

2010

Corporate Social Responsibility Report

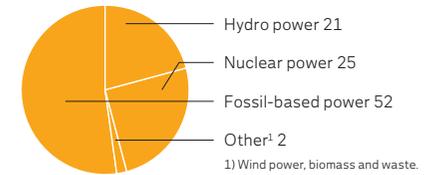
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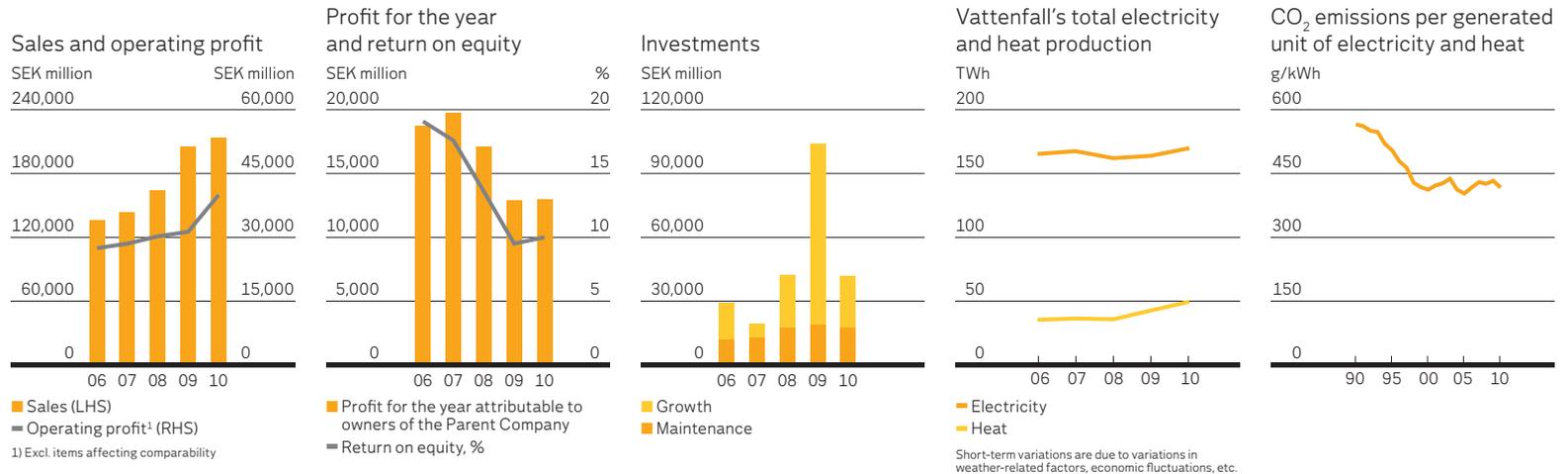
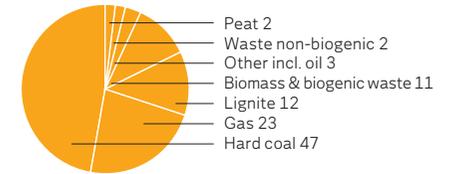
Vattenfall today – a European energy company

Vattenfall is one of Europe's largest generators of electricity and the largest producer of heat. Consolidated sales in 2010 amounted to SEK 213,572 million. Vattenfall's main products are electricity, heat and gas. In electricity and heat, Vattenfall works in all parts of the value chain: generation, distribution and sales. In gas, Vattenfall is mainly active in sales. Vattenfall is also engaged in energy trading and lignite mining. The Group has slightly more than 38,000 employees. The Parent Company, Vattenfall AB, is 100%-owned by the Swedish state. The core markets are Sweden, Germany and the Netherlands. In 2010 operations were also conducted in Belgium, Denmark, Finland, Poland and the UK.

Electricity generation 2010, %



Heat production 2010, %



Important events 2010

12/3

Vattenfall announces plan to divest its high-voltage transmission grid in Germany.

12/4

Øystein Løseth takes office as new President and CEO of Vattenfall AB.

27/4

Alpha ventus, Germany's first offshore wind farm, is inaugurated.

16/6

Vattenfall acquires stake in Liberian biomass company Buchanan Renewables Fuel to secure long-term supply of biomass.

17/6

Sweden's parliament lifts ban on construction of new nuclear reactors in Sweden.

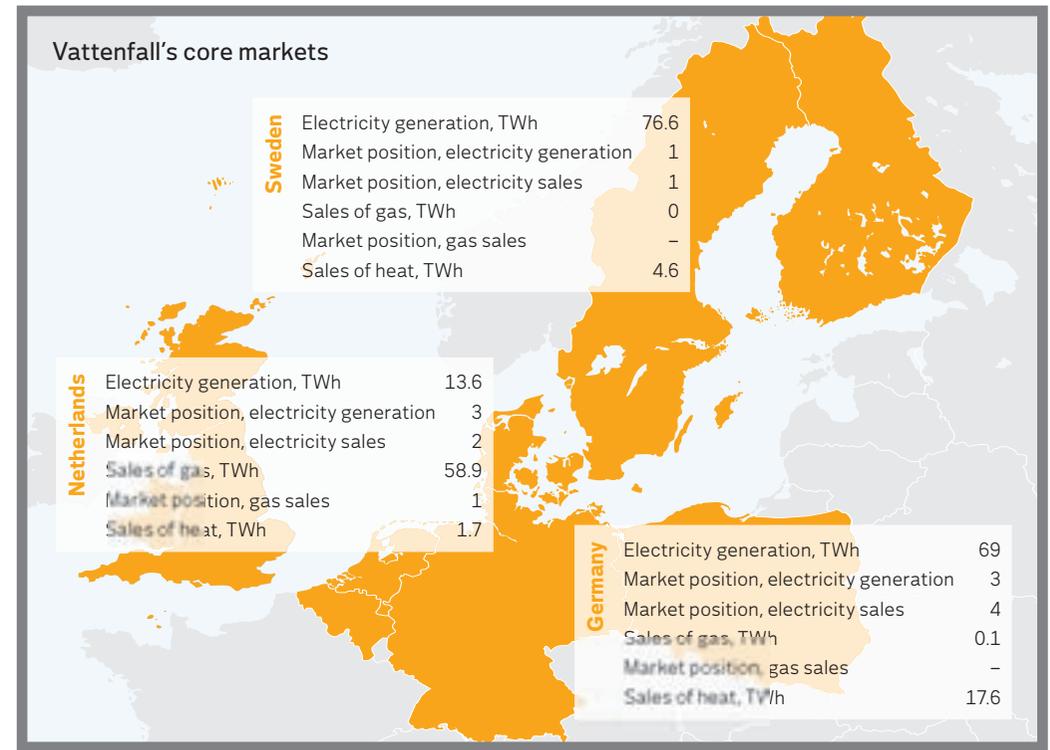
Key data

	2010	2009	Change, %	2010, EUR m ¹	2009, EUR m ¹
Net sales, SEK million	213,572	205,407	4.0	23,725	22,818
Operating profit excl. items affecting comparability, SEK million	39,952	31,294	27.7	4,438	3,476
Return on equity, %	10.0	9.5	-		
Investments, SEK million	41,794	102,989	-59.4	4,643	11,441
Electricity generation, TWh	172.5	158.9	8.6		
Sales of gas, TWh	63.3	20.1 ²	-		
Sales of heat, TWh	44.5	37.9	17.4		
Number of employees, full-time equivalents	38,179	40,026	-4.6		
CO₂ emissions, million tonnes					
Sweden	0.59	0.44	33.4		
Finland	0.28	0.30	-6.4		
Denmark incl. UK	6.40	6.21	3.2		
Germany	70.1	67.6	3.6		
Poland	6.40	5.98	7.1		
Netherlands incl. Belgium	7.78	9.12	-14.6		
Total	91.5	89.7	2.1		

1) Exchange rate SEK 9.002 = EUR 1. The EUR values are shown only to facilitate comparisons between SEK and EUR.

2) Pertains to quarters 3-4, 2009.

During the past decade Vattenfall has carried out a substantial expansion, transforming itself from a Swedish nuclear and hydro power operator to a major player in the European energy sector. International diversification has provided Vattenfall with more stable cash flow and a stronger platform for continued growth and value creation. However, Vattenfall is currently facing a number of challenges, including a weaker market outlook, pressure on profit margins and a need to reduce the company's CO₂ exposure. Vattenfall has therefore formulated a new vision and initiated a new strategic direction (for more information see pages 4-15).



Vattenfall's other markets

	Denmark	Finland	Poland	Belgium	UK
Electricity generation, TWh	8.4	0.6	3.6	-	0.7
Market position, electricity generation	2	>10	7	-	- ¹
Market position, electricity sales	-	3	5	3	-
Sales of gas, TWh	0	0.2	0	4.1	-
Market position, gas sales	-	-	-	3	-
Sales of heat, TWh	7.0	1.7	11.9	-	-

1) Second largest in offshore wind power.

23/8

An Extraordinary General Meeting approves amendment to Vattenfall AB's Articles of Association clarifying Vattenfall's assignment.

5/9

Agreement reached on lifetime extensions of German nuclear power plants and new tax on nuclear fuel.

21/9

Vattenfall announces new strategic direction and new organisational structure.

23/9

Vattenfall inaugurates Thanet, the world's largest offshore wind farm, in the UK.

21/10

Decision to together with Stadtwerke München build DanTysk, a large offshore wind farm in the German North Sea.

15/12

Vattenfall and E.ON agree on joint optimisation process for the Krümmel and Brunsbüttel nuclear power plants in Germany.

What is important for Vattenfall's stakeholders?

Energy plays a central role in society, and understanding and responding to society's expectations is crucial to Vattenfall's business. In recent years, expectations in some parts of society – particularly civil society, politicians, and the media – have risen dramatically, and Vattenfall has not always been able to meet them.

Building society's trust in Vattenfall requires a keen understanding of expectations and a long-term sustainable strategy for addressing them.

At Vattenfall we study and respond to stakeholder expectations at every level of our business. At the corporate level, our CSR Issues Management tracks concerns of stakeholders who relate to the company as a whole, with particular focus on expectations on Vattenfall to do more than is required by regulations or market competition. This report is in part a documentation of that process.

In 2010 we monitored more than 30 issues related to corporate responsibility and sustainability, tracking how they were

Comments from stakeholder surveys

“What may be lacking is a clear strategy for renewable generation.”

“You need to clarify your approach to fossil energy – a more nuanced picture is needed.”

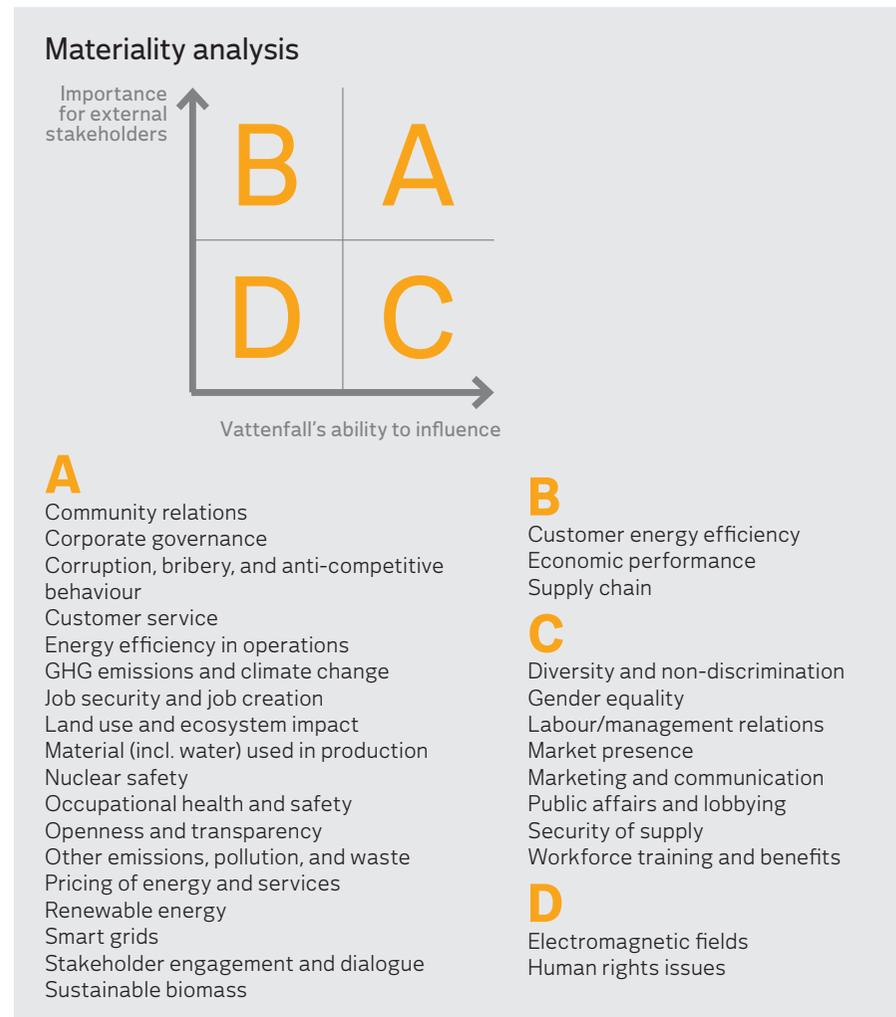
“Discussion of nuclear safety, waste, and management issues is important.”

“There must be greater coherence between words and deeds.”

“It is essential that Vattenfall shows transparency. In the face of criticism, transparency helps.”

viewed in the political debates, the media, academia and in direct dialogues with our stakeholders. We assessed the issues' importance to our stakeholders, the potential impact on our business, our ability to influence the issues, and changes in perception over time.

As a part of this analysis, Vattenfall performs a number of stakeholder surveys and interviews throughout the year. Some of the questions and comments received through those studies are noted here – and the topics raised in this report are based on this feedback.



A year of change

The past year has been one of transition for Vattenfall and for many of the countries in which we are active. Among other events that affected the company, 2010 saw a clarification of our assignment from our owner. Our sustainability work is now clearly tied to the situation in Europe, rather than just in Sweden, which provides clarity and helps us set objectives:

"The object for the Company's activities is to generate a market rate of return by, directly or via subsidiaries and associated companies, operating an energy business that enables the company to be among the leaders in developing environmentally sustainable energy production."

The assignment further identifies Europe's 20-20-20 targets as natural reference points for Vattenfall's own work with emissions reductions, renewable energy, and energy efficiency. While our long-term ambitions of a 50% reduction in CO₂ emissions by 2030 and climate neutrality by 2050 remain in place, our sustainability work will now place a greater emphasis on the first steps in those directions that are being taken in this decade. I encourage you to read more about how we will assess our performance in light of Europe's sustainability goals on pages 8–9.

To guide our work going forward, we adopted a new strategic direction in September 2010. With regard to sustainability, our highest priority is reducing CO₂ emissions in our portfolio from their high level today. This report goes into detail about how we plan to achieve that, using all six of the energy sources we have today to help build a more sustainable system for tomorrow. Delivering on our vision requires a more focused, leaner organisation with a common focus, and we have reorganised the company in a way that will support these objectives.

Stakeholders expect Vattenfall's CSR work to look to the future. When we do, we see that we still face great uncertainty: about the extent and nature of the economic recovery, about global climate policies, and about the conditions for investing in a more sustainable energy system. Continued long-term uncertainty combined with a clearer assign-



ment leads to the conclusion that we must focus our work on the steps that we can take in the short- and medium-term that are aligned with long-term sustainability.

The past year has been one of tangible achievement. Among other milestones, we commissioned the Thanet offshore wind farm in the UK, which is currently the largest offshore wind farm in the world. It is part of the ongoing efforts that have put us among Europe's leading offshore wind operators; in 2010 we installed more offshore wind power than any other company in Europe. We also see co-combustion of biomass as a significant sustainability measure within our grasp. In 2010 we began scaling up our efforts at sourcing sustainable biomass, including our major agreement with Buchanan Renewables Fuel in Liberia. In partnership with Volvo, we contributed to the launch of the new V60, a unique plug-in diesel hybrid automobile that we have developed together. By driving the concept of e-mobility forward today, one of our core products, electricity, can begin making a broader contribution to a more sustainable society.

We understand that we must earn society's trust through our actions and through open dialogue. We continue to support the principles of the United Nations Global Compact and accept that we have a responsibility to society that goes beyond the financial realm. We will continue to show our stakeholders that we are delivering on what matters to them. As always, this report is an important part of delivering on that responsibility, by communicating our situation and the actions we are taking.

Stockholm, March 2011

Øystein Løseth
President and CEO

New vision

Vattenfall will develop a sustainable, diversified European energy portfolio with long-term increased profits and significant growth opportunities. At the same time, Vattenfall will be among the leaders in developing environmentally sustainable energy production.

New strategic direction

As Vattenfall now enters the second decade of the new millennium, it is with new Articles of Association, a new vision, a new strategic direction, new management and a new organisational structure. The new strategic direction rests on four pillars: greater focus on profitability and value creation, focus on three core markets, three main products, and growth in low CO₂-emitting energy production and in gas.

Improved profitability and value creation are fundamental prerequisites for continued growth and for Vattenfall's ability to

be among the leaders in developing environmentally sustainable energy production. Vattenfall has chosen to focus on the markets in which the company has a strong position: Germany, Sweden and the Netherlands. The company's main products are electricity, heat and gas. In addition, Vattenfall will act decisively to change the composition of the production portfolio towards more environmentally sustainable energy production in order to reduce its CO₂ exposure and thus also its financial exposure to the cost of CO₂ emission allowances.

- Greater focus on profitability and value creation
- Focus on three core markets
- Three main products – electricity, heat and gas
- Reduced CO₂ exposure and growth in low CO₂-emitting energy production, and in gas

Roadmap for implementation of the new strategic direction

Vattenfall breaks down implementation of its new strategic direction into two phases – a consolidation phase and a growth phase. Being able to invest in new, more efficient plants with lower CO₂ emissions during the growth phase will require successful measures during the consolidation phase. During the

consolidation phase, annual costs will be cut by SEK 6 billion at the same time that the five-year investment plan for the period 2011–2015 will be reduced compared with previous plans. In addition, opportunities to divest assets that do not support the new strategic direction are being thoroughly investigated.

Consolidation phase

Next 2–3 years

Short-term efficiency improvement programme

- Cost-cutting programme, SEK 6 billion
- Divestment of non-core businesses
- Revised investment plan for 2011–2015 to SEK 165 billion (compared with SEK 201 billion for 2010–2014)
- New business-led organisational structure from 1 January 2011

Growth phase

2014–

Reshaping the generation portfolio¹

- Focus on growth in low CO₂-emitting energy production, and in gas
- Focus on large markets with good growth opportunities and on markets in which Vattenfall has sizeable positions
- Reduced CO₂ exposure

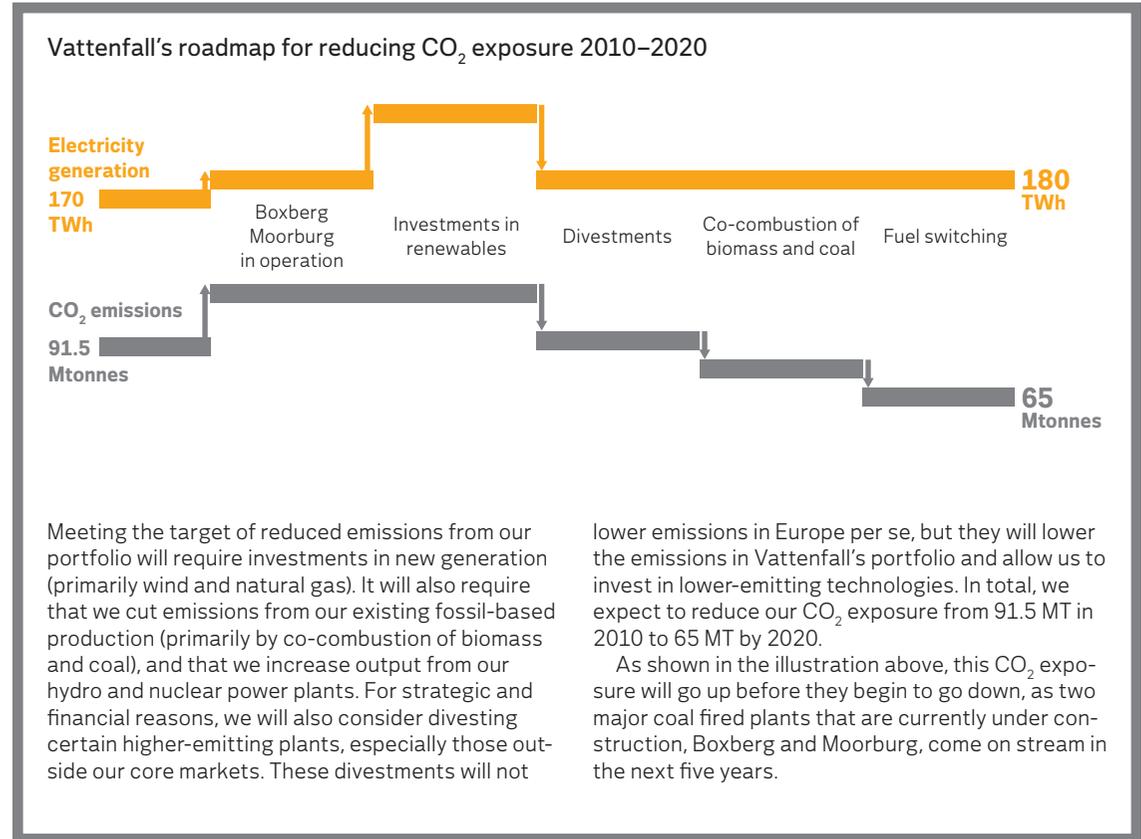
¹ Read more about the growth phase in Vattenfall's 2010 Annual Report.

Sustainability implications of the new strategic direction

Vattenfall’s new strategic direction builds on a clarification of Vattenfall’s assignment made by its owner, the Swedish state. The new Articles of Association state:

“The object for the Company’s activities is to generate a market rate of return by, directly or via subsidiaries and associated companies, operating an energy business that enables the company to be among the leaders in developing environmentally sustainable energy production.”

As a European energy company, Vattenfall’s commitment to the development of environmentally sustainable energy production is aligned with the goals of the European Union. In the long-term, the EU’s stated target of an 80%–95% reduction in carbon emissions by 2050 is reflected in Vattenfall’s own goal of climate neutrality by mid-century. In the near-term, the EU’s 20-20-20 targets to reduce emissions by 20% (vs. 1990 levels), increase the use of renewable energy to 20% of total, and reduce energy use by 20% through efficiency improvements set the framework for our business to 2020. Vattenfall supports these goals and the



associated policies at the European and national levels. By creating requirements, incentives, and regulations that affect the entire industry, these policies facilitate making sustainability a part of core business strategy.

Business and sustainability performance for Vattenfall are tightly linked. The rising price of carbon emissions in the European Emissions Trading System (ETS) means that it will be more costly to emit CO₂. The cost of emissions and the subsidies available for renewable-based generation will support our growth in wind and biomass. And a variety of policies for improving energy efficiency will favour companies that help their customers get more from their energy use.

Vattenfall's owner wants the company to be among the leading companies in each of these areas. Using the EU's 20-20-20 targets as a benchmark, we will assess our performance in the following areas:

**Specific emissions from electricity generation:
350g CO₂e/kWh by 2020.**

Meeting the overall target for emissions reduction will require total emissions from all electricity generation in the EU to decrease by about 40% from 1990 levels and by about 20% from 2008 levels. A comparable reduction would put *Vattenfall's total emissions at approximately 350 g CO₂e/kWh in 2020*, down from 465g CO₂e/kWh in 2010.

Generation from renewable energy: 8 TWh of electricity generated from wind and biomass by 2020.

23% of our electricity generation already comes from renewables, primarily the 35 TWh of electricity derived from hydro power. Hydro power will make a major contribution to Europe's goals, but options for growth are limited. In Europe, non-hydro renewable electricity generation is expected to grow by 172% between 2008 and 2020. A similar increase would put *Vattenfall's generation from non-hydro renewables at 8 TWh in 2020*, up from 3.9 TWh in 2010.

More efficient energy use: Continuous improvement in the efficiency of our own plants and our customer's energy use.

The goal of improving energy efficiency by 20% will require improved efficiency in both generation and end use among customers. Later in this CSR report you can read about *Vattenfall's range of programmes related to energy efficiency (see page 50)*.

The European energy market

The process of reshaping Vattenfall's generation portfolio begins with the state of the European energy system today – a system that is itself in transition.

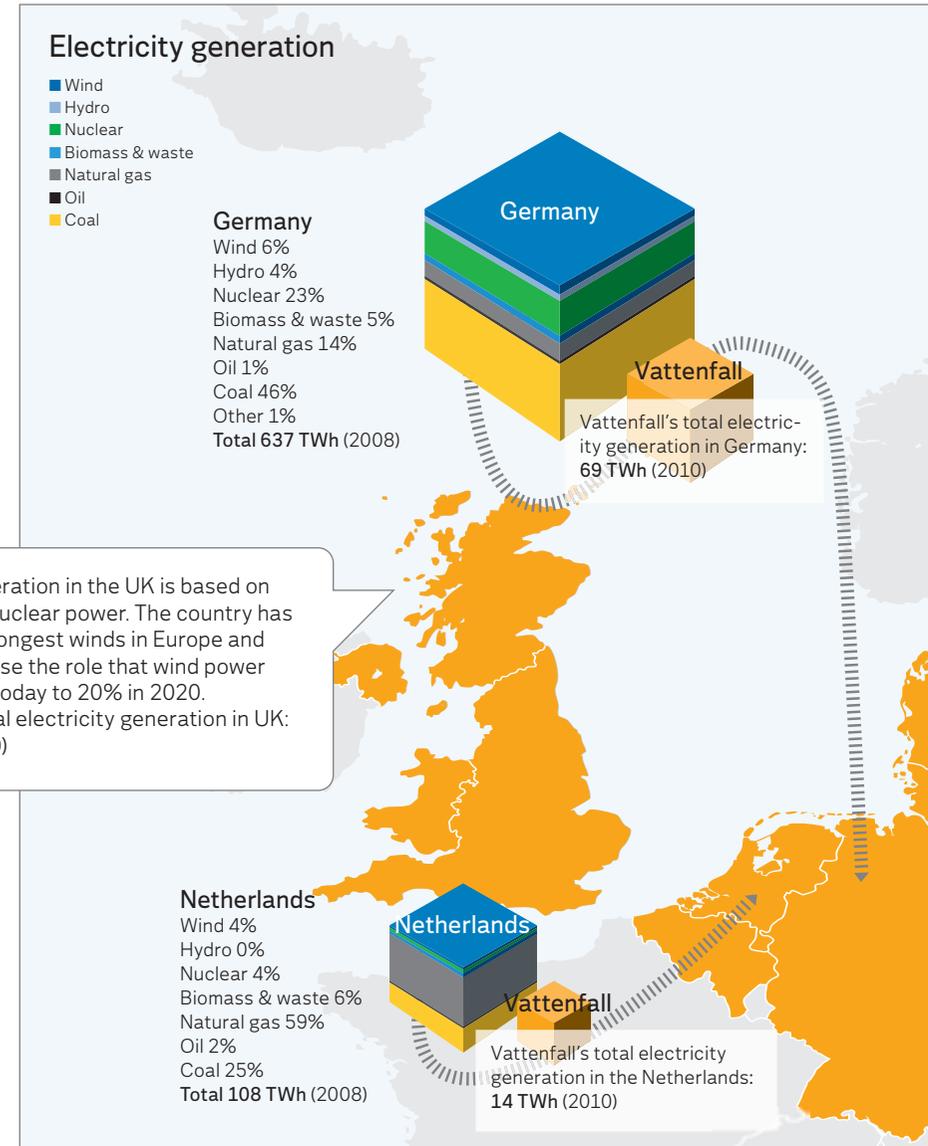
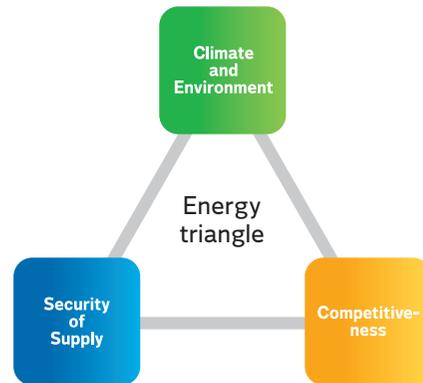
Today's energy system was largely constructed based on national conditions and priorities. As energy infrastructure was developed, the priority objectives were to secure access to energy, and to make that energy as affordable as possible.

Shortages of fuels and unreliable electricity systems cause major problems for societies and economies. Securing supply therefore means guaranteeing that primary energy is available, and that delivered energy is reliable, essentially 100% of the time. This has led most countries to build electricity systems based on primary energy that could be found locally, and generation technologies that could meet "base load" demand and be controlled to handle variations.

Countries have also tried to keep the overall costs of delivered energy as low and stable as possible for households and businesses. For electricity this meant building large, capital-intensive energy infrastructure that delivers high volumes of electricity for many decades.

In practice, meeting these two objectives of security of supply and cost competitiveness has led European countries to build a foundation of hydro power, nuclear power, and fossil-fuelled power plants.

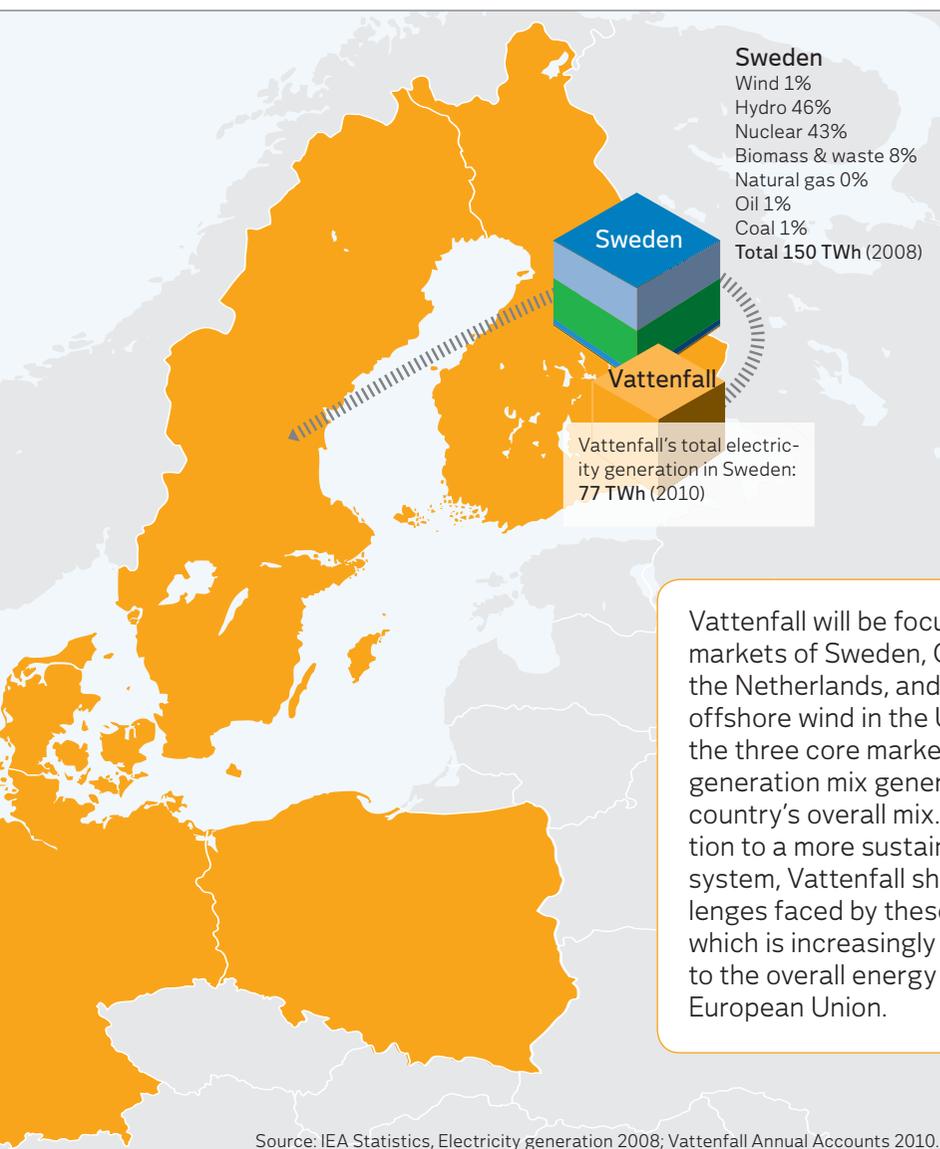
Together, these sources still account for 93% of Europe's electricity generation, but the situation in Europe is changing. In recent years, concerns about the impact of energy on the environment and climate change have become an additional priority that must be balanced with security of supply and cost.



Different starting points...

Each country within Europe has pursued its energy objectives based on national conditions. Countries like Sweden and Norway feature large river systems in mountainous regions, which supported the construction of large-scale hydro power. Other countries do not share these conditions, but unlike Sweden, they have local access to fossil fuels. In Poland and Germany, coal offers a secure and affordable domestic energy source, while the Netherlands controls some of Europe's richest natural gas deposits.

Increasing demand over time meant that not even these local resources were likely to suffice. Some countries, including France, Sweden, the UK and Germany, supported the construction of nuclear power as part of their national energy strategies.



Vattenfall will be focusing on its core markets of Sweden, Germany, and the Netherlands, and also on building offshore wind in the UK. In each of the three core markets, Vattenfall's generation mix generally reflects the country's overall mix. In the transition to a more sustainable energy system, Vattenfall shares the challenges faced by these countries – which is increasingly to contribute to the overall energy strategy of the European Union.

20/20/20 ...but a common direction

In meeting the challenges represented in the Energy Triangle (see opposite), European leaders have increasingly seen the advantages of a coherent strategy and a common European energy policy. In practice this has meant that the EU has an increasing amount of influence on member states' national energy policies.

The common energy policy focuses on securing long-term energy supply, curbing climate change and building the foundation of a competitive and sustainable energy sector. For the year 2020 the goal is to increase the proportion of renewable energy sources used in the energy mix to 20%, reduce CO₂ emissions by 20% from 1990 levels, and make energy consumption 20% more efficient. While each of these targets is seen as potentially supporting multiple objectives, the dimension of environmental sustainability is predominant.

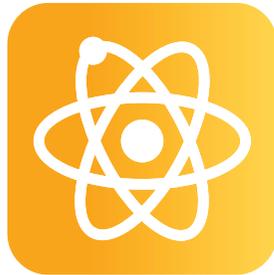
This strategy has already produced concrete policies and programmes that are changing the conditions for Vattenfall and the energy industry.

All sources are needed today...

Vattenfall produces electricity and heat from six energy sources today – this gives the company a flexible, diversified business and means that we have responsibilities across the whole value chain in which we are active.



Coal (lignite and hard coal) delivers the high-volume, affordable heat and electricity that is the basis of the economy in central Europe. Vattenfall operates 17 plants that use coal in Germany, Poland, the Netherlands and Denmark. Coal is the predominant source of greenhouse gas emissions from Vattenfall's operations – about 83 MT of CO₂. From a sustainability perspective, our responsibility is to ensure that these plants run efficiently and that options for reducing greenhouse gases are implemented as soon as possible. As an owner of lignite mines, we also have a responsibility for restoration of affected landscapes and resettlement of people when necessary.



Nuclear power can produce stable, large volumes of electricity and play an important role in keeping energy costs competitive. Nuclear power is low-emitting but has high safety requirements coupled to operation and radioactive waste. Vattenfall operates or has interests in nuclear reactors at four sites in Sweden and Germany. Vattenfall's responsibility is to ensure the highest safety standards for operation and to work with specialist organisations handling the storage of radioactive waste.



Hydro power is renewable, low-emitting, and plays a role in the energy system today as both a large source of base load power and a flexible technology that can be started and stopped quickly to balance fluctuations in the system. Vattenfall operates more than 100 hydro power stations, primarily in Sweden, where the company was formed a century ago as the national developer and operator of hydro power assets. Our responsibilities in hydro are to maximise efficiency and reduce the local environmental impact of today's plants.



Natural gas plays an important role as a flexible, scalable energy source that burns cleaner and produces fewer greenhouse gas emissions than coal. Like hydro power, gas can provide both base load and balancing power to the electricity system. Vattenfall's involvement in gas comes primarily through the acquisition of Nuon in the Netherlands, where the company is involved in exploration, production, storage, distribution, trading and generation. Electricity and heat production from gas currently accounts for only 7.7% of Vattenfall's overall emissions of CO₂.



Wind power is renewable and low-emitting, and is the fastest-growing energy source in Europe. Vattenfall operates wind farms in the UK, Germany, Sweden, the Netherlands, Belgium, Denmark, and Poland, and is one of the largest operators of offshore wind power in Europe. Vattenfall strives to be a leader in the rapid build-out of wind power – particularly offshore.



