

# For Modern Quality of Life

A Report on Social Responsibility



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A close-up photograph of a child's eye, looking directly at the camera. The eye is a vibrant green color with a dark pupil. The child has bright red hair that is slightly messy and frames the eye. The skin around the eye is fair and has some natural texture visible.

## Sustainable development

Landsvirkjun seeks to be a responsible company operating in the spirit of sustainable development. The term sustainable development was first defined in the report *Our Common Future*, which was prepared in 1987 under the chairmanship of Gro Harlem Brundtland, former Prime Minister of Norway.

*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

Sustainable development has three main pillars: Economic prosperity, social progress and environmental balance. These three aspects must be viewed in context and an effort made to maximise economic prosperity and social progress without harming the environment. One of the foundations for sustainable development is a responsible economic sector.

*A socially responsible company is one that contributes to the foundations of sustainable development.*

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# Introduction

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At Landsvirkjun, success is measured on the basis of economy, environment and society, given that the company operates in accordance with the spirit of sustainable development. In this way, the company wants to show true social responsibility.

Landsvirkjun is Iceland's largest energy producer and is responsible for providing one of the fundamental needs of any modern society. Energy is one of Iceland's primary natural resources, and its utilisation is an important source of income and progress. It is vital that developments in which Landsvirkjun is involved are carried out for the benefit of society as whole, that proper account is taken of environmental issues and that the nature of the operation and the manner in which the company operates is understood.

Landsvirkjun, therefore, wants to account for the social context in the company's operations, in order to encourage working practices that strengthen the company's relationship with society and to return results that can be measured on the basis of the economical, environmental and social yardsticks.

This is the first independent report issued on Landsvirkjun's social responsibility. The report is intended to describe the manner in which the company's activities have supported social responsibility, to analyse working practices that have been employed and to signpost the path to greater successes in the future. The report is prepared on the basis of a draft international standard for the social responsibility of companies, ISO 26000. Landsvirkjun's goal is that work practices that accord with this draft standard are incorporated into the company's integrated management system, which has been developed on the

basis of, among others, the ISO 9001, ISO 14001, ISO 27001 and OHSAS 18001 standards on quality management, environmental management, information security management and occupational health and safety management, respectively. In the spirit of quality management, it is anticipated that issuing an annual report and performing an annual assessment on the manner in which Landsvirkjun addresses its social responsibilities will lead to the formulation of ever clearer goals. Moreover, this will lead to the formulation of methods to measure the company's standing at each time, which will again lead to actions to attain these goals.

The approach we have chosen in this report is to discuss Landsvirkjun's social responsibilities in five main chapters:

- The Company – its infrastructure, administration and operating centres.
- The People – our human resources.
- The Environment.
- Society.
- Electricity – the company's product.



# The Company

The establishment of Landsvirkjun in 1965 can be traced to the Icelandic Government's plans to utilise the country's energy resources more efficiently by attracting foreign investors to invest in energy-intensive industries in Iceland.

Early in the 1960s, the Swiss aluminium manufacturer Alusuisse showed an interest in building an aluminium smelter in Iceland. Landsvirkjun was subsequently established for the purpose of building and operating a power station that could sell electricity to power-intensive industries and provide electricity to the general market at economical prices. Previously, the electrification of Iceland had been managed by the State and local authorities and the operation of electricity utilities did not generate sufficient revenue to cover new constructions in the energy sector.

On the establishment of Landsvirkjun, work began on the construction of the Búrfell Power Station. Approximately a third of the funding was obtained from the World Bank, a fact that had considerable effects on the organisation and working practices of Landsvirkjun. The company was characterised by the conditions set by the Bank. A number of these conditions have remained an integral part of the company culture ever since. The Bank strongly recommended that the company be self-governing and independent of government interference. As a result, the Bank insisted that the State and the City of Reykjavík each own one-half of the company. From the very beginning, efforts were made to ensure a secure flow of revenue for the company. To this end, the owners of Landsvirkjun supplied the company with the Sog Hydro Stations (at the time, the largest energy provider in Iceland) and water rights in River Thjórsá. The Bank for-

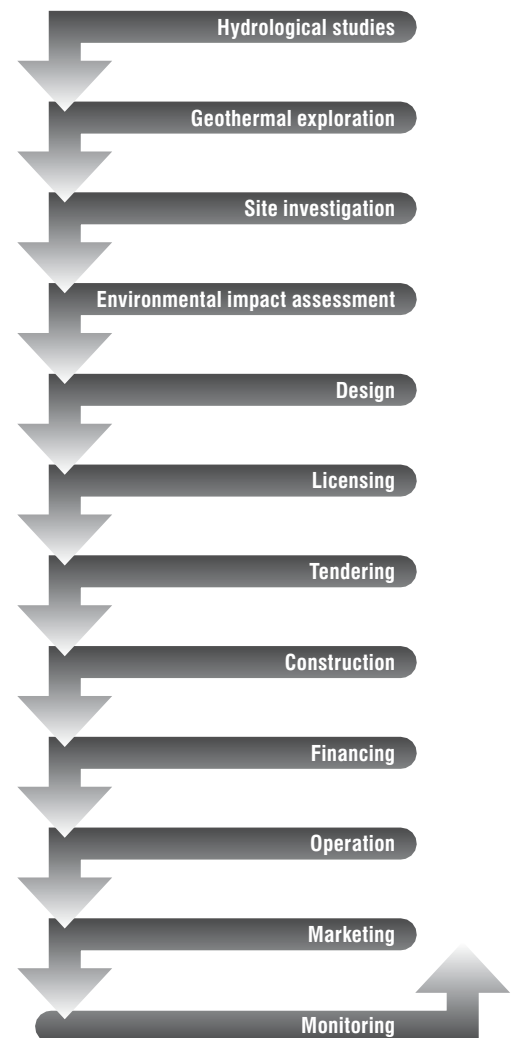
mulated depreciation rules, accounting and pricing structure for Landsvirkjun in accordance with Western models. The Bank's requirements, moreover, included the stipulation that the staff of Landsvirkjun be kept to a minimum and that the company issue invitations to tender internationally for all work and hire consultancy engineering companies for project management and for monitoring the contractors responsible for construction. This policy has remained in effect in the company, which only employs approximately 200 employees despite being one of Iceland's leading companies. Ever since it was established, Landsvirkjun has been more successful than most other companies in Iceland in achieving good results in meeting financial and construction schedules and in being responsible for quality tenders and purchases.

