.nve.no
**Advanced meters for all electricity customers**

*NVE* has proposed introducing new, advanced meters for all households and other customers with old “mechanical” meters. This replacement process will involve around 2.5 million meters. *NVE* anticipates that all meters could be replaced by the end of 2014.

The proposed amendments to regulations that would instruct grid owners to replace existing electricity meters with Advanced Metering and Management Systems (AMS) were presented in October 2007. Comments on the proposal will be considered in the first half of 2009 and the final regulation will not be determined until the result of the comments process is finished.

The idea of replacing the current mechanical meters with meters that utilise modern technology is not new. However a number of studies showed that the benefit of such a reform was quite uncertain.

New studies in 2007, however, concluded that it is highly probable that the benefit of a full roll-out of AMS is greater than the costs. This provided a basis for initiating a project to establish the requirement to introduce AMS through regulations. The Ministry of Petroleum and Energy also supported this assessment.

*NVE* believed it was particularly important to formulate functional requirements for the equipment in order to ensure the new equipment has the right dimensions and functionality.

Three external studies were therefore initiated in order to provide the best possible basis for producing proposed amendments to the regulations.

For the same reasons contact with trade and consumer organisations, equipment suppliers and various regulatory agencies was established at an early phase.

*NVE* believes that new, advanced metering systems will have a number of advantages. Electricity customers will no longer have to read and submit meter readings.

They are billed for their actual consumption and not on the basis of stipulated values.

It also becomes easier and faster for customers to switch supplier.

Introducing AMS will also provide customers with real-time information about consumption and prices.

AMS will present companies with better opportunities to tailor power products to meet customers’ wishes and needs, and provide a better basis for the efficient operation and planning of the electricity grid.
Expense categories

Personnel expenses: NOK 204.2 million

Besides the wage costs of NVE’s employees associated with administrative activities in 2008 this amount also includes time-limited contract positions, as well as expenses incurred through temps and extra help, overtime expenses and employer’s national insurance contributions. In the last couple of years the annual percentage increase in personnel expenses in NVE has been around 11%. The increase has primarily been due to nationally negotiated wage increases during the year, local negotiations in NVE over the last two years. In addition to this come payroll increases from the net increase in the number of person-years in the directorate.

Other operating expenses: NOK 118.1 million

Rent, electricity, cleaning, etc, relating to the head office and regional offices amounted to around NOK 42 million. The remaining approximately NOK 76 million (approximately NOK 72 million in 2007) covered consultants, travel and office expenses, and fixtures, fittings and equipment procurement, among other things.

Assignment expenses (excluding international assistance and co-operation): NOK 36.8 million

More than 60% of the expenses were incurred from project activities for generation companies including station operation and glacier surveys. The expenses shall be covered in their entirety by revenues.

Safety and environmental measures along river systems: NOK 90.5 million

Approximately NOK 90.5 million was spent on protection and environmental measures in river systems in 2008. Around NOK 42.2 million was spent on protection measures against mudslides, around NOK 43.3 million on protection against flooding and erosion, and around NOK 5 million on environmental measures and overview planning. More than 70 measures were under construction or were completed. Among the major projects completed were flood protection in Innbygda along the Trysil River, landslide protection for residential areas along the Lier River in the Municipality of Lier, flood protection in Fiskåna in Jørpeland in the Municipality of Strand, and flooding and erosion protection in Skytjøe in the Municipality of Ørsta. NVE’s regional offices were responsible for the planning and execution of the measures.

Hydrological station network: NOK 5.6 million

The upgrading and rehabilitation of NVE’s hydrological station network continued in 2008. The necessary upgrading of aged equipment and establishment of new stations have been completed. Further investment in long-distance transmission stations and groundwater stations is particularly necessary.

Distribution tariffs equalisation subsidy: NOK 30 million

The amount is channelled to the grid owners to directly reduce the distribution tariffs for end-users in those areas of the country with the highest distribution costs.

Energy efficiency and energy production: NOK 11.4 million


Research and development: NOK 21.1 million

NVE is participating in or running R&D activities including in the areas of river system environments, flooding problems and energy management. The bulk of the costs in 2008 were spent on programmes/projects in energy and water resources research.

International assistance and co-operation: NOK 18.5 million

International assistance is regulated through a cooperation agreement between NVE and NORAD and encompasses NVE’s activities as an advisor to NORAD, and authorises NVE’s tasks associated with institutional agreements in developing countries. The agreement assumes that NVE’s expenses incurred through activities that fall within the scope of the agreements will be covered.
Revenue categories

Fee revenue: NOK 41.4 million
The revenue comes from fees for safety inspections of dams and other river system installations, supervision of electrical facilities and district heating facilities, environmental supervision and contingency planning supervision. The fee revenue covers expenses associated with power supply contingency planning and conducting NVE’s supervisory activities.

Assignment revenue (excl. international assistance and cooperation): NOK 33.6 million
This revenue is intended to cover the operating costs associated with NVE’s international assistance and co-operation.

Reimbursement for international assistance and cooperation: NOK 19 million
The amount is reimbursed to NVE by consultancy companies to cover the expenses incurred by the directorate in connection with projects linked to the cooperation agreement with NORAD and expenses from activities stipulated in institutional agreements.

Excerpt from
2008 accounts

All expenses and revenues are gross totals in NOK millions and are recognised in line with the cash principle.

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<th>2008</th>
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