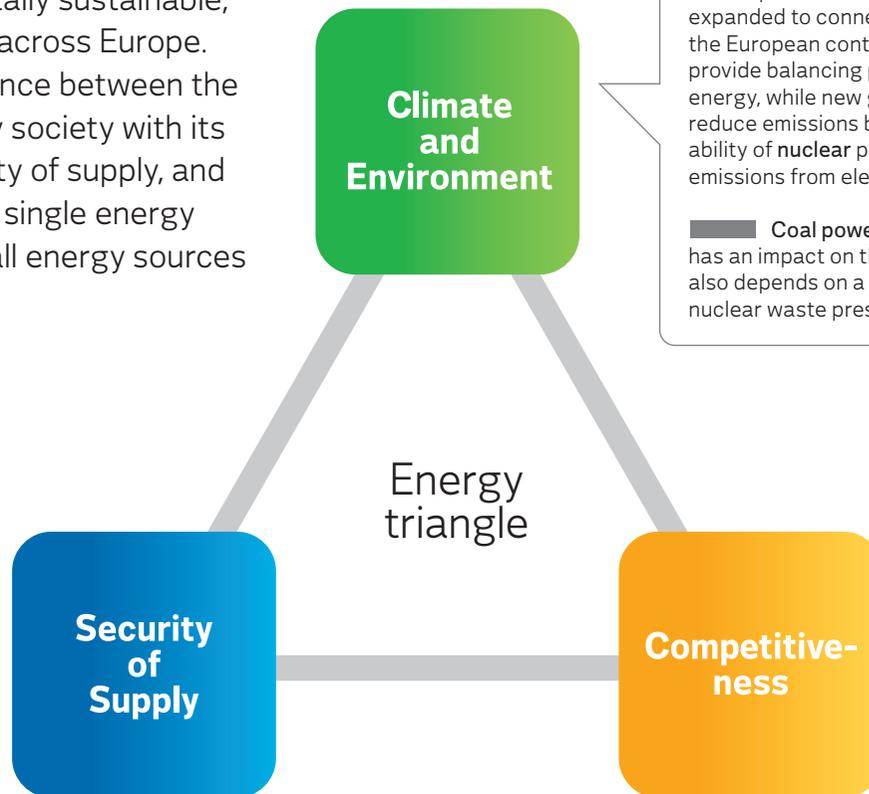
Biomass is already an important source of industrial and district heat, and is a renewable resource with low net emissions of greenhouse gases. Vattenfall operates 40 plants fired partly or entirely by biomass. Vattenfall's ambition is to significantly expand the role of biomass in both heat production and electricity generation, and to be a leader in sustainable sourcing of biomass.

...and every source has a role to play in the transition

Being active in each of six sources means that Vattenfall has a responsibility to make the best use of each source in the transition to a more environmentally sustainable, secure, and affordable energy system across Europe. The energy triangle illustrates the balance between the three key dimensions needed to supply society with its energy needs: competitiveness, security of supply, and environment and climate. Currently, no single energy source is optimal from all dimensions; all energy sources are needed.

Primary energy supplies should be reliable, and converted energy should be available to meet demand:

- +** Wind and hydro power resources are fully renewable and locally available. The combination of the two supports secure supply of primary energy. Although nuclear power and coal power are based on finite fuels, supplies and markets for them are reliable. Coal, natural gas, nuclear and hydro can deliver high volumes of reliable base load power, and gas and hydro have the flexibility to keep the electricity system in balance.
- Biomass supplies are not yet as dependable as other fuels. Wind power is variable and cannot be relied upon to deliver base load power.



Any conversion of energy to electricity impacts the environment and the climate:

- +** Wind and biomass are renewable resources associated with low life cycle emissions of greenhouse gases. Despite limited opportunities to build new plants in Europe, renewable hydro power can help reduce emissions if transmission capacity is expanded to connect the Nordic electricity system with the European continent. Hydro power and natural gas provide balancing power for intermittent wind and solar energy, while new gas plants can replace coal power and reduce emissions by around 50%. Maximising the availability of nuclear plants will help Europe reduce overall emissions from electricity generation.
- Coal power has high CO₂ emissions, and mining has an impact on the natural environment. Nuclear power also depends on a mined resource, while management of nuclear waste presents a significant challenge.

The cost of generating electricity varies among energy sources:

- +** Nuclear power and hydro power have low running costs and long lifetimes, and can help keep overall costs of delivered energy low and stable. Coal power has low basic costs but will become increasingly expensive as costs to emit CO₂ go up.
- Wind and biomass have higher costs than other energy sources and are dependent on support systems. Natural gas prices have historically been high and volatile, although this situation is changing and prices have fallen in recent years.

Vattenfall is investing in all six energy sources...

Vattenfall sets its investment plans in five-year “moving” cycles, meaning that last year’s plan for 2010–2014 has now been updated for 2011–2015. This approach also means that much of Vattenfall’s current investment capital is tied up in ongoing projects begun in earlier periods, which with few exceptions, we will see through.

The largest of these projects are three fossil-fuelled plants: the Moorburg and Boxberg coal plants in Germany, and the Nuon Magnum multi-fuel power plant in the Netherlands. Together these plants account for 34.5% of Vattenfall’s total capital investments in 2011. They also will add 3.5 GW of installed capacity and approximately 15 MT of CO₂ emissions per year to Vattenfall’s portfolio in the near-term. Overall, investments in fossil-fuelled power have decreased relative to the previous investment period (2010–2014).

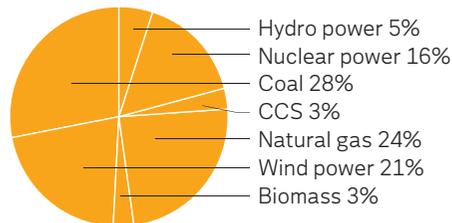
At the same time, investments in wind power will continue, accounting for 21% in the period.

Use of biomass will be scaled up by 33% by 2014, and growth will continue thereafter. This will largely be through co-combustion in existing plants, which does not require large capital investments.

Biomass-related investments account for 3% of investments.

In nuclear and hydro power, near-term investments are significant but focus on safety, efficiency and modernisation rather than new generation, which is not feasible by 2015.

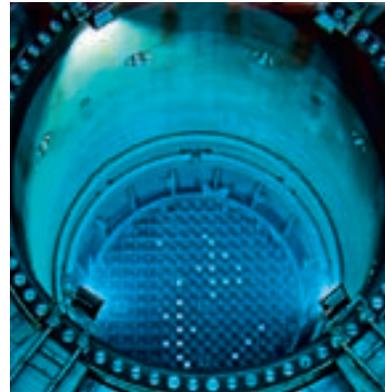
Investments in generation 2011–2015, (SEK 123 billion)



Development of generation portfolio up to 2020¹



Coal
The Boxberg and Moorburg plants will be completed, but no other coal-fired plants will be built until they can be built with CCS. In general, coal will become a smaller part of Vattenfall’s portfolio after 2015.



Nuclear
Vattenfall will remain involved in nuclear power, and will keep options open for growth. Currently, investments are being focused on upgrading and safety improvements.



Hydro
Vattenfall is exploring options for small-scale plants and for purchasing large plants in central and western Europe. France, which has recently opened the operation of its hydro power plants to competitive bids, is one place where Vattenfall may expand.



↑ Natural gas

Natural gas will be an important transition fuel for both Europe and Vattenfall. Gas will be a priority investment area for Vattenfall through 2020.



↑ Wind

Vattenfall will continue to grow in wind power, primarily in offshore wind. Our generation from wind will have doubled to 4 TWh from 2009 to 2011, and Vattenfall recently secured contracts to develop DanTysk, a major offshore wind farm in the German North Sea. A major development phase associated with the UK Round 3 in East Anglia was initiated in 2010. The potential of this wind project is 7,200 MW in a joint venture with Scottish Power Renewables, with construction starting as soon as 2015.



↑ Biomass

Vattenfall will be rapidly expanding the role of co-firing biomass in coal-based combined heat and power plants through 2020. The company's target is 50% co-combustion of biomass in coal-fired plants by 2020.

...and implementing an integrated strategy for sustainability.

Vattenfall will not act on these six energy sources independently of each other. Our strategy for our portfolio is an integrated strategy, with the different sources supporting each other, not least in terms of sustainability.

Delivering on our strategy to reduce CO₂ exposure by 2020 will require a smaller role for coal in Vattenfall's portfolio. Co-combustion of biomass will replace up to 50% of the coal used in our plants.

Rapid growth in offshore wind will add generation capacity without adding emissions. Yet even large-scale offshore wind farms are smaller than today's large conventional plants, and can require long lead times for construction. Growth in wind power also needs to be balanced out by sources which can provide base load and balancing power. Vattenfall's operations in hydro power, nuclear power, and increasingly natural gas will contribute in this way. At the same time, Vattenfall will continue to develop carbon capture and storage technologies, and will begin large-scale demonstration at its Jämschwalde plant in 2015. Should the necessary societal acceptance, legal frameworks, and commercial conditions develop, we hope to be able to begin implementing full-scale CCS at coal-fired plants from 2020, bringing CO₂ emissions down even further thereafter.

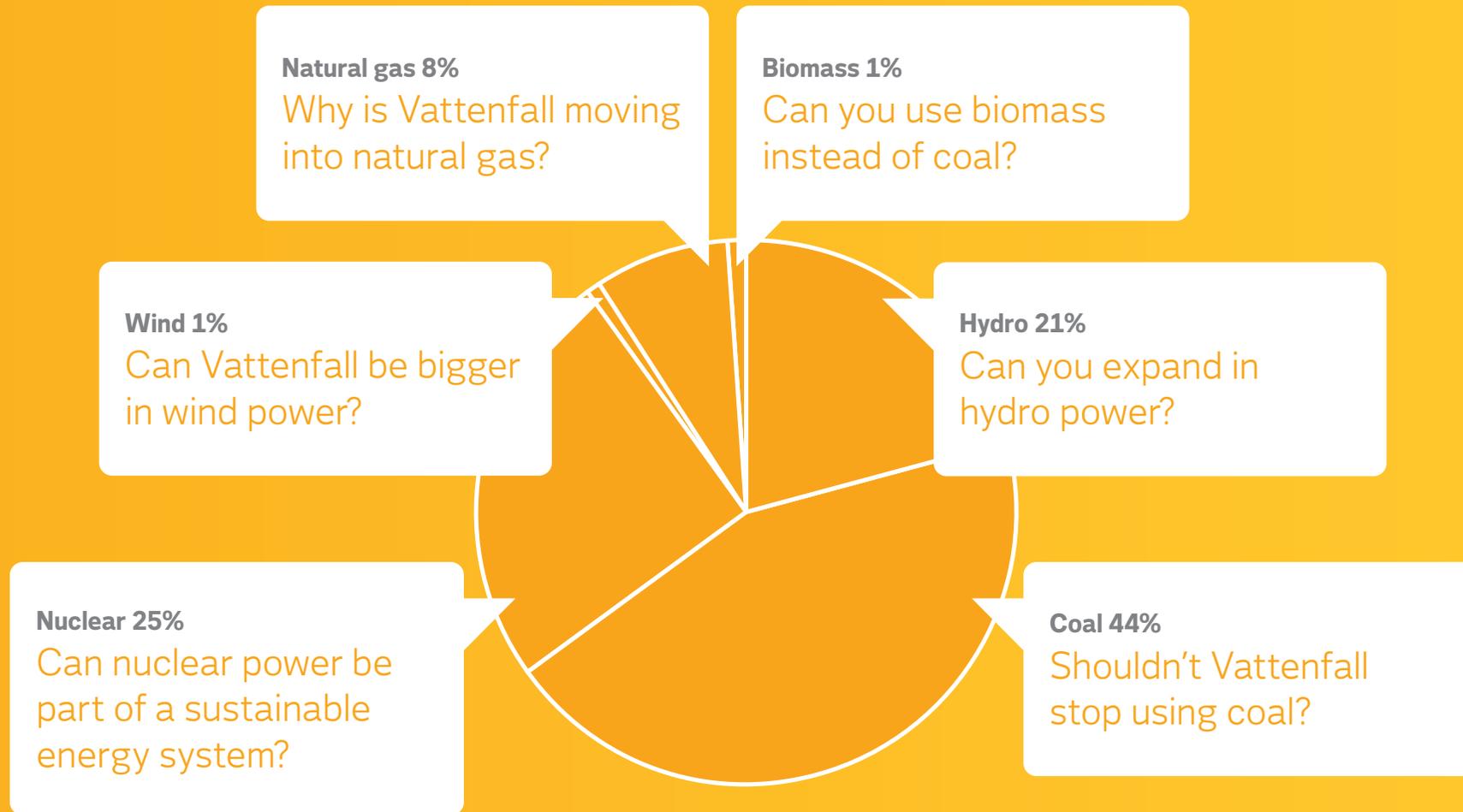
Taking this integrated approach will allow Vattenfall to put all the energy sources that are needed today to use in creating the energy system of tomorrow.

1) The arrows indicate the expected development in terms of relative share of the generation portfolio.

Vattenfall will put all the energy sources that are needed today to use in creating the energy system of tomorrow.

Vattenfall works with six energy sources, and in the pages that follow we take a look at some of the general questions our stakeholders have about each. Each source faces challenges in the transition to a more sustainable energy system, and in most cases we will need to work together with our stakeholders to address these.

Vattenfall's electricity generation by source, 2010



Can you expand in hydro power?

Vattenfall can maximise the benefits from existing plants by making them more efficient, safer, and better integrated with local environments.

Society asks a great deal of our energy system: that large volumes of energy be available constantly and flexibly; that costs of delivered energy be low and predictable; that environmental impact, and especially contribution to climate change, be reduced.

No one energy source can meet these demands by itself. But perhaps hydro power is the only source we have today that has the ability to deliver large-scale, flexible, affordable, and low-emitting power. As the transition to a more sustainable energy system demands more control, more flexibility and fewer emissions, hydro power will be an important asset.

Sustainability and balance

Hydro power is a renewable energy source that produces virtually no emissions that impact the climate or the environment. The 10% of the EU's electricity generation that today comes from hydro power is an increasingly important asset. Today only nuclear and hydro power plants deliver such large volumes of electricity without any direct emissions from generation.

An important characteristic of hydro power is that it generates a great deal of energy as soon as the water is released, and is not dependent on short-term weather conditions or long, complicated start-up processes – a characteristic not shared by many other types of energy. Hydro

power generation can be increased, for instance, to cover shortfalls from wind power and other energy sources that cannot be directly controlled, such as nuclear power, which takes longer to get started.

A limited resource
Unfortunately this resource, while renewable, is not infinite. Construction of hydro power

Inlandskraft

The inland area of northern Sweden is home to many of the country's most valuable natural assets – mountains, rivers, forests and mineral resources. But one of the region's greatest contributions to development in Sweden has been the harnessing of the potential for hydro power.

The residents of the region have been and remain positive towards hydro power, and the plants and their customers in heavy industry have played an important role in the region's economic benefit. In recent decades, however, the population in the region has declined. It is in Vattenfall's interest as a business and neighbour to invest in reversing that trend, and stimulate growth in the region.

Vattenfall seeks to give back by helping the inland north invest in itself. Vattenfall Inlandskraft is a subsidiary of Vattenfall formed in 2004 to support business and entrepreneurship across 20 counties in the north of Sweden. The goal is to support economic growth and job creation in the region. Inlandskraft works with small and growing companies to build networks, develop knowledge and skills in business, and guar-



antee investments. Inlandskraft is also working with local authorities to reverse the region's declining population by creating incentives and infrastructure for the residents of today and tomorrow.

To date Inlandskraft has worked with more than 300 companies, from manufacturing to IT to services, and has contributed to the creation of more than 2,000 local jobs.

plants is limited first by topography. Construction of a large-scale hydro power plant requires the right kind of watercourse, and these are not present in equal measures throughout the world.

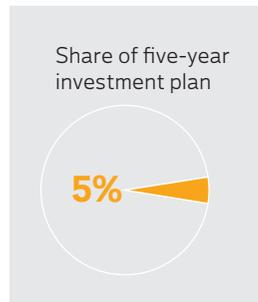
The proportion of hydro power in the energy mix of countries such as Sweden, France and Austria, which have large differences in altitude and suitable watercourses, is therefore very high. Hydro power accounts for more than 98% of total electricity generation in Norway, which is Europe's largest hydro power producer with annual production of approximately 141 TWh. Sweden also has a large share of hydro power, accounting for roughly 50% of annual generation. Countries such as Denmark, Germany and Poland, on the

other hand, do not have the conditions conducive for hydro power and therefore rely heavily on other energy sources.

Even in countries with favourable geographies, expansion of hydro power is limited by the impact it has on the local surroundings. Large-scale hydro power plants represent a significant encroachment on the surrounding natural environment, and altered watercourses can have implications for populations who may either be directly displaced by dams or have their lifestyles impacted by changing river flows and ecosystems.

Responsibility to optimise

The historical build-out of hydro power asked a great deal of



society and nature, sacrifices that laid the foundation for the benefits we can reap today. Today, most countries in Europe would not consider further alterations to major water systems, and there are few opportunities to build more or to expand existing hydro power plants.

Vattenfall was founded on hydro power more than a century ago. As we seek to be among the leaders in the transition to a sustainable energy system, it is our responsibility to get the most out of this tremendous resource. To do so we must put our experience and skills to use in increasing the efficiency of existing large-scale hydro power stations throughout Europe, work to protect and improve the natural environments around existing hydro power stations, and support the communities in regions where hydro power was developed.

Increasing efficiency, safety and licence to operate

While opportunities to build new hydro power are limited, this does not necessarily mean that hydro power cannot grow as an energy source. Vattenfall is focused on getting the maximum benefit from existing plants – by increasing their efficiency, improving dam safety, and decreasing environmental impact. Taken together these efforts will increase the expected output from the plants and extend their lifetimes.

Over a ten-year period Vattenfall will be investing in modernising and upgrading 30 existing hydro power plants, with an expected increase in output of 400 GWh by the year 2014. In Sweden alone, Vattenfall will be investing about SEK 4 billion between 2011 and 2014. This investment is oriented towards improved efficiency through new turbines, generators, control systems and transformers, and is expected to increase the lifetime of the plants. The investment programme also encompasses safety improvements, particularly dam strengthening. In the long run these investments can help extend the lifetime of hydro power assets and increase their total contribution to tomorrow's sustainable energy system.



Over a ten-year period Vattenfall will be investing in modernising and upgrading 30 existing hydro power plants, with an expected increase in output of 400 GWh by 2014. In Sweden alone, Vattenfall will be investing about SEK 4 billion between 2011 and 2014.

Mitigating environmental impact when upgrading

One of the most important investments Vattenfall has to make is in mitigating the significant impact large hydro power has on local ecosystems. While the impact of the initial damming and changing water flow is not entirely avoidable, we are working continuously to minimise these effects and restore natural systems in the areas surrounding dams. Old river channels are often not drained completely. To make the environment more conducive to plant and animal life, attempts are being made to maintain a natural, though reduced, water flow. Areas containing particularly important habitats, biotopes and species are protected whenever possible. Various types of waterways are also being built around power plants to facilitate fish migration and restocking.

These efforts must be redoubled when upgrading and modernisation work creates new challenges for fish life. In the summer of 2007 safety work at Vattenfall's Stornorrfors plant created a need for a new fish ladder – one of Europe's largest.

Such efforts are important to the environment – and to people whose lifestyles are closely connected to rivers and fishing. But they are also important to the energy system, as they help bring the solutions that suit global energy and environmental demands in line with the requirements of local environments and stakeholders.

In 2010 Vattenfall announced that it will pursue newly available concessions in hydro power in the French market. We believe that our experience in managing these local challenges in Sweden can help secure ongoing public support for one of Europe's most important energy resources.



Stornorrfors hydro power plant outside Umeå, Sweden.

The European Water Framework Directive – finding a balanced implementation

The EU's Water Framework Directive is in part an attempt to address local sustainability issues – prompting countries to set requirements for fish ladders and for diversion of water to feed natural systems. While such measures are desirable and appropriate, high requirements may also limit hydro power operators' ability to store enough water in the regulating dams to maximise hydro power's important role as a source of balancing power.

Vattenfall bears a responsibility to its stakeholders to maximise the potential of existing hydro power plants and thereby contribute to a more sustainable energy system while taking responsibility for the environmental impact. In Sweden, Vattenfall is working with Swedish Energy to come up with recommendations for an implementation of the Water Framework Directive that strikes a balance between improving local environments and making the most of this powerful energy source.

Stornorrfors is the most productive hydro power plant in Sweden and an example of how that balance can be achieved. Vattenfall completed a new fish ladder, extending 300 metres in 76 steps, adjacent to the facility in 2010. It is now one of Europe's longest fish ladders and helps salmon swim upstream every year to reach their spawning tributaries. Since its completion in spring 2010, Vattenfall has carefully monitored the numbers, sizes, and types of fish successfully migrating via the ladder. As of September 2010, 3,310 trout and salmon had made the journey. In Sweden, power companies that operate hydro power stations are obligated to operate fish hatcheries to compensate for the hatching grounds previously destroyed as a result of river regulation. Every year, Vattenfall releases 80,000 salmon smolt, 20,000 sea trout and 20,000 grayling.

Can nuclear power be part of a sustainable energy system?

Society is looking to nuclear power to help reduce carbon emissions. Maximising the contribution of nuclear power requires continuously improving safety systems and finding long-term solutions for nuclear waste.

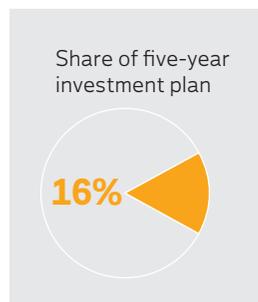
After decades of negative public opinion and political opposition, investments in nuclear power have regained momentum in several European countries. Sustainability is a primary driver: the possibility to generate a secure supply of electricity on a large scale, without emitting large amounts of CO₂, has led more and more people to reconsider nuclear energy's prospects.

There are currently 143 nuclear reactors operating in the EU, accounting for more than 28% of Europe's electricity generation.

In Germany, current law prohibits investments in new nuclear power plants. In September 2010 the government repealed the law that required the phase-out of existing capacity and granted lifetime extensions for existing nuclear power plants. Vattenfall has interests in three nuclear power plants (Brunsbüttel, Krümmel, and Brokdorf) in Germany. The change in Germany's nuclear policy will allow for lifetime extensions of 14 years at Krümmel and Brokdorf, and 8 years at Brunsbüttel.

The prospects for nuclear power have changed in Sweden as well. In summer 2010 Swedish parliament passed a bill that lifted the ban on constructing new reactors and opened up new investment opportunities provided that new units

replace old units and are built at the existing sites. Vattenfall operates seven nuclear reactors in Sweden (four at Ringhals, three at Forsmark). We have not yet established plans for developing new reactors in Sweden – this will be done on a commercial basis, i.e., whether we think the future of the energy market in Sweden makes such investments attractive.



Is nuclear power really low-emitting?

Many stakeholders disagree about what role nuclear power can play in reducing greenhouse gas emissions. One aspect of the debate involves disagreement about the actual emissions associated with nuclear power. While all parties agree that the actual electricity generation process produces negligible emissions of greenhouse gases, stakeholders have differing views as to the emissions produced in the so-called "life cycle" – including uranium mining and the processing, construction, and decommissioning phases.

Vattenfall has contributed to several analyses that may help answer questions about the potential of nuclear power. Vattenfall has commissioned certified life cycle analyses of its own nuclear operations in Sweden, and our calculations show low emissions of 5.36 g CO₂ per kWh – comparable to the life cycle emissions of the best renewable energy sources.

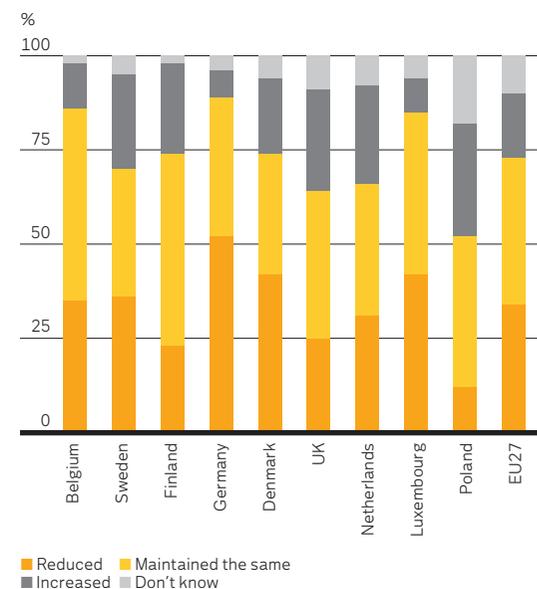
Vattenfall's low life cycle emissions are based specifically on Vattenfall's processes and supply chain and cannot necessarily be extrapolated to all nuclear power. Differences may arise based on such factors as the quality of uranium (and thus the energy required for processing), the electricity mix in the countries where mining, processing and plant construction take place, and the expected lifetime of the constructed plant.

Nonetheless, it is important to note the significant emission-reducing potential of nuclear power. Vattenfall's nuclear power emits less than 1% of the greenhouse gases emitted by conventional coal-fuelled power plants.

Can it grow?

There is also disagreement on whether nuclear power, with its long lead times for permitting and construction, can be mobilised in time to meet emission reduction timetables. Here there are legitimate restrictions – in Europe, for example, there is limited experience with the latest reactor

"In your opinion, should the current level of nuclear power in proportion to all energy sources be reduced, maintained or increased?"

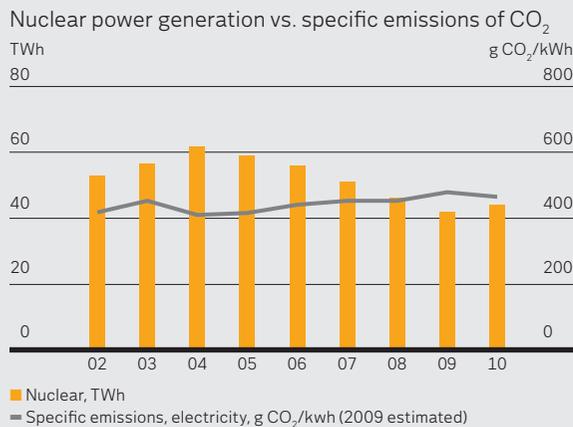


Attitudes towards the future role of nuclear power in Europe, from Eurobarometer 324, September–October 2009.

designs. This means that not all processes in supply and construction have been optimised yet. However, this problem will shrink exponentially as new reactors are built and learning is spread through the supply chain.

Vattenfall contributed to the 2008 McKinsey & Co. study

Pathways to a Low-Carbon Economy, which looked at the potential for different low-emission technologies to expand and thus reduce emissions by 2030. Taking into account expected hurdles, the study saw potential for nuclear power to expand between 30% and 70% globally. Such growth would account for between 3.5% and 7.6% of total necessary emission reductions related to energy – roughly equivalent to the potential contribution of wind power or solar photovoltaics.



Vattenfall's nuclear power plant output vs. specific emissions of CO₂ from electricity generation (update 2009 and 2010). The chart illustrates the correlation between the emissions intensity of Vattenfall's overall electricity generation and the production levels of our nuclear power plants. Many other factors affect emissions – for example, decreased generation from Swedish hydro power and increased generation from Danish coal plants in 2003. However, for Vattenfall, as for Europe, nuclear availability will play an important part in keeping emissions from electricity generation down.

Environmental benefits depend on availability and safe operation

Capturing the benefits of nuclear's low-emission output will require that nuclear plants are available – and availability is primarily a question of safety. Standard maintenance and modernisation can be planned for, but irregularities in safety procedures can extend these outages or even lead to unplanned outages.

Vattenfall's power plants have experienced well-documented outages in recent years for reasons related to safety. In 2010, as well, delays in the implementation of a large modernisation effort led to low availability in Sweden. One negative impact of these outages has been a temporary increase in emission intensity from Vattenfall's overall electricity generation portfolio. Since the primary alternatives for base load power throughout much of Europe are based on fossil fuels, this phenomenon illustrates the importance of nuclear availability more broadly. While none of the events at Vattenfall's plants posed any danger to humans and the environment, they required outages. Even if regulation and inspection can keep nuclear power safe, only flawless operation can keep nuclear power available.

Nuclear power plant safety has been an important element of nuclear power development, and today's safety systems are the result of long, intensive research. This includes advanced safety routines for nuclear power plant employees, development of new, more durable materials that encapsulate the fuel pellets in the reactor, and improvements of the many systems that prevent or mitigate accidents.

Major improvements have also taken place in education, training, preparation and international co-operation. Different types of national and international safety authorities have been created, and safety provisions for nuclear power plants are very advanced today. Nonetheless, Vattenfall follows international developments in nuclear safety closely and seeks to learn and improve on a continuous basis (see Vattenfall's 2009 CSR Report for an extensive review of previous outages and ongoing improvements in safety).

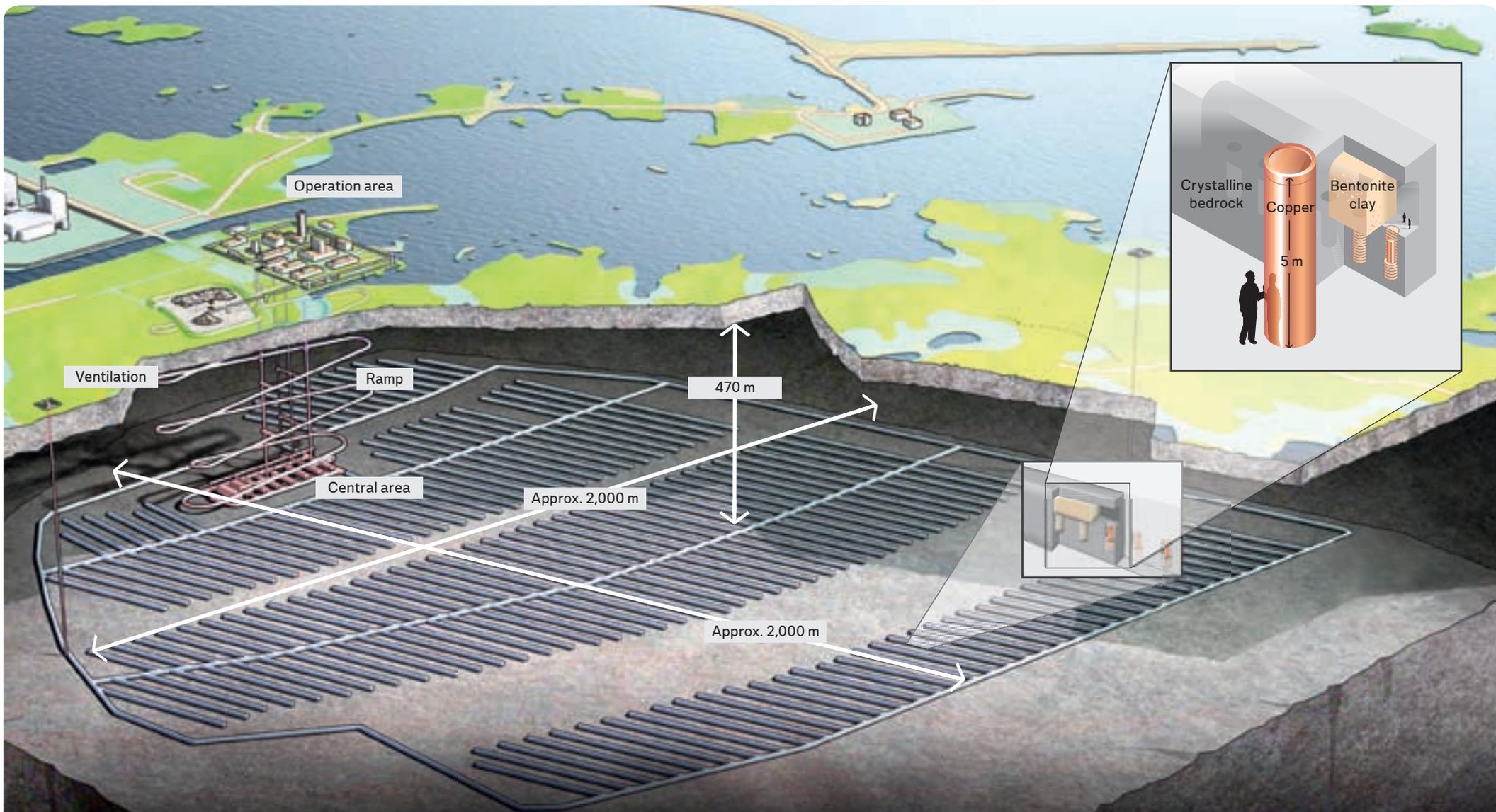
Dealing with nuclear waste: permanent storage and the next generation

Beyond operating safety, stakeholders remain concerned about the dangers of radioactive waste, particularly highly radioactive spent nuclear fuel. The ability to handle this waste in a credible fashion for the long-term is a key factor in building societal acceptance for the technology.

Spent nuclear fuel and radioactive waste are handled at nuclear power plants as well as by specialist organisations tasked with providing longer-term interim storage and with deploying and operating final repositories. The internationally preferred option for final storage is a geological repository located several hundred metres underground. Sweden, Finland and France are leading the way in the development and licensing processes for such final repositories. The system being developed in Sweden is intended to keep the waste isolated for a minimum of 100,000 years. We believe that this technology is suitable and credible, but it will be implemented carefully in order to ensure feasibility (see page 23).

Another future option may be "4th generation" nuclear technologies to be able to re-use elements of spent fuel, both from their own processes and potentially from those of earlier generations of plants. This reuse could reduce fuel needs while simultaneously decreasing the half-life, or period of dangerous radioactivity, of the resulting waste, from hundreds of thousands to hundreds of years.

Fourth generation nuclear power remains in the research phase, and is unlikely to be available before 2030. Nonetheless, the technology could possibly change the way society approaches the problem of nuclear waste.



Final storage in Sweden

A repository for spent nuclear fuel in Forsmark will be located close to the Forsmark nuclear power plant. Here, at a depth of approximately 500 metres in bedrock that is 1.9 billion years old, plans are to store some 12,000 tonnes of spent nuclear fuel.

A 5 kilometre ramp will be constructed down to a depth of about 500 metres. When construction is completed, the repository will contain up to 60 kilometres of tunnels in an underground system with a capacity for 6,000 copper canis-

ters of spent nuclear fuel. It is estimated that an area of about 4 square kilometres will be required for the construction.

SKB expects to start construction in 2016, which means that it could be completed by the early 2020s.

The copper canisters containing spent nuclear fuel will be deposited deep in the repository with the help of machines designed especially for this task.

New tunnels will be excavated in parallel with the start up of disposal in the completed tunnels.

This will continue for about 40 years until all nuclear fuel has been deposited, around 2070. The repository will then be sealed. Throughout the operational phase, geologists will continue to map out the rock and plan for new tunnels.

Once the Nuclear Fuel Repository is in full operation, there will be approximately 250 persons working there, half of whom will work above and half below ground level. Operational personnel will work with everything from research to safety management and facility services.

Facts about final repository at Forsmark

Number of copper canisters:	6,000
Amount of spent fuel to be deposited:	12,000 tonnes
Length of tunnels (in total):	60 km
Rate of disposal:	150 canisters/year
Number of employees (operational phase) approx.	240

Shouldn't Vattenfall stop using coal?

Vattenfall will use coal as long as it is essential to secure energy supply for our core markets. The role of coal in Vattenfall's portfolio will decrease by 2020, but we must continuously strive to manage our coal operations responsibly.

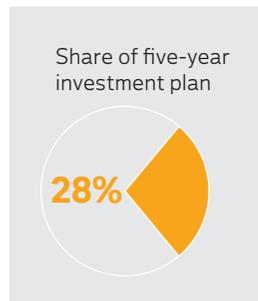
Vattenfall began acquiring and investing in coal-based power and heat as part of its expansion beyond Sweden into other countries in northern Europe. From a financial perspective, these have been some of the most attractive assets available, and from a strategic perspective coal offered the best and in some cases only way to enter these markets. This is because Germany, Denmark, the Netherlands, and especially Poland are heavily dependent on coal for electricity and heat.

In Germany, coal power accounts for approximately 46% of electricity generation. The corresponding figure in Poland is nearly 92%. Just as in many other parts of the world, the explanation for coal's significance in these areas is the existence of large domestic coal reserves that are expected to last for a long time, as well as access to proven, reliable, and cost-effective technology for electricity and heat production.

While Vattenfall has plans to reduce the amount of coal in its portfolio for strategic and financial reasons, our primary obligation to stakeholders is to manage the coal assets that we retain in a responsible way.

Greenhouse gas emissions and climate change

Stakeholders, particularly environmental groups and some politicians, are particularly concerned about how Vattenfall is going to reduce greenhouse gas emissions from its use of coal. This is appropriate, as the carbon dioxide released by coal combustion constitutes a large and growing share of total global emissions, and coal has the highest carbon content of any fossil fuel. The EU's climate targets call for a 20% reduction in CO₂ emissions by 2020 from 1990 levels. Identifying short-term solutions for reducing CO₂



emissions from coal is therefore crucial.

There is no single solution. A significant expansion of low-emitting electricity generation is needed, but the existing portfolio of coal plants – more than 200 GW of installed capacity – cannot be replaced by 2020. Measures to reduce emissions from existing plants, for example by pre-drying coal before combustion, or by substituting biomass for coal in existing plants, can help. Beyond 2020, Vattenfall expects that carbon capture and storage (CCS) technologies will be the most important tool for reducing emissions from coal. See Vattenfall's 2009 CSR Report for an extensive review of our work with CCS.

Reducing emissions – first steps on a long road

Vattenfall has set the goal of being climate neutral by 2050 – that is, by 2050 our operations should have no net effect on the climate. By 2030 we plan to reduce our emission intensity by 50% compared to 1990 levels. In 2010 we announced our intention to reduce the amount of emissions in our portfolio to about 65 MT by 2020, down from 91.5 MT in 2010. Unlike the 2030 target, this 2020 target addresses Vattenfall's portfolio and ownership of emitting production, rather than the emissions intensity of our production. The reductions to 2020 will include the sale of some assets that will likely continue to emit CO₂ under other ownership.

In many respects the first steps are the most difficult. This is because power plants take a long time to build, and even longer time to pay back their capital investment. By 2050, Vattenfall's current coal plants will all have lived out their economic lives and been replaced, giving us the opportunity to implement new technologies and alternative energy sources.

We can take small but important steps today. Perhaps most important is increasing the amount of biomass co-fired in our coal plants. Our agreement with Buchanan Renewables Fuel, detailed on page 34, represents a step change in our approach to biomass co-combustion. We can also prepare for tomorrow, by developing and demonstrating carbon

capture and storage (CCS) technologies that will reduce emissions from coal plants in the future. Vattenfall remains committed to its work on CCS technology. Unfortunately, legislative requirements for transport and storage, particularly in Germany, are behind schedule.

Emissions from coal – the road to 2020

Vattenfall is completing construction of two large coal-fired power plants, Boxberg and Moorburg, in Germany. These projects have been under way for a number of years. While these plants will replace older capacity with more efficient generation, they will nonetheless increase CO₂ emissions from Vattenfall's portfolio of assets by about 10 MT per year.