## Policy

Landsvirkjun's key skills involve the financing, design, construction and operation of geothermal and hydropower plants. This forms the foundation for Landsvirkjun's competitiveness. Constant efforts are made to strengthen these skills by seeking the most economic solutions, maintaining knowledge and monitoring innovations.

It is clear that success can only be attained if there is a clear understanding of the context in which the company operates. For this reason, Landsvirkjun ensures that the company's operation and construction activities always accord as well as possible with society and the environment. The operation must create solid long-term relationships with individuals and other interests in the neighbouring environment. Account is taken of the fact that Landsvirkjun holds a special position among Iceland's largest companies in that the

*Landsvirkjun has the skills to follow through on projects*



company's core operations are in rural areas. Efforts have been made to adapt the company's activities to diverse neighbouring interests and to cultivate an understanding of different perspectives. The company believes that this is the best way to encourage the growth and development of the communities in which it operates, ensuring that the company will continue to be an important partner in progress and development.

Landsvirkjun addresses its social responsibilities with the goal of achieving long-term results. The company's operation is one of the foundations for social prosperity. Success in operations is based on the judicious use of environmentally friendly energy. With efforts intended to ensure the performance of the company's social responsibilities in the broad sense stated in this report, the employees and management of Landsvirkjun intend to build on the considerable trust that Landsvirkjun enjoys. Nevertheless, we can expect the company and its activities will continue to be criticised to some extent. The nature and scope of Landsvirkjun's operation is such that the company is often at the centre of public debate. Landsvirkjun's efforts towards responsible operation have shown clear indications of success. Despite extensive battles fought in the media and discussion relating to Landsvirkjun in the national arena in recent years as a result of major projects, public attitudes toward Landsvirkjun are increasingly positive. At

year-end 2008, Landsvirkjun was, for the first time, rated above average among Icelandic companies as enjoying positive opinion and trust.

### **Goal for comprehensive success**

The main goal in Landsvirkjun's operation is to ensure that the company increases in value. In order to achieve this goal, the company must achieve complementary goals in various fields.

As regards financial issues, the principal goals mean that efforts must be made to ensure economical operation, financial management must be effective and efficient and the use of funds in new construction and other investments must be strategic and economical. Moreover, the company's market position must be strong.

In order to reach financial goals, it is important that Landsvirkjun meets the

expectations of its customers. This means that it must be a reliable and growing service company. Landsvirkjun must respond as well as possible to the current needs of customers, while at the same time being sensitive to changes and new demands and developing services to meet such new demands. This applies not least to the demands made in modern society as regards environmental and social issues. This is the basis for maintaining and strengthening Landsvirkjun's positive image.

To meet customer expectations, Landsvirkjun must ensure the efficiency and reliability of its operations. An effort must be made to ensure in every project a clear view of the correct manner in which to ensure that economical, environmental and social decisions are made in tandem with technical decisions. Moreover, innovations must be developed systematically.

To ensure that strategic processes provide good services to customers and lead to

### *Guiding lights*

In all our activities, we are guided by the following values:

- The customer comes first
- Changes mean new opportunities
- In each case, decisions are made by those responsible for the results
- We practice social responsibility
- We respect differing views
- Consultations and co-operation are necessary on all levels
- We show mutual respect and trust
- We reward and praise work well done and address any lack of results and remedies
- We respect nature
- The safety of our employees is of paramount importance in all our activities

### *Vision*

- A responsible company operating in the spirit of sustainability
- A flexible company that knows and fulfils the needs of its customers
- A popular and stimulating place of work that is based on the talents and initiative of its employees
- A valuable and growing energy company in the international arena

### *Principal goals*

- Increased profits and returns
- A strong position in the domestic energy market
- A sound image – a company that is recognised and valued
- Successful, efficient and environmentally friendly operation
- Targeted knowledge management and progress
- Advances into new markets

### **Landsvirkjun's mission**

Landsvirkjun is an energy company that lays the foundations for modern quality of life.

financial success, it is vital that efforts are spent on career development and employee training to make the company a good and sought-after place of work, that initiative and progress have a secure place in the operation and that development and implementation of innovations are successful. The prerequisites are a sound position for the operation in society. This can only be achieved through diverse participation in society and responsible operations.

### Corporate governance

Companies create value by manufacturing goods and providing services to meet demand. In this way, their activities benefit their owners, employees and the community at large.

