

## RISKS AND RISK MANAGEMENT

Vattenfall's operations are exposed to a number of risks. Vattenfall has established a risk management organisation and process which is comprised of the following components:

- Standardised risk definitions.
- Identifying origination of risks.
- Reliable methods for measuring risks.
- Effective risk management for manageable risks.
- Reporting in accordance with established routines.
- Management in accordance with established strategies and fixed rules.

### Risk mandate and risk management structure

The Board has overall responsibility for internal control and risk management within Vattenfall. Vattenfall's Board has, in turn, given Vattenfall's management a risk mandate. Management allocates this mandate to Vattenfall's business units in accordance with a delegation structure. Each unit manages its own risks and has some room to manoeuvre within its respective mandate. The results within units are continually followed up and reported to executive management by an independent risk control function, Group Risk Control, which is also responsible for supervision of the Group's overall risk mandate. It is also the responsibility of Group Risk Control to map out risks in the organisation and to develop appropriate models and measurement methods for managing these risks.

### The Risk Committee

The Group's risk management and reporting is coordinated by a Risk Committee under the CFO's leadership. The Committee's task is to scrutinise policies and mandates and to approve risk instructions and the risk models applied within the Group.

Political risks, operational risks, environmental risks and legal risks are of a general nature and are present within all Group units. The more specific risks in each respective part of the value chain are presented on pages 62–63.

### Electricity price risk

The price of electricity is determined by availability and demand. An important factor for demand is temperature; in the Nordic countries, for example, cold weather leads to higher demand due to increased

heating needs while in Continental Europe unusually warm summer temperatures leads to higher demand due to air conditioning needs. Other important factors for demand are the industrial economic situation and fuel prices.

Availability is determined by available capacity and varies. In the Nordic countries, for example, available capacity varies mainly with precipitation and the associated water supply (hydro power) while in Continental Europe it varies with the irregular feed-in of wind power.

Each hour the price is set to the market equilibrium, that is, the point where supply meets demand (see pages 22–23). For most of the year, and in most of Vattenfall's markets, electricity generation, and thereby the production cost, is dependent on some type of fossil fuel. As a result, the cost is also a reflection of the price of emission allowances for carbon dioxide and the market price of, for example, oil, natural gas or coal. Vattenfall's electricity price risk is therefore also a risk based on weather (temperature and precipitation), the price of oil, natural gas, coal and emission allowances for carbon dioxide.

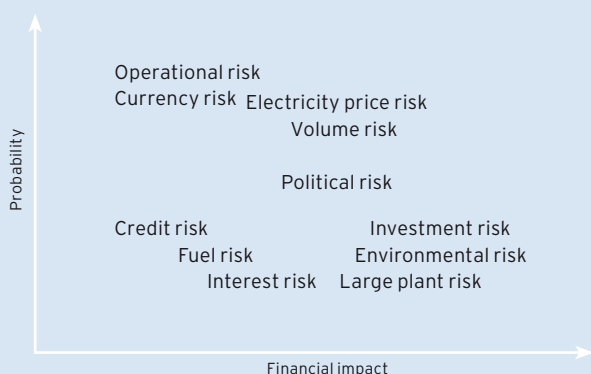
The electricity price risk is the risk that has the greatest impact on Vattenfall's financial performance.

In order to manage uncertainty in electricity price trends, Vattenfall hedges its generation and sales through the physical and financial electricity contracts available in the market. Such hedging is made while taking into account the liquidity in the market for different periods of time. The Group hedges in accordance with established mandates and generally three years ahead.

The business units conduct their hedging in Vattenfall's different markets through Vattenfall Trading Services, which hedges itself in the external market through, for example, the Nordic electricity

## Risks in Vattenfall's operations

Probability of financial impact on Vattenfall's profit



A risk that has a large probability of affecting Vattenfall's financial performance is the electricity price risk. The company's net position is hedged to a certain extent through financial instruments. For the part that is not hedged, in the case of Germany and the Nordic countries a price movement of 5 per cent would affect profit for the coming three years by approximately SEK 3,500 million. If the hedged part should increase, the reliability of the outcome (financial performance) also increases. During the year prices varied by about 35 per cent.