We do not plan to build any other coal-fired plants after these without carbon capture and storage, and much of our strategy from 2015 to 2020 will be focused on reducing emissions in Vattenfall's portfolio, which we see as a major business risk as the EU's cap on emissions is lowered. This strategy will involve reducing emissions from our existing plants, selling some plants in non-core markets, and replacing non-competitive coal production with increased production from gas and biomass.

Vattenfall is evaluating the divestment of fossil fuel-based generation associated with 12–14 MT before 2014. Also, we plan to reduce our annual emissions by 20–24 MT of CO₂ by 2020, through co-combustion with biomass and fuel switching from coal to gas. While we recognise that divesting coal-fired plants will not produce any environmental benefit, opportunities to do so will be taken when they are economically attractive.

Sustainability in coal mining

While greenhouse gas emissions represent the largest problem with electricity from coal-fired power plants, there are also sustainability and responsibility issues related to extraction of coal.

There are two basic methods for extracting coal – underground and open-cast mining – depending on the geology of

the coal deposit. Underground coal extraction is used when the coal is stored deep in the earth, and is more risky for workers than surface mining. Working conditions in underground coal mines have traditionally been arduous, and still today challenges remain. Sadly, 2010 saw a number of coal mining accidents globally, including fatal accidents in China, Colombia, New Zealand, and the USA.

Vattenfall does not own any underground mines, although we do purchase hard coal from underground mines both directly and on the spot market. In 2010 the risks of poor working conditions and unethical business practices at underground mines in Colombia became a topic of discussion among NGOs and the media.

Open-cast mines are used where coal lies close to the surface and entails a substantial degree of interference with the landscape and environment.

Sourcing hard coal – the challenge of sustainability in the supply chain

In 2010 members of the broadcast media in the Netherlands made allegations against certain Colombian coal mining companies, including Drummond and CMC. The reports alleged that both companies had been illegally supporting paramilitary groups in Colombia and were guilty of other bad social, ethical, and environmental practices.

This situation has raised broader questions around the sourcing of coal as a commodity. While Vattenfall’s policies and audits can help shield the company from supply chain risks, industry-wide dialogue is required to address issues systematically. Furthermore, coal is increasingly being traded on “spot” markets, where coal supplies are aggregated and differentiation between different source mines is all but impossible. For these reasons, Vattenfall has been an active participant in industry dialogues on responsible coal sourcing in the Netherlands (see p 26).

Open-cast mining: Impacts and restoration

Vattenfall owns and operates open-cast lignite mines in

Recultivation of landscapes after lignite mining is a process that takes about 30 years. The mining stage is relatively short, and already after a few years new vegetation takes root and animal life re-inhabits the area.



eastern Germany, a part of our operations that is of great interest to stakeholders. In surveys conducted by Vattenfall, environmental groups in Sweden and at the European level have expressed concerns about the impact on the local environment and the sustainability of using land for mining of this kind. Vattenfall's 2006 CSR Report provided a detailed review of the company's approach to this issue.

Open-cast mines have a major impact on the local landscape, and the areas affected therefore require intensive recultivation when mining has been completed. Soil dug up in the excavation is used to construct the desired landscape, including lakes, pasturelands and other types of cultivation that existed before the mining began. Groundwater pumped out of the lignite layer is purified and returned. Forests, farmland and various biotopes and geotopes are re-created after the landscape is formed. These processes are actually initiated in parallel with the mining itself: As extraction moves on across the landscape, restoration is begun in its wake.

Lignite mining has been conducted in these regions since the 19th century, and as such a certain degree of soil contamination took place in the absence of the knowledge and regulations that exist today. Vattenfall's focus is on preventing further contamination, but we are also working to improve soil contaminated by the activities of past decades.

Overall, in 2010 Vattenfall's lignite mining used 5.28 km² of land, and 5.2 km² were restored, of which 2.1 km² is forest-land.

The power industry looks at responsible coal sourcing

Demands regarding the origin of coal and the effect of coal mining on the environment and human rights are growing. Politicians, NGOs and the public at large are putting pressure on energy companies to be more transparent and take more responsibility in the coal supply chain.

In summer 2010 Nuon and the other energy companies in the Netherlands started, under the flag of the industry organisation Energie-Nederland, a multi-stakeholder dialogue to explore possibilities of improving coal supply chain responsibility in practice. Co-ordination of this dialogue has been placed in the hands of former Dutch Minister of Foreign Trade Affairs Frank Heemskerck.

Following several meetings within the energy sector, plenary stakeholder sessions were held from October onwards.

Attending these sessions were NGOs Cordaid, Both ENDS, Pax Christi and the labour union FNV; the mining industry, alternately represented by Anglo American, Xstrata and BHP Billiton; a representative from the steel industry (Tata); and Dutch energy producers E.ON, Electrabel, Nuon/Vattenfall, EPZ and Essent/RWE. A representative from the Ministry of Economic Affairs, Agriculture and Innovation (EL&I) was also present as an observer. The group met to share knowledge and practices, to identify where there is common understanding and where there is need to improve, and to agree on next steps in those areas.

This first phase of the coal dialogue entailed strengthening assurance processes with a view to improving local circumstances for communities, the work force and the environment in places where coal for the Dutch market originates. This process also entails respecting human rights, labour, the environment and conflict-sensitive business practices and improving transparency in the coal supply chain towards Dutch end consumers. On 28 February 2011 the final report of the Dutch Coal Dialogue (first phase) was published under the title "Working on understanding and contributing to improvements".¹

To ensure that this constructive process continues, the participants concluded that a second phase would be beneficial to work together towards the end goal of contributing to further improvements on a local level. Through Nuon, Vattenfall intends to participate in this second phase as well. Finally, parallel with the Dutch coal dialogue, Vattenfall is participating in exploration into the possibility of a European initiative on responsible coal.

1) The report and cover letters can be downloaded at www.energie-nederland.nl.





Progress of CCS

In Schwarze Pumpe, Germany, Vattenfall has built a 30 MW pilot plant for carbon dioxide capture at the lignite-fired power plant. The plant was inaugurated in 2008, and since then tests are being performed to evaluate the technology before building a larger scale demonstration plant. The next step will be a full-scale demonstration plant at Jämschwalde in Germany, planned for 2015. Vattenfall is also building a pilot plant at the Willem Alexander power plant in Buggenum, the Netherlands.

Share of five-year investment plan

3%

Why is Vattenfall moving into natural gas?

Gas will help Vattenfall meet sustainability objectives in the near term by switching gas for coal, which has higher carbon emissions. Also, gas balances the company's risks and opportunities for growth.

Natural gas is a versatile energy source. It is used in a variety of industrial processes and is converted into industrial heat and electricity. It is also used in homes for heating and cooking. In recent years, natural gas has also grown as a transportation fuel, particularly in developing countries, where automobile pollution is a major problem (gas is much more clean-burning than oil).

In 2008 natural gas accounted for 23% of electricity generation in the EU and 21% globally. Thirty-eight per cent of the EU's gas consumption is produced within the region; the rest is imported, chiefly from Russia, Algeria and Norway. Europe's largest natural gas producers are Norway, the UK and the Netherlands, countries with the greatest natural gas resources. Production from conventional gas fields in Europe is on the decline. This has led to concerns about import dependency, particularly dependency on Russia. However, recent increases in unconventional gas production around the world have improved the prospects for a diverse import base and lessened the supplier power of any single country.

There are large differences in the amount of gas consumed per country in Europe. The main European markets are Germany, the UK and Italy (an aggregate 50% of EU gas consumption), followed by the Netherlands, Spain and France.

Vattenfall's involvement in natural gas as an energy source increased significantly with the 2009 acquisition of Dutch energy group N.V. Nuon Energy. Vattenfall is active in all parts of the gas value chain: extraction, storage, trade, delivery to more than 2 million end consumers for household and industrial use, and our own generation of electricity and district heating. Natural gas currently accounts

for a relatively small share of Vattenfall's total electricity and heat generation. In 2010, Vattenfall generated 13.8 TWh of electricity and 8.3 TWh of heat using natural gas. However, gas is a priority investment area over the next few years. Nearly 24% of Vattenfall's investment programme will be focused on natural gas during this period.

Natural gas: Climate friend or foe?

For many of Vattenfall's stakeholders, the company's decision to increase its commitment to a fossil fuel like natural gas may seem like a counter-productive decision: after all, gas is not a renewable fuel, and like all fossil fuels its combustion results in greenhouse gas emissions. With time to act decisively on climate change running out, won't emissions from natural gas make the problem worse?

To answer this question, it is important to examine how the European electricity system is structured. Currently the system combines three kinds of power sources: "base load" power plants that deliver large amounts of energy constantly; "intermittent" power from wind and solar that feeds into the system whenever they are available; and "balancing" power that can be turned on and off quickly to balance out irregularities from variable supply and peaks in demand.

Variable power sources are given first priority by the system – if the sun is shining or the wind is blowing, that energy will be used first. Thus having more gas available in the system will not decrease the use of any existing renewable energy assets. Instead, increased use of gas is likely to reduce the use of coal in the system. Gas-fired electricity generation typically produces less than half the greenhouse gases of coal-fired generation, creating a significant benefit for the climate. Additionally, gas-fired plants can be started and stopped quickly, and thus they increase the amount of balancing power in the system. This should allow more variable wind and solar power to enter the system without threatening reliability.

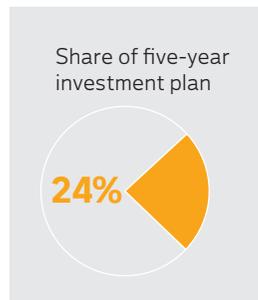
This reasoning applies for renewable power capacity that has already been built or will be built anyway. However, there



Artist's rendering of the new Magnum power plant in Eemshaven, the Netherlands.

is a legitimate concern among stakeholders that fossil-based power will be built instead of renewable energy. While replacing coal with gas may allow Europe to meet its short-term climate goals, stakeholders are concerned that it will create a "lock-in" of fossil-based power and corresponding "lock-out" of renewables, which won't receive the same level of investment and development during the lifetime of new gas plants.

Vattenfall believes this risk can and must be managed – capturing the advantages of gas in meeting short-term goals must not come at the expense of progress on renewables and other very low-emitting technologies such as carbon capture and storage. Currently, the European Emissions Trading Scheme (ETS) is not stringent enough to drive the development and deployment of these technologies, and they are dependent upon other subsidies. These subsidies for wind, solar, and CCS will have to continue, and future ETS targets will have to be more stringent if these solutions are going to come to market. Natural gas alone cannot meet the long-term reductions that are necessary to deal with climate change.



Vattenfall's involvement in natural gas

Vattenfall's involvement in natural gas as an energy source increased significantly with the 2009 acquisition of Dutch energy group N.V. Nuon Energy. Vattenfall is active in all parts of the gas value chain: extraction, storage, trade, delivery to end consumers for household and industrial use, and our own generation of electricity and district heating. Natural gas currently accounts for a relatively small share of Vattenfall's total electricity and heat generation. In 2010, Vattenfall produced 14 TWh of electricity and 8.3 TWh of heat using natural gas. However gas is a priority investment area over the next few years.

Gas, TWh

Sales of gas	63
Electricity generation based on gas	14
Heat production based on gas	11

Nevertheless, gas will have an important role to play alongside these other solutions. Beyond its flexibility as balancing power, gas can also be used in flexible applications – including plants that can also run on other fuels such as biogas (essentially the same chemical as natural gas) and gasified coal, which may be economically attractive in the future when combined with CCS. Thus gas-fired plants need not lead to lock-in or lock-out, but can actually lay the groundwork for tomorrow's even lower-emission solutions.

Magnum multi-fuel technology

In 2008 Nuon started construction of the new Magnum power plant in Eemshaven, in the northern part of the Netherlands. With a production capacity of around 1,200 MWe, this modern plant will be able to supply some two million households with electricity. We are now building the gas-fired section of the plant.

Current construction of the three combined cycle natural gas-fired units of Magnum started in September 2009, and the units will be commercially available at the end of 2012.



Magnum is a flexible plant that can adequately respond to the varying supply of wind energy, for example, and can contribute to the transition phase from fossil fuels to sustainable energy production.

Working together

To realise the full potential of the plant, co-operation with governments, environmental organisations, NGOs and the industry is necessary. On 21 June 2010 Nuon, together with two other companies, signed a Memorandum of Understand-

ing with six local NGOs. The intention of the parties is to create a win-win situation in which industrial development and improvement of the surrounding natural environment can be combined. The aim is to broaden the span of co-operation with other participants.

Vattenfall is active in all parts of the gas value chain: extraction, storage, trade, and delivery to more than 2 million end consumers for household and industrial use.

Can Vattenfall be bigger in wind power?

Vattenfall will remain active in onshore wind and strive to build on its leading position offshore. We are currently building nine wind farms in six countries.

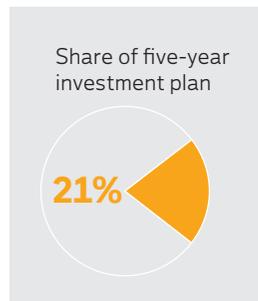
Wind power is the fastest growing source of energy in Europe and will play a central role in attaining the EU's 20-20-20 targets. Vattenfall is Sweden's largest operator of wind power and the second largest operator of offshore wind power in Europe. Vattenfall will continue to expand its involvement in offshore wind power in the countries around the North Sea and onshore in certain prioritised markets. Investments in wind power are an important factor in Vattenfall's future profitability – and in meeting our stakeholders' expectations of growth in renewable energy with low carbon emissions.

Wind power has made such progress and has received so much public attention that expectations of the role of it can play in the energy system have increased dramatically. Some stakeholders have questioned whether Vattenfall is building as much wind power as appears technically and economically possible.

There are some factors holding back the development of wind power, however. Vattenfall has a responsibility to act, within the framework of a commercial business, and to address these limitations. Most can only be addressed together with our stakeholders.

Access to good wind

In order for a wind power project to be profitable, it must have a good wind location. Optimal geographic areas for wind power are often in coastal and open landscape areas where winds are strong. Off-shore sites, away from the coast, are also often optimal. This is one reason Vattenfall has built 686 MW of offshore wind capacity and has some hundred projects under development. The Stor-Rotliden wind farm is the second largest onshore site in Sweden, and Vattenfall's largest in the coun-



try. The site takes advantage of high wind speeds in an open landscape area in the centre of northern Sweden to deliver electricity at a high capacity factor of 35%.

Capturing the best wind is not always easy. Some challenges are technical or logistical – remote and distant landscapes can be challenging for developers if they lack roads and other infrastructure. And where steady winds blow in less remote areas, acceptance and permitting grow more complicated.

Availability of grid connections

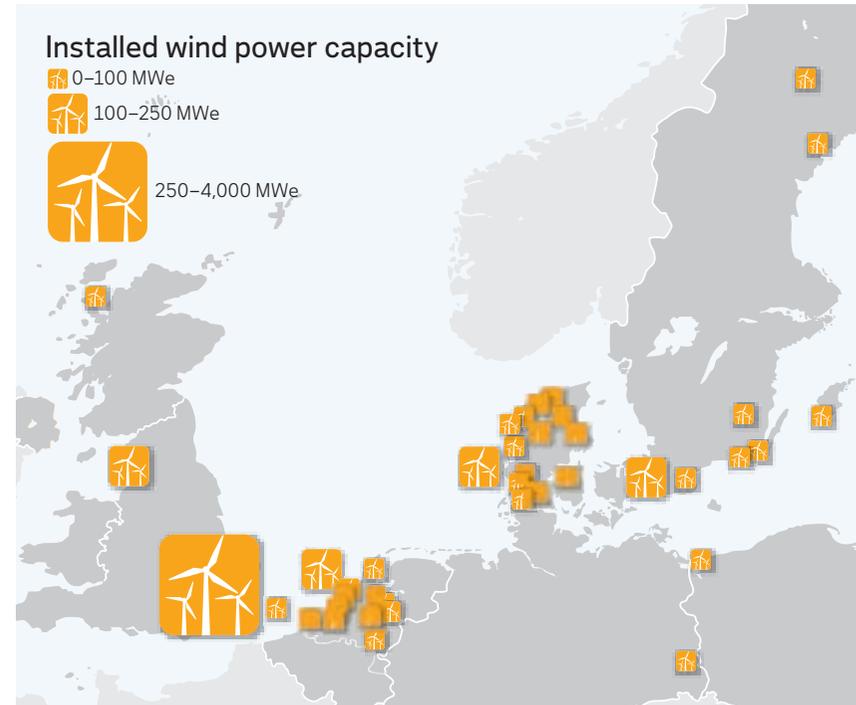
In many cases, favourable wind areas are located far from existing electricity transmission and distribution infrastructure. For example, among Vattenfall's many projects throughout the UK are five projects in the north of Scotland. This region has some of the best wind conditions in all of Europe, but it is not heavily populated and has little electricity infrastructure. A study by the Scottish government estimated that today's grid could accommodate 8 GW of renewable electricity capacity, of which only 2.8 GW is installed today. However, capturing more of the overall renewable potential in Scotland – up to 60 GW – will require major investments in the grid.

The build-out of this infrastructure is not generally under the control of the same companies who build the wind power generation assets. Co-ordinating grid expansion vis-à-vis

power generation development is complicated, and differs from country to country in Europe.

Development of the supply chain

Building wind power is a physically demanding process: Very



Vattenfall is one of the world's leading wind power developers and operators and is currently building nine wind farms in six countries. Vattenfall operates close to 900 wind power turbines in Sweden, Denmark, Germany, Poland, the Netherlands, Belgium and the UK. For more detailed information about all of Vattenfall's plants, visit powerplants.vattenfall.com.

large foundations, towers, and turbines need to be manufactured and transported by ship, rail, or truck before they can be erected. In July 2010 Vattenfall began installation of the 30 steel foundations that will support the turbines for the 150 MW Ormonde wind farm in the Irish Sea. Each of these steel structures is 45 metres high, weighs 450 tonnes, and must be towed by barge for several days from the manufacturing facility to the site.

The pace of wind power development in Europe is already fast and has already put pressure on the availability of supply infrastructure such as ports, roads, and transport ships. Increasing the pace of development will require strategic support for supply industries if they are to keep pace.

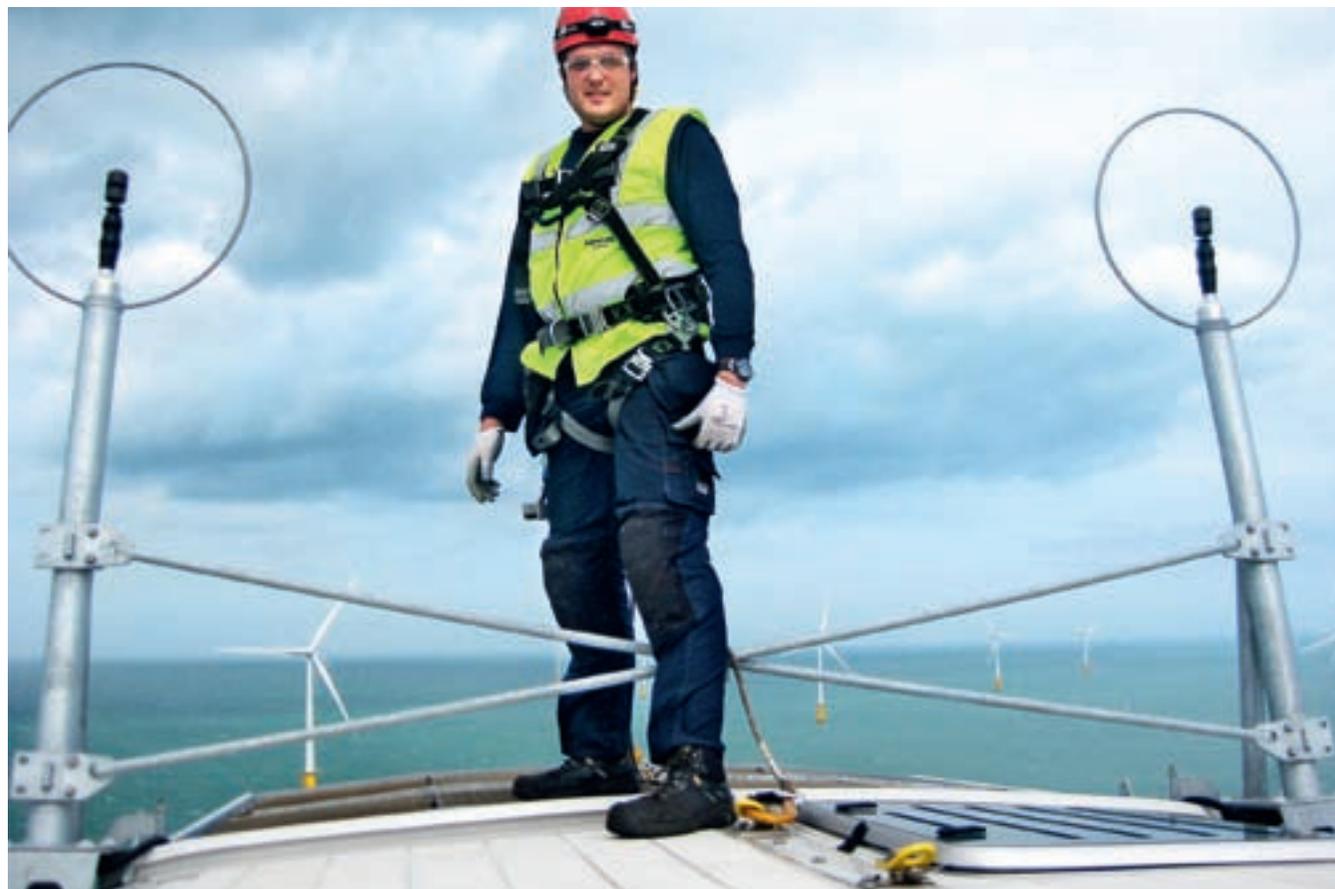
Availability of capital

The entirety of this supply chain needs to be financed, and up-front capital costs represent the bulk of costs for wind power. Vattenfall generally finances its projects “on the balance sheet”, using bonds, in order to capture more of the value from the assets and meet the owner’s required return on investment. During times of lower cash flows, such as 2009 and 2010, financing wind power in this way can become very difficult. This was one of the reasons that Vattenfall lowered its planned investments in wind power for the period 2010–2014.

Removing obstacles to growth

Together with our stakeholders we may be able to remove these obstacles to expansion of wind power. Industry can develop new technology that makes better use of the wind that is accessible. Governments and companies can work together to find the right risk and reward balance to stimulate grid investments. Suppliers and developers can collaborate to build confidence in tomorrow’s supply chain. Companies, investors, and governments can find innovative vehicles for financing capital investments.

Yet on some fundamental issues, Vattenfall’s stakeholders are themselves divided. On these matters, society faces



dilemmas. These dilemmas will influence how Vattenfall and other companies invest in wind power. Two of them are explored below.

Sailing against the wind: Local opposition to wind power

For some stakeholders, increasing the use of wind power is a matter of national, regional, and even global urgency. But the actual siting and construction of wind power plants is a matter of great local interest, and neighbours of proposed wind power sites often prioritise local concerns, even if they support the use of wind power in general. As many countries delegate planning to local authorities, trust and acceptance

The Thanet offshore wind farm project was acquired in November 2008, and construction was completed in September 2010. The 100 wind turbines have total capacity of 300 MW, which is sufficient to supply more than 200,000 homes per year with clean energy. Thanet is currently the largest operational offshore wind farm anywhere in the world.

from local communities is a prerequisite for investing in a wind power project. Even after a decision is taken, planning and authorisation can take a long time.

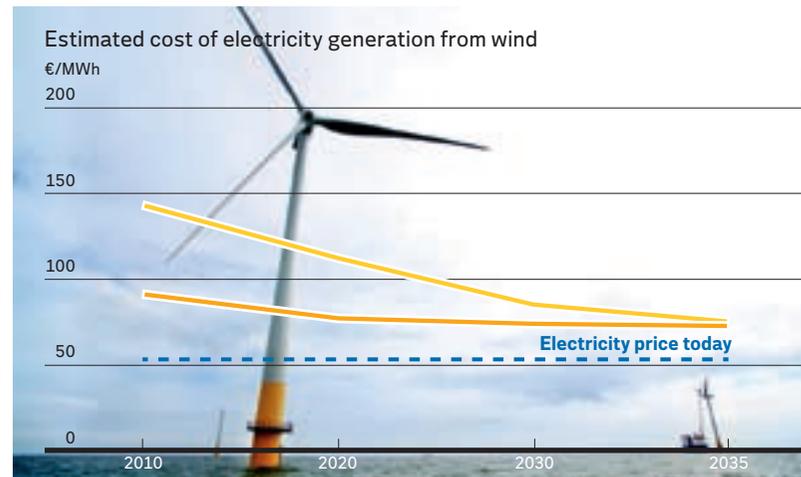
Most of Vattenfall’s wind power projects have strong local

support, but even so, they must go through long processes for planning and licensing. A project can take anywhere from two to ten years from initial planning to construction start. Planning is done in close dialogue and consultation with local authorities, local residents, the general public and other stakeholders. Noise and shade guidelines are followed as a matter of course. Consideration is given to the natural and cultural environment. The area where the turbines will stand is thoroughly inspected. Possible impact on people, animals and plants in the area is assessed.

The effectiveness of this process is key to whether a wind project will be profitable or not – unforeseen delays in getting turbines turning tie up capital unproductively and can turn an attractive project into an unprofitable one. Particularly for an investor like Vattenfall, which does not use bank loans but finances investments with its own equity and bond issues, such delays present a major risk.

Some of these complications – such as those regarding noise and sightline issues – are less significant for offshore wind farm development. Nonetheless, managing planning risks is an essential capability for investors in any kind of wind power project. As a company, it is our responsibility to engage effectively with local stakeholders, accept responsibility for the overall impact of a wind project on its surroundings, and find mutually acceptable solutions to local environmental and cultural concerns.

Governments can help by translating national ambitions into local development strategies. The UK government, through the quasi-governmental Crown Estate property management organisation, has developed a clear and detailed plan for developing wind resources in offshore waters that gives shape to the government's overall ambitions and gives companies clarity about what sites will be available and in what order.



Onshore Offshore

2010 estimated levelised cost of electricity compiled from a survey of literature on onshore and offshore wind in Europe – sources include IEA, Eurelectric, KPMG, Nomura and Mott MacDonald. Note that current European cost levels are significantly higher than global cost estimates from the IEA. Projections over time based on global cost improvements driven by growth in wind power are consistent with the International Energy Agency's New Policies Scenarios. Costs are assumed to reduce by 7% (onshore) and 9% (offshore) for each doubling of global capacity.

Speed vs. cost: Creating sustainable subsidies

Wind power, like many energy technologies, continues to become less expensive over time. However, it remains considerably more expensive than fossil-based and nuclear power, and thus requires support from government policies. In some cases, the price of carbon emissions created by the EU Emissions Trading System is enough to make wind power projects economically competitive. In other cases – particularly offshore wind and smaller scale onshore developments with less favourable wind conditions – additional subsidies are necessary.

These support systems represent a cost for society that is borne by either taxpayers or energy consumers. In recent years there has been disagreement in the public debate, with some stakeholders prioritising the speed of renewables development, and some seeking to lower the cost.

In the USA, contracts for wind power generation have been rejected by state regulators because they would lead to cost increases as small as 0.2%. In France and Spain, so-called feed-

in tariffs, which guarantee a price to renewable energy producers, were revised in 2010 under political pressure over high prices this year. In Sweden and the UK, as well, politicians and opinion-shapers have debated the costs and effectiveness of market-based certificate-trading systems.

Vattenfall prefers to work with such market-based tools, as they are better suited to our strengths as developers and investors. Nonetheless, both feed-in tariffs and certificate systems can provide effective incentives for different types of investors, but they must be perceived as politically stable and predictable.

Even if existing contracts based on subsidies are honoured, uncertainty over future regimes makes planning the place of renewables in Vattenfall's portfolio a challenge. In surveys and informal interactions, stakeholders have explicitly requested an overall plan for Vattenfall's development of renewable energy. Delivering on this request is challenging, and a fundamental reason is the societal and political dilemma of speed vs. cost.

Can you use biomass instead of coal?

At Vattenfall we are increasing our combustion of biomass to replace coal in generation of electricity and heat, thereby reducing CO₂ emissions from our existing plants and increasing our use of renewable energy sources.

Biomass presents unique opportunities for addressing sustainability concerns – but also unique challenges.

Biomass used as traditional cooking and heating fuel currently accounts for half of all primary renewable energy use in the world. Modern, efficient use of biomass for electricity and heat is small but growing. Much of this is biomass combustion for industrial heat, though the use of biomass for district heating and electricity generation is growing, primarily driven by the interest in increasing renewable energy use and reducing greenhouse gas emissions.

With respect to greenhouse gas emissions and climate change, biomass is the best near-term option for reducing the impact of existing fossil fuel-fired power and heat plants. The most common types of biomass used for electricity and/or heat production can contribute towards a reduction of CO₂ emissions by 55%–98% over fossil fuels when the whole supply chain is taken into consideration.

This can be achieved relatively simply and effectively through co-combustion – substituting biomass for part of the coal used in existing plants. The challenge lies in ensuring a sustainable supply chain that limits adverse environmental or social impact – particularly when sourcing from developing countries. This requires laws, regulations and legal frameworks that safeguard social and environmental sustainability aspects. A sustainable life cycle also includes re-plantation of biomass.

Share of five-year investment plan

3%



Vattenfall and biomass

Vattenfall is already one of the world's largest purchasers of biomass for power generation. The biomass used by Vattenfall consists primarily of household and industrial waste (more than 60%) and forest industry residue (30%). The remainder consists mainly of agricultural resi-

dues. Today, more than 40 of Vattenfall's heating and power plants are powered entirely or partially by biomass, and Vattenfall uses a total of three million tonnes of biomass per year, mainly in the Nordic countries. Biomass also plays an important role in Vattenfall's efforts to reduce its CO₂ emissions from fossil fuels.

If biomass is to increase its share in the energy mix, today's use of waste and residues will not be enough. A higher level of processing and increased international trade will allow for utilisation of a much larger portion of the residues from the global forestry industry. Production of energy crops and energy forests may also have to be increased.

One major challenge is finding suppliers that can provide large amounts of biomass that meet sustainability and affordability requirements. Cultivation of energy crops and forests can cause harm to environmentally important forests and a loss of biodiversity. Vattenfall therefore works with the entire supply chain, from forest to power plant. One of Vattenfall's main challenges is to find producers that meet the company's stringent environmental and social sustainability standards.

There are still no internationally accepted criteria defining sustainable bioenergy. Related standards and guidelines from the Forest Stewardship Council and the Programme for the Endorsement of Forest Certification schemes exist, and work on an ISO standard is in progress. However, a standard approved for use in an energy industry context is still needed. The goal is to establish a functioning system that guarantees that biomass production is carried out in a way that limits environmental and climate impacts, regardless of whether the product is domestic or imported. Such a system must also take all involved parties into account – from local residents of the producing country to the energy companies that purchase biomass. Managing this balance has become crucial for politicians and decision makers, and for Vattenfall.

Vattenfall's use of biomass

10% **Agricultural fuels, residues and other** (about 10%). The main agricultural fuel used by Vattenfall is straw that is not used for other purposes, such as livestock feed. This increases farmers' resource utilisation and does not impact food production. Bio-oils and biogas also play a minor role in the biomass fuel supply and consist mainly of residues.

30% **Forest industry residue** (about 30%). Residues from forest industry operations include wood chips made from branches, tops, thinning and bark, and are commonly available from local and regional suppliers, which reduces transportation. For fuels related to forestry, forest origin and risk of land use changes are always taken into account.

60% **Household and industrial waste** (about 60%). Waste from industry and households is a considerable and important part of Vattenfall's fuel mix. These fuels can vary significantly in content since they include household waste, industrial waste, and sludge. Household waste is typically considered to be 60% biogenic, i.e., from living organisms, and the remaining part is considered to be fossil-based.



Rubber trees typically produce latex between the ages of 7 and 30 years, after which they are harvested and replaced by newly planted trees. The practice has been to let these harvested trees rot or to burn them on site, with some of the wood used for charcoal production. To purchase and use these trees for energy generation, and substituting fossil fuels used today, is one of the ideas to achieve more sustainable generation.

Sourcing sustainable biomass – Rubber trees from Liberia

Vattenfall needs to source biomass in volumes not now available locally. We are developing a portfolio of projects to achieve this, and one attractive option, both economically and environmentally, is the use of unproductive rubber trees from plantations in Liberia.

Liberia is a country with a large resource of rubber trees, as rubber export is a key component in plans to revitalise the economy. These cultivated trees typically produce latex between the ages of 7 and 30 years, after which they are harvested and replaced by newly planted trees. In the past the practice was to let these harvested trees rot or to burn them on site, with some of the wood being used for charcoal

production. Buchanan Renewables, a Canadian-owned company based in Liberia, has developed a biomass business based on making wood chips from these non-productive trees. In 2010 Vattenfall, together with Swedfund, the Swedish government’s investor in developing countries, acquired 30% of the subsidiary Buchanan Renewables Fuel (BR Fuel) to secure its supply of large volumes of sustainable wood chips. Purchasing trees that no longer produce rubber, and which would in any case be disposed of, is an environmentally and economically efficient option.

Before entering the agreement with BR Fuel, Vattenfall performed a thorough analysis of the risks and opportunities related to environmental, social, and climate issues. Some of the key issues, and our proposals for addressing them, are outlined briefly below.

Of course, importation of biomass produces other emissions coupled to processing and transportation. Vattenfall has performed a life cycle analysis to assess the extent of

these emissions. When compared to a similar life cycle analysis of coal-based production, we see that use of biomass from Liberia should generate a net reduction of greenhouse gas emissions of 88%¹. The reduction is less than 100% primarily because wood chips are less energy dense and therefore somewhat less efficient to ship than coal. Overall, however, the impact is very positive.

Local environmental impacts

Vattenfall has investigated issues related to the local environment that could arise related to increased production of bioenergy resources. These include:

- Water pollution from runoff from compound areas and from the storage site in Buchanan port
- Soil erosion at the plantations
- Waste water and solid waste management at the plantations
- Biodiversity impacts in areas surrounding the plantations

1) The EU considers biomass itself to have zero net emissions.

- Indirect effects on overall forestation (if increased demand for rubber trees leads to charcoal production from other forests).

Buchanan Renewables has produced a plan for sustainably managing harvests, for assessing the environment impact of its activities, and for managing and mitigating these impacts. Vattenfall found these plans to be satisfactory.

Overall, Buchanan Renewables has shown that it understands local environmental issues and environmental management, and has been an enthusiastic partner on these issues. The greatest challenge may be maintaining effective environmental management and control as the business grows in the coming years.

Governance, corruption, and labour practices

Liberia is a country in recovery from a 14-year civil war that ended in 2003. Though progress is being made, the country is still struggling with security problems. Corruption is also widespread – Liberia ranks 138 out of 180 countries in Transparency International's Corruption Perception Index – and enforcement of the rule of law, including labour laws, is suspect.

Working with Buchanan Renewables gives Vattenfall confidence that these problems can be addressed. The company has established clear ownership of CSR issues within management, and has strong relationships with both the government and local farmers. Buchanan Renewables is also supported by the Overseas Private Investment Corporation, a development-oriented US government agency. These relationships have helped give the company a strong foundation in terms of governance, social responsibility, and sustainability.

As Buchanan Renewables grows its operations, this foundation may be tested, especially as the company's own set of suppliers expands. Vattenfall intends to work closely with Buchanan Renewables on the formulation and implementation of CSR policies, action plans, and control systems as these changes take place.



Biomass in the news – Fears for global food production

In 2010 the world saw the return of very high prices for certain food commodities and associated concerns about the world's ability to produce enough food, particularly in the long run. While global agricultural production is an extremely complex system, one of the major factors in developments in 2010 was above-average temperatures and drought conditions – issues that are likely to remain current as global temperatures rise over time.

While many factors will play a role in tomorrow's agricultural productivity, one possible concern is the growth of bioenergy and its potential to compete for land and water resources. For Vattenfall, this concern leads to several responsibilities as an actor in the bioenergy market:

1. Ensure that waste products are preferred sources whenever possible
2. For energy crops, prioritise sources from agriculturally unsuitable land and avoid sourcing from virgin land whenever possible
3. Work with other stakeholders to support development of global standards that minimise the negative sustainability impacts of bioenergy. Vattenfall is actively involved in the development of the ISO standard on sustainability of biomass (both solid biomass and biofuel). Vattenfall's internal standard closely follows the work that has been done by others, e.g., the Round Table on Biofuels and Forest Stewardship Certification.

Opportunities for development

Vattenfall's involvement in Liberia does not entail only risks. This arrangement gives us a unique opportunity to support sustainable economic development in a place where support is greatly needed.

The project is expected to contribute to poverty alleviation by generating additional income for small farmers and creating up to 1,500 new jobs in the biomass supply chain. The development of this supply chain will also support infrastructure development, including the development of the

transport sector, improvements to roads and ports, and the rejuvenation of redundant rubber plantations. Vattenfall is exploring options for capacity-building programmes to make sure such effects are captured and benefit as many Liberians as possible.

A sister company to BR Fuel, BR Power, will build a 36 MW biomass power plant fuelled by rubber tree wood chips. Electricity will be fed into the public distribution network. Today only 7 MW are available for the public. The project will break ground in early 2011.

Is Vattenfall helping to change the way energy is used?

Vattenfall sees important changes coming in energy use. Two of the most important are the growth of electricity in transportation, which we call e-mobility, and efforts to make cities more sustainable.

E-mobility

Today, private transport is highly oil-dependent, and vehicles emit both carbon dioxide and other greenhouse gases. Electricity offers possibilities for long-term efficient and sustainable private vehicle transport. Electric cars are not a new invention – in fact they existed a century ago. However, earlier attempts to introduce them widely have failed. Today the situation is different, and a large-scale transformation of the transport sector may be imminent.