Landsvirkjun's vision is to be at the forefront of progressive companies whose operations are conducted in a responsible manner under the banners of sustainability and sound environmental policy. Responsible operation must be founded on a comprehensive vision, long-term interests and sensitivity to different perspectives.

Landsvirkjun aims to be a reliable and dynamic international energy company operating on the basis of sustainable development. Landsvirkjun is among the largest companies in Iceland and is wholly owned by the Icelandic State. The Board of Directors of Landsvirkjun is elected at the company's Annual General Meeting for a term of one year and is fully responsible for the company's finances and operations.

Landsvirkjun's interests depend on compliance with the highest standards of business conduct. It is the goal of the Board of Directors, the Managing Director and employees to set an example for responsible

working practices. Our values are communicated through our employees, whose work practices are reflective of the company's values that are the basis of all company policies and products. The company's operation is based on established policies in the field of human resources, equal rights, business ethics and social responsibility.

Landsvirkjun has focused its efforts on various community issues as well as excellence in all aspects of operating the company. Underlying these efforts is the perception that it is important for the company to pay attention to the context in which its activities are conducted and to accept responsibility for the environment in keeping with its role and position at any time.

### Neighbours

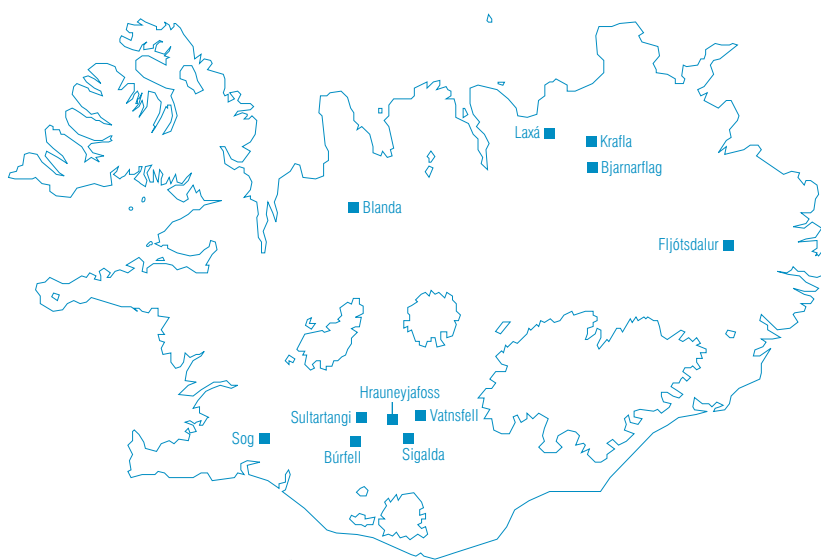
Landsvirkjun operates 11 hydropower stations and two geothermal stations in various locations in Iceland. The company's operations take place in 8 operating units, including the headquarters in Reykjavík.

The operation of the power stations focuses on a comprehensive view of economy, reliability and the operation's cohabitation with the environment and society. Landsvirkjun has worked with the International Hydropower Association (IHA) in the development of an assessment protocol that defines how well the operation of hydropower stations accord with goals for sustainable development. This provides a view of the aspects that matter, the manner in which they have been handled to date, to what extent improvements may be made and the possible actions that could be taken to help the company better achieve goals for social responsibility.

### Local benefits

- The operation of the power stations has proved to be of substantial benefit for local businesses and has strengthened the economy of many communities. Among other things, Landsvirkjun supports government growth and development initiatives for the regions in which the

### *Landsvirkjun's power stations*



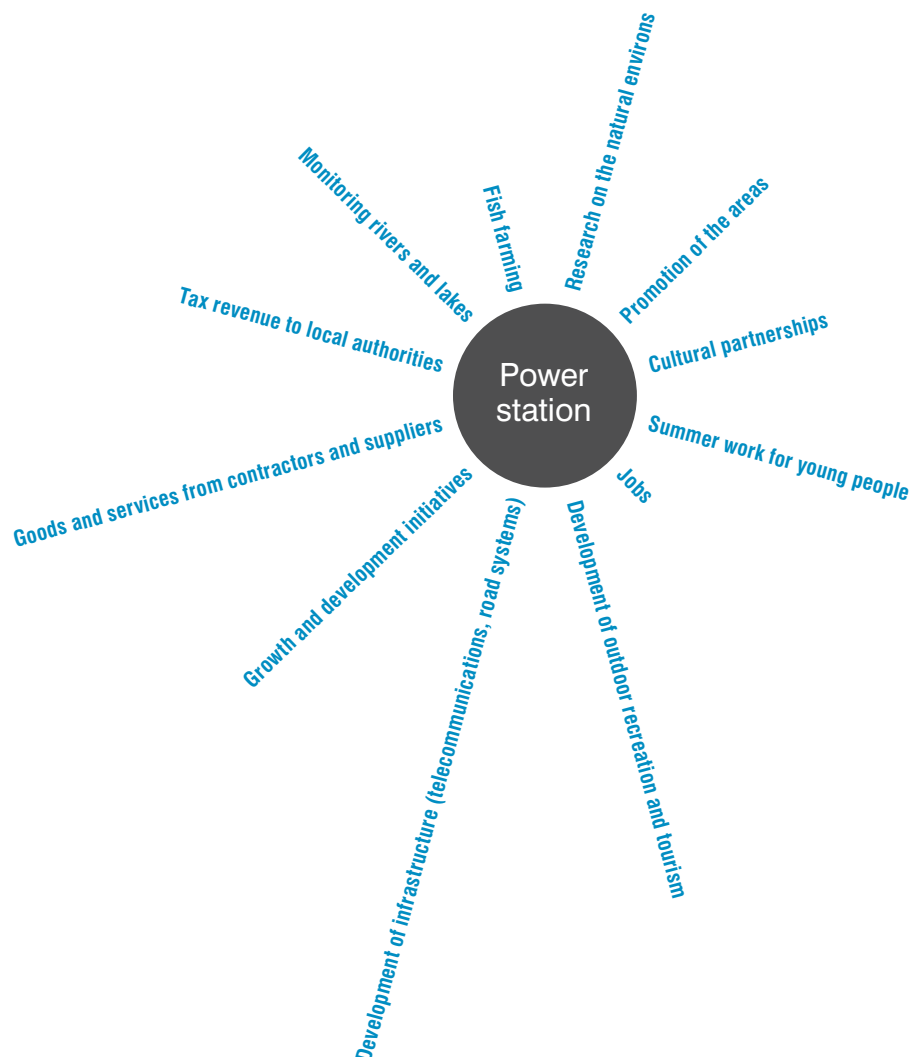
company operates by contributing funds and taking part with the local population in determining how best to proceed.