The fuel price risk mainly affects Vattenfall indirectly through the effect on electricity prices. The direct effect of an increase in coal prices, which affects production costs, is marginal due to the high degree of hedging.

As for currency risk, this is mainly attributable to translation exposure in equity in currencies other than SEK (see the description in the section on currency risk), see Note 35 of the consolidated accounts, pages 95–97. There is also interest risk described.

Plant risk is described in the illustration on risk management along the value chain page 62–63.

exchange Nord Pool and the German electricity exchange, EEX (European Energy Exchange).

The mandates allocated to the different business units regulate which electricity price risk that is acceptable. Exposure is followed up in relation to the mandate on a daily basis. In order to measure electricity price risks, Vattenfall applies methods such as Value at Risk (VaR) and Profit at Risk (PaR) together with various stress tests.

#### Investment risk

Before any investment decision is made, the risks are analysed. By simulating different outcomes of, for example, prices, costs, delays and cost of capital, the risks involved in each individual investment are assessed.

Nordic Generation, for instance, has a broad investment portfolio with the repair and maintenance of nuclear power, hydro power and dam installations, which have placed increasing demands on systematic risk management.

The largest investment programme concerns upgraded safety levels and increased lifetime and power output from nuclear power and encompasses a total of about SEK 24 billion until the year 2012. This means that the availability of, for example, suppliers and engineers and access to government authority resources to obtain permits are critical factors that must be considered if the large plethora of projects that Vattenfall, and even other power plant owners, plan are to function. The successful implementation of the programme within the established time schedule is decisive for profitability. Throughout the year risk analysis was conducted to illuminate and quantify internal and external risks associated with all nuclear power plant investments. In order to minimise these risks action plans have been drawn up to systematically minimise, manage and monitor the different risks throughout the implementation of investment projects.

#### Plant insurance protection

Vattenfall's largest insurable risks are associated with the operation of power generation and heat production plants.

The nuclear power plants in Sweden have insurance cover for property damage through EMANI, a European mutual insurance company. The Nordic Nuclear Insurance Pool participates in this insurance programme in Sweden, and also issues nuclear liability insurance. The German nuclear liability risk is insured by the German Mutual Atomic Energy Reinsurance Pool, and by the mutual undertaking between German power plant operators.

Vattenfall Insurance, a captive company, provides the non-nuclear facilities of the Swedish and German units and companies with insurance cover against property damage and consequential losses. The Group companies in Finland and Poland are insured through their respective local insurance markets.

Electricity transmission and distribution networks are uninsured, with the exception of transformer stations and switchgear. The reasoning is that these risks are not generally covered by most insurance providers. Vattenfall continually works to reduce electricity network vulnerability.

In Sweden, liability for damage to third parties as a result of dam accidents is strict and unlimited. Vattenfall and other hydro power producers have therefore taken out dam liability insurance together.

Vattenfall Reinsurance S.A. in Luxembourg reinsures part of Vattenfall Insurance's insurance commitments. Economies of scale and direct access to the international reinsurance market mean that overall insurance costs can be kept low.

#### Political risk

Political risk is defined as the business risk that may arise as a result of political decisions. Examples of this are price regulation within electricity distribution and transmission, uncertainty with regards to a new political majority or changes in fiscal policy. In conjunction with acquisitions and other investments, this type of risk is managed by adjusting the cost of capital.

Another type of political risk consists of changes in the regulations that affect the energy sector. This may concern changed taxes, environmental charges and changes in the way natural monopolies are regulated. This type of risk is difficult to predict and protect oneself against. As a result, Vattenfall is actively engaged in monitoring socio-political and economic factors and keeping in contact with decision-makers in all relevant markets. Vattenfall is also a member of national and international trade organisations.