The biggest driver of this situation is climate change. While overall emissions associated with vehicle traffic vary with the fuel used to produce electricity, in the EU, overall the so-called well-to-wheel emissions of electric cars are about 56% lower than modern gasoline-powered cars. And because emissions from electricity in the EU are already capped, any increase in emissions created by electric cars will be compensated by a reduction somewhere else in the system. So in the long-run, electric vehicles may offer the

best way of achieving drastic reductions of emissions from transportation.

There are many challenges ahead, including technological improvements and cost reductions for batteries, infrastructure changes related to charging, and the growth of public acceptance and market demand. Nonetheless, e-mobility has the potential to change the market for one of Vattenfall's core products: a study by the European Climate Foundation estimates that growth in electric vehicles could stand



Volvo and Vattenfall making e-mobility a reality on the road

In 2007 Vattenfall and Volvo started a unique co-operation, with the goal of having a plug-in hybrid vehicle on the market by 2012. This was faster than most observers believed possible, but development of the car is on track, and a prototype was launched at the Geneva Motor show in March 2011.

The car will be a plug-in hybrid – a car that can run on battery power or a diesel engine – built into a Volvo V60. It will be mass-produced and will offer an expected consumption of 0.19 l/100 km and CO₂ emissions of 49 g/km. The journey range for the lithium-ion battery is estimated to be 50 km – which will cover the entire daily use for many commuters.

The 70 BHP electric motor on the rear axle draws its power from a 12 kWh lithium-ion battery pack. The battery can be charged using a standard power socket, and the estimated charging time is four to six hours.

The front wheels of the Volvo V60 Plug-in Hybrid are driven by a five-cylinder 2.4-litre turbo diesel engine of 215 BHP, which can also be run on biodiesel. Alongside its environmental appeal, the car has the power and performance of a Volvo sports car. While the purchase price is higher, the running costs are expected to be about one-third of those of a diesel V60.

Vattenfall is contributing its experience of the electricity system and Volvo its knowledge of manufacturing cars. The development of the car is being carried out and financed by both companies.

A One Tonne Life

One Tonne Life is a project in which A-hus, Vattenfall, Volvo Car Corporation and other partners are seeking to create a climate-smart household. A selected family will try to reach a level of per-person emissions compatible with a stable climate in the long-run, roughly estimated at one tonne of CO₂ equivalents per year. They will be helped in a variety of ways, not least with a climate-smart house featuring solar cells

on the roof that are used to recharge the electric car parked in the driveway.

Experts from Chalmers University of Technology in Gothenburg, Sweden, are taking part in the project to ensure reliable calculation of the family's carbon dioxide emissions.

For six months, Alicja, Jonathan, Hannah and Nils Lindell will leave behind their home and car and move

into Älghagstigen 24 in the Stockholm suburb of Hässelby. The Lindells are an ordinary family with two teenagers, and they do not regard themselves as particularly climate-smart. Do they have what it takes to significantly reduce their CO₂ footprint, from 7 tonnes of CO₂ per person and year to just 1 tonne?



Solar cells and collectors Solar cell panels are located on both the roof and the south-facing façade. These solar cells are integrated into the structure of the house and generate the energy needed for supplementary heating and ventilation, to power the refrigerator and freezer and so on. Surplus power is used to recharge the family's electric Volvo. The solar collectors on the carport roof provide hot water and also contribute to the little extra heating that may be required.

Climate Shell Through a well-insulated and sealed climate shell, the house consumes little energy. The climate shell consists of the windows, doors, walls, floors and roof. Energy consumption is reduced through improved insulation in the walls, roof, and foundation, and by fitting low-energy windows and doors.

Windows Compared with conventional windows whose U-rating (in other words their insulating ability) is about 1.2, the U-rating here is as low as 0.7 in the fixed windows and 0.8 in the opening windows.

Volvo C30 Electric The family car offers the very same levels of safety, comfort and interior space as a standard car does. The difference is that the Volvo C30 Electric runs entirely on electricity. The car is powered by a lithium-ion battery pack that is recharged via a regular household electric socket. A full charge takes about eight hours. The car's range on a full charge is up to 150km.

Wind-catcher The wind-catcher in the entrance has the same function as the traditional entry porch found in Swedish country cottages. With its double doors, the wind-catcher prevents indoor heat from escaping and also stops cold outside air from entering the house.

Indoors To ensure a supply of fresh air of the right quality in this well-insulated house, a ventilation unit sucks out air from the bathrooms, the airing cupboards and kitchen, and replenishes it with fresh, tempered air in the bedrooms, living room and other family areas. The heat in the exhaust air is recycled. The house's heating requirements are met by the incoming air, the occupants' body heat and heat-generating white goods and kitchen appliances. Floor heating is installed on the ground level.

Solar traps The eye-catching cubes that encase the windows give the house an interesting appearance, but they fulfil an important function. Their task is to shade the interior when the sun is high in the summer sky, yet let in light and supplementary energy when the sun is low on the horizon in the winter months.

Walls The house has a triple layer of walls with exceptional insulation capability and minimum air leakage. The plastic foil that keeps the climate shell intact is carefully positioned to further reduce air leakage.

In Berlin, Vattenfall and BMW are running a project called Mini E, which allows 100 people to lease an electric BMW Mini Cooper for six months.

for 16% of overall electricity demand by 2050. E-mobility is also an area where electricity can contribute greatly to society's climate and sustainability objectives. Vattenfall is taking a role in addressing the needs of this new market.

Building demand for electric cars

Together with the City of Stockholm, Vattenfall has initiated a project to support the joint procurement of electric and plug-in hybrid vehicles. After an initial study identified existing demand for approximately 14,000 vehicles, the procurement of cars was launched in autumn 2010 with the support of the Swedish Energy Agency. The Electric Vehicle Initiative will procure electric and plug-in electric cars on behalf of private companies and public authorities, with a goal of 6,000 cars in total.

Building public support via demonstration

Vattenfall is participating in three demonstration projects. The testing of the Volvo V60 is the first, with a focus on private charging at home. In Berlin, Vattenfall and BMW are running a project called Mini E, which allows 100 people to lease an electric BMW Mini Cooper for six months. Charging stations have been installed at the test drivers' workplaces and homes, and 50 charging posts have been erected around the city. In Amsterdam, Vattenfall is looking to have 200 charging posts in place by 2012.

The purposes are to increase public acceptance and understanding of electric vehicles, and to study the interactions between consumers, the charging systems, and the electricity grid. For example, Vattenfall has designed a system that registers when there is a surplus of wind energy in the grid, and steers the charging sockets. We are also testing a pricing model with an environmental incentive to match charging with times of supply.

Sustainable Cities

Cities are becoming more and more aware of their impact on the environment and are working hard to minimise it. Much

of this impact is related to energy – and Vattenfall can be a partner for cities in their transition to become more sustainable and use energy more efficiently.

Urban areas are rapidly becoming the new main consumers of energy. At the same time, the debate about carbon dioxide emissions and the greenhouse effect is becoming more intense and many cities are working hard to reduce their carbon footprints, for example by reducing energy consumption in new and existing buildings, making sure that their energy comes from low-emitting sources, and ensuring that the energy is produced and distributed in an efficient way.

Energy systems could be a complex puzzle to solve. Vattenfall's Sustainable Cities Programme is conducted both from a research and development perspective and a business development perspective, and in close co-operation with city stakeholders.

Vattenfall is looking at society as a whole and offers a systematic approach to improving energy sustainability. A city's energy system is made up of different kinds of generation, both large and small-scale, as well as a variety of distribution methods and customer segments. For a residential building in Madrid it might, for example, be beneficial to use solar panels to produce heat and electricity, while an office building in Berlin might be able to use district heating for both heat and cooling, or to pick it up from the bedrock using



a small-scale geothermal system. Ultimately, however, the best way of achieving sustainability is to reduce energy waste, for example by adding insulation, making sure new buildings are built in an energy-efficient way, or simply by visualising consumption so that everyone can get an understanding of and direct feedback on their initiatives to reduce energy consumption.

Within the Sustainable Cities R&D programme, all this is covered by six different sub-programmes; Metering technologies, Product-related energy services, Distributed generation, District cooling, Solar energy, and Geothermal. Currently, Vattenfall is running 26 different long- and short-term projects within these sub-programmes. An example of a long-term project is the evaluation of the potential for geothermal energy in Vattenfall's existing markets, and an example of a short-term project is the study of heat pumps and heat storage that is being conducted in Germany.

GRI Content Index

Vattenfall reports in accordance with the Global reporting initiative's (GRI) G3 sustainability reporting guidelines in order to measure performance and achieve transparency and international comparability in sustainability performance reporting. Vattenfall has applied the GRI guidelines since 2003 and reports on the A+ level as defined and checked by GRI. For further information, see www.globalreporting.org.

Following is a content index for indicators specified by the GRI guidelines and which are reported by Vattenfall. It includes indicator names and GRI identification numbers and provides references to the pages where relevant information can be found (a full GRI Content Index can be found at www.vattenfall.com/csr). In addition, relevant UN Global Compact Principles are indicated for each indicator.

Statements of status and boundaries are provided in the respective indicator reporting text.

Page reference

IFC Inside front cover
AR 2010 Annual Report

Indicator	Page	Related UN Global Compact Principles ¹	Indicator	Page	Related UN Global Compact Principles ¹	Indicator	Page	Related UN Global Compact Principles ¹	
Profile			Report profile, scope and boundaries			Environmental performance			
Strategy and analysis			3.1 Reporting period			Management approach			
1.1	4		3.2	41		Performance indicators			
1.2	5		3.3	41	EN1	48	8		
Organisational profile			3.4	76	EN2	48	8-9		
2.1	IFC		3.5	41	EN3	48	8-9		
2.2	IFC		3.6	41	EN4	48	8		
2.3	IFC		3.7	41	EN5	50	8-9		
2.4	76		3.8	41	EN6	50	8-9		
2.5	IFC		3.9	41	EN7	50	8-9		
2.6	IFC		3.10	41	EN8	51	8		
2.7	IFC		3.11	41	EN9	51	8		
2.8	IFC		3.12	39	EN11	51	8		
2.9	41		3.13	73	EU13	51	8		
2.10	41		Governance and CSR management			EN12	51	8	
EU1	64		4.1	AR	EN13	51	8		
EU2	64		4.2	AR	EN14	51	8		
EU3	64		4.3	AR	EN16	52	8		
EU4	64		4.4	42	EN17	52	8		
EU5	64		4.5	AR	EN18	53	7-9		
			4.6	42	EN20	53	8		
					EN21	51	8		
					EN22	55	8		
					EN23	55	8		
					EN25	51	8		
					EN28	55			

Indicator	Page	Related UN Global Compact Principles ¹	Indicator	Page	Related UN Global Compact Principles ¹	Indicator	Page	Related UN Global Compact Principles ¹
Social performance			Product responsibility			Sector supplement indicators		
Management approach	56		SO5 Public policy positions and development	64	1–10	EU7 Demand side management – <i>Not material, Vattenfall operates in a deregulated market</i>		
EU14 Ensuring availability of skilled workforce	57		SO6 Political contributions	64	10	EU10 Planned capacity (MW) against projected electricity demand – <i>Not applicable, Vattenfall operates in a deregulated market</i>		
EU15 Employees eligible to retire	57		SO7 Legal actions pertaining to anticompetitive behaviour	64		EU11 Average generation efficiency by energy source – <i>Data not available</i>		
EU16 Health and safety of contractors	57		SO8 Sanctions	64		EU12 Transmission and distribution losses – <i>Data not available at time of publication. Assessment of reporting process on-going</i>		
Performance indicators			Management approach			EU27 Number of residential disconnections for non-payment – <i>Data not available at time of publication. Assessment of reporting process on-going</i>		
LA1 Workforce	56		EU23 Programmes that improve access to electricity services	65		EU28 Power outage frequency – <i>Data not available at time of publication. Assessment of reporting process on-going</i>		
LA2 Employee turnover	57	6	EU24 Accessibility of information on safe use	67		EU29 Power outage duration – <i>Data not available at time of publication. Assessment of reporting process on-going</i>		
EU17 Work by contractors	56		Performance indicators			EU30 Average plant availability – <i>No data available. Data considered confidential</i>		
EU18 Health and safety training for contractors	57		EU25 Number of injuries and fatalities to the public	65				
LA3 Employee benefits	57		EU26 Access to electricity	67				
LA4 Collective bargaining agreement coverage	57	1, 3	PR1 Health and safety impacts	65				
LA5 Operational changes	57	3	PR3 Product and service information	65	8			
LA6 Health and safety committees	58	1	PR5 Customer satisfaction	66				
LA7 Injuries, absentee rates and fatalities	58	1	PR6 Responsibility in marketing communications	66				
LA8 Support regarding serious diseases	58	1	PR7 Non-compliance with regulations and codes	67				
LA9 Health and safety and union agreements	58	1	PR8 Customer privacy and customer data	67	1			
LA10 Training of employees	59		PR9 Laws and regulations on products and services	67				
LA11 Skills management and learning	59		Economic performance					
LA12 Performance and career development reviews	59		Management approach					
LA13 Composition of governance bodies	60	1, 6	EU6 Approach to ensure availability and reliability	70				
LA14 Ratio of salary of men to women	60	1, 6	EU8 Research and development activities	70				
Human rights			EU9 Provisions for decommissioning of nuclear power sites	70				
Management approach			Performance indicators					
Performance indicators			EC1 Economic value generated and distributed	68				
HR2 Human rights screening of suppliers	61	1–6	EC2 Financial implications due to climate change	69	7			
HR3 Human rights training	61	1–6	EC3 Coverage of benefit plan obligations	69				
HR4 Discrimination incidents	61	1–2, 6	EC4 Government financial assistance	70				
HR5 Freedom of association and collective bargaining	61		EC6 Spending on locally-based suppliers	70				
HR6 Child labour	61	1–2, 5	EC7 Local workforce and management	70	6			
HR7 Forced labour	61	1–2, 4	EC8 Investments and services for public benefit	70				
Impact on society			Vattenfall does not report on the following core indicators					
Management approach			EN19 Ozone-depleting substances – <i>Not material, ozone depleting substances are used only to a very limited extent</i>					
Performance indicators			EN26 Mitigation of environmental impact of products – <i>Not material due to the nature of our products</i>					
EU19 Including stakeholders in decision-making processes	62		EN27 Percentage of products sold and packaging materials reclaimed – <i>Not material due to the nature of our products</i>					
EU20 Managing impacts of displacement	62		HR1 Human rights screening of investments – <i>Not material. In countries where Vattenfall operates, these issues are controlled by legal frameworks and specific screening is generally not performed</i>					
EU21 Emergency management and contingency planning	64							
Performance indicators								
SO1 Managing impacts of operations and displacements	62							
EU22 Assessment of impacts of operations	62							
SO2 Risks related to corruption	63	10						
SO3 Anti-corruption policies, procedures and training	63	10						
SO4 Actions against corruption	63	10						

Report profile, scope and boundaries (3.1–3.11)

The numerical data provided in the reporting section refers to 2010. Significant events up until 9 March 2011 are also reported. Vattenfall has published annual CSR reports according to GRI guidelines since 2003. This report was published on 31 March 2011. The previous report was published on 31 March 2010, covering performance in 2009. The scope of this report is for the Vattenfall Group and its operations, which is the same as for the Annual Report.

Boundaries

Vattenfall has limited the reporting boundaries to areas in which the company has full control over data collection and information quality. Downstream impact of heat and electricity use are so widespread that it would be difficult to measure them in a reliable way.

Accounting policies

The financial data as well as most data related to human resources presented in the CSR report are taken from Vattenfall's audited annual accounts. The reporting currency of Vattenfall AB is Swedish kronor (SEK). The accounting policies for financial reporting are outlined in Vattenfall's 2010 Annual Report.

The consolidation principles for environmental data are the same as for the financial statements, i.e., they include subsidiaries in which Vattenfall AB holds more than 50% of the voting power or in any other way has a controlling influence. This policy was fully implemented in 2007.

Environmental data for the CSR report, including energy-related data, is collected via the Group's environmental reporting. Group-wide definitions for all environmental parameters are used to enhance quality and facilitate comparisons across the Group. Where possible, reporting of historical data has been recalculated in line with these changes. This is explained in comments adjacent to the tables.

To allow for future comparisons, Nuon's operations are included for the full year for the period 2007–2010, although Nuon was not consolidated in the Vattenfall Group until 1 July 2009. This is in accordance with the Greenhouse Gas Protocol¹, which is the standard for greenhouse gas accounting, that stipulates that data shall be updated retroactively; Vattenfall applies that principle to all environmental data. This means that, in contrast to the financial reporting, an acquisition will result in the addition of historical data, including production, to previous years' accounting, while a divestment would result in the elimination of data for the divested units from historical accounting. Any other restatements or changes in environmental reporting are described in comments adjacent to the respective tables. The

1) www.ghgprotocol.org

Almere plant in the Netherlands, although acquired in 2010, has not been included in the figures to allow a comparison between years. Almere will be included in the CSR report from 2011.

Reported CO₂ emissions are based on fuel consumption. It should be noted that calculation methods differ from country to country. Calculation methods are stipulated by national legislation, among other things in connection with the EU Emissions Trading System. In the case of blast furnace gas bought from steel plants, CO₂ emissions have been calculated on the basis of use of natural gas with an equivalent energy content. The remaining CO₂ emissions are allocated to the steel plant. This calculation is done for two units in the Netherlands.

All other emissions have either been measured (in cases where continuous monitoring equipment has been installed) or based on periodic measurements. The number of digits displayed in numbers reflect the accuracy of the data. Rounding differences in the last digit between sums and single items may occur.

Significant changes during the reporting period (2.9)

On 19 May 2010 the sale of the subsidiary 50Hertz Transmission GmbH, which owns and operates Vattenfall's high voltage transmission grid in Germany, was completed.

Vattenfall completed the sale of N.V. Nuon Energy's German subsidiary Nuon Deutschland GmbH to ENERVIE – Südwestfalen Energie und Wasser AG with retroactive effect from 1 January 2010. The European Commission had approved the acquisition of N.V. Nuon Energy under the condition that Vattenfall sold all of its shares in Nuon Deutschland GmbH.

On 3 June, the Swedish parliament's decision clarifying Vattenfall AB's assignment was formally adopted through an amendment of Vattenfall AB's Articles of Association at an Extraordinary General Meeting of Vattenfall on 23 August 2010. The aim of the amendment was to clarify the owner's (the Swedish state) assignment with respect to its requirement for a market rate of return and to the fact that Vattenfall is a company with operations spanning a large part of Europe.

On 15 December Vattenfall sold its 24.9% stake in the German municipal energy company Städtische Werke AG Kassel to Thüga AG. In addition, an agreement was reached to sell the Hillerød combined heat and power (CHP) power station in Denmark to Hillerød Forsyning. The transaction is expected to be completed during 2011.

Events after the balance sheet date

On 1 February 2011 Vattenfall sold its 25% stake in the Rosstock coal-fired power plant to RheinEnergie AG. The plant has installed capacity of 553 MW.

Lars Westerberg decided, on 18 March 2011, after consultation

with the Ministry of Finance, to leave his post as Chairman of the Board of Directors of Vattenfall AB. Björn Savén was appointed acting Chairman of the Board, as well as deputy Chairman of Vattenfall AB until the Annual General Meeting of Vattenfall on 27 April 2011. Lars Gejrot left on 18 March 2011 his position as Senior Vice President, Staff Function Human Resources and Member of the Executive Group Management (EGM).

Awards received (2.10)

Vattenfall's telephone exchange in Räcksta, Sweden, won the silver medal in the Swedish Telephony Championships, with 78% satisfactory connections.

Vattenfall and the agency Tidningskompaniet shared the Best Book prize at the Swedish Guldbladet publishing awards for the 2009 publication A One Tonne Future: A Guide to the Low-Carbon Century.

Governance and CSR management

Governance and direction of CSR

Vattenfall does not have a separate CSR organisation. CSR issues are governed at the Group level as an integrated aspect of all other business matters. The overall strategic direction is set at the Group level, and the Business Groups are managed through the strategic planning and business planning processes, in which requirements are formulated, and through Group steering documents. The day-to-day running of operations is decentralised.

Overall CSR responsibility at the Group level rests with Vattenfall's CEO. The staff functions are responsible for monitoring the Business Divisions with regard to the staff functions' respective areas of functional responsibility. Each staff function has been assigned authority and responsibility throughout the entire Vattenfall Group within its area of expertise and responsibility. With respect to financial compliance, the Finance Compliance Officer within Staff Function Finance has specific responsibility for compliance in relation to accounting and to parts of the Vattenfall Management System. The Compliance Officer thereby requires representation letters from the line organisation. The line organisation reports all major disputes to Staff Function Legal Affairs regularly and in connection with specific cases.

As emphasised by the ethical guidelines detailed in Vattenfall's Code of Conduct, the intention is for each employee to assume responsibility for ensuring that the company lives up to the high expectations of its stakeholders. In the light thereof, Vattenfall encourages every employee to report violations of

law or of Vattenfall's Code of Conduct. If serious irregularities can be found at an early stage, Vattenfall will be better able to prevent risks and limit any damage to the benefit not only of Vattenfall, but also of its employees and stakeholders. In 2010 Vattenfall completed the introduction of a Group-wide whistleblowing function with locally appointed external ombudsmen to whom employees, consultants and contractors can turn to report suspected, serious improprieties that the "whistleblower" for some reason does not want to report internally via the normal reporting channels. To the extent the whistleblower gives his or her consent, the ombudsman will forward information to the local compliance co-ordinator. At the Group level, a Group Compliance Committee has been established and is responsible for communication and co-ordination of compliance issues, identification of necessary actions, recommendations for better practice and analysing whistleblowing cases from a Group perspective. In 2010, 14 cases were reported via the whistleblowing function.

A comprehensive disclosure of how Vattenfall is governed (with respect to GRI-indicators 4.1–4.3, 4.5, 4.7–4.8, 4.10) can be found in the 2010 Annual Report and in the corporate governance section on www.vattenfall.com.

Recommendations to highest governance body (4.4)

The shareholder's direct influence over the company is exercised at the Annual General Meeting, which is the highest decision-making body in the company. Vattenfall AB has held open Annual General Meetings since 2005. The reason for this is to offer not just the owner's representative but also the general public the opportunity to attend and pose questions to company management directly.

The Swedish government has established a separate division for state enterprises within the Swedish Ministry for Finance (previously within the Swedish Ministry for Industry, Employment and Communications) which, like other owners, governs and issues recommendations by different means, such as:

- Nomination of the Board of Directors, which is the highest governance body;
- Adoption of the Articles of Association, which stipulate the object of Vattenfall AB's operations;
- Nomination of auditors;
- Approval of principles for compensation and other employment terms and conditions for board members and senior executives.

In order to clarify the Swedish state's view on certain issues, and to achieve uniformity among the administered companies, the

Swedish government has established a state ownership policy, which forms part of the Swedish government's annual report on state-owned companies (a link to this policy can be found in the corporate governance section of www.vattenfall.com). The policy regulates the Annual General Meeting, the board nomination process, the composition of the Board, evaluation of the Board's work, directors' fees, committee work, the appointment of auditors and the responsibilities of the Board, among other things. The policy requires Vattenfall AB to adhere to the Swedish Code of Corporate Governance, however with some exceptions, as described in Vattenfall's Corporate Governance Report.

In addition, the Swedish government has established guidelines for external reporting, for terms of employment for senior executives, for the Board's Rules of Procedure and for managing certain information-related issues. The Swedish government has also identified certain crucial policy issues concerning social responsibility that state-owned companies shall adhere to. This applies to such areas as equal opportunity, the environment, diversity, the work environment and the company's role in society.

Board processes to ensure conflicts of interest are avoided (4.6)

No specific processes exist, however, the rules on conflicts of interest in the Swedish Companies Act apply. For further information, see Vattenfall's 2010 Annual Report and www.vattenfall.com.

Board procedures for management of sustainable performance (4.9)

As stated in the Board's Rules of Procedure, the Board must annually discuss the Group's strategic plan and the Group's total risk exposure. At board seminars held each year, the Board receives more detailed information about and discusses Vattenfall's long-term development, strategy, competitive scenario and risk management.

Antitrust issues and major disputes are reported annually to the Board. The most important policies and instructions relating to finance, risk and the environment (including the Code of Conduct) are to be approved by the Board.

The Board also has an audit committee which assists the Board on issues regarding financial risks and reporting as well as external auditing. The committee is thereby responsible for preparation of the Board's work to ensure the quality of Vattenfall's financial reporting. Furthermore, the Audit Committee is responsible for application of the Code of Corporate Governance. The Board's risk management process is further described in 4.11, the Corporate Governance Report and on the corporate governance pages at www.vattenfall.com.

Precautionary principle (4.11)

The precautionary principle intends to provide guidance when there is a lack of knowledge about the harmful effects that a particular activity can have. In Vattenfall, the precautionary principle is formalised through risk management.

The main purpose of risk management at Vattenfall is to identify, manage and control risks to which the Group is exposed in a way that is in line with the strategic, environmental and financial targets. Risks should also be managed in a way that is transparent towards the Executive Group Management, the Board of Directors and ultimately the owner of Vattenfall.

The Board of Vattenfall has overarching responsibility for Risk Management in the Group. The Board is entitled to receive independent information on risk issues through Vattenfall's Chief Risk Officer, who manages the Risk Management organisation within Vattenfall and ensures risk governance, control and support through the Enterprise Risk Management (ERM) process. The ERM process enables Vattenfall's management to handle uncertainty, risks and opportunities efficiently and to compare risks. This gives a better basis for decisions and increases risk awareness and transparency throughout the entire organisation. The Vattenfall ERM is based on the COSO (Committee of Sponsoring Organizations of the Treadway Commission) risk management standard. An improvement of ERM during 2010 is the solid connection to the business and strategy planning, as well as to the financial follow-up process. In accomplishing this, Vattenfall ensures that risk management is fully integrated throughout all parts of the organisation and business.

Risk management is emphasised through a "three lines of defence" model, which establishes the different roles in risk ownership, control and assurance. Line management, as the risk owner, provides the first line of defence; the second line of defence is provided by the Risk Management organisation; and the third line of defence is provided by the (internal) auditor.

More information about risk management and Vattenfall's risks is provided in Vattenfall's 2010 Annual Report.

CSR initiatives and principles endorsed (4.12)

- UN Global Compact (supporter through Swedish Partnership for Global Responsibility since 2002; individual signatory since 2008)
- Partnering Against Corruption Initiative (PACI) – signatory since 2005
- Signatory of various statements related to global climate change from 3C, World Economic Forum, the Climate Group, Corporate Leaders' Group, Caring for Climate, etc.
- Participant in efforts to develop improved sustainability criteria

- for biomass at the European (EURELECTRIC) and national levels (Sweden and the Netherlands)
- Sponsor of European Climate Foundation Roadmap 2050

Principal memberships in associations and organisations (4.13)

Corporate Responsibility and Sustainability

- Alliance for Global Sustainability
- 3C (Combat Climate Change)
- World Business Council for Sustainable Development
- The Global Reporting Initiative
- CSR Europe

Trade and industry bodies

- EURELECTRIC
- Business Europe
- International Chambers of Commerce
- EuroHeat and Power
- Euracoal
- Eurogas
- European Wind Energy Association
- Foratom/The European Nuclear Energy Forum/ENISS
- Zero Emissions Platform
- European Federation of Energy Traders
- International Emissions Trading Association
- Cigré – International Council on Large Electric Systems
- World Energy Council
- Various bilateral chambers of commerce

Other

- International Energy Agency Business Advisory Board
- World Economic Forum Industry Partner
- European Energy Forum
- Various academic/research partnerships

Stakeholders and identification (4.14–15)

Vattenfall has identified its stakeholders by mapping the impact Vattenfall has on certain groups, or the impact that these groups have on the company. The following major stakeholder groups have been identified through impact assessment:

Society: Neighbours, citizens, media, politicians, authorities, non-governmental organisations, potential employees, sub-contractors and competitors

Customers: Retail customers, business and industrial customers

Internal: Employees, employee representatives, unions and managers

Financial: The owner (the Swedish state), capital providers

Characteristics of stakeholder relations

Main group	Stakeholders	Attributes and description
Society	Neighbours	Neighbours are people living close to Vattenfall plants and operations who may be directly affected by the company's activities. It is very important for Vattenfall to maintain an open dialogue with neighbours, since they can influence public opinion. Vattenfall meets its neighbours in face-to-face meetings with the purpose of providing information and taking neighbours' needs into account in decision making processes.
	Citizens	Vattenfall has an impact on citizens in all countries in which it operates, mainly as a provider of electricity and heat, but also as an employer and taxpayer. Vattenfall is owned by the Swedish state, which makes Swedish citizens stakeholders in the sense that they can be regarded as indirect owners of the company. Vattenfall paid a dividend of SEK 6.5 billion to the Swedish state in 2010.
	Potential employees	Vattenfall's long-term business planning involves analyses of the company's future competence needs. Mostly, the company needs people with an engineering background and good commercial knowledge to work in the core business. But there is also need for people with knowledge and skills in such areas as the environment, IT, project management and general management. Vattenfall's company philosophy and core values are the foundation for the corporate culture. It is important that potential and current employees share this mindset.
	Media	Energy is high up on the media's agenda. As one of the largest players in the European energy industry, Vattenfall is in focus. The national media in all markets – including tabloids, daily newspapers, business newspapers, radio and TV – monitor Vattenfall's activities very closely. Local media has a particular interest in Vattenfall, especially in areas in which the company conducts its operations. Recently, Vattenfall has also attracted growing interest from international business media. Media coverage is of utmost importance for Vattenfall, since independent media have a substantial influence on public opinion. Vattenfall maintains an open and constant dialogue with key media to update them on developments within the company while also being available as a knowledgeable partner in energy-related issues.

Main group	Stakeholders	Attributes and description	Main group	Stakeholders	Attributes and description
Society <i>(cont.)</i>	Politicians	Vattenfall interacts with politicians at the local, national and European levels. The purpose of these contacts is to increase general knowledge about Vattenfall and the energy industry and thereby enhance the quality of decision-making through mutual support in terms of expertise and knowledge. Relationships are based on respect, trust and openness.		Business and industrial customers	Vattenfall provides the public and private industry sectors with electricity and heat, and also offers a variety of energy-related services. Vattenfall caters to the specific needs of each industrial operation. Electricity purchases can be combined with energy solutions and operation and maintenance services to increase efficiency and lower costs. Vattenfall is a long-term partner in large-scale energy projects.
	Authorities	Vattenfall maintains an ongoing open dialogue with authorities involved in the energy sector. This is of great importance since authorities in a wide sense set the rules of the electricity market. Vattenfall has a need to understand how authorities want the energy sector to develop, and it is in the company's interest to increase the authorities' knowledge about Vattenfall and the rationale behind company actions. This dialogue is based on openness and respect for the authorities' oversight of the electricity market.	Internal	Employees	Vattenfall has more than 40,000 employees in total, of whom 52% are located in Germany, 26% in the Nordic countries, 15% in the Benelux region, 0.2% in the United Kingdom, and 7% in Poland.
	Non-governmental organisations (NGOs)	It is of utmost importance for Vattenfall to build relationships with NGOs based on mutual understanding and respect. Vattenfall conducts dialogues at the local, national and European levels – for example regarding the company's development of Carbon Capture and Storage (CCS) technology – and has partnered with international NGOs on climate change initiatives.		Employee representatives	Vattenfall has employee representatives in representative bodies such as the European Works Council (EWC–Vattenfall), local co-determination bodies, supervisory boards and commissions. Vattenfall's Board of Directors includes three employee representatives.
	Customers	Vattenfall has 7.8 million electricity customers, 2.1 million gas customers and 5.7 million network customers – in nine countries (Sweden, Finland, Denmark, Norway, the Netherlands, Belgium, Germany, Poland and France).	Financial	Owner (the Swedish state)	For information about the owner, see the Corporate Governance section on www.vattenfall.com .
	Retail customers	Vattenfall offers a variety of electricity and heat services to households in Belgium, Finland, Germany, the Netherlands, Poland and Sweden. A wide range of fixed, variable and tailored pricing options enables customers to choose the most suitable solution. In many markets, electricity with a declaration of origin is also available. Vattenfall has made a number of improvements in recent years, such as through the introduction of a Customer Ombudsman function, installation of remote meters and offering disruption guarantees. In the Netherlands, Vattenfall's policies for avoiding cancellation of energy supply exceed the legal requirements, and the company has taken additional initiatives to avoid cancelling service to customers with special needs.		Investors	These include bond investors, such as insurance companies, pension funds, hedge funds and asset managers, and other lenders, such as banks and credit institutions. Vattenfall's total net debt in 2010 was SEK 144 billion.

Stakeholder engagement (4.16–17)

Listening to stakeholders helps Vattenfall better understand what actions to take and what priorities to set. Information provided by stakeholders includes, for example, concerns regarding climate change, renewable energy sources, security of supply, energy efficiency and equal opportunity policies. Every day a multitude of meetings take place between Vattenfall employees and people with an interest in the company's activities, including one-on-one meetings with customers, business partners, government representatives, local authorities and NGO representatives, dialogues with permit-issuing authorities, consultations regarding environmental impact assessments, investor meetings, general shareholder meetings, employee dialogues and negotiations. Vattenfall's stakeholder interactions are grounded in four basic principles: to listen, to focus on issues instead of solutions, to make stakeholder consultation a part of the day-to-day business, and to make sure to respond to feedback received from stakeholders regarding information practices.

Vattenfall's stakeholder dialogue involves all stakeholders. See also EU19 and SO1.

Examples of Vattenfall's Stakeholder Consultation during 2010 are shown at right.

Examples of Vattenfall's stakeholder consultation during 2010

Stakeholder group	Central level (Group)	Local level
Society	<ul style="list-style-type: none"> • Participation in selected international dialogues on energy and business, such as the World Economic Forum and the UK–Nordic–Baltic Summit. • Ongoing dialogue with a broad spectrum of stakeholders in the EU, such as European institutions, various non-governmental organisations, trade associations and think-tanks. • The Annual General Meeting, which is open to the general public. • Direct dialogue with opinion-shapers in all markets. • Group-wide Brand Reputation Index measurement. • Publication of the CSR Report. Materiality analyses and rankings of stakeholder issues. 	<ul style="list-style-type: none"> • Vattenfall's wind organisation regularly measures acceptance of wind power projects through opinion polls before, during, and after construction. • Vattenfall Hydro Power engages with the Sami population in northern Sweden. One example is the restoration of a station used to separate reindeer from a large herd to different owners. • Student relations are handled locally with well defined key universities, colleges and other schools and with specific messages for defined target groups. Special emphasis is put on encouraging women to choose a technical education. • Vattenfall initiated and developed a carbon abatement study with 15 organisations (15 largest CO₂ emitters) in Uppsala Municipality. This is now the basis of the Uppsala Climate Protocol and actions.
Customers	<ul style="list-style-type: none"> • Group-wide Brand Reputation Index measurement. 	<ul style="list-style-type: none"> • Customer Satisfaction Index measurements (see PR5). • Customer events.
Internal	<ul style="list-style-type: none"> • The annual My Opinion employee survey. • European Works Council – dialogue with employee representatives. • Group-wide Brand Reputation Index measurement. • Annual management conference gathering 250 executives. • Employee events. 	<ul style="list-style-type: none"> • Continued implementation of company philosophy, core values and Code of Conduct. • Annual individual development dialogues between managers and their employees. • Discussion of My Opinion results and action planning in all work teams.
Financial	<ul style="list-style-type: none"> • Group-wide Brand Reputation Index measurement. • Annual General Meeting – open to the public. • Capital Markets Day, an event that gathers analysts, investors, bankers and financial journalists in a dialogue with Vattenfall's senior management on the strategic direction of the company. • Conference calls (webcasts) with capital providers and journalists with the opportunity to ask questions. Investor presentations and one-on-one meetings. • Annual review meetings as well as ad hoc meetings with rating agencies (Standard & Poor's and Moody's). • Publication of annual and quarterly reports. 	

Other contributions to society – Voluntary contributions and investments

Vattenfall strives to be a good corporate citizen, which is manifested through various sponsorship, donation and support activities. According to Vattenfall's Group Instruction on sponsoring, all sponsoring projects should include activities that benefit society, and priority is given to projects with extensive positive social impact.

Vattenfall sponsors a variety of projects within the areas of humanity and ethics, the environment, culture and sports, and community. Following are some examples:

Humanity and ethics

- The World Childhood Foundation – Through the support of more than 100 projects in 14 countries, the World Childhood Foundation works to create a brighter future for the world's most at-risk children – street children, children living in institutions and young mothers. Vattenfall is one of the World Childhood Foundation's major partners and is active as sponsor in all countries in which Vattenfall operates.
- Donations of coal to centres for sick and homeless in Poland.
- In Sweden Vattenfall has a sponsorship agreement with Fryshuset, a foundation working with many projects to support young people in Stockholm, Gothenburg and Malmö. In partnership with Vattenfall, Fryshuset is conducting a tour in Sweden called Fryshusandan to spread knowledge and experience and to award local commitment with Vattenfall's "Energiser" prize.

The environment

- Heureka's Vattenfall Planetarium in Finland is one of the most modern digital planetariums in Europe. Through this co-operation Vattenfall has the opportunity to communicate about the environment, climate change and energy efficiency in a creative way. The planetarium hosts approximately 285,000 visitors per year, of whom many are children and youths.

- In Germany Vattenfall Europe's Environmental Foundation has provided support to 120 projects related to environmental care since 1994.
- Since 2004 the German Stiftung Lausitzer Braunkohle foundation has promoted about 80 projects in the areas of education, international co-operation and the environment in the Lausitz region.