- The power stations provide quality jobs for the permanent staff, which are important to the local community. The stations also offer young people good summer jobs. Every year, the summer work groups at Landsvirkjun participate in dozens of summer projects on environmental matters and the development of tourist infrastructure. Partners include local authorities and public bodies as well as various NGOs throughout Iceland.
- The local authorities receive substantial tax revenues from the operation of the stations.
- Landsvirkjun has sought partners for the development of tourism and outdoor recreation infrastructure. Many of the stations have been developed as places of interest for visitors. This has strengthened tourism in nearby areas. These activities are advertised, and Landsvirkjun thereby promotes the surrounding areas, which increases tourism.
- With cultural activities in the company's exhibition centres in six stations around Iceland, a forum has been created where local and national culture can be represented. Choirs, vocal soloists and instrument players, dancers and actors, film-makers, painters and various other artists have performed and exhibited in Landsvirkjun's power stations in recent years.
- Co-operation with farmers is extensive and includes land reclamation, facilitation of sheep herding, etc. Provisions to

such effect have often been included in contracts at the beginning of construction.

- The coexistence of hydropower stations and fishing in lakes and rivers has largely been a success. An example is the growth and development of the salmon stock in River Blanda which has become one of the salmon rivers in Iceland that provide the largest catches.
- In the operation of the stations, regular consultation with local stakeholders is

employed and agreements are followed as regards the use of mitigating measures and co-operation and the settlement of disputes, both before and after construction. Particular mention may be made of the Sustainability Initiative launched by Landsvirkjun and Alcoa in co-operation with East Icelandic communities where different stakeholders have agreed on indicators that show sustainable development in communities in the area following the construction of the Kárahnjúkar Hydropower Project and the aluminium plant in Reydarfjörður.





## Safety

Landsvirkjun lays the foundation for all construction through extensive research and design work where the safety to society, workers and facilities on the basis of risk assessment is used for guidance. In each location, the company has prepared emergency evacuation plans and, in this context, co-operates closely with civil protection committees.

In contracts with local authorities as regards the construction of stations, the company has ensured that infrastructure (e.g. roads and telecommunications) are sound enough to ensure provision of information to the public and successful evacuation in the event of a disaster. Mention may be made of the fact that Landsvirkjun's facilities have in recent years successfully withstood earthquakes of up to 6.7 on the Richter scale without sustaining any damage. Furthermore, during a sub-glacial eruption in the 90s, Landsvirkjun's pre-existing research showed right from the start what the hazards were and the company's emergency plans worked perfectly.

## Subsidiaries

### Landsnet

Landsnet hf. was established in 2005 when a new electricity act introduced deregulation in Iceland. The company is responsible for the transmission of electricity and power system operation. Landsnet operates in accordance with a special licence and is subject to the supervision of the National Energy Authority. Landsnet's owners are Landsvirkjun (65%) and a number of Icelandic power utilities.

### Landsvirkjun Power

Landsvirkjun Power (LVP) was established in 2007 and began operations at the begin-

## *The Annual Accounts at a glance*

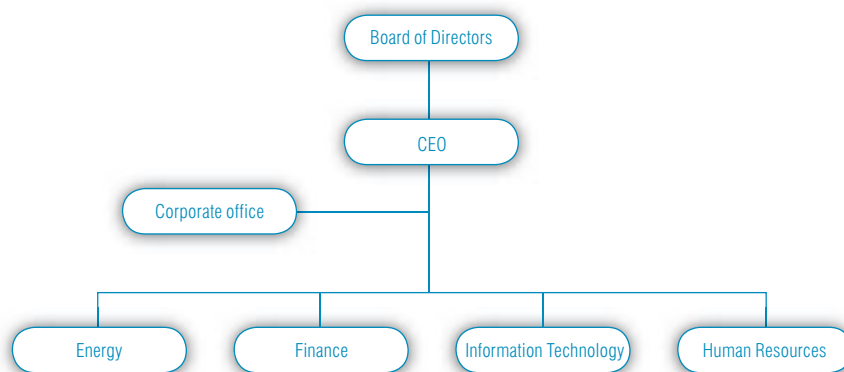
Landsvirkjun's operating losses in 2008 can be traced, for the most part, to the fact that assets in embedded derivatives in the company's sales contracts have fallen considerably between years. The value of the contracts was estimated much higher in the 2007 financial statements, when aluminium prices were high, than at year-end 2008, following a sharp downturn in global aluminium prices. As commonly known, the price of aluminium controls the price of electricity in Landsvirkjun's contracts with aluminium plants in Iceland.