#### Operational risk

Operational risk is defined as the risk of incurring financial losses, or loss of confidence, due to mistakes or shortcomings in the company's administrative routines.

Operational risks can be divided into the following categories:

- Administrative risks – risks of losses due to shortcomings in the company's division of responsibility, competence, reporting routines, risk measurement and evaluation models, and in control and follow-up routines.
- Legal risks – a risk of losses arising from the non-fulfilment of contracts due to shortcomings in documentation, counterparts lacking the right to conclude contracts or uncertainties regarding contract validity.
- IT risks – risks that entail a risk of losses due to shortcomings in IT systems.

Each business unit is responsible for limiting and managing operational risks within Vattenfall by ensuring that well-documented routines, reliable IT systems and satisfactory internal controls are in place. For more information about internal control, see the report on internal control on page 57.

#### Environmental risk

Environmental risks can be divided into two categories – environmental liabilities and environmental risks. Environmental liabilities refers to environmental problems that have been identified in production plants, installations or operations and for which requirements on measures can be expected through more stringent legislation, restricted permits or stipulations in the company's environmental policy. Environmental risks refers to the possibility of accidents and shortcomings in operations, and their impact on the environment.

Work to prevent and control risks is carried out largely on a local basis, and is based on the knowledge and experience present within the Group's units. The environmental risks and environmental liabilities in the Group's business units are comprehensively mapped and analysed on a continual basis. The business units are responsible for identifying and expressing risks in monetary terms, together with a probability factor. With this risk inventory, we increase the possibilities to implement measures that reduce the Group's impact on the environment.

Consequences of environmental risk can entail such things as:

- Decontamination/clean-up costs
- Damages to persons and property
- Loss of production
- Effects of the questioning of the Vattenfall brand
- Opinions and policies that lead to more difficult permit processes and production limitations

Business units report with regards to environmental liabilities within the following areas:

- Air, water and ground pollution
- Noise
- Landfills
- Oil-filled cables with lead encapsulation
- Mercury in electrical equipment and fumes

- Insulation in electrical equipment
- Asbestos in thermal power plants and CHP plants
- Magnetic fields from transformers and power lines
- Modernisation of measurement equipment

Environmental liabilities are mapped and analysed for decisions on measures to be taken. At present, an action programme is under way for Vattenfall's hydro power plants in Sweden and Vattenfall's acquired operations in Poland. Vattenfall sees keeping ahead in this

area as a way of strengthening the Group's competitive edge in the long-term. In the German companies, funds have been reserved for restoring polluted land and action plans have been drawn up in consultation with the authorities involved.

One of the considerable challenges for Vattenfall and the energy sector is to reduce emissions of climate-affecting carbon dioxide from fossil-fired power plants. Societal representatives place much focus on this issue, and Vattenfall is approaching it with an integrated risk perspective, which includes both technological and political

## Risk management along the value chain

The illustration shows examples of risks along Vattenfall's value chain and how Vattenfall manages these risks.

### Environmental risks and environmental liabilities

Environmental risks refers to the possibility of accidents and short-comings in operations and their impact on the environment. Environmental liabilities refers to identified environmental problems for which requirements for measures can be expected. These are handled through mapping, analysis and decisions on measures.

### Plant risk

Vattenfall's production plants can be damaged due to near-accidents and breakdowns, which in general also entail consequential losses. Loss-prevention measures and comprehensive maintenance, training and good administrative routines minimise such risks. As far as possible, insurance policies protect the Group against major financial losses.

### Price area risk

Price area risks arise when electricity prices differ between geographic areas due to shortages in transmission capacity between areas. This risk is controlled centrally and is managed by Vattenfall Trading Services. In the Nordic countries, where Nord Pool provides a market for the financial instruments used to regulate this risk through area swaps, the price area risk is managed through trading in such area swaps. Through Vattenfall's obligation to be a market maker on Nord Pool, the liquidity of these instruments is secured and in this manner Vattenfall contributes to spreading risks for other players. In the physical trading of foreign cables outside the Nordic countries, the price area risk is managed through hedges in each particular area.