Culture and sports

- Vattenfall sponsors a variety of sports activities, including sponsorship of regional handball and football teams, national ski teams and the Swedish Olympic Committee in Sweden. Vattenfall also sponsors events such as the Berlin half-marathon, the "Cyclclassics" bike race in Hamburg, charity runs in the Netherlands, and swim meets.
- Through Vattenfall's new partnership with the International Ski Federation, Vattenfall has become one of the main sponsors of 16 World Cup Nordic event competitions, the Alpine World Championship in Garmisch Partenkirchen in 2011, the Alpine World Cup in Åre, Sweden, and the Four Hills Tournament (ski jumping).
- Since 2004 Vattenfall has been an exclusive partner of the Brandenburger Tor in Berlin, one of the most famous historical-cultural monuments in Germany.
- Vattenfall sponsors the "Festival of East European film" in Cottbus, Germany (Filmfestival Cottbus, Festival des osteuropäischen Films). This annual event features films from throughout eastern Europe.
- For thirteen years Vattenfall has arranged the Vattenfall Lesetage, in Hamburg. It is one of the biggest literature festivals in northern Germany, offering a wide cultural programme for adults, children and teenagers.
- Vattenfall is also the initiative-taker behind "Vattenfall SchulCup", the biggest school sport event in Germany. Schoolchildren in Berlin, Hamburg and the Lausitz region can participate in cross-country running, basketball, chess and cycling.

Community

- Many of Vattenfall's power plants have visitors' centres, which provide information to the public about the plants' operations and promote dialogue between the local communities and Vattenfall.
- In the Lausitz region, Vattenfall provides occupational training to apprentices in its in-house training centre and participates in a local citizen contact group, and a co-operation agreement has been signed with a science college in Leipzig (Hochschule für Wissenschaft) and the University of Dresden.
- In 2009 Nuon launched the Nuon Energy Foundation (successor of Nuon Foundation), whose objective is to "stimulate employees to volunteer their time for the benefit of society and to support them financially to that goal".
- Nuon has increased its efforts in the area of social work programmes and currently has two social programmes. Within Step2Work, young unemployed individuals receive education and training that is designed to help them regain paid employment. Participants in Nuon Step2Save in the Netherlands receive training and become qualified as energy advisers so that they can give energy savings advice to tenants of participating housing corporations and municipalities.
- In February 2010 Vattenfall Nordic employees participated in a drive to raise funds for children in Haiti following the major earthquake. The funds were donated to Save the Children.

Environmental performance

Vattenfall manages many different energy sources and technologies, all with different environmental characteristics and challenges. Most of Vattenfall's operations are strictly regulated by laws, regulations, and permits – on global, EU, national, regional and local levels. Vattenfall also considers environmental performance to be a foundation for sound business development, which improves the company's competitive position and protects the value of current and future assets.

Environmental goals and performance

At the Group level, Vattenfall sets long- and short-term business planning targets for reducing CO₂ emissions. The long-term development of Vattenfall's generation portfolio requires significant investments, which are co-ordinated at the Group level. At other unit levels, additional environmentally related targets apply.

Environmental Management System

At the Vattenfall Group level, environmental data from operations is reported and consolidated annually in a dedicated reporting process. In addition, reporting on qualitative issues, such as general status development, risks and incidents, is done quarterly.

Vattenfall's Group Environmental Management System includes annual Environmental Management Reviews where corrective actions can be initiated. Most parts of Vattenfall have their own environmental management sub-systems aligned with recognised standards, many of which are certified. ISO 14001 is the most commonly used standard for certification but also EMAS is used. The certificates cover approximately 50% of installed production capacity.

Organisational responsibility for environmental performance

The environmental issues in focus for Vattenfall's Executive Group Management includes strategic development, long-term development and financing, managerial principles and deviation analyses. Based on targets set by the Executive Group Management, each unit has full responsibility for planning, carrying out, following up on and developing its business. This includes taking responsibility for environmental concerns. All organisational

units are required to have access to relevant competence to manage environmental aspects.

Vattenfall's Staff Function Environment manages and follows up environmental issues within the Group and ensures that an efficient and competent environmental organisation is in place at the Group level to support the organisation. Staff Function Environment also monitors and evaluates environmental opportunities and risks of importance for the Vattenfall Group and the Vattenfall brand. Staff Function Environment creates and supports platforms for sharing best practice within the Vattenfall Group. The Head of Staff Function Environment executes the functional responsibility for environmental issues as described in the Vattenfall Management System and is the Environment Management Representative for the Group.

Business Divisions and Business Units have their own Environment Management Representatives and often additional resources to handle their particular environmental aspects.

Environmental risk management

Environmental risks are monitored, managed and mitigated locally in Vattenfall. The Group Environmental Risk Management approach includes six different components including environmental debt, legal and regulatory risks, environmental risks, health and safety risks and incidents and accidents.

Environmental risks (qualitative, as well as quantitative estimates of probability and consequences) are reported and aggregated at the Vattenfall Group level annually.

Training and awareness on environmental issues

Training is important as a foundation for awareness and environmental work. E-learning on important environmental issues is available for all employees. Environmental issues are included in management training programmes, e.g., seminars, newsletters and so forth.

Vattenfall's key environmental aspects

Vattenfall's key environmental aspects include energy and resource efficiency, emissions reduction, management of waste and by-products, responsible land use and biodiversity protection. In addition, as an energy utility with large market presence and

Vattenfall's Environmental Policy

Vattenfall's Environmental Policy, which applies throughout the Group, states the following (extract):

An important part of Vattenfall's vision is to be among the leaders in developing environmentally sustainable energy production. This means that:

- For each energy source and each type of technology, we strive to be amongst the best in class.
- Safety, performance and co-operation are fundamental in our operation.
- We do our utmost to choose modern, efficient and environmentally effective technologies while making a sound assessment, balancing environment and economy when making investments.
- We strive to increase our use of energy sources and technologies that have low emissions of carbon dioxide and other emissions.
- We invest in research and development to improve energy efficiency in our operations, to increase the competitiveness of our renewable and low emission energy sources and to reduce carbon dioxide emissions from our power plants.
- We have a structured and systematic approach to taking environmental and other essential sustainability aspects into account, including setting requirements and targets as well as performing follow-ups. We handle this as an integral part of our business management and have regular strategic discussions within top management.
- We specify and assess environmental, social and ethical performance when selecting suppliers, contractors and business partners.
- We promote customers' efficient use of energy as a means to reduce environmental impact.

Vattenfall governs environmental issues at all organisational levels. Environmental performance is a business responsibility and is described in the Vattenfall Management System, which applies for the entire Vattenfall Group.

Environmental performance

purchasing power, Vattenfall strives to ensure that its activities to improve environmental performance also target suppliers, customers and policy makers:

- Supplier criteria are developed to ensure that UN Global Compact standards are met in procurement. These are described in Vattenfall's Code of Conduct for suppliers. Supplier audits are performed, and Vattenfall may provide support to improve a supplier's environmental work (see also HR2).
- Vattenfall provides retail and industrial customers with support and expertise regarding energy efficiency measures (see EN5–7, PR3).
- Information on the environmental impact of Vattenfall's production and generation is also provided. For some markets, Environmental Product Declarations (EPDs) – detailed information from a life-cycle perspective – are available (see PR3).
- In relation to policy makers, Vattenfall actively takes initiatives and enters into dialogue to stimulate the development of frameworks needed to reduce environmental impact from energy generation while at the same time meeting society's need for secure energy supply.

Materials use

The largest quantities of materials used by Vattenfall are fuels for electricity generation and heat production.

Other large quantities of materials include auxiliary chemicals used mainly for flue gas cleaning, such as limestone, ammonia and urea. Improved flue gas cleaning normally leads to increased use of these chemicals. Long-term structural changes leading to reliable trends can only be seen over at least a 10-year period. The proper measurement time frame would be an investment cycle that lasts 30–40 years.

Across the Group, inventories have been taken of hazardous substances such as asbestos and PCBs, and plans have been put into action to phase out these substances. No PCBs remain in use in Germany, Poland and the Netherlands, but some PCB remains to be phased out in the Nordic operations. Asbestos has been found, and phase-out is on-going. In Sweden, Finland, the Netherlands and Poland, some asbestos still remains to be phased out.

For some energy sources, such as hydro power, wind power and ocean energy, the construction phase is where most materials are used. Vattenfall has specified all environmental impacts from cradle to grave for these energy sources in Environmental Product Declarations (EPDs), which can be found on www.environdec.com.

Waste, both industrial waste and household waste, is a small, yet important part of Vattenfall's fuel mix. It is used for heat

production and electricity generation, both in waste incinerators as well as in co-combustion with other fuels. Almost 100% of the waste is from external sources, and the use of waste as a fuel is increasing. Society strives for efficient recovery of waste, and incineration is an effective method of energy recovery from waste that cannot be recycled. Power plants that have a permit to combust waste are strictly regulated in terms of flue gas cleaning and ash management.

Materials used (EN1)

ktonnes	Lime expressed as CaO	Ammonia	Other chemicals for flue gas cleaning
Sweden	9.61	1.17	0.63
Finland	0.06	0.00	0.00
Denmark incl. UK	22.7	4.45	25.7
Germany	891	4.23	5.33
Poland	9.34	0.00	0.00
Netherlands incl. Belgium	8.60	2.86	0.00
Total 2010	941	12.7	31.6
Total 2009	955	12.9	26.9
Total 2008	975	12.0	29.1
Total 2007	1,030	12.2	25.6

Lime consumption was lower in 2010 compared with 2009 due to lower average sulphur content in the fuel.

Materials used that are waste (EN2)

Percentage of fuel that is waste

% (not including uranium)	
Sweden	32.0
Finland	1.8
Denmark incl. UK	0.0
Germany	3.4
Poland	0.0
Netherlands incl. Belgium	0.0
Total 2010	3.1
Total 2009	2.6
Total 2008	2.7
Total 2007	2.4

Two new waste incinerators were put in operation in Germany with an aggregated fuel use of 1.4 TWh in 2010.

Energy

Energy efficiency is one of the most important environmental aspects for Vattenfall. Improved efficiency in power plants means that society's need for energy will be met while using less resources and causing less environmental impact per generated unit of energy. Many development and investment programmes aim to increase energy efficiency.

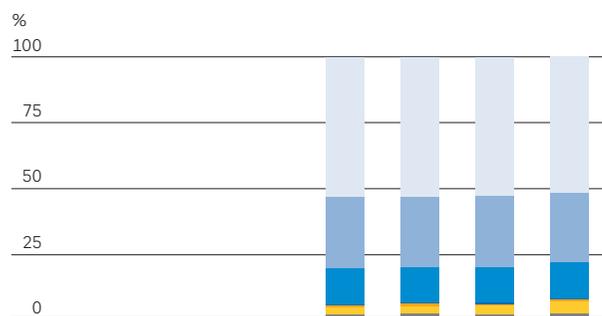
Generation of heat and electricity is dependent on many factors, such as weather and market conditions. During cold winters, demand for heat and electricity is higher, resulting in more generation, often from energy sources with higher emissions. In a very dry year, there is less hydro power available, and other generation – possibly fossil-based – will increase. This is also the case when nuclear power plants are not in operation. The energy market is also affected by the overall economy, fuel prices, etc. For additional information, see the 2010 Annual Report.

Energy use (EN3–4)

Vattenfall's major energy use consists of fuels. Uranium is used in nuclear power plants to generate electricity. Fossil fuels (lignite, hard coal, oil and natural gas), peat, biomass fuels, blast furnace gas and waste are used to generate electricity and heat. Electricity is also generated in hydro power plants, wind power plants and to a small extent in solar cells.

The largest indirect source of energy consumption is electricity for operating power plants. This electricity is derived primarily from own generation, and data is not gathered at the Group level. The environmental impact of this electricity is accounted for through reporting of net production. The second largest source of consumption consists of losses in energy transfer. Electrical resistance in power lines and transformers inevitably causes technical distribution losses amounting to around 6 TWh under normal conditions. Mining is the third largest source of electricity consumption, consuming 1.2 TWh electricity from Vattenfall's own generation, when large amounts of ground water and overburden material (mostly sand) have to be redistributed.

Total use of fuels per year

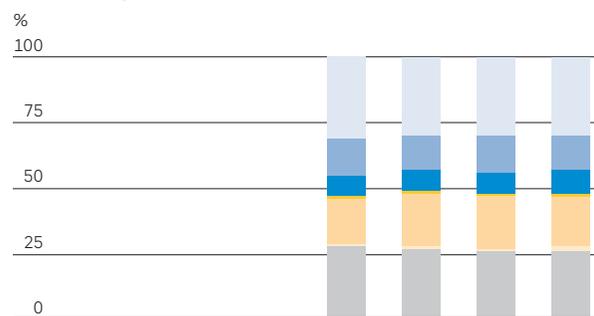


TWh	2007	2008	2009	2010
Lignite	149	144	140	143
Hard coal	76.2	71.3	71.3	73.5
Gas	38.7	36.6	36.1	37.7
Peat	1.1	1.3	1.4	1.6
Waste non-biogenic	2.0	2.2	2.0	2.6
Biomass & biogenic waste	7.7	8.1	8.2	11.7
Other fuel incl. oil	6.0	6.4	5.8	6.9
Total	281	270	265	277
Uranium, tonnes	136	146	140	104

Higher electricity demand and cold winters, resulting in higher heat demand, led to an increase in fuel consumption.

The reported uranium use was lower in 2010 than in 2009 due to the fact that Ringhals unit 2 did not have any fuel reload in 2010. A reload was made in 2009, and the next will be done in 2011. Ringhals units 3 and 4 reloaded small amounts in 2010 due to shorter operating cycles.

Electricity generation mix per year



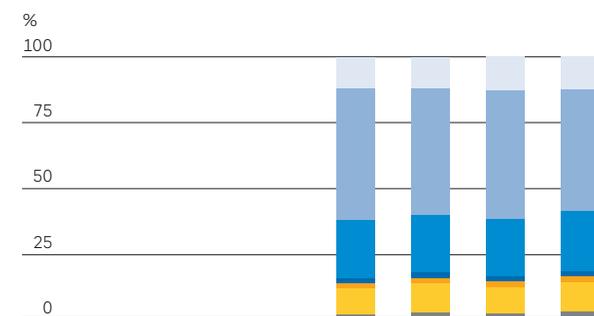
TWh	2007	2008	2009	2010
Lignite	54	52	50	51
Hard coal	25	23	23	22
Gas	15	14	13	14
Peat	0.14	0.25	0.26	0.31
Waste non-biogenic	0.35	0.41	0.33	0.50
Biomass & biogenic waste	1.1	1.2	1.1	2.2
Hydro power	31	34	32	32
Wind incl. solar	1.8	2.1	2.0	2.5
Nuclear power	51	46	42	44
Other fuel incl. oil	0.60	0.57	0.66	0.80

Total generation excl. pumped storage

Electricity generation from biomass and biogenic waste increased from 2009 to 2010. The reasons are increased co-combustion of biomass, new straw-fired units in Denmark, and new waste-fired units in Germany.

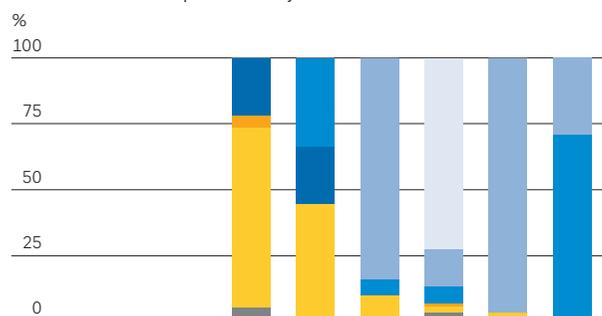
TWh	2007	2008	2009	2010
Total generation excl. pumped storage	180	173	164	170

Heat production mix per year



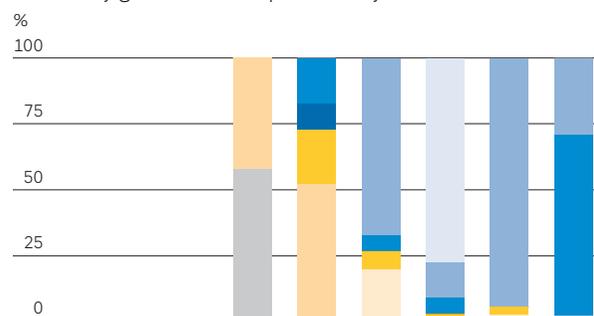
TWh	2007	2008	2009	2010
Lignite	4.9	5.1	5.3	6.1
Hard coal	20	20	21	23
Gas	8.9	9.3	9.3	11
Peat	0.8	0.8	0.9	1.0
Waste non-biogenic	0.8	0.8	0.8	0.8
Biomass & biogenic waste	4.1	4.5	4.4	5.6
Other fuel incl. oil	1.0	1.0	1.0	1.4
Total	40.8	41.7	42.6	49.4

Total use of fuels per country



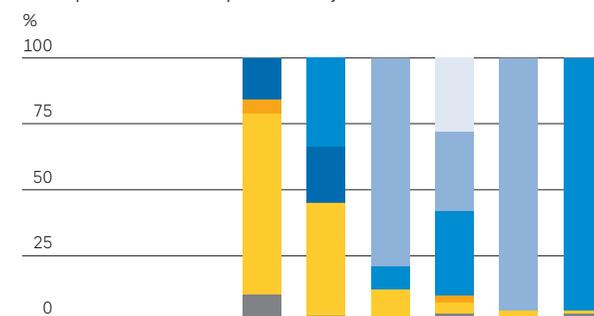
TWh	SE	FI	DK incl. UK	DE	PL	NL incl. BE
Total	5.1	2.1	21.4	197	19.4	31.9

Electricity generation mix per country



TWh	SE	FI	DK incl. UK	DE	PL	NL incl. BE
Total generation excl. pumped storage	77	0.66	9.3	66	3.8	13

Heat production mix per country



TWh	SE	FI	DK incl. UK	DE	PL	NL incl. BE
Total production	4.3	1.5	6.4	22	12	3.7

Energy-efficient and renewable energy-based products (EN5–7)

Energy efficiency and increased generation from renewable energy sources are fundamental components of Vattenfall's environmental strategy.

Initiatives and activities to increase efficiency are performed across Vattenfall's operations, and efficiency measures in power plants target both direct and indirect energy use. Continuous improvement work is long-term, and data on energy savings is not currently gathered at the Group level, since measurements are very complex.

A number of energy efficiency projects were carried out during the year. For instance, refurbishment programmes in Sweden and in Finland led to increased efficiency equivalent to the generation of a new hydro power plant, with the same amount of water. In Poland, investments are being made in the electricity distribution grid to reduce distribution losses, thereby improving energy efficiency and reliability.

During the year, the City of Stockholm and Vattenfall made a joint effort to promote electric cars in the Swedish capital through joint procurement of a fleet of electric cars for companies and municipalities. The first cars will be rolled out during 2011. In addition, a new Group-wide car fleet policy was introduced that establishes a CO₂ limit for company cars and provides a foundation for future electric vehicles in the company fleet.

Vattenfall has a substantial investment programme to increase renewable energy generation across the Group (see page 14). Electricity from renewable energy sources is sold to customers in all of Vattenfall's main markets, and Vattenfall actively supports industrial and retail customers in energy efficiency improvements. This includes providing customer advice, consulting services to industry, advertising, offering energy-saving products, such as meters, holding seminars, promoting energy-saving incentives and so on. In addition, Vattenfall supports extensive research and development of future energy saving products, possible future energy sources and programmes within R&D to promote further energy savings in society.

Water use

Water is used in many of Vattenfall's operations. In mining, ground water is removed, cleaned and returned to water bodies. In combustion power plants and nuclear power plants, water is used for cooling. Hydro power plants affect the hydrology of rivers. Vattenfall takes a water balance perspective to its management of water use, considering impacts of water withdrawal as well as discharge. Impacts of water use include temperature changes and the impact on biodiversity in surrounding water

bodies, among other things. Risks for emissions and leakages, for example of oils, into water bodies are carefully monitored, and preventive measures are taken.

Use of water for cooling

The cooling process at nuclear power plants and combustion power plants requires water, and cooling water is taken from rivers, lakes and the sea.

The largest amount of cooling water is used in Vattenfall's nuclear power plants in Sweden and Germany, and most of the water is taken from the sea. The temperature increase from discharges of cooling water is monitored and kept within specific limits for each respective plant. In terms of the plant's environmental performance, the benefits of efficient cooling exceed the temperature increase caused from discharges of cooling water into a large body of water.

Power plants with inland locations use cooling towers and thereby significantly less water. For example, Vattenfall's lignite power plants use state-of-the-art industrial cooling systems, with cooling towers and closed cooling cycles, demonstrating water consumption generally less than 2 m³/MWh.

Use of water in lignite mining

The water sources most significantly affected by withdrawal of water are around Vattenfall's lignite mines in Germany: Jänschwalde, Cottbus–Nord, Welzow–Süd, Nochten and Reichwalde (no mining is currently being conducted at Reichwalde).

In 2010, approximately 384 million m³ of groundwater was removed to make fuel extraction possible. The removed groundwater is cleaned and used to cover the freshwater requirements of the nearby lignite-fired power plants, thereby sparing other water sources. Vattenfall's need for freshwater is well below the amount of removed groundwater, and the treated excess groundwater is made available to nearby municipalities and industries. Even though Vattenfall and the surrounding municipalities and industries make use of the water, most of the cleaned groundwater is returned to rivers and lakes.

So-called eco-water inlets are used to support protected rivers and watercourses around the mines from running dry as a result of lowered groundwater levels during mining. About a fourth of the extracted mine water is used for this purpose.

To further limit the impact of lowering the groundwater when draining open-cast mines, "sealing wall" technology has been developed by Vattenfall. Inflows from watercourses, valley plains or wetlands are sealed off by underground sealing walls on the periphery of the open-cast mine. To date, Vattenfall has built sealing walls 7 km and 9 km in length along the Jänschwalde and Cottbus–Nord open-cast mines, respectively. In 2009, construc-

tion of an additional sealing wall was started at the Reichwalde open-cast mine, which had a length of approximately 500 m by the end of 2010, and in 2010 construction of a sealing wall was started at the Welzow–Süd open-cast mine.

Hydro power

Vattenfall owns and operates hydro power plants in Germany, Sweden and Finland. In Germany, pumped storage power plants are used to store energy from other energy sources. River regulation and reservoirs for hydro power and pumped storage power have an impact on the natural water flow of rivers as well as on the surrounding landscape. Hydro power plants have a significant impact on biodiversity in rivers and streams, especially fish spawning grounds and the ability of fish to reach them. For this purpose, fish ladders for salmon and trout have been constructed on some of the regulated rivers where spawning areas exist upstream of power stations. Every year, Vattenfall's Nordic operation plants about 1.3 million fish in rivers and streams. In Germany, Europe's largest fish ladder was opened, which will help to repopulate the Elbe River with the almost extinct Atlantic sturgeon.

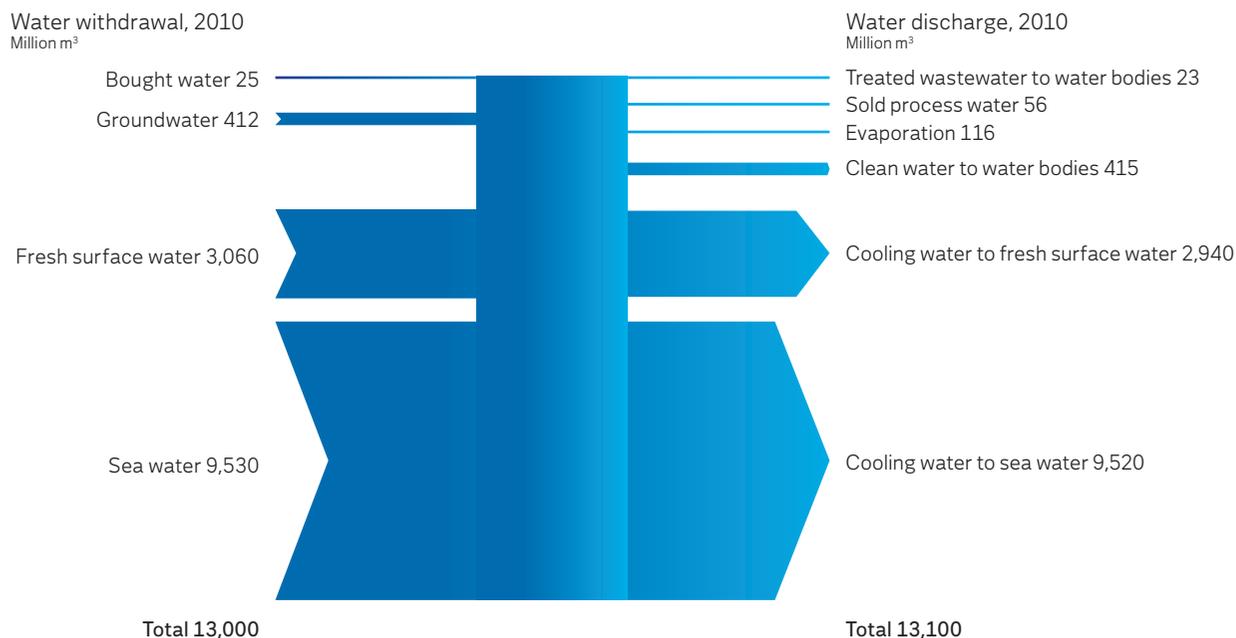
For each hydro power plant, permits regulate how flows are allowed to fluctuate. In some cases, it is ecologically motivated to determine a so-called instream flow, or minimum flow, to ensure a continuous water perimeter. This means that the flow is never allowed to fall below a set minimum level. A combination of instream flow, weirs and other physical adjustments can be very effective for enhancing the conditions for aquatic organisms.

Re-creating spawning areas is another way of promoting fish populations. These measures have been performed in some of the rivers in which Vattenfall operates hydro power plants.

A number of initiatives and investments have been taken to improve the efficiency and environmental standard of Vattenfall's hydro power operations, including a new oil strategy, replacing oil in the hydraulic system with a mixture of water and propylene glycol, improving the quality of smolt released into rivers, building new fish ladders and various efforts to rescue Swedish eel.

Total water withdrawal and discharge (EN8, EN21)

Vattenfall has conducted a thorough analysis to assess the largest streams and impacts from the use of water by the Group. This analysis has resulted in the reporting of ten water parameters, covering both water withdrawal and water discharge.



Most water intake is used for cooling. The largest part is taken from the open sea and returned to the sea. Input and output flows will not match exactly as minor flows are left out.

Effect on water sources and biotopes (EN9, EN25)

Due to the diverse nature of Vattenfall’s operations and large number of sites, information on water sources, protected status and biodiversity values of water bodies is handled locally, as it is most efficient. Information is therefore not gathered at the Group level; however, the water use and main sources are described in general and with examples under “Water use” above.

Land use and biodiversity

The nature of Vattenfall’s operations, with large power plants, dams, open-cast mines, wind farms and electricity networks, has a physical and visual impact on the landscape. The affected areas have differing biodiversity value, and the conservation processes and actions differ accordingly.

Before starting new construction or major rebuilding work, envi-

ronmental impact assessments are carried out, including impacts on biodiversity. Vattenfall strives to harmonise operational facilities with the landscape and the environment, and is committed to the protection of flora and fauna in the surrounding area. This is often a requirement of the permits granted by the regulatory authorities to operate power plants, and processes to obtain permits and protect biodiversity are well established within Vattenfall. This work is done in co-operation with national and regional authorities.

Furthermore, Vattenfall has developed the Biotope Method, an assessment tool for quantifying the impacts on biodiversity of land and water use. Impact assessments of Vattenfall’s Nordic generation are described in Environmental Product Declarations (these can be found at www.environdec.com). For impacts in the supply chain, see HR2.

In Sweden, a pilot project was started in 2009 whereby environmental values are studied in the vicinity of selected hydro power plants. The study will form the basis for assessments of the impact

of various technical solutions when hydro power plants are to be rebuilt, improved or enhanced. Early environmental inventories allow the observed environmental values to be taken into account when alternative technologies are analysed.

Land use in protected areas (EN11)

Vattenfall’s most significant land use pertains to electric transmission corridors, power plants – especially hydro power plants – and lignite mining operations in Germany. Due to the diverse nature of the operations and the large number of sites, information on protected status and biodiversity values of sites is handled locally, as this is most efficient. Information is therefore not gathered at the Group level.

Description of impacts, protection and management of biodiversity (EN12–14, EU13)

Land use in lignite mining

Vattenfall’s lignite mining in Lausitz, Germany, is conducted in open-cast mines, which claim land areas. The impact on the landscape is considerable when the cast is open, but mining and re-cultivation of mined areas are two phases of the same operation.

Re-cultivation planning starts during the early planning stages of mining. The interests of authorities and business as well as the concerns of the local community are taken into consideration in the early planning, and affected stakeholders are invited to take part in the process (see also SO1, EU20, EU22). All land used for open-cast lignite mines is acquired by Vattenfall. Co-operation with potential future land users and local stakeholders creates a solid basis for making productive use of the land after concluding mining activities. Re-cultivation programmes aim to achieve a natural, pre-industrial landscape. The objective is to allow for sustainable agriculture, forestry and water management in the post-mining areas in combination with desirable biodiversity, a harmonious landscape and possibilities for outdoor life. The factors that characterise the new landscape are soil quality, land and water distribution, and topography. Lakes are planned for the post-mining landscape.

During the active operational period of Vattenfall’s five lignite mines in Germany, to date 177 km² have been claimed. Land use in 2010 was 5.28 km² (6.61 km² in 2009). Large quantities of land mass are redistributed in order to enable lignite extraction from the open-cast mines. In 2010, a total of 406 million m³ of land mass (396 million m³ in 2009), mainly sand, was moved to extract 57 million tonnes (56 million tonnes in 2009) of lignite. A total of 5.2 km² (3.5 km² in 2009) were re-cultivated, of which 2.1 km² have been restored to forestland and 0.6 km² to agricultural land.

In Germany, Vattenfall owns and operates 335 km of railway, used for transporting lignite from mines to power plants. Rail is

Environmental performance

also used to transport lime to the power plants and ash and gypsum from the plants. The railway is connected to Deutsche Bahn at two junctions, and Vattenfall owns and operates its own fleet of engines and wagons.

Land use and biodiversity around electricity transmission corridors

Electricity networks also have an impact on large land areas. Overhead transmission and distribution lines, in particular, claim significant land areas. The length of transmission and distribution grid lines provides an indication of the land areas used. The lengths of Vattenfall's local and regional distribution grid lines are 449,000 km. In the cities of Berlin and Hamburg, the networks are mainly served by underground cables. In addition, Vattenfall had 10,000 km of transmission grid lines in Germany, which were divested by mid-2010.

Power lines are a potential threat to birds. Vattenfall takes measures to minimise this risk by equipping power lines with devices to prevent birds from flying into the power lines.

In some cases though, this has a positive impact on biodiversity. In Sweden, studies show that many rare species have found refuge around overhead distribution grid lines thanks to the regularly recurring right-of-way clearance. Sections of Vattenfall's Swedish power line corridors have been declared "Natura 2000" areas, harbouring rare and red-listed species. This means these areas represent valuable natural habitats to be preserved with the help and support of the EU, with the aim of protecting biodiversity. During 2010, plans for adjusted clearing of four Swedish power line corridors in Natura 2000 areas were developed and communicated. Special consideration is taken when performing maintenance work in these areas.

Land use for power plants

Power plants, offices and other buildings use limited land area. However, reservoirs for hydro power plants have a significant impact on the landscape. Vattenfall's most significant impact comes from the large reservoirs for river regulation in Sweden, involving both natural lakes and inundated land. The reservoirs hold approximately 9,500 million m³ and cover an area of approximately 640 km². The variation in storage period is from zero to several years. The area in which the water is allowed to vary is defined in water rights, and the deviation is between 0 to 34 metres, depending on the reservoir.

Vattenfall has established a number of environmentally protected areas along the Lule River in Sweden. The company's commitment in these areas consists of taking inventories, long-

1) Approximately 70% of these emissions are N₂O emissions, and the remaining 30% are CO₂ emissions from operations and emissions of other greenhouse gases.

term conservation, enhancing natural assets and presenting them for visitors.

In Warsaw, Poland, 48 hectares will be available for alternative use after the Myśluborska ash landfill adjacent to Żerań CHP closes. The future direction of reclamation of the land will be agreed upon with local authorities.

Emissions

The most significant environmental impact of Vattenfall's operations¹ that remains to be handled is from CO₂ emissions from fossil fuel combustion in energy generation, both in terms of quantity and their effect on global warming. Vattenfall believes that curbing CO₂ emissions will be the overriding challenge of our time and a defining issue for the power industry. Therefore, Vattenfall has laid out the strategic direction of reducing emissions from energy generation by developing low CO₂-emitting technologies and reshaping Vattenfall's energy generation portfolio during the coming 20 years.

Vattenfall has set the target to reduce emissions of CO₂ per kWh in its generation portfolio. The long-term target is a 50% reduction by 2030 compared with 1990.

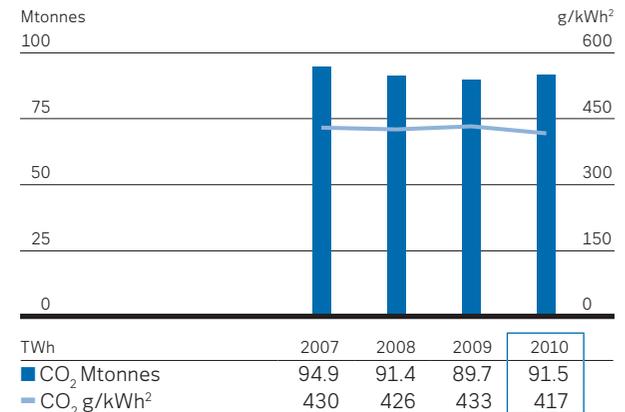
Other significant emissions from Vattenfall's operations are sulphur dioxide (SO₂), nitrogen oxides (NO_x) and particulates. These emissions are significantly reduced by flue gas cleaning. Small amounts of greenhouse gases other than CO₂, such as nitrous oxide (N₂O) and methane (CH₄), are produced in boilers when any fuel is combusted. Sulphur hexafluoride (SF₆) is still used in some electrical equipment. Vattenfall strives to reduce emissions as far as possible by using advanced technologies to keep its emissions below national and regional requirements.

Greenhouse gas emissions (EN16–17)

The predominant greenhouse gas emission consists of direct CO₂ emissions from fossil fuel combustion for electricity and heat production. Direct emissions of other greenhouse gases than CO₂ and direct emissions from other activities than energy generation, amount to approximately 1 million tonne of CO₂-equivalents, which corresponds to approximately 1% of reported CO₂ emissions. Indirect emissions from fuel transport and business travel account for less than 0.5% of total greenhouse gas emissions. Emissions from use of electricity (scope 2 according to the Greenhouse Gas Protocol) are included in direct emission, since most electricity used is from Vattenfall's own generation.

CO₂ emissions are dependent on weather conditions and economic development (see also EN3–4). During cold winters, demand for heat and electricity is higher, resulting in more generation and consequently more emissions. During a very dry year, when there is less availability of hydro power, generation from other – possibly fossil-based – energy sources will increase. This is also the case

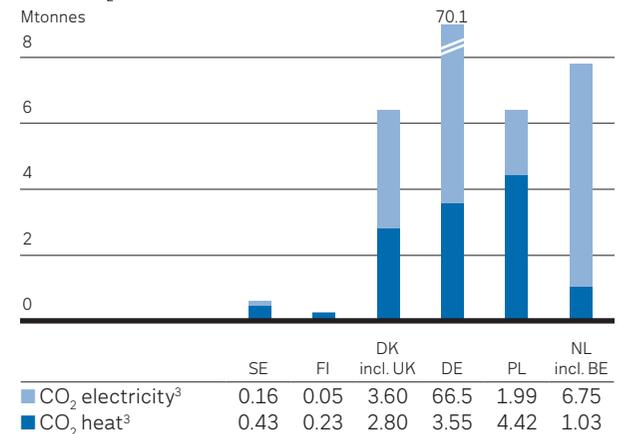
when nuclear power plants are not in operation. This makes it difficult to monitor short-term trends in CO₂ emissions per year (total and specific)



2) Average of electricity and heat

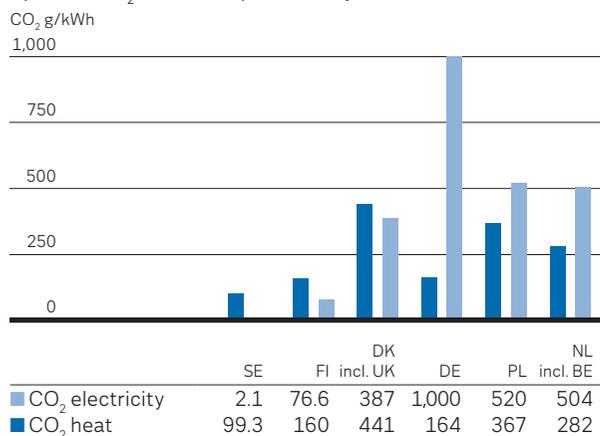
Increased production in 2010 compared with 2009 led to higher absolute CO₂ emissions. Specific CO₂ emissions have decreased due to an increased share of heat production (often by co-generation with electricity) depending on colder weather. This has increased the overall efficiency.

Total CO₂ per country



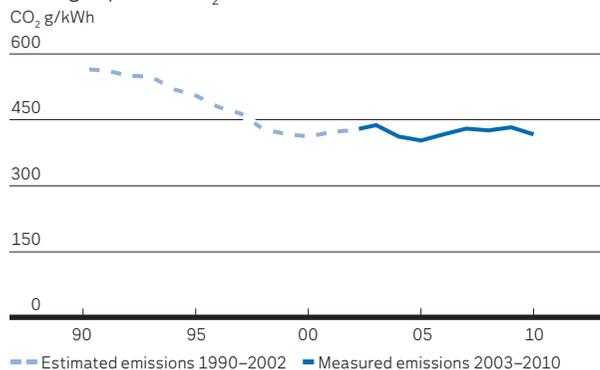
3) Allocation of CO₂ between electricity and heat is based on national methods.

Specific CO₂ emissions per country¹



1) Allocation of CO₂ between electricity and heat is based on national methods.

Average specific CO₂²



2) Average of electricity and heat. Historical data for Nuon before 2003 is missing. An estimation based on a constant market share and total energy sector emission in the Netherlands has been used to estimate Vattenfall's total emissions recalculated according to the Greenhouse Gas Protocol.