### Highlights of the annual accounts


	2008	2007
Profits (loss) . . . . .	(USD 344.5m)	USD 459.3m
Cash from operating activities . . . . .	USD 184.4m	USD 138.5m
Liabilities . . . . .	USD 3.2bn	USD 3.5bn
Equity . . . . .	USD 1.4bn	USD 1.6bn
Equity ratio . . . . .	29.5%	31.1%

Despite operating losses in 2008, Landsvirkjun recorded increased cash from operating activities. This has been growing in recent years and best shows Landsvirkjun's ability to pay its debts. The company's liquidity position is good given the present circumstances, and efforts are made in all the company's operations to ensure that this remains the case. The company has liquid assets and funds from operations which enable it to meet all its commitments to the end of 2010 even if no action is taken.

## *Landsvirkjun's Organisation Chart*



In conjunction with Landsvirkjun's organisation, on which the company's operation is based, there is a separate arrangement for policy formulation and change management. The company's management meet regularly to assess the company's policies and examine possible changes. Such meetings address policy issues that concern the company as a whole and its future development.



ning of 2008. LVP has 40 employees, the majority of which worked in the engineering and construction division of Landsvirkjun for a number of years. LVP's tasks include preparations, general research, design and construction of geothermal and hydropower stations for Landsvirkjun and power systems for Landsnet in addition to providing expert consultancy services to the subsidiaries and affiliates of LVP. Moreover, LVP's goal is to seek opportunities internationally through direct participation in energy projects in other countries.

#### **Fjarski**

Fjarski ehf. was established in 2000 and is fully owned by Landsvirkjun. Fjarski took over the telecommunications system that Landsvirkjun has operated for a number of years for remote system operations. The aim with Fjarski is to extend these activities and sell telecommunications services. Fjarski's telecommunications services are restricted to the business-to-business market.

#### **Icelandic Power Insurance**

IPI is a captive insurance company whose object is to handle the insurance and re-insurance of Landsvirkjun's power stations and to manage project guarantees during construction.

# The People

Part of Landsvirkjun's social responsibility lies in striving to be a model employer. In recent years, the company has received awards for outstanding results in this area. Further work has gone into erasing gender-related wage differences within the company. Significant results have already been achieved to this end.

Human Resources is represented in the company's top executive management, and human resources issues are an integral part of all matters addressed by management. The company has an established human resources policy and a gender equality plan. Workplace analyses are performed regularly, employee interviews are conducted annually, all employees have career development plans, wage surveys are performed regularly and systematic efforts are made to eliminate gender-based wage differences.

The company's goals and pre-defined abilities for each position are utilised to formulate appropriate training and education for employees in light of the positions they hold as well as based on what interests them and their career goals. Continuous education begins immediately on commencement of employment. The company has full understanding that life does not revolve solely around work and that all education is a positive thing. As a result, employees receive subsidies for recreational studies and physical exercise. After three years of continual employment, employees

are entitled to apply for two months' paid leave for retraining. A large number of employees have taken advantage of the option of studying alongside work. New managers receive targeted training, and coaching is offered, both for managers and specialists. Switching jobs and visits between operating centres are encouraged.

Workplace analyses have been performed on a regular basis since 1999. These reveal that job satisfaction at Landsvirkjun is among the highest known in the Icelandic employment market and that the company's employees are well equipped in that they are supplied with the tools and equipment they need and know what is expected of them at work. As soon as workplace analyses have been completed, meetings are held with divisions and departments and responses formulated for issues that can be improved.

Staff, department and division meetings are held on a regular basis. These are used to share information and to allow staff to comment. Employee interviews are a formal forum for staff and management to discuss current issues and the employee's performance, expectations and authority to take action. Such meetings, moreover, encourage open dialogue. Every year, the Managing Director either calls all employees to a meeting to engage in teamwork and discussions on the company's projects and policies or he visits all operating centres for discussions with staff. This provides

*In 2004, Landsvirkjun received the Icelandic award **Weights that Tip the Scale**, awarded by the group "Supporters of Striking the Balance". This award is given for exceptional efforts within a company or public body for the benefit of the goal of increasing flexibility and making it easier for employees to balance work and private life.*

*In 2005, Landsvirkjun received the **Best Practice in Vocational Education and Training Award**. This is awarded to those who accomplish exceptional work in the field of professional training. Its purpose is to support Icelandic innovation and progress in professional education and to increase interest in the field.*

## Human Resources Policy

- Landsvirkjun's policy in human resources is based on mutual trust and consideration and respect between the company and its employees and among the employees.
- Landsvirkjun seeks to be a popular place of work with excellent working conditions.
- Landsvirkjun seeks to recruit dynamic and reliable employees with diverse backgrounds. Each person recruited by the company is welcomed and provided with systematic training for his/her job.
- Landsvirkjun seeks to offer an enjoyable working environment and encourages employees to show positive attitude and mutual respect in all interactions. Open exchanges of opinion and information sharing is encouraged.
- Landsvirkjun's policy is to ensure gender equality and that each employee is valued on his/her own merits.
- Work/life balance is supported by mutual flexibility in working hours.
- Landsvirkjun promotes systematic information exchange with employees by means of regular meetings, on the intranet and by other means. Employees are encouraged to share their knowledge with their colleagues.

employees with the opportunity to air their views and to ask questions of the Managing Director and other members of management.