### Electricity price risk

Risk of loss on account of changes in the wholesale price of the electricity in which Vattenfall conducts physical and financial trade. The price of electricity is greatly affected by fundamental factors such as water supply, fuel prices, emission allowances for carbon dioxide, temperature changes and electricity consumption, so the continual analysis of these aspects is an important factor for success. Vattenfall manages this risk by selling and buying electricity futures and forwards. Deals on the different electricity markets are made through Vattenfall Trading Services' market access function. The Board of Vattenfall has issued mandates specifying how large an electricity price risk is acceptable. These mandates are followed up against exposures on a daily basis. In order to measure electricity price risks, Vattenfall applies Value at Risk (VaR), Profit at Risk (PaR) and various stress tests.

## Electricity/heat generation

### Electricity price risk

Earnings risk on account of changes in the wholesale price of the electricity generated in Vattenfall's production plants. In order to evaluate electricity price risk, Vattenfall simulates expected electricity spot market outcomes. Forecasts for expected generation are established and these parameters provide the basis for deciding how large a proportion to hedge. Factors that affect the electricity price risk include changes in electricity consumption, the price of coal and emission allowances for carbon dioxide, water supply and temperature changes. Vattenfall manages the electricity price risk by hedging its expected production through forward trading in electricity. In this way, profit distribution is evened out over time.

### Fuel price risk

Risk of loss on account of changes in the market price of the fuels that Vattenfall uses in its production plants. The measurement and management of fuel price risk is conducted within the individual production units. Fuel prices are affected by such things as macroeconomic factors. Vattenfall manages fuel price risks by forecasting and analysing price developments and planning fuel purchases. Financial and physical instruments, such as coal and oil, are used to even out the outcome over time.

## Trading

### Credit risk

Risk of loss resulting from the counterpart in a transaction not fulfilling its obligations. In order to manage and limit this risk, Vattenfall uses external rating information (when available, otherwise internal models) to establish the creditworthiness of its counterparts. Individual limits are established for each counterpart and each counterpart is regularly assessed. Exposure is followed up in relation to the credit limits on a daily basis. If necessary, additional credit assurances are demanded in the form of, for example, a guarantee from the parent company or a bank. In those cases where general agreements are entered, net calculations of debts and receivables for an individual counterpart are permitted. In those cases where Vattenfall has more than one general agreement with the same counterpart, a so-called master netting agreement is desirable in order to calculate the net debt and receivables amount, even when trading in different raw materials, such as electricity, coal and gas. When contracts are closed in marketplaces such as Nord Pool and EEX, which offer central counterpart clearing, the risk is in the market instead.

### Currency risk

Currency risk is the risk of negative effects on Vattenfall's earnings and balance sheet as a result of exchange rate fluctuations. In Nordic operations, most transaction exposure is in NOK and EUR in conjunction with the hedging of electricity prices, primarily in Nord Pool. This currency exposure is hedged with forward exchange rate contracts.

aspects. Vattenfall has, among other things, initiated a project for large-scale separation and storage of carbon dioxide.

The project is partly financed by the EU and is being carried out in cooperation with a number of larger utilities, including RWE.

**Financial risks**

The Group's financial risks are mainly managed by Vattenfall Treasury AB, which houses the Group's internal bank and finance function. These finance operations are intended to provide cost-effective

management of the Group's financial risks.

The Group's funding, investments and currency trading are mainly carried out by Vattenfall Treasury AB and, to a lesser extent, by Vattenfall Europe AG. The Group's liquidity is centralised using so-called group cash pool systems. Speculative investments are made to a limited extent within fixed risk limits. For a more detailed description and quantification of financial risks, see Note 35 of the consolidated accounts.