Initiatives to reduce greenhouse gas emissions (EN18)

Investments and work on reducing emissions are long-term. A fundamental requirement is that society's needs for secure energy supply and stable energy prices are met.

Vattenfall is involved in a number of both large- and small-scale initiatives aimed at reducing greenhouse gas emissions. Overall activities and investments to reduce such emissions include

increasing generation from renewable energy sources, equipping coal-fired power plants with Carbon Capture and Storage (CCS) technology, and increasing nuclear power capacity. Improvements are also being made to existing technology in an effort to increase efficiency, resulting in reduced emissions per generated unit of electricity and heat. In addition, Vattenfall has a substantial R&D programme supporting the development of new renewable energy sources, as well as better use of existing ones.

Increased use of renewables

During the year, a new biomass programme was launched with the aim of increasing the use of sustainable biofuels in Vattenfall's energy mix. The number of combustion plants, co-fired or totally replaced with biofuels, has increased both in Poland and in Denmark. Vattenfall is now one of Europe's largest users of biomass. To secure biomass supply for the company's biomass operations, in 2010 Vattenfall acquired a stake in the Liberian biomass company Buchanan Renewables Fuel (see page 34). Also during the year, Vattenfall entered into a partnership with the Dutch Energy Research Centre to test a new technology for upgrading biomass to high-quality solid fuel.

In 2010 Vattenfall continued investing in renewable energy for long-term reduction of CO₂ emissions, most notably in wind power. The inauguration of the Thanet offshore wind farm off the coast of Britain represents a major investment of nearly EUR 1 billion. The wind farm has the capacity to meet the electricity needs of 240,000 homes. It is currently the world's largest offshore wind farm.

Other projects include the Alpha Ventus wind farm offshore the island of Borkum in the German North Sea, which was commissioned during the year, and the Ormonde wind farm offshore the coast of Britain in the Irish Sea.

Coal using Carbon Capture and Storage (CCS) technology

Vattenfall is a leader in the development and commercialisation of CCS technology (see also page 12). Since 2009, a CCS pilot plant in Schwarze Pumpe, Germany, has been in operation and is providing valuable results for further steps in the development. In addition, construction of another pilot CO₂ capture plant, Buggenum, in the Netherlands, is under way. A CCS demonstration plant in Jämschwalde, Germany, is planned to open in 2015, where two different technologies will be tested. These are important steps for reducing green gas emissions in Vattenfall's operations, securing the competitiveness of the Group's energy mix and reaching the goal of achieving a 50% reduction in CO₂ emissions per kWh by 2030, compared with 1990 levels.

Nuclear power

Nuclear power generation has low emissions and plays an important role in Vattenfall's strategy to reduce CO₂ emissions from electricity generation in the markets where it is accepted. Significant investments are being made to increase the power output

in the Group's nuclear power plants, both by increasing plant efficiency and by capacity increases. In all, these measures will boost generation of low carbon electricity by some 8 TWh annually, thereby reducing the environmental impact per generated kWh of electricity. In parallel, continuous efforts are being made to ensure world-class safety management.

NO_x, SO_x and other emissions to air (EN20)

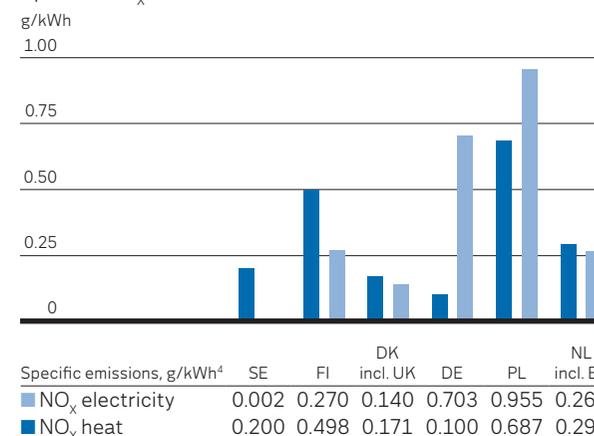
Other emissions to air include SO_x, NO_x and particulates, which have decreased in recent decades due to the modernisation of generation facilities and installation of flue-gas cleaning equipment. Some acquired facilities have not yet been equipped with the latest technologies, and work is being done to bring them up to Vattenfall's standards.

Total emissions SO_x, NO_x and particulates

Absolute emissions, ktonnes ³	Sweden	Finland	Denmark incl. UK	Germany	Poland	Netherlands incl. Belgium
NO _x electricity	0.14	0.18	1.30	46.7	3.64	3.56
NO _x heat	0.86	0.73	1.09	2.17	8.28	1.07
SO _x electricity	0.14	0.03	0.45	45.9	7.36	1.38
SO _x heat	0.44	0.24	0.39	1.56	16.5	0.04
Dust electricity	0.01	0.00	0.11	1.07	0.25	0.05
Dust heat	2.46	0.04	0.09	0.03	0.63	0.00

3) Allocation of emissions between electricity and heat is based on national methods.

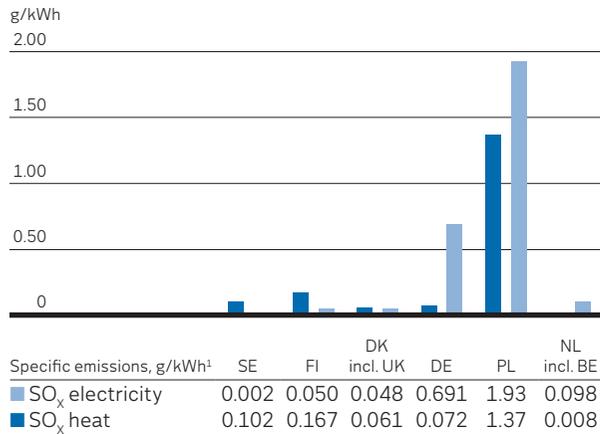
Specific NO_x



4) Allocation of emissions between electricity and heat is based on national methods.

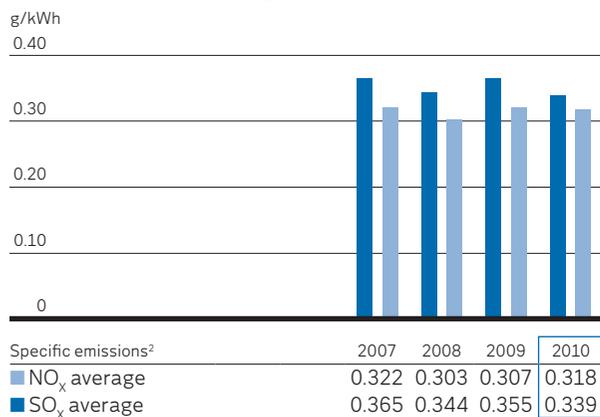
Environmental performance

Specific SO_x



1) Allocation of emissions between electricity and heat is based on national methods.

Specific NO_x and SO_x emissions per year, electricity and heat average



2) Emissions of SO_x vary from year to year, depending on varying sulphur content in the lignite mines.

Waste, residues, by-products and spills

Vattenfall's operations generate various types of waste and residues. Nuclear power plants generate radioactive waste. Combustion of solid fuels such as coal, biomass and waste generate ash and mineral by-products, such as gypsum, which can be reused.

Waste management

Depending on different national legislation, some of the ash generated in Vattenfall's power plants falls under waste legislation. Vattenfall strives to enable reuse of ash by applying quality and environmental standards. Hazardous waste is treated in accordance with permits and regulations.

Waste from construction and the decommissioning of power plants, distribution grids, etc., is handled in accordance with the respective national legislation. Vattenfall strives to promote reuse and recycling of construction waste. Amounts of waste vary from year to year, depending on the type of operation, ongoing construction work, etc.

Most waste from Vattenfall's administrative offices, such as paper, etc., is recycled. Waste from IT is handled locally by the vendor of the equipment, or by specialised companies.

Reuse of residues, ash and mineral by-products

Combustion of solid fuels and flue gas cleaning result in large amounts of useful ash and gypsum, which are considered as by-products. When ash and by-products are substituted for other materials, it leads to less consumption of new resources. It also significantly reduces the amount of ash that has to be deposited. Most ash and mineral by-products from Vattenfall's plants are reused, and increased use is encouraged. Studies show that the risks associated with using ash as construction material are very small. Vattenfall undertakes research efforts together with the construction industry to improve the use of ash.

The most significant by-products are ash from lignite- and coal-fired plants, and gypsum from flue-gas desulphurisation. This gypsum is sold to Europe's gypsum and cement industry.

Ash from lignite power plants is mainly used in the open-cast mining area for landscaping in the post-mining environment. Ash from Vattenfall's hard coal combustion in Germany, Poland and Denmark is used in the construction industry and for road construction.

Some of the ash from biomass combustion is spread in forests as fertiliser. As biomass fuel use increases, ash from biomass fuels is also increasing.

Some ash needs stricter handling, however. Ash from waste incineration is strictly regulated. Ash is reused to the greatest possible extent, and smaller fractions with high metal content are deposited at special sites. Fly ash from the Uppsala waste incineration plant is sent to Langøya, Norway for reuse as filling material.

Radioactive waste

Vattenfall operates nuclear power plants in Sweden and Germany. It is the operator's responsibility to have reliable and acceptable solutions for managing nuclear waste. High-level long-life radioactive waste, which consists primarily of spent nuclear fuel, must be carefully shielded during handling and transportation. It takes approximately one hundred thousand years for the radioactivity

to decline to the level that occurs in the uranium ore from which the fuel was originally extracted. Vattenfall supports research and development on final disposal solutions for radioactive waste, a process that is conducted according to different time plans in Sweden and Germany.

In Sweden, the Swedish Nuclear Fuel and Waste Management Company (SKB) has developed a solution for a final repository for spent nuclear fuel. SKB is jointly owned by Sweden's nuclear power operators.

In 2009 SKB selected a site near the Forsmark nuclear power plant, in Östhammar municipality, as the most suitable location for a final repository. The site selection was based on several factors, such as extensive requirements on the bedrock characteristics and long-term safety, environmental impact, supporting infrastructure and local acceptance. The final design and licensing procedures are still to be completed. In 2011 SKB will apply for the permits needed for the final repository in accordance with the Swedish Act on Nuclear Activities, and will simultaneously apply for permits for the interim storage facility, the encapsulation facility and the final repository in accordance with the Swedish Environmental Code.

The first spent nuclear fuel can be deposited in the final repository by 2020 at the earliest. Meanwhile, all spent nuclear fuel in Sweden is stored in water basins 30 metres below ground level at a central interim storage facility in Oskarshamn municipality. Swedish radioactive operational waste is stored in a final repository (SFR), which is also near the Forsmark nuclear power plant.

In Germany, plans to establish two final repositories, both in deep geological formations, are being investigated. Following initial studies, the use of a salt formation near Gorleben for high active waste has been explored. This exploration has still not been finalised. The Gorleben repository was chosen out of more than 140 salt formations in the 1970s. For Gorleben (or any other repository in salt formations), all basic technology and tools have already been developed. In Germany the interim facilities are located at the nuclear power plants and operated by the nuclear power companies.

For low- and intermediate-level waste with negligible heat generation, the former Konrad iron mine is fully licensed and under construction. Start of operations is now planned for 2015.

Costs associated with the final disposal of radioactive waste from today's nuclear electricity generation are borne today. It has been taken into consideration that a significant part of the costs for the final disposal of high-level radioactive waste is incurred many years after production has been closed down. In Sweden, the nuclear power companies continuously pay fees to the Swedish Nuclear Waste Fund, which is a state fund intended to cover all costs associated with waste handling and storage, and dismantling of nuclear reactors. In Germany, costs associated with the final disposal of nuclear waste are to be borne by those who produce the radioactive waste. Normally, provisions are built up to cover the cost of handling nuclear waste and decommissioning. These provisions remain within the nuclear industry, i.e., the utilities and energy

companies. These provisions are reported in the companies' respective financial statements. See also EU9.

Waste and mineral by-products (EN22)

Treatment of waste¹

ktonnes	Hazardous waste excl. radioactive ²		Non-hazardous waste	
	Recovered	Deposited	Recovered	Deposited
Sweden	4.05	2.68	11.3	3.93
Finland	0.18	0.03	0.44	0.28
Denmark incl. UK	0.55	15.6	2.14	2.42
Germany	104	78.6	214	18.8
Poland	0.20	0.21	9.35	0.48
Netherlands incl. Belgium	0.00	0.51	0.00	3.46
Total 2010	109	97.0	237	25.9
Total 2009	82.2	34.7	320	27.3
Total 2008	76.1	20.9	153	21.0
Total 2007	77.9	17.7	172	19.7

1) Totals 2007–10 are excluding the Netherlands and Belgium.

2) Hazardous waste includes fly ash from waste incineration.

Two new waste incineration plants in Germany were put in operation, resulting in an increase in fly ash classified as hazardous waste.

By-products

ktonnes	Fly ash	Furnace bottom ash	Ash from biomass fuels	Slag from waste incineration	Other by-products	
					Gypsum	
Sweden	0.0	0.0	64.0	62.0	0.8	11.0
Finland	0.0	0.0	19.8	0.0	0.0	0.0
Denmark incl. UK	274	34.7	19.6	0.0	63.8	52.7
Germany	4,260	1,080	14.9	243	2,650	36.2
Poland	468	50.1	0.0	0.0	0.0	0.0
Netherlands incl. Belgium	79.9	45.3	0.0	0.0	26.1	1.9
Total 2010	5,080	1,210	118	305	2,740	102
Total 2009	5,080	1,210	53.0	255	2,920	73.2
Total 2008	5,340	1,220	63.2	287	2,960	80.3
Total 2007	5,170	1,220	48.5	275	3,110	64.1

Other by-products mainly consist of desulphurisation products other than gypsum.

Radioactive waste

Radioactive waste	Medium and low-level radioactive operational waste (m ³)	Nuclear core components (tonnes)	Spent nuclear fuel – assemblies taken out (tonnes)	Spent nuclear fuel – original uranium content (tonnes) ¹
Sweden	498	494	135	82
Germany	63	0	0	0
Total 2010	561	494	135	82
Total 2009	514	0	185	141
Total 2008	3,670	0	206	147
Total 2007	1,290	10	202	148

1) Original uranium content in assemblies taken out.

The increase in reported waste from nuclear core components is relating to maintenance work at Forsmark.

Spills and contamination (EN23)

The risk for spills and other contamination is monitored, managed and mitigated locally. Incidents that could possibly result in significant environmental impact, such as spills, leaks and contamination, are reported in accordance with Vattenfall's Incident and Crisis Management (ICM) framework, see EU21.

Many of Vattenfall's facilities have been operating for a long time. Work is under way to identify land that was contaminated during times when environmental awareness was lower and environmental legislation was less rigorous. Contaminated land exists in the Nordic countries, Germany and Poland. Known contaminated sites have been identified and characterised. Action to restore such land is taken when necessary and in dialogue with the authorities.

Monitoring programmes have been developed. For example, all potentially contaminated sites around Vattenfall's facilities in Sweden have been identified, and potential risks associated with the contamination have been assessed. The plan for taking care of contaminated land is progressing on schedule.

Operational safety

Safety is a fundamental aspect and basic requirement for all of Vattenfall's operations. Adverse impact on human health and safety is minimised through comprehensive safety work and well-established risk management systems. Within the nuclear operations area, the Vattenfall Group co-ordinates all safety work through the Chief Nuclear Officer, who reports directly to the CEO (see also EU21). Dam safety is an important aspect of hydro power, since a dam failure could have serious consequences, causing substantial property damage and a threat to human life. The risk of a dam failure is extremely small, and current requirements are calculated for water flows that statistically occur every 10,000 years. Vattenfall has invested actively in improved dam safety and is

active in the industry's dam safety work. International audits indicate that Vattenfall's dam safety has a very high standard.

Risks for incidents, contamination and significant spills are carefully monitored, managed and mitigated locally (at the plant and regional level). Examples of risks include oil leaks from transformer stations and oil-filled cables in the distribution grid, and accidental discharges to water from power plants (for example, from hydro power plants). Training in co-operation with local authorities to prepare for possible incident scenarios is carried out at regular intervals in parts of the organisation. In addition, incidents, including such where there is a risk for environmental impact, are handled according to Vattenfall's Incident and Crisis Management (ICM) framework, which is applied to enhance preparedness and provide effective and proactive ways of handling events that could lead to an incident or crisis (see EU21).

Electromagnetic fields (EMFs)

Vattenfall is committed to complying with recommended and legal guidelines regarding electromagnetic fields, see PR1.

Compliance with codes, agreements and frameworks

Vattenfall is a signatory of the UN Global Compact, which is the underlying framework of Vattenfall's overall sustainability work, and as such it has the most important influence. Environmental law sets an important regulatory framework for Vattenfall's operations, and a wide range of legal instruments in this field are relevant for Vattenfall.

Fines and incidents (EN28)

Vattenfall has a Group-wide Incident and Crisis Management (ICM) organisation. For additional information, see EU21.

Environmental incidents and the handling of fines are regulated under Vattenfall's environmental policy, stating that Vattenfall shall comply with existing laws, regulations and permits and take preventive and/or remedial action in order to reduce environmental impact as well as make advance assessments of the environmental impact of new activities. When accidents occur, Vattenfall acts to minimise the damage, restore any damage caused and take precautionary measures to avoid future incidents. On a quarterly basis, all Group functions, business units and shared service centres report on progress in environmental protection as well as on accidents and incidents regarding environmental impact.

In 2010, a faulty filter at a waste incineration plant in Uppsala led to higher particulate emissions and a transgression of dioxin limits. Minor oil spills occurred in several places. The emissions limit for ammonia to air was exceeded at Ringhals by 4% in 2010. The incident was reported to the authorities, and actions were taken to prevent future violations.

Social performance

Labour practices

Vattenfall's employees are the backbone of its business. Their talent is a resource of individual knowledge, skills and qualifications. In the future, the most significant success factor for Vattenfall will be having people with the right competence. This means that Vattenfall strives to create a work environment that enables the company to attract, develop and retain people with leading competence and promote top performance.

Human Resources Policy

Vattenfall's Human Resources Policy describes Vattenfall's approach to five areas: culture and organisation, leadership, competence development, work environment, and compensation and rewards.

Briefly, the policy states that "Vattenfall strives to create a work environment that attracts and develops people with leading competence and encourages top performance. By continually developing and improving our human resource work, we are recognised, externally as well as internally, as a highly attractive employer. The human resource work contributes to our business operations and to greater competitiveness. We address all issues according to local practice, and our actions are always accountable and socially responsible. We facilitate change and are constructive and open to new possibilities and models."

Vattenfall is a signatory of the UN Global Compact. Vattenfall is committed to complying with the Global Compact's principles regarding responsible labour practices. The principles adhere to international frameworks such as the core conventions of the ILO and the OECD development guidelines for multinational enterprises.

Human resource goals and performance

Vattenfall's human resource performance is defined in terms of employee commitment, excellent leaders, the right competence and attractiveness for students.

Vattenfall's annual employee survey, My Opinion, measures a broad range of aspects that reflect Vattenfall's company culture and employee commitment. The overall response rate in the My Opinion survey was 73% in 2010. Vattenfall also measures its attractiveness among students using external benchmarks.

Vattenfall's ambition to be an Employer of Choice is followed up by measuring employee commitment. In 2010 the commit-

ment score was 64%. Commitment drivers include job satisfaction together with company management and environment & society. Commitment targets are part of every business unit's business plan for the coming three years

Organisational responsibility

Group Function Human Resources (Group HR) supports and assists management teams at the Group and Business Division level in the management of Vattenfall. Group HR has functional responsibility for human resource issues at Vattenfall and provides expert advice on matters of importance to the company. The head of Group Function Human Resources is also a Senior Executive Vice President and member of the Executive Group Management.

Group HR issues directions and objectives for different areas and provides models and tools for the local units when appropriate. The work of Group HR is mainly performed in various national and international projects. Most HR-related activities, however, take place locally in the various units.

Group HR focuses on continuous improvement and value creation by developing and providing high-performance programmes and tools, including Talent Management, Organisational Development and Compensation & Benefits.

Employment

During the coming decade, demographic changes will lead to increased competition for potential employees, as a significant number of the company's employees are approaching retirement. In combination with plans for growth and large investments, this is leading to significant recruitment needs and is making the ability to attract, retain and develop the right competence a critical business success factor.

Market-oriented salaries and benefits – including performance-based compensation – are a prerequisite for being able to recruit and retain competent employees. Vattenfall offers competitive salaries and benefits and strives to be an employer that rewards strong performance, identifies potential and applies flexible solutions to facilitate employees' work. Accordingly, Vattenfall offers individual and differentiated salaries with focus on performance and potential.

Vattenfall has an international assignment process, and the number of employees stationed abroad is steadily increasing. In view of the company's international operations, mobility across national borders is highly important.

Workforce (LA1, EU17)

Total headcount (as of 31 December)¹

	2010			2009		
	Men	Women	Total	Men	Women	Total
Sweden	6,924	2,445	9,369	7,094	2,477	9,571
Denmark	577	113	690	609	118	727
Finland	240	203	443	285	217	502
Poland	2,200	650	2,850	2,215	678	2,893
Germany	15,660	5,181	20,841	16,500	5,576	22,076
Netherlands (incl. Belgium)	4,473	1,617	6,090	4,582	1,688	6,270
UK	49	28	77	23	16	39
France	2	1	3			0
Total	30,125	10,238	40,363	31,308	10,770	42,078

1) Employment categories are not defined in Vattenfall and data is therefore not divided between categories. Breakdown reflects where each individual is employed.

The decrease in the total number of employees is attributable to general restrictions on new hiring that were instituted in 2010 and to organisational changes in Germany that affected Business Group Central Europe.

Subcontractors

Contract workers are used, for example, during maintenance and reloading of nuclear power plants, in daily operations, and to temporarily fill competence gaps. These contracts are handled locally, and statistics are not gathered at the Group level. Vattenfall does not track or calculate how large a portion of the work that is performed by workers who are legally recognised as self-employed.

Apprentices and seasonal employees are hired when needed. Consultants are used both during peaks in the work load and as a source of additional competence.

Employee turnover (LA2)

Employee turnover¹, %
(external recruitment/external resignations)

	2010	2009	2008
Sweden (including residual)	6.5	4.5	4.3
Denmark	4.5	11.4	n.a.
Finland	5.2	4.0	7.8
Germany	0.9	1.1	1.1
Poland	6.4	4.3	4.3
UK	9.1	0.0	
Netherlands incl. Belgium	10	6.4	

1) Employee turnover is based on the number of employees holding permanent employment who have left the Vattenfall Group of their own accord. Employee turnover data according to gender or age is not gathered at the Group level. Average length of tenure not available.

Due to an effort to reduce personnel cost the number of employees decreased. In order to do so, a strict recruitment policy was implemented. For this reason most vacant positions have not been replaced with new employees.

Processes to ensure the availability of a skilled workforce (EU14, EU15)

Ensuring the availability of a skilled workforce is one of the most important areas from a human resources perspective. During the next five years, 7% of Vattenfall's employees will retire, which means the company must attract, recruit, develop and retain skilled employees. The annual Competence Planning process is used to analyse the organisation's current competence status and future competence needs on the basis of business plans. To reduce the gaps identified in the annual process for individual and working group training, Vattenfall arranges internal and external training, including technical training that is specific for various complex operations, such as nuclear power (see also LA10).

Vattenfall has an advanced job database. The Job Database ensures a single global system that offers many opportunities to search for jobs across borders. The aim is to increase international rotation and diversity for Vattenfall.

Safety training for contractors (EU16, EU18)

All contractors and subcontractors working at Vattenfall's plants and at Vattenfall's facilities receive necessary health and safety information. The content and the extent of instructions and training depend on the work area and work tasks of the respective contractors and subcontractors. Preventive health and safety measures cover essential dangers related to Vattenfall's facilities, plants and processes, and are adapted to the specific national

legal requirements of the specific plant or facility.

As part of the procurement process, suppliers, their subcontractors and sub-suppliers sign the Vattenfall Code of Conduct for suppliers. This includes complying with the respective countries' health and safety legislation and ensuring that employees have undergone necessary health and safety training. Vattenfall's health and safety policy states that personnel of contractors shall be treated in the same way as Vattenfall's own employees with respect to health and safety issues. At the same time, Vattenfall expects contractors to adhere to the Group's health and safety standards while working for Vattenfall. Instruction and training are carried out in the decentralised line organisation, and data on the number of participants is not aggregated at the Group level.

Employee benefits (LA3)

Employee benefits differ between the countries where Vattenfall operates. Examples of benefits include long service awards and child birth grants (Germany), health care (Poland, Finland, Denmark, Sweden), compensation during parental leave (Sweden), support for sporting activities (Finland, Sweden, Poland) and extra days off (Denmark).

Following are some differences in benefits between full-time and temporary or part-time employees:

- In Germany, employer contributions to the company pension scheme are not paid until an employee has served two years for the company. Most temporary employees are therefore not eligible for such payments. A group accident insurance plan is in place for exempt and executive staff – a service that is not provided to other employees.
- In Finland there are differences in support in cases of redundancy and parental and other leaves of absence.
- In Sweden there are differences in company cars, which are regarded as a flexible benefit.
- In Denmark, all employees are offered insurance, which is regulated by the Equal Opportunities in the Labour Market Act (Ligebehandlingsloven). Extra days off are offered after nine months of employment.
- In Poland there is no difference between part-time and full-time employees regarding benefits.
- At Nuon there is no difference between part-time and full-time employees regarding benefits.

Labour/management relations

The annually recurring My Opinion employee survey covers a wide range of issues and aspects. Through My Opinion, employees have an opportunity to express their opinions about every-

day work, managers and the company. The tool is used throughout the organisation as a basis for action plans to improve the work environment. Best practices derived from the action plans are shared and become a useful tool for management.

In addition, local actions are taken in all countries and include open-door initiatives in which employees can meet with management, team meetings, and forum/chats on the intranet regarding current issues of employee interest. In 2010 the overall response rate for the My Opinion survey was 73%, which was an increase from 2009 when the response rate was 70%.

Collective bargaining agreement coverage (LA4)

Employees represented by trade unions, estimation¹

%	2010	2009	2008
Sweden	85	85	85
Denmark	70	70	70
Finland	85	85	85
Germany	70	70	70
Poland	55	55	44
Netherlands incl Belgium	n.a.	n.a.	

Employees covered by collective bargaining agreement, estimation¹

%	2010	2009	2008
Sweden	98	98	98
Denmark	44	44	44
Finland	95	95	96
Germany	98	98	98
Poland	98	98	92
Netherlands incl Belgium	n.a.	n.a.	

1) Data on contractors not collected at Group Level

Operational changes (LA5)

Collective agreements and regulations regarding operational procedures differ between the countries where Vattenfall operates, depending on national legislation and collective bargaining agreements.

Occupational health and safety

Protection of the health and safety of the people who are affected by Vattenfall's activities is such an important issue that Vattenfall has defined it as one of the company's core values. Vattenfall is committed to creating a safe and healthy work environment; this means that the company aims for zero injuries,

zero occupational ill health and zero accidents. Vattenfall's efforts to reach this target include a systematic and proactive approach to the management of health and safety in all of the Group's activities.

Vattenfall's Health and Safety Policy states that no one at Vattenfall should be injured or fall ill as a result of their work. Risks should be reduced as much as possible. No work is so important that it is allowed to be performed in an unsafe manner. When a situation becomes unsafe, every employee is required to stop working immediately.

Top management is involved in health and safety work by setting and monitoring safety goals. Vattenfall's managers also serve as role models by promoting and demonstrating health and safety-oriented behaviour.

Overall, Vattenfall strives to follow a preventive approach and implements best practices in health and safety management at all times. To promote high levels of health and safety, Vattenfall maintains a continuous improvement process. In 2010, activities aimed at lowering accident rates and improving safety performance were extended to strengthening and improving the company's safety culture. In the coming year the Vattenfall Safety Culture Development Programme, which will be introduced throughout the organisation, makes use of the Hearts & Minds toolkit. Implementation will be supported by a central project team.

Vattenfall also works actively to improve employees' health by offering regular health check-ups and taking preventive measures according to national legislation. The company is active in supporting employees with prolonged illnesses so they can return to work.

Each year well-being and safety are also measured in the My Opinion employee survey. This instrument allows analyses of the health and safety status of every unit and takes adequate action for each group within Vattenfall. In 2010 the survey was revised with regard to health and safety questions in order to obtain in-depth information in this area. In 2010, 60% of respondents gave positive scores to Vattenfall's health concerns, and 64% gave a positive scores to safety matters.

Health and safety committees (LA6)

Health and safety committees are organised at the operational level. The committees deal with local problems and provide management with suggestions for improvements. Vattenfall's employees are well informed about initiatives and programmes that contribute to safe working conditions. More than 75% of the total workforce is represented in formal joint-management/worker health and safety committees.

Injuries, absentee rates and fatalities (LA7)

From 2007 to 2009 Vattenfall managed to reduce its accident rate by about 35%. Unfortunately, a slight increase was noted in 2010. Vattenfall's management team reacted to this with several actions, of which the first one was to make Health and Safety a core value. Accordingly, Vattenfall will conduct safety culture programmes in every unit of the company. Every unit is to discuss safety matters and set targets that will be incorporated into a safety culture development plan. Figures are reported from all parts of the organisation on a quarterly basis as part of the regular reporting system.

	2010	2009	2008	2007
Reported accidents at work (per 1,000,000 hours worked)	4.7	4.3	4.4	5.1
Number of lost days per employee due to accidents	0.1	0.1	0.1	0.1
Sick leave (%)	3.8	3.2	3.1	3.1
Work-related fatalities	2 ⁴	3 ³	2 ²	7 ¹

Figures are reported from all parts of the organisation on a quarterly basis, as part of the regular reporting system. An accident is defined as an acute incident that occurred in the course of work and which resulted in personal injury. Work-related fatalities include external contractors. For the occupational disease rate (ODR), qualitative data is not available at the Group level. However, occupational diseases are followed up in accordance with national practice by the health and safety organisation and management. Because of different regulations in the countries, commuting accidents are not reported.

- 1) Employee – Electrocuting during maintenance work on a 30 kV cable in Riddarhyttan, Sweden, 14 September; Contractor – fall from 40 m pylon, Bad Tennstedt, Sachsen-Anhalt, Germany, 17 May; Employee – commuting accident in car, Mulkwitz, Sachsen, Germany, 24 June; Contractor – fall from height, Boxberg power plant, 7 August; Contractor – fall from height while dismantling a work platform, Markersbach pumped storage plant, 28 September; Employee – crushed between a truck and a wheel loader, Reichwalde open-cast mine, 22 November; Employee – crushed under a transformer while replacing it, Berlin–Tempelhof, 1 December.
- 2) On 23 January, a contractor was hit by a falling object during maintenance of a high voltage cable in Hamburg, Germany. On 10 November, one employee died in a commuting accident.
- 3) A diver (contractor) was sucked under water and died. An employee entered a wrong switchgear and died from electric shock. During maintenance at the basin of a pump plant, a rope of the working machine broke and a man on it drowned.
- 4) On 10 February, a contractor who was delivering wood-shred to a plant biofuel receiving station fell on a conveyor system and was pulled into the shredder. On 24 March, a linesman from a contractor had climbed up a pole. He came in contact with electric current (10 kV) and was electrocuted.

Support regarding serious diseases (LA8)

Vattenfall's various companies have a long tradition of promoting employee health and measures to prevent incidents and serious diseases. Accordingly, preventive medical check-ups are provided in compliance with the national health and safety legislation in the respective countries. Employees exposed to night shift work, noise, heat, hazards to eyesight, work at heights, chemicals, ionising radiation, dust, etc., can seek medical assistance and undergo additional tests from various specialists if needed. Employees who have been exposed to high risks, such as exposure to asbestos, undergo regular follow-up examinations to provide early diagnosis of related diseases.

In addition, various measures are offered to employees, such as back exercise courses and health promotion activities. In large parts of the organisation, vaccination programmes for influenza and other diseases are further elements of health promotion. Medical emergency aid is an integral part of occupational safety and health protection. Vattenfall has a permanent first aid training programme for employees. All employees have access to individual counselling and assistance by professional social workers or psychologists. Reintegration and disability management programmes have been established.

Health and safety and union agreements (LA9)

Health and safety are strategically important matters for Vattenfall, and co-operation with the unions is an important aspect. Regulations differ in the countries where Vattenfall operates. In all countries where Vattenfall operates, health and safety matters are covered by law, and union agreements generally do not cover these issues in detail.

Training and education

Vattenfall provides opportunities for all employees to develop as professionals and individuals. There is no Group-wide policy regarding training and education; instead, local country-specific regulations apply.

Vattenfall has two internal institutions for competence development, Vattenfall Management Institute (VMI) and Vattenfall Business Institute (VBI). VMI is designed for management development and offers both general management training as well as advanced programmes at the strategic level for senior managers. VBI offers development programmes for functional specialists, such as financial control, HR, procurement and communications.

The talent management process is a holistic process designed to define, attract, develop and retain the talent

Vattenfall needs to meet future challenges. The process includes management planning and competence planning.

Management planning

Excellent leaders are key drivers of the company. Vattenfall has developed a Group-wide leadership model to evaluate and assess managers and young potentials. The annual management planning process provides an overview of management capacity in the Group as well as information to support succession planning. To ensure a high rate of internal succession, Vattenfall focuses on early development of its leaders. International leadership training programmes are conducted in order to help leaders develop their ability to work under rapidly changing conditions and in different cultures.

Competence planning

Ensuring the right competence is a crucial task for Vattenfall. To do so the Group has an annual competence planning process to analyse the organisation's current competence status and future competence needs. The analyses are made on the basis of business plans and identify competence gaps. The purpose of the process is to ensure that the organisation has the proper skill sets from both the short- and long-term perspectives.

Action plans are prepared to consider specific local needs and ensure sufficient competence in the future. The competence planning process covers areas such as efficiency improvement, implementation of new technology, investments, skills development, recruitment, job rotation, trainee programmes, demographic analyses and the use of consultants.

Training of employees (LA10)

Vattenfall's approach to competence development is that skills development occurs mainly during daily work and through participation in various projects. Therefore Vattenfall does not aggregate information about the number of training days per employee. To enhance managers' knowledge about Vattenfall's vision and strategic ambitions, the Vattenfall Management Institute (VMI) conducts management development programmes.

According to the annual My Opinion employee survey, in 2010 69% of employees responded that there are sufficient opportunities to receive training to help them perform their present job well, which was a 3-point increase compared with 2009. Every Vattenfall company that receives result reports is responsible for analysing and preparing action plans.

Programmes for skills management and lifelong learning (LA11)

Vattenfall offers various training programmes to make sure that employees have the skills necessary to maintain high performance and fulfil the company's strategic ambitions as well as to facilitate personal development and life-long personal learning. Several assistance programmes to support employees who are retiring are in place including internal training courses, funding support for external training or education, sabbatical periods with guaranteed return, assistance when retiring, severance pay that takes age and years of service into account and job placement services.

Performance and career development reviews (LA12)

Reviews on performance and career development are important ways of ensuring that Vattenfall's work environment and competence development objectives are met. Following is a summary of results from the My Opinion employee survey.

Performance and career development reviews

Sweden

Eight-seven per cent of employees responded that they have had a detailed discussion to clarify their job objectives, and 54% said that their manager has given feedback related directly to their performance and improvements.

Finland

Seventy-eight per cent of employees responded that they have had a detailed discussion to clarify their job objectives, and 46% said that their manager has given feedback related directly to their performance and improvements.

Denmark

Eight-two per cent of employees responded that they have had a detailed discussion to clarify their job objectives, and 44% said that their manager has given feedback related directly to their performance and improvements.

Germany

Seventy-five per cent of employees responded that they have had a detailed discussion to clarify their job objectives, and 47% said that their manager has given feedback related directly to their performance and improvements.

Poland

Eighty-nine per cent of employees responded that they have had a detailed discussion to clarify their job objectives, and 79% said that their manager has given feedback related directly to their performance and improvements.

the Netherlands

Eighty per cent of employees responded that they have had a detailed discussion to clarify their job objectives, and 50% said that their manager has given feedback related directly to their performance and improvements.

Diversity and equal opportunity

Vattenfall's Human Resources Policy states the company's view of diversity and equal opportunity as well as its importance:

"We strive for diversity in teams and units in regards to gender, age, background and experience, enabling employees from different units and of different nationalities to work together".

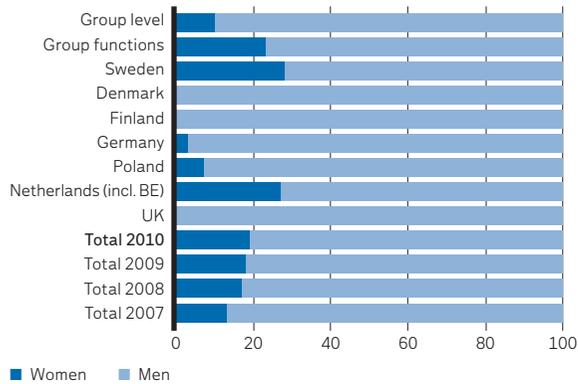
The policy covers Vattenfall's ambition that the workforce should reflect the societies in which the company operates. Vattenfall is committed to creating equal opportunities and rights for all employees, and to establishing diversity as a natural part of operations.

Goals and activities to improve diversity

- Vattenfall will mirror society in terms of ethnic background. Vattenfall partner with the Diversity Challenge, a programme for newly graduated, offering advantages to women and people with an immigrant background in the recruitment process. Focus on recruitment process to ensure possibilities for people from diverse backgrounds to apply and succeed with their application.
- Obtain a more balanced age structure at Vattenfall. Vattenfall uses output from the competence planning process as a basis for student relations' activities, knowledge transfer programmes and general competence development.
- Attain an equal ratio of female managers to female employees. Focus on gender diversity in the succession planning and management planning processes as well as in competence development measures. (see LA13)

Composition of governance bodies (LA13)

Composition of governance bodies (managers), %



	Women	Men
Group level	1	9
Group functions	9	30
Sweden	39	96
Denmark	0	8
Finland	0	3
Germany	3	86
Poland	1	13
Netherlands (incl. Belgium)	15	41
UK	0	1
Total 2010	58	248
Total 2009	58	264
Total 2008	42	210
Total 2007	33	211

The numbers refer to end-of-year figures. For data on all employees, see LA1. Categories: Group level – Board of Directors (appointed by AGM) and Executive Group Management. Group functions – Managers within Group functions. Country level – Business Group management, business unit management and company presidents. Data on age groups is not available. Data on minority groups may not be collected by law.