*Landsvirkjun received the **Icelandic Quality Award** in 2007. The Evaluation Committee noted that "the initiative and dedication of the staff is admirably placed in a well-defined work environment with active, energetic and goal-orientated management of human resources that provides exemplary staff support".*








# The Environment



In 2006, an environmental management system in accordance with the ISO 14001 standard was incorporated into all operations of Landsvirkjun's Energy Division. When the environmental management system was initially incorporated, the company had operations in four locations: at River Sog, River Thjórsá, Lake Mývatn and at River Blanda. The operations were audited and certified in 2006. One year later, the Fljótsdalur hydropower station was added, and in early January 2009, all of Landsvirkjun's operations had received environmental management certification in accordance with ISO 14001.

Landsvirkjun has established a clear environmental policy, and based on this policy, the company's environmental objectives have been defined. Based on these objectives, measurable goals are established for each division along with implementation plans to achieve the goals and ensure continuous improvements.

The following factors in Landsvirkjun's operations are measured to monitor progress towards objectives. The results in 2008 are indicated with red and green to show negative or positive development from the previous year.

-  Deviations in reservoir management.
-  Percentage of separation water from the Krafla boreholes that is reinjected into the geothermal reservoir.
-  Release of chemicals into the environment from geothermal power stations.
-  Use of fossil fuels.

-   Greenhouse gas emissions from reservoirs.\*
-  Greenhouse gas emissions from geothermal power stations.
-  Carbon binding with land reclamation and reforestation.
-   Total greenhouse gas emissions from Landsvirkjun's operations.\*
-  Recycling and reuse of waste as a percentage of landfilling.

\*   *Greenhouse emission from reservoirs and operations increased in total between years by 90% and 16% respectively, while electricity generation increased by 43%. Despite the increase in total emissions, the emissions per generated kWh decreased by 35%.*

## Carbon footprints

There is a huge difference between energy resources with regard to their greenhouse effect. The following table on page 13 shows this difference according to statistics from the World Energy Council and compares them to the emission per GWh at Landsvirkjun in 2008.

Landsvirkjun has conducted green accounting for its operations since 2006. On that basis, it can be seen that the company's carbon footprints in 2008 is, in total, the equivalent of about 55,600 tonnes of CO<sub>2</sub> or 4.5 tonnes per GWh generated. As mentioned above, this entails an increase in total emissions, but taking into account the 43% increase in electricity production, this is actually a 35% decrease in emissions per GWh. This track record compares extremely favourably with production

## Environmental policy

Landsvirkjun aims at being in the forefront environmentally and promotes sustainable development in Icelandic society.

Landsvirkjun puts emphasis on knowing the environmental impact of its operations and on minimising the impact. In order to continue its success in this area, the company monitors significant environmental factors and makes systematic efforts to improve them.

Landsvirkjun ensures that every legal requirement that relates to the environment is fulfilled and places stricter standards on itself if appropriate.

Landsvirkjun stresses that its employees, as well as others working for the company, have the capability and expertise to carry out this Policy.

Landsvirkjun presents its Environmental Policy to the public and reports on the company's success in environmental affairs, thus encouraging open and objective discussion.

## Objectives

Landsvirkjun's environmental objectives:

1. Operate without environmental accidents.
2. Conduct operations in harmony with the natural ecosystem.
3. Use resources better.
4. Reduce greenhouse gas emissions.
5. Reduce waste generation.

from other energy sources worldwide. Coal generation produces about 165 times more emissions per energy unit, natural gas 77 times more and solar cells some 19 times more.

The following table shows the carbon footprints of Landsvirkjun's hydropower generation on the one hand, and its geother-

mal generation on the other. Taking into account the carbon binding that takes place by Landsvirkjun through landreclamation and afforestation, it can be seen that the company's hydropower generation has incredibly little effect, or only 0.8 tonnes per GWh generated, or in total about 9.7 tons for the production of over 12.3 TWh. The carbon prints of geothermal electricity generation is also low compared to other energy sources at about 96 tons per GWh.

### Green accounting for suppliers and contractors

Since its establishment, Landsvirkjun has placed considerable importance on tendering large projects and equipment internationally and has purchased consultancy services and hired contractors in a similar manner. The company has a policy on these matters and follows European standards for public procurement that have been adopted into legislation in Iceland. Furthermore, Landsvirkjun has been developing systematic supplier assessment and has defined requirements in green purchasing. Moreover, the company has

had software created for green accounting which is distributed free of charge. Tenders stipulate that contractors must employ green accounting (e.g. with the software from Landsvirkjun) in work carried out for the company.

Landsvirkjun's intention is to extend supplier assessments and requirements in environmental issues to consultants and contractors to ensure that a comprehensive approach is taken as to how socially responsible Landsvirkjun's suppliers and service providers are.