Ratio of salaries of men to women (LA14)

The ratio of salaries of men to women differs between the countries where Vattenfall operates¹:

- In Finland, women’s salaries are about 88% of men’s, but in similar positions they are nearly equal.
- In Sweden, women’s salaries are about 90% of men’s, and in

1) Based on estimations performed every other year.

the management category, women’s salaries are 91% of men’s.

- In Denmark, women’s salaries are an average of 74% of men’s, ranging from 65%–95%, depending on education, age, employee category and seniority.
- In the Polish energy sector, women’s salaries are about 85% of men’s salaries. At Vattenfall, the percentage varies between 72% and 100%, depending on the tariff category. The differences are mainly the result of many men working in shifts, for which they have additional allowances. However, when comparing non-shift positions, women’s salaries range from 85% to 96% of the level for men.
- In Germany and at the Netherlands (Nuon), no gender breakdown of salary data is collected. Salaries are based on tariffs/standard job scales.

Human rights

Vattenfall conducts its business in regions where rules and regulations governing basic human rights have a long history and are well established. For example, working conditions, freedom of association, and bans on forced labour are regulated not only on a constitutional level but also on a more detailed level.

Vattenfall strives to be a good and reliable corporate citizen by always adhering to laws, regulations and good practices that are in accordance with human rights in the countries in which it operates. The company supports fundamental human rights and respects those rights when conducting its operations.

Human rights issues are handled as an ordinary part of day-to-day business activities within the general management framework. Although Vattenfall conducts its business in regions with well-established regulations, where risks are smaller, there is still a risk for human rights violations within the supply chain. Vattenfall urges all of its suppliers to adhere to the ten principles of the UN Global Compact, including human rights.

Policy

Vattenfall’s position on human rights issues is expressed in the Group’s Code of Conduct, the Code of Conduct for suppliers, the Human Resources Policy and by commitments under the UN Global Compact.

Vattenfall became a signatory to the UN Global Compact initiative in July 2008. However, since 2002 Vattenfall has supported the Swedish government’s “Globalt Ansvar” initiative (Swedish Partnership for Global Responsibility) and has thereby been committed to adhering to the UN Global Compact and the OECD’s guidelines for multinational enterprises.

Code of Conduct

Vattenfall’s Code of Conduct covers compliance topics related to legal requirements (business ethics) and Corporate Social Responsibility (e.g., people and environment):

Sustainability – We work to provide energy solutions that support the sustainable development of society and have as little impact on the environment as possible.

Customers and Suppliers – Vattenfall takes responsibility along the whole value chain with regard to customer needs, fair competition and setting standards for suppliers.

People – Our employees are empowered to develop to their full potential – with equal opportunities for all.

Culture and Values – Our core values – Safety, Performance and Co-operation – are the foundation of our work and they guide us to achieve our strategic direction and to create an integrated international company.

Business Ethics – Employees comply with all laws, rules and regulations as applicable at their workplace, as well as with internal instructions and policies.

Health, Safety and Security – The safe operation of our plants and facilities is the precondition for protecting our employees’ health and the general public – securing the energy supply.

Communication – We strive to share information openly and always have a proactive dialogue with our stakeholders.

Investments and procurement practices

As the fifth-largest generator of electricity in Europe and the largest producer of heat, Vattenfall sources substantial amounts of fuel as well as several billion euros of material and services to operate its business. Regardless of whether the company is mining lignite in own operations, purchasing other fuels through a partner or contracting a partner to perform maintenance in power plants, Vattenfall sets high standards.

Vattenfall’s Group-wide Code of Conduct for suppliers is based on the UN Global Compact and has been communicated to thousands of suppliers and included in Vattenfall’s agreements with them since the beginning of 2009.

To make sure that suppliers accept the Code of Conduct for suppliers and live up to the minimum standards, Vattenfall’s Group Procurement has developed a solution where suppliers are asked to go through a qualification process. The process is managed in the Vattenfall Supplier Bank, a web-based solution that can be accessed via Vattenfall’s website. The Vattenfall Supplier Bank solution is gradually being rolled out across the Vattenfall Group. In 2010 a specific campaign in Poland was conducted for suppliers

with a spend in excess of EUR 20,000. The campaign resulted in the qualification of some 75 suppliers.

Vattenfall has decided to create a new function at the corporate level, Supplier Management, whose function includes conducting numerous audits each year to verify compliance with the self-assessment part of the pre-qualification tool. As part of the new Group-wide sourcing initiatives, Vattenfall will continue conducting CSR reviews where risks are high. One example of this is the on-site audits of fuel suppliers against the Code of Conduct for suppliers/UN Global Compact. In 2010, Vattenfall also initiated work with the intent to better define control activities.

Another targeted effort in 2010 was conducted towards a couple of suppliers of IT services in India, where comparative audits were performed that allowed both learning and benchmarking of Vattenfall's audit practices.

Human rights screening (HR2)

Risk assessment of nuclear fuel and coal suppliers has led Vattenfall to pay continuous on-site visits to suppliers in these areas in order to conduct audits against the Code of Conduct for suppliers.

To date, 83% of Vattenfall's significant suppliers in all steps of the nuclear fuel supply chain have undergone human rights screening, which is a documented procedure for auditing suppliers' policies, communication and implementation of practices in order to respect and support human rights. Each year two to four audits are performed of suppliers in the nuclear supply chain. These audits also cover other aspects of the UN Global Compact, such as labour standards and environmental impact. Since 1 July 2008, all new nuclear fuel contracts include a clause on compliance with the principles of the UN Global Compact.

To date 6% of Vattenfall's coal suppliers¹ have undergone auditing against the ten principles of the UN Global Compact.

Vattenfall intends to increase the use of biomass in its operations. To assess the risks in the biomass supply chain, specific criteria are being developed.

In 2010 Vattenfall acquired 20% of Buchanan Renewables Fuel in Liberia. Preceding the acquisition, a CSR due diligence was performed, particularly with respect to human rights. Vattenfall is now working actively on improving CSR standards at Buchanan Renewables Fuel (see also page 34).

Human rights training (HR3)

Vattenfall's employees are obligated to know and act in accordance with the company's Code of Conduct, which contains basic information about human rights. The Code of Conduct is part of the management system and is available to employees via the company's intranet.

1) Excluding coal from trading activities.

Non-discrimination

Vattenfall does not tolerate any form of insulting behaviour or harassment at work or in work-related situations. Everyone is to be treated with respect. This applies to all areas, including recruitment, salary, benefits, work environment, education, promotion and leadership. It also applies not only to employees, but to all people in contact with Vattenfall, including customers and potential employees in the recruitment process. Each and everyone in contact with Vattenfall should always be treated with respect regardless of his or her background and traits.

Vattenfall's policy is to offer equal opportunity – Vattenfall strictly condemns every act of discrimination – concerning all situations in working life and beginning with the recruitment of personnel. All employees and applicants shall have equal opportunities regardless of their ethnic background, age, gender, faith, political opinions, national or social origin or any other factors. We strive to enable employees from different units and of different nationalities to work together.

Discrimination incidents (HR4)

No cases of discrimination were reported in 2010.

Freedom of association and collective bargaining

Freedom of association and collective bargaining (HR5)

In the regions in which Vattenfall operates, freedom of association is both constitutionally guaranteed and governed by a number of specific laws. These laws are adhered to throughout Vattenfall's organisation.

Preventing child and forced labour

In the regions in which Vattenfall operates, child and forced labour is prohibited by a number of specific laws. These laws are adhered to throughout the organisation.

Preventing child and forced labour (HR6–7)

Vattenfall opposes all forms of child labour and forced labour. Vattenfall considers forced labour to be contrary to the Group's core values and the Code of Conduct as well as to its commitments under the UN Global Compact.

When Vattenfall employs minors for summer jobs, apprenticeships and so on, this is done in accordance with national legislation that governs the type of work minors may perform and their

working hours, such as only allowing for safe work with limited working hours during school holidays.

Complaints and grievance practices

A Group-wide whistleblowing system is being implemented; see also "Governance of CSR", page 41.

Indigenous rights

Vattenfall's operations have both natural and cultural environmental impacts. Mainly two indigenous and minority groups are directly affected; the Sorbs in Germany and the Samis in the Nordic region.

The Sorbs are a minority group who live in eastern Germany in areas where Vattenfall has considerable operations. Vattenfall subsidises the Sorb organisation Domowina in eastern Germany, to support and preserve the Sorb culture. Domowina and Vattenfall want to strengthen their existing constructive co-operation in the future. A milestone was reached in 2007, when representatives from Domowina and Vattenfall adopted a joint declaration in which Vattenfall has expressed its support of the Sorbian population in the mining regions by ensuring the preservation of their social and ethnic identity. Initiatives include promotion of the Sorbian language, economics and tourism, support of Sorbian media, traditions and art, and documentation of Sorbian history and development.

In northern Sweden, Vattenfall operates several hydro power plants. The Samis, an indigenous population of formerly nomadic, reindeer-herding people, have inhabited the northern parts of Norway, Sweden, Finland and Russia since ancient times. The Samis are an ethnic minority in Sweden today, with their own language and a rich cultural tradition.

Vattenfall's hydro power expanded from the beginning of the 20th century until the 1960s, and the building of hydro power plants in the northern parts of Sweden had an impact on reindeer husbandry. Vattenfall is engaged in a continuous dialogue with Sami communities, as with all stakeholder groups. A large number of mitigation programmes have been initiated and sponsored by Vattenfall, including construction of alternative crossing routes for reindeer herds.

In addition, Vattenfall is helping to preserve Sami cultural heritage by supporting cultural projects, such as sponsorship of the Ájtte Sami Museum in Jokkmokk, as well as other small-scale cultural preservation projects. A more organised dialogue between Sami villages affected by hydro power and Vattenfall is currently being developed.

Guidance on dealing with indigenous groups is provided for in Vattenfall's Code of Conduct as well as through adoption of Global Compact principles.

Impact on society

Energy is a basic requirement in modern society. Vattenfall serves society by delivering the energy needed to make society work and become prosperous. Vattenfall also plays an important role in society as an employer and business partner, and corporate citizenship is emphasised in markets in which the company operates. Vattenfall's responsibility is to contribute to sustainable development of society while providing energy solutions that meet customers' – and thus society's – needs. All activities are guided by Vattenfall's core values:

- Safety means that we care about the health and safety of our employees, contractors and the society. All actions have to be taken in a safe and responsible manner. We continuously make every effort to prevent injuries and occupational illnesses. We put a strong effort on increasing awareness and knowledge on safety and safe behaviour. Our production sites must adhere to a high level of process safety from design to operations.
- Performance means that we focus on passionately achieving our objectives while acting according to our core values. It's natural for us to perform at our best and continuously evaluate our actions in order to improve. While progressing we will ensure excellence in performance to realise our strategic direction. We do what we say and we keep our promises.
- Co-operation means that we trust each other and openly work together to achieve our objectives and reach our vision. We want to live in a new era of co-operation – getting to know each other better, thinking, acting and sharing knowledge while learning from each other and exchanging experiences across countries, divisions and functional borders. In the same way, we work together with our external stakeholders.

Policy

Vattenfall has no specific, formal framework for managing societal interaction and support. Instead, it relies on several principles and tools, for example:

- The company's philosophy, Business Ethics Principles and Code of Conduct. High ethical standards must be maintained in all actions and in all contexts.
- Vattenfall has formal processes for assessing stakeholders' expectations and opinions. This forms a basis for operational and reporting matters, such as for improving this report.
- Vattenfall is a signatory to the UN Global Compact.
- The World Economic Forum's Partnering against Corruption Initiative – Principles for Countering Bribery (the PACI Principles).

Impact on society – goals and performance

Customer Satisfaction Index

Vattenfall has set a customer satisfaction target to measure success. For more information on CSI, see indicator PR5.

Vattenfall Reputation Monitor

Vattenfall is interested in how society perceives the company and in people's opinions about the company, and strives to continuously improve stakeholder relationships. One important tool for collecting feedback from all stakeholder groups is the annual Vattenfall Reputation Monitor (VRM), which measures awareness, reputation and preference of Vattenfall – among many other parameters – and through statistical simulation suggests actions areas for improvement

Organisational responsibility

Organisational responsibility for managing societal impact and interaction follows the regular governance structure. Organisational responsibility for managing the impact of operations (including sponsoring and donations) is handled by the respective Business Division and/or Staff Function.

With respect to community and public policy development, a separate organisation exists within Vattenfall – Vattenfall Public and Regulatory Affairs, under Staff Function External Relations and Communications. This is a wide-ranging function that co-ordinates Vattenfall's positions on key issues and is a direct link to Vattenfall's owner – the Swedish state. Public and Regulatory Affairs departments exist in every country in which Vattenfall operates and at the EU level in Brussels.

The General Counsel of the Vattenfall Group co-ordinates the instructions and follow-up of measures to prevent corruption and anti-competitive behaviour. It is the responsibility of each manager in the line organisation to ensure compliance (e.g., by implementing local instructions) and to report on this compliance. The line organisation also reports all major disputes to Corporate Legal Affairs regularly and on specific cases.

Training and awareness

Vattenfall's managers and employees throughout the Group carry on a continuous dialogue with stakeholders in society. Vattenfall strives to improve communication skills at all levels of the company, for example through media training and workshops.

Effective and fair competition is vital to ensure market efficiency. Competition rules are important tools serving this purpose. To increase awareness about competition law issues throughout the group and to give a common basic understand-

ing of the rules and how to comply with them and internal Vattenfall policies and rules, in 2005 Vattenfall initiated the Vattenfall Antitrust Compliance Programme. The Vattenfall Antitrust Compliance Programme includes training on competition law and anti-corruption.

The Vattenfall Antitrust Compliance Programme will be updated in 2011 and re-launched in the new organisation in 2011.

Community

It is important for Vattenfall that its operations have as little adverse impact as possible on the people living in the vicinity of the company's operations. Regardless of the type of impact the operations may cause, Vattenfall as a company strives to be receptive and responsive to the needs and demands of affected stakeholders. Vattenfall has therefore established processes to interact with communities when planning for new operations. This is to ensure that everybody has an opportunity to have their say and suggest possible improvements.

Including stakeholders in decision-making processes (EU19)

Vattenfall's stakeholder dialogue is conducted on many levels throughout the Group, centrally at the Group level as well as at the local operational level. Vattenfall has identified its stakeholders by mapping the impact its operations have on certain groups, or the impact that these groups have on the company. Stakeholders are involved in many decision-making processes, especially changes affecting a specific stakeholder group, such as people living in the vicinity of the company's operations. For additional information, see also Governance of CSR, 4.14–15 and 4.16–17 and national websites.

Managing impacts of operations and displacement (SO1, EU20, EU22)

Resettlement and mining operations

The most significant impact on communities is related to Vattenfall's lignite mining operation in Germany where several small communities have been resettled as a consequence of our mining activities. In 2010 four estates were resettled, while larger resettlements are planned for the future. For this purpose, a formalised socially acceptable resettlement process is used for all lignite mining operations to ensure that Vattenfall is a Benchmark of the Industry by handling the issue with great care and respect. The resettlement programme involves all aspects, from financial compensation to preserving the village's social

structure. At the beginning of the resettlement process an assessment is performed that involves all citizens. This assessment results in a specification of social requirements (Soziales Anforderungsprofil, SAP). The resettling community and Vattenfall then sign specific resettlement agreements that address the following points:

- The aim is for all inhabitants to move to a common location together. New villages are connected to existing communities. If there is no access to services (e.g., schools, utilities, health-care) in the existing community, new institutions are built. In this way both communities benefit.
- The resettlers are included in the overall process of resettlement and are involved in shaping it. The resettlers are part of a working group together with Vattenfall and the county. As part of this working group, the resettlers are fully involved in the complete process of resettlement. It is the resettlers who decide on the new location, usually by choosing from among up to five different locations. The next step is that all resettlers are given the opportunity to choose their new place of property and direct neighbours. Furthermore, all residents' requests and suggestions are considered, such as clubs and social associations of the resettled and the new communities.
- The affected villages are developed and preserved until the time of resettlement.
- Property owners are compensated on the basis of their existing property by providing them with adequate family-based replacement property with no need for new funding.
- A tenant action concept provides a number of guarantees, including acceptable rents in apartments at the resettlement location.
- Small businesses are preserved and continued.
- Community life in clubs and associations is kept functioning and is supported. The resettled community has all necessary infrastructure to conduct social activities, sports or other recreational activities, including stadiums and community centres. Items of cultural heritage, such as historical monuments or buildings, are transferred to the new location. Furthermore, funds are raised to support social and sports activities, events such as anniversaries and local traditions, social work and economic development.
- For the move itself, an action concept is drawn up together with the resettling and the absorbing communities.
- The move is carried out in the shortest time possible.
- Four villages have been resettled since 1993, and plans have been drawn to resettle parts of two more villages by 2013.

Resettled villages

Year	Village	Resettled inhabitants
1993–1996	Kausche	360
1997–2002	Geisendorf	45
2002–2004	Horno	350
2000–2006	Haidemühl	650
2009–2013	parts of Trebendorf/Schleife	270

Preventing corruption and bribery

Vattenfall works against corruption in all forms, including extortion and bribery. Vattenfall's business ethics principles state that no employee may offer or receive improper benefits or benefits that may be regarded as improper remuneration in order to obtain, retain or direct business or in order to secure any other improper advantage in business conduct. Such prohibited benefits (bribes, etc.) include cash, items, pleasure trips or services of another nature.

The key to anti-corruption work at Vattenfall is to educate all managers and others with extensive external contacts on all levels of the organisation about internal and external rules and, for management, to ensure compliance with these rules. Given this, Vattenfall has offered training on anti-corruption within the Vattenfall Antitrust Compliance Programme.

Moreover, Vattenfall has signed an anti-corruption initiative launched by the World Economic Forum in co-operation with Transparency International and the Basel Institute of Governance. Vattenfall thereby supports "Partnering against Corruption – Principles for Countering Bribery" (the PACI Principles), derived from Transparency International's Business Principles for Countering Bribery. Adherence to the PACI Principles means adopting a zero-tolerance policy on bribery and a commitment to develop a practical and effective internal programme for implementing this policy. More information about the PACI Principles and definitions can be found at www.weforum.org. In May 2006 Vattenfall also became a Principal Corporate Member of Transparency International Sweden, part of an anti-corruption network headquartered in Berlin. Vattenfall has a zero-tolerance policy regarding the giving and accepting of bribes, and it also expects its suppliers to respect this position. With respect to Vattenfall's suppliers, Vattenfall's Code of Conduct for suppliers has been adopted and shall form a part of all agreements with suppliers.

Risks related to corruption (SO2)

The business unit management is required on an annual basis to confirm that the relevant Group and Business Division instructions that provide guidelines for the use of benefits and gifts have been complied with. This confirmation is a part of the general risk reporting of the Vattenfall Group. All business divisions are analyzed for risks related to corruption.

Anti-corruption policies, procedures and training (SO3)

Training in antitrust compliance and anti-corruption policies has been conducted since 2005 within the Vattenfall Antitrust Compliance Programme. All managers and other employees with extensive external and competitor contacts are required to participate in at least one antitrust compliance seminar or in a similar education programme. It is the responsibility of each business unit to decide who should receive such training.

Given the coming re-launch of the Vattenfall Antitrust Compliance Programme, no seminars within this Programme took place in 2010. In addition, in 2010 approximately 195 employees in Germany participated at an anti-corruption seminar arranged internally and as part of the Vattenfall Antitrust Compliance Programme. In Poland employees have participated in anti-corruption training. Awareness for anti-corruption was raised in the Netherlands by posting information on the intranet. A percentage of employees trained is not calculated, as not all employees have work tasks that require this.

Actions against corruption (SO4)

Six cases of anti-corruption actions at Vattenfall were reported in 2010, in which employees were dismissed, disciplined for corruption, or required to participate in the company's anti-corruption training.

Public policy

The energy sector is a complex industry that is highly dependent on public policy and political decisions. Being a large energy supplier, Vattenfall is an important actor in society and actively participates in the public debate and democratic process. All public policy work at Vattenfall aims to create the best possible conditions for providing energy to society on commercial grounds. Vattenfall's Business Ethics Principles stipulate that all actions and activities must be based on full respect for democratic principles as well as for laws, rules and regulations.

Vattenfall's main operations are in the countries in which the company is a provider of electricity and heat: Finland, Den-

mark, the UK, Germany, Poland, the Netherlands and Sweden. In addition, Vattenfall is active on the European scene, primarily through the Vattenfall European Affairs Office in Brussels.

Public policy positions and development (SO5)

Vattenfall engages in public policy and lobbying discussions on all relevant energy sector issues, from development of joint policy papers with other actors in industry and society (e.g., on CCS and climate change) to direct recommendations from Vattenfall regarding local, national, and European laws and directives.

Combating climate change is a significant issue for Vattenfall. Vattenfall fully recognises the implications of climate change and wants to contribute constructively to efforts to find solutions to the problem. Accordingly, Vattenfall has engaged in this issue internationally and launched a global initiative – Combat Climate Change (3C) to support the development of global climate change policy. Starting in 2010, the initiative was coordinated via a collaboration with the Stockholm Environment Institute. Voluntary contributions from participating companies will support the research.

Political contributions (SO6)

Vattenfall does not give support to political parties, politicians or related institutions. Other contributions to society are summarised under 4.16–17. Vattenfall is a state-owned company, and shares in the company are not publicly available.

Preventing anti-competitive behaviour

Vattenfall has numerous principles, policies and rules designed to ensure that it does not engage in anti-competitive behaviour. Effective and fair competition is vital to ensuring market efficiency. Competition rules are important tools that serve this purpose. As it is truly beneficial from a business perspective, the Vattenfall Group is dedicated not only to complying with competition rules, but also to acting in accordance with business standards that meet the highest expectations from customers and the public.

Vattenfall's Code of Conduct states: "We are to carry on our business activities effectively and in fair competition. We do not enter into or carry into effect restrictive agreements with competitors."

Vattenfall has also adopted specific internal antitrust and competition compliance rules designed to ensure fair trade and practice in the market.

The key to preventing anti-competitive behaviour at Vattenfall is to educate all managers and others with extensive external contacts on all levels in the organisation about internal and

external rules and, for management, to ensure compliance with these rules. Therefore, a Vattenfall Antitrust Compliance Programme has been initiated by the Executive Group Management (EGM).

Given the coming relaunch of the Vattenfall Antitrust Compliance Programme, no seminars within this Programme took place in 2010.

In addition, in 2010 1,476 employees in Germany participated in an antitrust compliance seminar arranged internally but outside of the Vattenfall Antitrust Compliance Programme (including 486 employees through an e-learning tool). Moreover, Trading employees in the Netherlands attended the Business Group Benelux Competition Awareness session in 2010.

Vattenfall has a monthly Group-wide reporting system in place to ensure compliance. In addition, business units are analysed for risks related to anti-competitive behaviour by the business unit management on an annual basis as part of the Group-wide risk reporting structure. The results of this annual review are reported to the General Counsel, Executive Group Management and the Board.

One specific issue related to competition among energy utilities is unbundling. Vattenfall complies with unbundling rules. These rules form part of national legislation, based on EU directives, and stipulate that transmission and distribution businesses must be separated (for instance placed in separate legal entities) from other businesses, especially the electricity generation and sales businesses. Accordingly, the regulated monopoly business is separated from businesses that operate under free competition. Compliance with unbundling rules is essential to ensuring that Vattenfall only uses fair means of competition. For instance, Vattenfall's transmission and distribution companies may not discriminate against generation and sales companies from outside the Vattenfall Group. In return, Vattenfall also expects transmission and distribution companies from outside the Vattenfall Group to not discriminate against Vattenfall's generation and sales business.

In cases of non-compliance, Vattenfall's management may, in accordance with internal instructions, take all necessary actions. Employees found responsible for a breach of the instructions and/or competition rules are held accountable. Depending on the nature of the breach, appropriate disciplinary actions, not excluding dismissal, will be considered and taken.

Legal actions pertaining to anti-competitive behaviour (SO7)

No legal actions regarding anti-competitive behaviour were reported in 2010.

In autumn 2009 the Finnish Competition Authority commenced an enquiry concerning pricing of district heating for the

ten largest district heating companies in Finland. This enquiry by the Finnish Competition Authority is still ongoing. Vattenfall expects that the outcome of this enquiry will not give rise to any adverse consequences for Vattenfall.

Sanctions (SO8)

One administrative sanction for non-compliance with laws and regulations was reported in 2010. The fine amount is relatively small.

Risk management

Vattenfall is exposed to both financial risks (price risk, credit risk) and non-financial risks (political risks, technical risks, environmental risks). Risks that can threaten Vattenfall's goal achievement are identified and managed in the Enterprise Risk Management process.

Non-compliance can have considerable financial consequences, especially with regard to anti-competitive behaviour. Furthermore, there is an obvious risk of damage to the Vattenfall brand. Internally, prevention of corruption and anti-competitive behaviour is mainly regulated by instructions at different levels in the Group and in Vattenfall's Code of Conduct. Read more about risks in the 2010 Annual Report (page 77) and 4.11.

Emergency management and contingency planning (EU21)

Incident and Crisis Management (ICM) within the Vattenfall Group is governed by Group instructions that are part of the Vattenfall Management System (VMS). The purpose of ICM is to ensure that all types of incidents and crises are managed in a professional, secure and responsible manner.

The main objective is that the organisation shall

- work proactively to detect, avoid or mitigate any event that could lead to an incident or crisis;
- always be prepared and equipped to perform effectively in an incident or crisis situation.

Incident and crisis management must be an integrated part of the daily business activities in order to be able to deal with extraordinary situations that can occur.

The ICM unit includes Duty Officers for Crisis Management and Crisis Communication with 24/7 responsibilities, at both the Group and Business Group levels. The ICM organisation focuses on monitoring events that affect Vattenfall's business while analysing and supporting the line organisation in crisis management to ensure proactiveness.

The basic requirement is that all units within the Vattenfall Group whose operations involve risks that could lead to an incident or crisis must be able to manage any such incident or crisis. This implies that:

- analysis must be performed of all risks that could lead to a crisis;
- business continuity plans shall be in place if the risk is unacceptable;
- an emergency management plan shall be in place;
- an emergency management group shall be appointed, prepared and trained; and
- there must be capacity for taking care of personnel and family who are affected by a crisis.

Vattenfall also participates in various national programmes and forums regarding critical infrastructure protection.

Vattenfall's goal remains to be number one in nuclear safety within the industry by 2014. An important part of the improvement work is the use of external benchmarks and best-practice sharing.

During the year, an IAEA OSART review was performed at Ringhals. Several examples of good practices were found, for example in training and the trend of decreasing radioactive leaks. Recommendations and suggestion for improvements were given in the area of management and organisation as well as within improved follow-up of trends and self-assessment. Also a WANO (World Association of Nuclear Operators) peer review was performed at the Brunsbüttel plant. The review resulted in a number of recommendations for improvement, but revealed no major issues related to nuclear safety.

During 2010, key performance indicators (KPIs) were developed for world class in safety and operation, and targets were set. Measurements will start in 2011. No events classified as >0 according to INES occurred during the year, which is the second consecutive year without any such events.

An Integrated Plan programme has been performed with the objective of safely restarting Krümmel and Brunsbüttel.

The action programmes of the transition plans for fulfilment of regulations in Sweden regarding design and construction of nuclear power plants have been progressing and will continue to do so for some years to come. Ringhals has been running an extensive number of action programmes developed to overcome the special supervision of the regulator SSM. These have also been assessed by a separate Vattenfall task force. It is still too early to see positive effects of the programmes.

Product responsibility

Vattenfall's main products are electricity and heat. The nature of these products implies that when used correctly, they have little direct adverse impact on the environment, public health or safety. Vattenfall works actively with energy efficiency, in its own operations as well as by providing customers with advice and support on improving their energy efficiency. Vattenfall also informs customers about safe use of electricity and provides information on electromagnetic fields based on current research in this area.

Managing product responsibility issues

Vattenfall strives to take an advisory role in helping customers save energy. What the company can control pertains to the generation and distribution of electricity and heat and the use of the resources it requires. Vattenfall works actively to avoid and reduce any adverse impact of its operations, including emissions, effluents, waste and noise from power plants.

Goals, performance and risks

Vattenfall does not control the use of its products, and the products are neither a liability nor a risk to the company as such. However, Vattenfall acts immediately whenever safety risks are discovered and actively promotes energy efficiency. Vattenfall does not track performance regarding product responsibility other than measuring customer satisfaction (which to some extent correlates with how customers perceive information).

Organisational responsibility

Vattenfall provides information on the safe use of electricity to customers via different communication channels. Responsibility for communication with customers lies with the marketing and sales functions. For further information, see the Product and service information (PR3) indicator.

Customer health and safety

Most health and safety issues associated with Vattenfall's products arise when customers use electricity to operate other products, not from the electricity itself. Although there are certain direct risks in the use of electricity, these are usually negligible in correct everyday use. The same applies for heat and cooling.

Vattenfall's marketing and sales functions have a high-profile

role in promoting safety by informing customers about safety issues in connection with their use of electricity. Information to customers is generally communicated in brochures, newsletters and marketing material in all countries. Customers are also continuously informed through Vattenfall's websites and at customer service centres in all countries. The information that Vattenfall provides ranges from electricity safety in general, to safety measures during thunderstorms and power outages.

Health and safety impacts (PR1)

Vattenfall actively strives to take the initiative in detecting serious hazards that pose a risk to customers, especially with respect to incorrect use. For example, in Poland Vattenfall promotes use of district heating instead of water heated in individual, hazardous old systems based on gas boilers.

Power lines, like any electrical device, generate electromagnetic fields (EMFs). Concerns have been raised about whether electricity could be hazardous to people's health, and whether EMFs could cause cancer or any other disease. Over the past thirty years considerable effort has been dedicated to investigating this issue. The research is ongoing, and there is a range of divergent views. However, the balance of scientific evidence to date suggests that normal levels of EMFs do not cause diseases. Vattenfall actively monitors related international scientific work in this field and complies with the international industry standard set by the International Commission on Non-Ionising Radiation Protection as well as related national regulatory requirements. Vattenfall contributes to the collaborative research undertaken by Elforsk (the Swedish Electrical Utilities' R&D company).

Number of injuries and fatalities to the public (EU25)

In 2010 eight health and safety-related legal cases were reported within Vattenfall.

Product and safety labelling

In addition to information regarding safety, Vattenfall strives to take a role in helping customers save energy, primarily by providing information via websites and customer service tools, but also through the sale of energy-saving products and services, particularly in the Benelux region.

Product and service information (PR3)

Vattenfall is committed to complying with local regulatory requirements regarding product information and labelling,

Social performance

and issues regarding this are dealt with by the local marketing organisations. Vattenfall meets the product information requirements on electricity labelling in national legislation (based on EU directives), which require that electricity suppliers provide information to all customers on the fuel mix and environmental performance (minimum CO₂ emissions and radioactive waste).

In addition, Vattenfall describes its environmental impact in a transparent and detailed manner using life cycle assessments and environmental product declarations. Vattenfall uses life cycle assessments (LCAs) as one method to assess the environmental impact of its operations "from the cradle to the grave". Vattenfall was the first company in the world to receive an Environmental Product Declaration (EPD) according to ISO 14025.

Customer satisfaction (PR5)

Customer Satisfaction Index (CSI)	B2C		B2B			
	2010	2009	SME		Large	
	2010	2009	2010	2009	2010	2009
Electricity sales						
Sweden	68	69	62	64	69	66
Finland	72	69	65	63	74	79
Germany	72	73	65	66	73	70
Poland	76	76	66	64	66	66
Netherlands	71	-	64	-	65	-
Belgium	71	-	65	-	66	-
Distribution						
Sweden	67	68	61	63	65	66
Finland	69	67	62	63	65	67
Germany	72	72	65	66	71	68
Poland	76	76	65	64	66	67
Heat						
Sweden	72	68	61	65	-	-
Finland	64	67	66	63	-	-
Germany	-	-	69	69	-	-
Poland	74	72	75	74	-	-
Netherlands	70	-	-	-	-	-

Customer satisfaction issues have gained increased attention during the last couple of years and will continue to have high priority in the future.

Targeting and measuring customer satisfaction

Vattenfall's process of measuring customer satisfaction is centralised in order to ensure quality and comparability of results between markets and customer segments within the Group. The objectives of the centralised process are to enable transparent

internal and external benchmarking, target-setting and utilisation of links with other Group-wide stakeholder measurements. The CSI process covers retail customers as well as business-to-business customers within Electricity Sales, Distribution and Heat in all of Vattenfall's markets. Following Vattenfall's acquisition of Nuon in 2009, the integration of the Dutch and Belgian customer segments into the Group-wide CSI process was initiated, and Business Group Benelux was included in the 2010 CSI measurements.

The CSI methodology used gives an index result on a scale of 0 to 100. Together with the overall Customer Satisfaction Index, a number of parameters/factors such as image, customer service, product range, price value, etc. are measured. Statistical modelling then provides insight into influences from each area on overall satisfaction.

Customer satisfaction targets are set in comparison with leading service companies in Europe (mainly the major power, telecom and insurance companies) and are communicated in the business planning directives issued to the organisation once a year. The long-term target is that Vattenfall's Customer Satisfaction Index (CSI) score should be in the top tier among the leading competitors in each market. Customer satisfaction should also be at the same level as leading actors in similar industries, such as telecom. As of 2010 the long-term CSI target for retail customers was raised from 70 to 75. For corporate and industrial customers, the long-term CSI target remains at above 65.

Trends in customer satisfaction

As markets develop, the same trends for customer satisfaction scores can be noticed:

- Fairly high levels of satisfaction in regulated or recently deregulated markets
- Then a drop in ratings when the competition increases, price pressure intensifies and supplier switching increases
- After that, a gradual recovery as a result of a maturing market, with increased value perception and competitiveness in services and offerings.

Compared with 2009, the results among retail customers in 2010 were quite stable. Nuon customers entered with results that were on level with average results for the Vattenfall Group. Satisfaction trends among business-to-business customers are mixed within the Group, although a majority of the market segments reached the long-term target in 2010.

Actions to improve customer satisfaction

Vattenfall has taken a number of actions in all its geographical areas to maintain and increase customer satisfaction, mainly on the operational level:

- Product portfolio development – The product portfolios have

been developed to better suit individual needs and preferences of customers. Examples of product development efforts are the growing number of customers choosing the electricity product Easy Natur in Germany. In many markets Vattenfall now offers customers the possibility to choose source of energy. Some examples are Sweden and Finland, where customers now can choose electricity from wind, nuclear or hydro power.

- Additional services to customers – During the past year Vattenfall developed advisory services for both retail and business customers regarding how to save energy. In the Netherlands, energy advice services were a recurring component in 2010. In Sweden and Finland, Vattenfall has offered advisory services via the company's website and in personal contacts. In Poland, customers were offered to send a text message to Vattenfall and in return get advice on how to save energy. Customers in Germany were offered coupons to receive advisory services.

- Customer information – Improvements in the way Vattenfall provides information to customers have been made in several markets. Examples include improved websites, more frequent newsletters to business customers, and customer seminars and events.

- Customer service – Service levels in the customer care centres were closely monitored and developed during the year. In several markets, such as Finland, customer care centres regained good service levels. Strong development efforts were made in Germany to improve satisfaction with the customer care centres.

- Other development areas – Vattenfall has been active in a number of other areas to improve customer satisfaction. One example is the development of the customers experience at critical stages in the customer life cycle, e.g., introductions, moves and complaints handling in the Netherlands and Belgium. In Germany, smart grids and smart meters have been introduced.

Marketing communications

Responsibility in marketing communications (PR6)

Vattenfall is committed to compliance with international codes, such as the ICC International Code of Advertising Practice and the OECD Guidelines for Multinational Enterprises. In the countries where Vattenfall operates, we also comply with national legislation, which is often more stringent than international codes and frameworks. Review of compliance is handled locally, the frequency is not measured at the Group level.

Non-compliance with regulations and codes (PR7)

Five different types of cases related to non-compliance with marketing communications were reported in Germany in 2010. No fines or penalties were imposed.

An information request was filed with Nuon Sales Netherlands regarding Nuon's compliance with the BMNR rules ("do not call me registry"). The investigation is still ongoing.

In Finland and Belgium one incident was reported.

Customer privacy

Vattenfall's Communication Policy states that "Secrecy is strictly applied with regard to relations or agreements with customers and business partners. The same applies to information about employees or previous employees of Vattenfall". In addition, the Code of Conduct states that "information concerning personal data is handled with respect for the individual's privacy and in consideration of the respective valid personal data protection laws in the various countries in which Vattenfall operates".

This is further elaborated upon in the Group Instruction on Legal and Business Ethics Principles, which states, among other things: "Information concerning a natural person (personal data) shall be handled with respect for the individual's privacy at all times. The Vattenfall Group shall always endeavour to ensure that personal data is processed with the individual's consent. Personal data that may be regarded as sensitive may only be processed if there are strong reasons to do so and it is clear that the legal conditions have been met. No one is allowed to disclose personal data to a person outside the Vattenfall Group unless it is clear that the legal conditions for doing so have been met. It shall be noted that in certain cases there might be specific reasons for keeping personal data confidential."

Both the Communication Policy and the Instruction on Legal and Business Ethics Principles apply throughout the Group. Furthermore, a number of laws are in effect that govern citizens' right to privacy, such as through EU directives concerning the protection of data privacy.

Customer privacy and customer data (PR8)

No complaints regarding breaches of customer privacy were reported in 2010.

Compliance with codes, agreements and frameworks

Vattenfall has adopted and is committed to compliance with several product responsibility frameworks:

- Customer privacy laws and regulations, such as national legislation based on EU directives concerning protection of data privacy.
- Vattenfall meets the requirements for product information and electricity labelling stipulated by EU directives.
- Vattenfall was the first company in the world to receive an Environmental Product Declaration (EPD) according to ISO 14025.
- Vattenfall meets the requirements on unbundling according to national legislation (based on EU directives), thus enabling customers to choose their electricity supplier without being discriminated by the customer's distribution company.

Laws and regulations on products and services (PR9)

One case incidents of non-compliance with laws and regulations concerning the provision and use of products and services was reported in Poland in 2010.

Access to electricity and information

Vattenfall believes that access to electricity is a major contributor to well-being and welfare. The company strives to maintain and/or increase access in accordance with the conditions in the markets in which it works, and in one case through a voluntary initiative in the developing world. Vattenfall's supply of electricity is complemented by information on safe and effective use that is available through multiple channels.

Access to electricity services (EU23, EU26)

Vattenfall is commonly obligated to deliver electricity in all distribution areas, and the number of customers that do not have access to electricity is very small.

In the Nordic countries, Vattenfall is obligated to deliver access to the electricity grid to customers even if they have a poor credit history. In such cases a cash deposit must be paid in advance. If no such means are available, social services are contacted to arrange for payment of the deposit.

In the Netherlands, a ministerial ruling on energy disconnections stipulates that customers may only be disconnected by the grid manager during the winter months (from 1 October to 1 April) if they refuse debt assistance, are guilty of fraud or have no energy supplier.

Nuon's policy is to apply the ministerial seasonal ruling during the summer months as well. Nuon has signed covenants with various Municipal Health Departments, debt assistance organisations and credit institutions, such as the Dutch Association

for People's Credit (NIVK), to facilitate the exchange of personal details. Within the limits set by the Personal Data Protection Act, this allows the company to provide social services and other institutions with timely information on customers who may be in need of psychiatric and/or psychosocial assistance. In this way, energy disconnections can be avoided for such customers who need assistance.

In addition to programmes in Vattenfall's markets, Vattenfall is engaged in the World Economic Forum's Energy Poverty Action (EPA), which is a private sector initiative to reduce energy poverty by bringing effective energy delivery and use to under-served villages and periurban areas. Together with two other utilities, Vattenfall has formed an alliance that is currently developing its first projects in this area. In one of these projects, a village in southern Lesotho will be provided electricity by a combination of grid extension and solar cells.

In the Netherlands, Nuon is the main sponsor of FRES (Foundation for Rural Energy Services), a non-profit foundation that was established by Nuon in 2004. Together with FRES, Nuon provides one of the main preconditions for achieving the millennium goals: electricity. FRES provides clean energy to families in rural areas of developing countries. FRES aims to establish new companies to provide approximately one million people with electricity in a professional, sustainable, environmentally safe – and most of all – in all healthy manner. Currently, FRES manages four companies in three African countries (Mali, Burkina Faso and South Africa). In 2009, FRES received a grant from the European Commission ACP/EU Energy facility to start a company in Burkina Faso. This project has two concrete objectives: Electrification of 3,400 households and small businesses in rural areas of Burkina Faso, and contribution towards the electrification of 100,000 households and small businesses in rural areas, via the public-private partnership and by launching spin-off business activities.

Accessibility of information on safe use (EU24)

Customer centres and websites are important sources of customer information. Vattenfall strives to support groups with special needs by making its websites more available and user-friendly. The basis for this work is the Group Web Access Initiative and the Web Content Accessibility Guide, which provide a set of international guidelines.

Vattenfall's customer centres are staffed with foreign language speakers, and some information material is produced in different languages. One example is in Berlin, where customer information on energy savings is available in Turkish.

Economic performance

Securing the future through economic value creation

Improved profitability and greater value creation are fundamental prerequisites for continued growth and for Vattenfall's ability to be among the leaders in developing environmentally sustainable energy production. Economic value creation and profitable growth are the starting points for the Group's financial targets, which in turn are the platform for the business planning process at the business unit level. Vattenfall's strategic direction emphasises a need to act decisively to reduce the major financial exposure to the price of CO₂ emissions that Vattenfall's existing generation facilities have today and thereby to change the composition of the generation portfolio towards more environmentally sustainable energy production.

Measuring and managing performance

Creating economic value by generating a competitive return over time is Vattenfall's overriding financial objective, since the Group's other strategies are based on a requisite level of financial strength. For a capital-intensive company like Vattenfall, it is important to generate a satisfactory return on invested capital. Long-term value creation is measured by calculating operating profit less the required return on net assets to meet the owner's required rate of return. The overall long-term profitability requirement for Vattenfall set by its owner is a 15% return on equity (ROE) after tax. This has been translated to a Group-wide return target that is expressed as a return on net assets before tax and financial costs (operating profit as a percentage of average net assets). In addition, the owner has also specified targets for interest coverage, credit rating and dividend pay-out.

Financial targets

The owner's required rate of return is used as the basis for setting targets for profitability, dividends and financial risk. The Board reviews the proposed targets and decides to propose them to the Annual General Meeting, where the owner then makes the final decision. Vattenfall's four current financial targets are:

Profitability – The owner's long-term return target is that profit after tax will amount to a 15% return on average equity. Translated to the Group's long-term required level of profitability, expressed as the return on net assets, this corresponds to a return of approximately 11% before tax and financial costs.

Cash flow interest coverage – The cash flow interest coverage ratio after maintenance investments should amount to 3.5–4.5 times over the long-term.

Credit ratings – It is Vattenfall's intention to maintain a long-term credit rating in the single A category from both Moody's and Standard & Poor's.

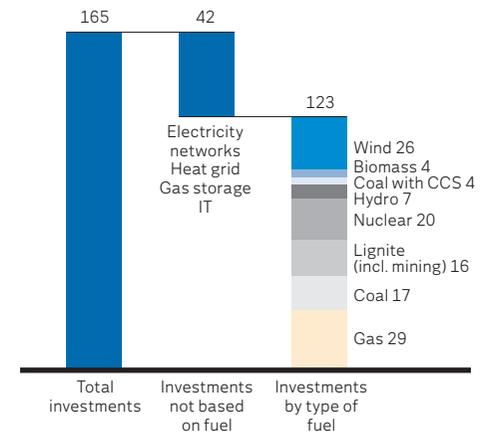
Dividend policy – The aim is that the dividend over the long-term shall amount to 40%–60% of profit after tax. However, yearly decisions on the dividend shall take implementation of the company's strategy, financial position and other economic targets into account.

Vattenfall's investments

Five-year investment programme

Investment planning is done long-term, and at the Vattenfall Group level, five-year investment plans are established. Vattenfall sets its investment plans in five-year moving cycles, meaning that last year's plan for 2010–2014 has now been updated for 2011–2015. This approach also means that much of Vattenfall's current investment capital is tied up in ongoing projects begun in earlier periods, which with few exceptions, the company will see through (see page 14).

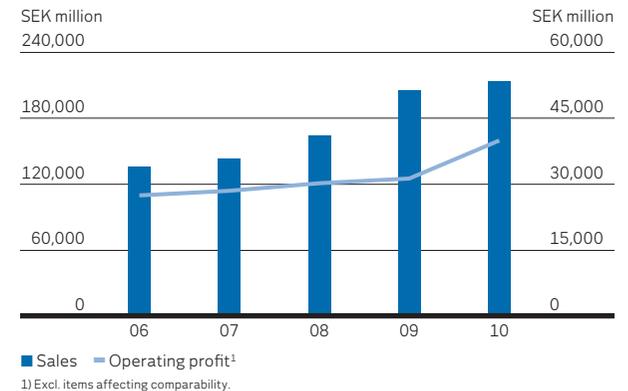
Total investments 2011–2015, SEK billion



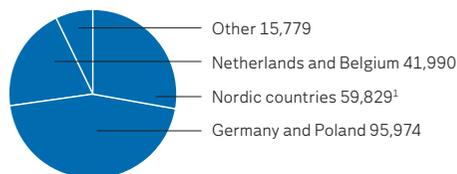
Economic value generated and distributed (EC1)

Economic value distributed 2010

Sales and operating profit 2010



External net sales 2010
– geographic breakdown, SEK million
Total SEK 213,572 million



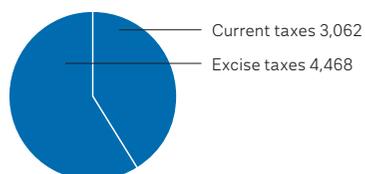
External net sales as stated in the 2010 Annual Report, Note 10 to the consolidated accounts.

Overview of economic value distributed
2010, %



1) Note on operating expenses: The cost of all goods, materials and services is based on the information in Notes 7, 8 and 50 to the 2010 Annual Report and is calculated as follows: External net sales minus depreciation/amortisation/impairment losses/reversed impairment losses and operating profit. Voluntary contributions and investment of funds in the broader community (includes donations) are not included in the chart above, but are disclosed below.

Payment to government – total taxes, 2010
Total SEK 7,530 million



Economic value retained, SEK million

External net sales	213,572
Operating costs	-128,240
Employee wages and benefits	-20,158
Payments to providers of capital	-22,566
Payments to government	-7,530
Economic value retained	35,078

Financial implications due to climate change (EC2)

Major environmental issues representing financial risk/adverse financial impact

Vattenfall’s business environment contains several uncertain factors that are related to climate change. Risks and opportunities are considered and managed throughout the organisation.

The primary impact of climate change for Vattenfall is regulatory, as the EU Emissions Trading System (ETS) creates a cost for the emission of greenhouse gases and a corresponding value for reductions of emissions. A cornerstone of Vattenfall’s long-term strategy is to reduce negative exposure to rising CO₂ prices by reducing emissions from the Group’s portfolio and increasing the Group’s investments in low-emitting electricity generation, including gas (see page 14).

Vattenfall is also exposed to physical risks, including changing weather patterns that could affect demand as well as supply from hydro power plants. Water shortages and warmer water temperatures could also affect cooling of combustion plants, and more frequent and intensive storms could have an impact on transmission and distribution networks. Hydro power dam safety could be affected by higher precipitation levels.

Major environmental issues that represent an economic/financial opportunity

Concerns about climate change will likely lead to higher demand for efficient and low-emitting energy solutions. The ability to provide heat and electricity with inherent efficiency and the potential for clean and sustainable generation technology could prove to be a tangible competitive advantage. Vattenfall is investing heavily in renewable energy generation and sees significant business opportunities in areas such as sustainable cities and e-mobility (see page 36).

Coverage of benefit plan obligations (EC3)

Defined contribution pension plans

Defined contribution pension plans are post-employment benefit plans according to which fixed fees are paid to a separate legal entity. There is no legal or constructive obligation to pay additional fees if the legal entity does not have sufficient assets to pay all benefits to the employees. Fees for defined contribution pension plans are reported as an expense in the income statement in the period they apply to.

Defined benefit pension plans

Defined benefit pension plans consist of other post-employment benefit plans than defined contribution pension plans. The Group’s defined benefit pension obligations are calculated separately for each plan in accordance with the Projected Unit Credit Method by calculating employees’ current and past service cost. Estimated future salary adjustments are taken into consideration. The net obligation comprises the discounted present value of the total earned future salaries less the fair value of any plan assets. The discount rate consists of the interest rate on the balance sheet date of a first-class corporate bond with a lifetime that corresponds to the Group’s pension obligations. When there is no deep market in corporate bonds of this kind, the market rate yield on government bonds with an equivalent lifetime shall be used instead.

When benefits in a plan are improved, the proportion of the increased benefit attributable to the employees’ past service cost is reported as an expense in the income statement on a straight-line basis distributed over the average period until the benefits are fully earned. If the benefits are fully earned, an expense is reported directly in the income statement.

For actuarial gains and losses, the so-called corridor rule is applied. Actuarial gains and losses arise from the effects of changes in actuarial assumptions. The corridor rule entails that the part of the net amount of the accumulated actuarial gains and losses that exceeds 10% of the greater of the obligations’ present value and the fair value of plan assets is reported in the income statement, starting in the year after that they arise, over the expected average remaining service period for the employees covered by the plan.

When the calculation leads to an asset for the Group, the reported value of the asset is limited to the net of unreported actuarial losses and unreported past service costs and the present value of future repayments from the plan or reduced future payments to the plan.

Government financial assistance (EC4)

Government grants

Grants are reported at fair value when it can reasonably be assumed that the grant will be received and that the Group will meet the conditions of the grant. A grant tied to a non-current asset reduces the book value of the asset. A grant intended to cover expenses is reported in the income statement as Other operating income. Government grants received, balance brought forward, amounted to SEK 4,983 million (6,439). Accumulated interest reported as an asset, totalling SEK 2,524 million (1,650), is included in cost of building. Vattenfall is 100%-owned by the Swedish state.

Spending locally-based suppliers (EC6)

Vattenfall's policy is to support competition where possible. Vattenfall will always buy from the supplier that is the most competitive and that fulfils established requirements. Although Vattenfall is an important contributor to the business life in the regions in which it operates, local suppliers will never be favoured solely on basis of being local. Furthermore, sourcing will become more global as more of the world's suppliers gain access to the European markets. Vattenfall's procurement function embraces this development.

However, local and regional suppliers are competitive and still receive a large share of Vattenfall's order volume.

Local workforce and management (EC7)

In the countries where Vattenfall operates, local residents represent the recruiting base. In regions where Vattenfall is one of the biggest employers (e.g., Cottbus in Brandenburg, Germany), local residents make up the employment base. In metropolitan areas, the employment base is made up of a mixture of local residents and people from different regions. For Vattenfall, the local workforce is the foundation for setting up a new business, so knowledge of local people is crucial for operations. When growing through acquisition, Vattenfall takes over the employer responsibility for local residents/people already working at the plants.

Investments and services for public benefit (EC8)

Vattenfall creates and distributes what is perceived as a common good, hence it is hard to separate and distinguish investments by the degree of public benefit. Most investments made represent public benefit in one way or another. For additional information see 4.16–4.17, EN3–4, EN5–7, EN16–18, EU23 and EU26.

Plans for generation portfolio (EU6)

Vattenfall's long-term investment roadmap represents a transition to new energy sources to ensure future value creation and to reach the tough targets on reducing CO₂ emissions, see pages 14–15.

Research and development activities (EU8)

Vattenfall's R&D plays an important role in supporting the Group's strategic ambition to increase electricity generation and heat production from low-emitting energy sources, reduce CO₂ exposure, and be among the leaders in sustainable development. The company's R&D includes energy efficiency improvements across the entire value chain for energy supply, from fuel extraction to consumers' use of electricity, heat and gas. A key part of Vattenfall's R&D encompasses activities intended to meet previously made obligations, such as the final storage of spent nuclear fuel from Vattenfall's nuclear power plants in Sweden. Total R&D expenditures in 2010 totalled SEK 1,545 million.

Vattenfall is not a research and development company in the traditional sense, since it does not develop equipment or products, but sets requirements and finds intelligent uses for equipment in energy systems, and explores new areas for intelligent electricity use. Vattenfall's ambition is to be an excellent user of technology that is mainly developed by others, notably equipment manufacturers. To achieve this, the company works together with different suppliers, from the laboratory stage or in pilot projects and joint demonstration projects. Like all other actors in the energy sector, Vattenfall needs educated and talented personnel. Vattenfall collaborates with universities and research institutions in all of the countries in which it is active.

Provisions for decommissioning of nuclear power sites (EU9)

Provisions for future expenses of nuclear operations: Vattenfall's nuclear power producers in Sweden and Germany have a legal obligation upon the cessation of production to decommission and dismantle the nuclear power plants and to restore the plots of land where the plants were located. Further, this obligation also encompasses the safeguarding and final storage of spent radioactive fuel and other radioactive materials used by the plants. The provisions include future expenses for the management of low- and medium-level radioactive waste.

For the Swedish operations, current assumptions indicate that all provisions will result in disbursements later than 2026.

Current plans for the decommissioning of the German nuclear power operations entail that approximately 91% of the provisions will result in cash flows after 2012. For 2011, disbursements are estimated at about 4% of the provisions. The corresponding figure for 2012 is 5%.

Provisions for future expenses of nuclear operations

Changes in 2010, SEK million	Sweden	Germany	Total
Balance brought forward	29,323	13,187	42,510
Provisions for the period	67	–	67
Discounting effects	1,267	639	1,906
Revaluations versus non-current assets	4,717	-621	4,096
Provisions used	-1,029	-93	-1,122
Provisions reversed	–	-332	-332
Translation differences	–	-1,697	-1,697
Balance carried forward	34,345	11,083	45,428

Vattenfall profile¹

	Sweden		Finland		Denmark		Germany		Poland		Netherlands		Belgium		UK		Total	
	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009
Installed capacity																		
electricity, MW²																		
Hydro power ³	8,510	8,510	126	126	-	-	2,880	2,880	-	-	-	-	-	-	-	-	11,516	11,516
Nuclear power	6,792	6,786	-	-	-	-	771	771	-	-	-	-	-	-	-	-	7,563	7,557
Fossil-based power	1,212	1,212	45	45	1,757	1,757	11,292	11,292	878	878	3,764	3,646	-	-	-	-	18,948	18,830
of which, gas	-	-	45	45	137	137	1,712	1,712	-	-	2,861	2,743	-	-	-	-	4,755	4,637
of which, lignite	-	-	-	-	-	-	7,123	7,123	-	-	-	-	-	-	-	-	7,123	7,123
of which, hard coal	-	-	-	-	1,620	1,620	1,826	1,826	878	878	903	903	-	-	-	-	5,227	5,227
of which, oil	1,212	1,212	-	-	-	-	631	631	-	-	-	-	-	-	-	-	1,843	1,843
Wind power	258	164	-	-	388	377	13	13	30	30	313	313	15	15	431	102	1,448	1,014
Biomass, waste	179	159	20	20	126	126	123	74	-	-	-	-	-	-	-	-	448	379
Total Electricity	16,951	16,831	191	191	2,271	2,260	15,079	15,030	908	908	4,077	3,959	15	15	431	102	39,923	39,296
Installed capacity																		
heat, MW	2,441	2,398	930	930	2,223	2,223	10,013	10,088	4,707	4,707	2,844	2,364	-	-	-	-	23,158	22,710
Generated																		
electricity, TWh																		
Hydro power ³	31.9	30.8	0.3	0.4	-	-	3.1	2.5	-	-	0.1	0.2	-	-	-	-	35.4	33.9
Nuclear power	43.6	41.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43.6	41.5
Fossil-based power	0.1	-	0.1	0.1	7.4	7.2	65.2	61.7	3.6	3.5	13.3	7.8	-	-	-	-	89.7	80.4
of which, gas	-	-	0.1	0.1	0.5	0.4	3.9	3.5	-	-	9.3	5.3	-	-	-	-	13.8	9.3
of which, lignite	-	-	-	-	-	-	52.4	50.4	-	-	-	-	-	-	-	-	52.4	50.4
of which, hard coal	-	-	-	-	6.9	6.7	8.9	7.9	3.6	3.5	4.0	2.5	-	-	-	-	23.4	20.6
of which, oil	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-
Wind power	-	0.4	-	-	0.7	0.7	0.1	0.1	-	-	0.2	0.2	-	-	0.7	0.3	2.2	1.7
Biomass, waste	-	0.3	0.1	-	0.2	-	0.7	1.1	-	-	-	-	-	-	-	-	1.5	1.4
Total Electricity	-	73.0	0.5	0.5	8.3	7.9	69.1	65.4	3.6	3.5	13.6	8.2	-	-	0.7	0.2	172.5	158.9
Heat sales, TWh																		
Fossil-based power	0.1	0.1	0.8	0.7	5.4	5.2	16.3	14.4	11.5	10.6	1.7	0.6	-	-	-	-	35.8	31.6
of which, gas	-	-	0.7	0.7	0.8	0.5	5.1	4.5	-	-	1.7	0.6	-	-	-	-	8.3	6.3
of which, lignite	-	-	-	-	-	-	4.5	4.2	-	-	-	-	-	-	-	-	4.5	4.2
of which, hard coal	-	-	-	-	4.6	4.7	6.7	5.6	11.5	10.6	-	-	-	-	-	-	22.8	20.9
of which, oil	0.1	0.1	0.1	-	-	-	-	0.1	-	-	-	-	-	-	-	-	0.2	0.2
Biomass, waste	4.5	4.3	0.9	0.8	1.6	-	1.3	1.2	0.4	0.1	-	-	-	-	-	-	8.7	6.4
Total Heat	4.6	4.4	1.7	1.5	7.0	5.2	17.6	15.6	11.9	10.7	1.7	0.6	-	-	-	-	44.5	37.9
Gas sales, TWh	-	-	0.2	0.2	-	-	0.1	0.3	-	-	58.9	18.3	4.1	1.3	-	-	63.3	20.1

Vattenfall profile

	Sweden		Finland		Denmark		Germany		Poland		Netherlands		Belgium		UK		Total	
	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009
Number of retail customers, electricity	983,000	919,000	347,000	338,000	-	-	2,823,000	2,645,000	1,012,000	1,009,000	2,288,000	2,295,000	320,000	302,000	-	-	7,773,000	7,508,000
Electricity volume, TWh retail customers	9.6	7.6	2.8	3.2	-	-	9.0	8.4	2.7	2.7	8.8	4.4	1.5	0.7	-	-	34.4	27.0
Electricity volume, TWh resellers	4.2	4.0	0.7	0.6	1.7	1.8	26.6	21.0	0.7	-	-	-	-	-	-	-	33.9	27.4
Electricity volume, TWh industries	34.2 ⁴	33.9 ⁴	4.9	3.2	-	-	12.7 ⁵	15.0 ⁶	4.1	4.2	5.8	3.3	1.8	0.6	-	-	63.5	60.2
Number of network customers	921,000	920,000	393,000	387,000	-	-	3,273,000	3,234,000	1,132,000	1,128,000	-	-	-	-	-	-	5,719,000	5,669,000
Number of gas customers	-	-	300	300	-	-	9,300	12,600	-	-	1,935,000	1,934,000	190,000	177,900	-	-	2,134,600	2,124,800
Electricity network Transited volume, TWh⁷	73.4	68.4	6.4	6.1	-	-	27.1	27.7	14.0	13.0	-	-	-	-	-	-	120.9	115.2
Distribution network, km	168,000	175,000	74,000	73,000	-	-	137,000	138,000	70,000	70,000	-	-	-	-	-	-	449,000	456,000
Allowance in million metric tonnes of CO₂/yr, trading period 2008–2012⁸	0	0	0.200	0.200	2.70	2.70	44.1	44.1	6.10	6.10	7.90	7.90	-	-	-	-	61	61

1) Data in this table is based on financial accounting. Contractual adjustments may apply.
Netherlands and Belgium included from 1 July, 2009.

2) Certain values for 2009 have been adjusted compared with previously published information.

3) Mainly pumped storage power in Germany.

4) 3.6 TWh to industries in Norway

5) 5.6 TWh to industries in France.

6) 4.7 TWh to industries in France.

7) Excl. generation transiting.

8) The European Emission Trading Scheme (ETS) covers the vast majority of Vattenfall's fossil CO₂ emissions.
The annual allocation is 61 million tonnes. Additional allowances are bought on the market.

Combined assurance report

Auditor's Combined Assurance Report on the Vattenfall AB's Corporate Social CSR Report 2010

To the readers of the Vattenfall AB's CSR Report

Introduction

We have been engaged by the board of directors of Vattenfall AB (hereafter: Vattenfall) to perform an assurance engagement on the Vattenfall's Corporate Social Responsibility Report for the year 2010 (hereinafter: CSR Report). The board of directors and the senior management are responsible for the ongoing activities regarding environment, health and safety, quality, social responsibility and for the preparation and presentation of the CSR report in accordance with the applicable criteria. This responsibility includes designing, implementing and maintaining internal control relevant to the preparation of a CSR Report that is free of material misstatements, selecting and applying appropriate reporting policies that include the GRI reporting principles and using measurement methods and estimates that are reasonable in the circumstances.

The Scope of the Examination

We have performed the assurance engagement in accordance with RevR 6 Assurance of CSR Reports issued by Far. The objective of an audit is to obtain reasonable assurance that the information in the CSR Report is free of material misstatements. An audit includes examining, on a test basis, evidence supporting the quantitative and qualitative information in the CSR Report. A review is mainly limited to making inquiries of personnel responsible for sustainability issues, and applying analytical and other review procedures. Hence, the conclusion based on our review procedures does not comprise the same level of assurance as the conclusion of our audit. Since this assurance engagement is combined, our conclusions regarding the audit and the review will be presented in separate sections.

Our assurance engagement includes examination of the following areas, with the purpose of either providing reasonable assurance (hereafter referred to as audit) or limited assurance (hereafter referred to as review).

Our audit is limited to the following information:

Financial information, GRI-indicator EC1;

- Head count, GRI-indicator LA1;
- CO₂-emissions as disclosed in the table CO₂-emissions, per year (total and specific) on page 52–53;
- SO_x and NO_x emissions as disclosed in the table SO_x and NO_x-emissions, per year (total and specific) on page 53–54.

Our review is to verify that the information in the CSR Report of Vattenfall is, in all material respects, a reliable and adequate representation of the policy, activities, events and performance with respect to corporate responsibility during 2010. Our engagement does not provide any assurance relating to future information such as estimates, expectations or targets, or their achievability.

The scope of the report including any inherent limitations that could affect the reliability of the information contained therein is set out in the section "Report profile, scope and boundaries" of the Report.

The criteria on which our review are based are the parts of the CSR Reporting Guidelines G3, published by The Global Reporting Initiative (GRI), which are applicable to the CSR Report, as well as the accounting and calculation principles that the Company has developed and disclosed. These criteria are presented on pages 39–41. We consider these criteria suitable for the preparation of the CSR Report.

Review Procedures

The main procedures of our review have included the following:

- Assessing the acceptability of the reporting policies used and their consistent application, as well as reviewing significant estimates and calculations made in preparing the Corporate Social Responsibility Report 2010.
- Obtaining an understanding of the sector, organisation and its most relevant social responsibility issues;
- Obtaining an understanding of the design and operation of the systems and methods used to collect and process the reported information, including the consolidation process;
- Reviewing based on a risk analysis the plausibility of the information contained in Vattenfall's Corporate Social Responsibility Report by performing analytical procedures, conducting interviews with responsible company officers, and checking the substations of this information on a test basis, as well as retrieving the relevant corporate documents and consulting external sources;
- Assessment of the company's declared application level according to GRI guidelines;
- Evaluating the sufficiency of the Corporate Social Responsibility Report of Vattenfall and its overall presentation against the criteria mentioned above.

We believe the evidence we collected during our procedures to be sufficient and appropriate in order to support our conclusions listed below.

Audit Procedures

We have performed all the procedures deemed necessary to obtain the evidence that is sufficient and appropriate to provide a basis for our conclusions. Our main procedures performed for the information where we provide reasonable assurance on are:

- Identifying inherent risks relating to the reliability of the information and investigating the extent to which these risks are covered by internal controls;
- Performing tests of control to review the existence and effectiveness of internal controls aimed at reviewing the adequacy and reliability of the information;
- Following the audit trail on a test basis, from the source data to the information contained in the Corporate Social Responsibility Report 2010;
- Performing tests of details on a test basis aimed at reviewing the reliability of the primary information.

Conclusion

Our conclusion based on our review

Based on our procedures performed, nothing has come to our attention that causes us to believe that the information in the Vattenfall's CSR Report which has been subject to our review has not, in all material respects, been prepared in accordance with the above stated criteria.

Our conclusion based on our audit

In our opinion, the information in Vattenfall's CSR Report which has been subject to our audit has, in all material respects, been prepared in accordance with the above stated criteria.

Stockholm, March 31, 2011

Ernst & Young AB

Hamish Mabon
Authorized Public Accountant

Dick de Waard
Authorized Public Accountant

Glossary

3C Combat Climate Change. A global initiative, launched by Vattenfall, aimed at creating a global alliance of companies demanding integration of climate issues into the world markets. From 2010 the 3C Initiative collaborates with the Stockholm Environment Institute (SEI) to produce research on climate policy.

Base load A term that describes electricity or district heating demand that exists irrespective of load fluctuations. This constant demand is met by power plants that operate 24 hours a day, 365 days a year. (See also peak load.)

Bioenergy Bioenergy is generated by the use of biomass fuels.

Biogenic The term means something generated by living organisms and is used to differentiate between waste fractions that are biogenic compounds (such as food residues, paper, etc.) and fossil-based compounds (such as plastic, etc.).

Biomass Biomass refers to products, waste and residues from agriculture, forestry and related industries, as well as the biogenic fraction of industrial and municipal waste.

Biomass fuel Biomass fuels are solid, liquid or gaseous fuels with biomass origin, which are used for energy purposes. (This is contrary to biofuel, which predominantly refers to gaseous and liquid fuels used for transportation.)

Capacity Capacity is the maximum ability of a power plant to generate electricity or an electricity distribution grid to transfer electricity. It is usually measured in megawatts (MW). It can refer to input (fuel or thermal capacity, MWth) or output (electric capacity, MWe or heat capacity).

Carbon dioxide (CO₂) Carbon dioxide is naturally present in the atmosphere and involved in photosynthesis, but is also formed during combustion. The chemical formula is CO₂. Carbon dioxide is necessary for life on earth to exist. It is a greenhouse gas in the atmosphere, see GHG.

CCS Carbon Capture and Storage involves technologies for isolating carbon dioxide from flue gas (at combustion plants) and storing it. This means that a significantly lower amount of CO₂ is emitted into the atmosphere. There are three principal ways to capture CO₂ produced in large power plants:

- Oxyfuel combustion, where fuel is combusted in oxygen instead of air
- Postcombustion, where CO₂ is removed from the flue gas

- Precombustion, where carbon is removed from the fuel before combustion

CHP Combined Heat and Power. CHP plants generate both electricity and heat.

Climate change Increase of the global temperature caused by a higher concentration of greenhouse gases in the atmosphere, adding to the natural greenhouse effect.

Coal (hard coal and lignite) is combusted to generate electricity and produce district heating. Coal is a major energy source worldwide and is used to produce about 67% of global electricity supply.

CO₂-neutral A fuel or process is termed CO₂-neutral if it does not lead to the accumulation of excess CO₂ in the atmosphere.

Deregulate Deregulation removes legal restrictions on economic activity in order to facilitate freer competition. In the power sector, this often refers to the elimination of monopoly rights for utilities and the creation of a competitive electricity industry.

District heating A method for distributing heat energy for heating a number of buildings from a central location. To achieve this, hot water is circulated through a system of pipes, usually underground.

Efficiency The efficiency of a power plant denotes the percentage of the input energy that is converted into electricity and/or heat.

EMAS Eco Management and Audit Scheme. European Commission regulations for environmental management and auditing.

Energy Several different forms of energy exist, for example potential energy, kinetic energy, thermal energy, and electromagnetic energy. Energy is measured in joule (J) or watt-hours (Wh), meaning power (watt) multiplied by time. It is common practice to use an appropriate prefix, such as kilo for 1,000, mega (M) for 10⁶ (1,000,000), giga (G) for 10⁹ or tera (T) for 10¹² (1,000,000,000,000).

EPD Environmental Product Declaration. An ISO standard for certified environmental product declarations (see www.environmentalproductdeclaration.com).

EU ETS, the European Union Emissions Trading Scheme, wherein companies buy and sell permits to emit greenhouse gases under a shared cap. The EU ETS covers electricity generation and much of heavy industry, and will also cover airlines from 2012.

Fossil fuels Fossil fuels are originally formed from vegetation and microorganisms that have been transformed into coal, oil and natural gas over the course of millions of years. Today, fossil fuels are the world's biggest source of energy, supplying some 80% of all used energy.

Gas Natural gas is a fossil fuel consisting mainly of methane. Natural gas is commercially produced from oil fields and natural gas fields.

Generation Generation of electricity.

GHG Greenhouse gases – gases in the atmosphere, such as carbon dioxide, methane and nitrous oxide (N₂O), that trap heat and thus contribute to the greenhouse effect.

Global Compact The UN Global Compact is an initiative to encourage businesses worldwide to adopt sustainable business practices and comprises ten principles in the areas of human rights, labour, environment and anti-corruption.

GWh A measurement of energy. Abbreviation of gigawatt-hour, or 10⁹ (1,000,000,000) watt-hours.

Hard coal Hard coal is a black, sedimentary rock type with a carbon content of 84%–91%. See also fossil fuel.

Hydro power Hydro power plants use the gravitational force of running water to generate electricity. In reservoir plants, water is kept in dams to be able to regulate power generation. In run-of-river plants, turbines are placed directly in the water stream. Pumped storage plants are used to store energy generated from other sources.

IAEA International Atomic Energy Agency. The UN's centre of co-operation in the nuclear field. The IAEA works with its member states and multiple partners worldwide to promote safe, secure and peaceful nuclear technologies (www.iaea.org).

IEA International Energy Agency. The International Energy Agency (IEA) is an intergovernmental organisation that acts as energy policy advisor to 28 member countries in their efforts to ensure reliable, affordable and clean energy for their citizens.

ISO14001 An international standard to certify environmental management systems.

Joule Unit of work or energy. 1 joule = 1 watt second = 2.7778 ×10⁻⁴ watt-hour. Since a joule is a small unit, giga joule (GJ) is often used, 10⁹ Joules, which is equivalent to 278 kWh.

kWh Unit of energy. Abbreviation of kilowatt-hour, or 1,000 watt-hours.

Lignite Lignite is a soft, brown type of coal, with characteristics that places it somewhere between hard coal and peat. Lignite has a lower energy content and different characteristics than the longer-compacted hard coal.

MW, MWe, MWth A unit of power (energy per unit of time). See also capacity.

MWh Unit of energy. Abbreviation of megawatt-hour, or 10⁶ watt-hours.

NordPool The Nordic electricity exchange.

NO_x Nitrogen oxides (NO and NO₂) are formed when nitrogen reacts with oxygen during combustion. NO_x have many adverse effects on the environment, such as causing ground-level ozone that triggers respiratory problems, and contributing to acidification and eutrophication.

Nuclear power In nuclear reactors, uranium is used to heat water to generate electricity. Nuclear power is used as base load power in many energy systems.

Ocean energy Energy in waves, currents and tidal streams is used to generate electricity. For example, surface buoys may be used to absorb wave energy.

Oil A mixture of different hydrocarbons, usually called crude oil. Crude oil cannot be used directly, but is a raw material that is refined at an oil refinery into a range of products. See also fossil fuel.

OSART Operational Safety Review Team, an IAEA programme under which international teams of experts conduct in-depth reviews of operational safety performance at nuclear power plants

Oxyfuel combustion A type of CCS technology. The Oxyfuel combustion process eliminates nitrogen from the flue gas by combusting the fuel in a mixture of oxygen and recycled flue gases. After combustion, the flue gas is cleaned.

Peak load Short-term peak demand of electricity or district heating is called peak load (see also base load).

Peat Peat is an accumulation of partially decayed vegetation matter and forms in wetlands or peat lands, variously called bogs, moors, muskegs, pocosins, mires, and peat swamp forests. Peat is not classified as biomass or as fossil fuel according to IPCC, although it could be defined as slowly renewable.

Plug-in-hybrid car A plug-in hybrid electric car is a hybrid vehicle with batteries that can be recharged by connecting a plug to an external electric power source. It has an electric motor and an internal combustion engine.

Renewable energy Energy from natural resources that are renewable, or naturally replenished. For example wind, solar, geothermal, wave, tidal, hydro power, biomass and biogas.

SKB Svensk Kärnbränslehantering AB. Swedish Nuclear Fuel and Waste Management Company, tasked with managing Swedish nuclear and radioactive waste in a safe way. Partly owned by Vattenfall.

Smart Grid A smart grid, or intelligent network, delivers electricity from suppliers to consumers using two-way digital technology to control appliances at consumers' homes to save energy, reduce cost and increase reliability and transparency.

SO₂ Sulphur dioxide is formed when fuels containing sulphur compounds, such as coal and oil, are combusted. When SO₂ is emitted to the air, it causes acidification of water and soil.

Stakeholder A Stakeholder is a person, group, organisation, or system that affects or can be affected by an organisation's actions or that is interested in an incident, process or the economically development of a company.

Thermal power Electricity generated via a heating process, such as a gas turbine or a steam cycle in a coal-fired or nuclear power plant (compare CHP plant).

TWh Unit of energy. Abbreviation of terawatt-hour, or 10¹² watt-hours.

Unbundling Unbundling rules form part of national legislation, based on EU directives, and state that transmission and distribution businesses must be separated (for instance placed in separate legal entities) from other businesses, especially the electricity generation and sales businesses. Accordingly, the regulated monopoly business is separated from the businesses under free competition.

Uranium A silvery-gray metallic chemical element with the highest atomic weight of the naturally occurring elements. Uranium is weakly radioactive and occurs naturally in low concentrations (a few parts per million) in soil, rock and water. It is commercially extracted from uranium-bearing minerals such as uraninite. When used in nuclear reactors, uranium is enriched, which means that the content of the isotope U235 has been increased.

Value chain Set of interrelated economic activities that combine to create value in the production of goods and services.

Waste incineration Waste incineration plants generate heat and/or electricity. As combustible waste mainly consists of organic (biogenic) material, waste is considered to mainly generate bioenergy.

Wind power Electricity is generated by wind turbines, often built in clusters called wind farms. Power generation is dependent on wind conditions.

Contacts

Vattenfall in general

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Additional information

www.vattenfall.com/csr
www.vattenfall.com/ccs

Other publications



Vattenfall's Annual Report 2010.

All reports can be ordered or downloaded
from Vattenfall's websites

www.vattenfall.se
www.vattenfall.com

Reports can be ordered from
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Disclaimer

Vattenfall considers that the information contained in this report presents a true and fair picture of Vattenfall. The CSR Report has been assessed by a third party as described in the combined assurance report.

The financial data presented in the report is taken from Vattenfall's audited annual accounts. The reporting currency of Vattenfall AB is Swedish kronor (SEK). For detailed information on Vattenfall's financial status and performance, the reader is kindly requested to refer to the Annual Report.



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