### *Landsvirkjun's carbon footprints*

*Emissions from **hydropower** producing 11,867 GWh in 2008 (in tonnes CO<sub>2</sub> equivalents)*

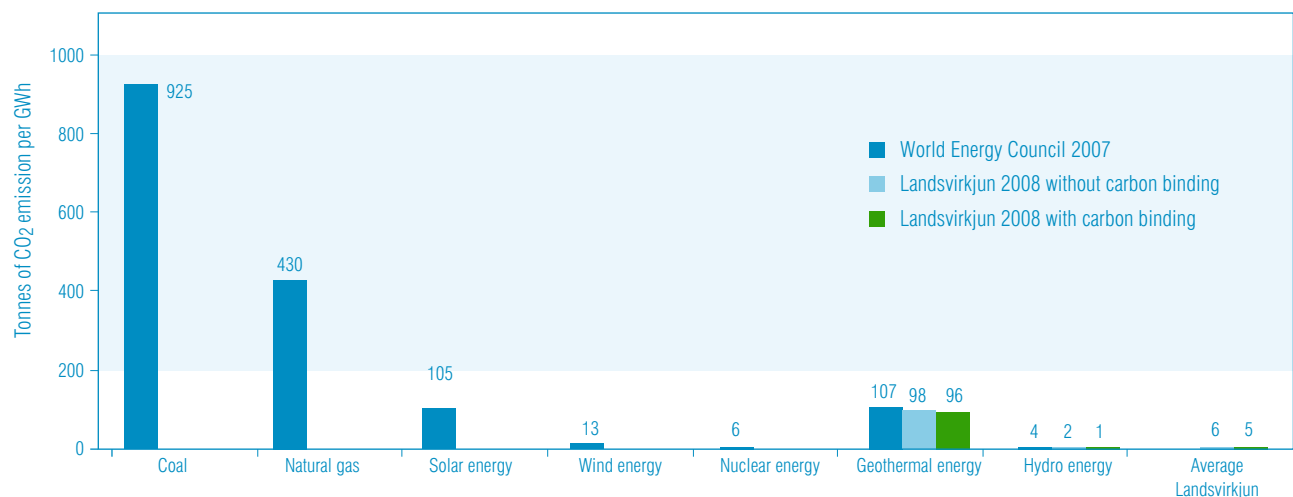
Emissions from reservoirs. . . . .	27,925
Other emissions (vehicles, etc.) . . .	1,235
Total emissions. . . . .	29,171
Carbon binding. . . . .	– 19,296
Carbon footprints. . . . .	9,874
<b>Carbon footprints per GWh . . . .</b>	<b>0.83</b>

*Emissions from **geothermal power** producing 497 GWh in 2008 (in tonnes CO<sub>2</sub> equivalents)*

Emissions from geothermal fields . . .	46,388
Other emissions (vehicles, etc.) . . . .	173
Total emissions. . . . .	46,561
Carbon binding. . . . .	– 776
Carbon footprints. . . . .	45,786
<b>Carbon footprints per GWh . . . . .</b>	<b>95.99</b>

*Further information on Landsvirkjun's environmental management and the company's carbon footprints can be found in company reports on those subjects. Both reports are supplied upon request and can also be found on Landsvirkjun's website.*

### *The greenhouse effect of different energy sources*







# Society

Landsvirkjun believes that a sound company endeavours to maintain good relations with society. A position of trust through co-operation and exchange of information leads to long-term success. Landsvirkjun, therefore, makes every effort to engage in consultation and co-operation in as many fields as possible that relate to its operation, society as a whole, and communities near its operating units.

Consultation and co-operation are an important means of resolving disputes and co-ordinating differing interests. One way to achieve such success, and one which Landsvirkjun has explored, is the so-called Sustainability Initiative in East Iceland. The project involves extensive co-operation between diverse stakeholders at the initiative of Landsvirkjun and Alcoa. Participants in the project include local authorities in East Iceland, NGOs, the business sector, the university community, different employment sectors and the church, to mention a few. Initially, the Sustainability Initiative involved the group reaching conclusions on what aspects relating to the economy, environment and society are important indicators of sustainable development. The group subsequently reached a joint conclusion on the manner in which to measure these issues and their initial positions at the beginning of the construction of the aluminium plant in Reydarfjörður and the hydropower development at Kárahnjúkar. The two companies have pledged to take action if the passage of time reveals undesirable developments according to these indicators.

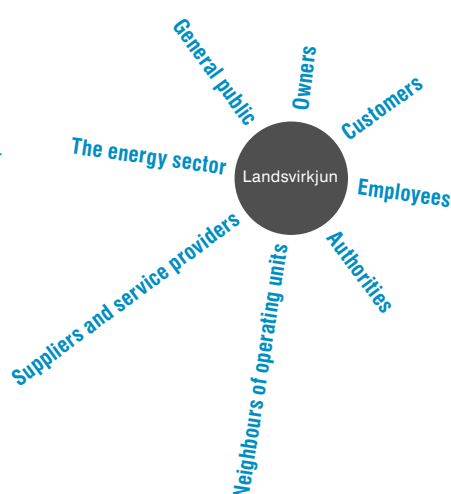
The advantage of having such extensive co-operation with the community involves not least the fact that a joint understanding has been reached as to what development towards sustainability in the community

involves, as well as a commitment to address any issues that may take a turn for the worse.

Landsvirkjun closely follows discussions about the company and attitudes toward it in society. According to attitude surveys, views of Landsvirkjun are currently more positive than ever measured before. Landsvirkjun's positive image and trust in the company is above average among Icelandic companies. Moreover, Landsvirkjun has had an analysis performed in focus groups as regards the company. This work has shown that Landsvirkjun is considered reliable and that it performs its projects well. It is, however, the nature of power companies that views vary as regards individual projects.

## Stakeholders

Landsvirkjun stakeholders can roughly be divided as follows:



## Co-operation with the authorities

Landsvirkjun makes every effort to co-operate and provide the authorities with

information for policy formulation for energy issues. On the enactment of laws and regulations applicable to energy and environmental issues, the Althingi and the authorities frequently seek Landsvirkjun's opinion, which the company has then supplied in a professional manner.

From the very beginning, Landsvirkjun has been an active participant in the preparation of framework programmes for development of the highlands and has, for this purpose, provided both funds and work toward research. Landsvirkjun is of the opinion that by means of the framework programme, a better consensus may be achieved in society in the protection and utilisation of individual areas. Unfortunately, however, such has not been the case entirely. Landsvirkjun hopes that the work currently underway on the preparation of Framework Programme II and the protection and utilisation plan to be submitted before the Althingi will bring us closer to the goal of reaching a consensus on how and to what extent energy resources in Iceland should be utilised.

In order to obtain permits for development, these need to be confirmed in municipal (regional) zoning plans that define permitted land use. As result, Landsvirkjun has had, over the years, close and excellent co-operation with municipalities in the preparation of planning proposals and during construction of power projects. To this end, diverse information and assistance has been made available to the municipalities, given that the work is often extensive and it is only fair that the developer pay its share in such work.

## Participation in public debate

Landsvirkjun, energy and environmental issues have been prominent in the public

debate for many years. Landsvirkjun endeavours to provide as comprehensive information as possible in order to allow objective discussion on the issues that involve the company. Particular mention must be made of the company's efforts to facilitate public access to information on the construction of the Kárahnjúkar Project and on the work itself while underway. The number of guests that visited Landsvirkjun's information centre in Fljótisdalur during the construction of the Kárahnjúkar Project was high on a quarter of the population of Iceland.

*Landsvirkjun's goals in participating in the public debate are as follows:*

- To separate Landsvirkjun's affairs from politics
- To maintain open work practices
- To encourage the public to find out about Landsvirkjun and energy issues
- To present Landsvirkjun's affairs without being provocative
- To show initiative in creating relationships and communications
- To ensure protection of interests – not allow one-sided criticism to take place in a vacuum

Landsvirkjun follows all discussion of the affairs of the company in the media and makes every effort to assist reporters in obtaining information on energy issues and Landsvirkjun.

The company's employees are encouraged to contribute to a constructive public

debate. Moreover, representatives of the company participate in discussions on the Internet, and some material, created by employees, on Landsvirkjun and energy issues may be found on Wikipedia.

Students have always been very interested in finding out about Landsvirkjun. The company receives numerous visits by student groups of every age every year and informs them of the operation. NGOs of various types regularly invite Landsvirkjun employees to visit with presentations of the energy issues that are prominent in the public arena.

### **Information, research and education**

We believe that it is very important to teach young people how electricity in Iceland is produced by means of renewable and pollution-free methods. Every year, many schools have taken the opportunity of visiting Landsvirkjun's power stations with their pupils, in order to be educated about energy production. In addition, Landsvirkjun has been involved in the construction of an energy website, where teachers can obtain information and materials for use in teaching about energy matters. The company's website also contains educational materials for primary school students. The site contains diverse information on the production of electricity, together with an interactive energy game.

Over the past two years, Landsvirkjun has co-operated with Kópavogur Primary School in developing educational material on energy and environmental issues for senior primary school students. Students have been instructed by Landsvirkjun's experts in energy issues and have gone on field-trips to Landsvirkjun's operating units. The plan is that the results of this

work will be published on the website, once they are ready in one-year's time, and thus made accessible to all the schools in Iceland.

Landsvirkjun is of the opinion that basic education in the field of energy issues is of fundamental importance for the company's future. It is important that competent individuals choose an education useful to the energy sector. For this reason, Landsvirkjun has promoted the advantages of education and jobs in the energy sector to university students by participating in e.g. career day at the University of Iceland.

Every year Landsvirkjun's Energy Research Fund offers substantial grants to masters and doctoral students in diverse fields of study. The projects that have been supported in recent years are extremely diverse. The following are some examples of the fields: civil engineering, physics, chemistry, aircraft engineering, industrial engineering, geochemistry, geophysics, geology, geothermal engineering, soil biology, earth sciences, geography, law, plant ecology, history, electrical engineering, meteorology, mechanical engineering and ecology. In 2008, 10 study grants and 17 project grants were awarded, amounting to a total of over ISK 40 m.

In 2007, Landsvirkjun became a founding member of Orkuvörður ehf. The object of the company is to increase the competitiveness of the Icelandic economy by, among other things, increasing education, research and innovation at the university level that will be useful to the employment sector. Orkuvörður is the owner of The School for Renewable Energy Science (RES), which operates as an independent school although in close co-operation with the University of Akureyri and the University of Iceland.

RES is an international school in the field of renewable energy science. The role of the school is to increase knowledge and research in this field, focusing on masters and doctoral students. Approximately 45 students from 14 countries currently attend the school. Moreover, Landsvirkjun has, for a number of years, paid in part for teaching positions in fields relating to energy at the University of Iceland and the University of Akureyri.

Landsvirkjun has provided extensive funds to the natural sciences, as basic research into Iceland's nature has been lacking in most development areas. The company, therefore, has been responsible for a number of research projects into Iceland's nature; hydrographical, meteorological, glacier and earthquake measurements; the preparation of geology, plant and topographical maps; research into fish stocks in lakes and rivers; and diverse studies of Iceland's flora and fauna. A great deal of the information that has been collected is open to the public. Landsvirkjun co-operates extensively with educational and scientific institutions in this field, and the company funds a large part of studies into Icelandic nature.

### Community projects

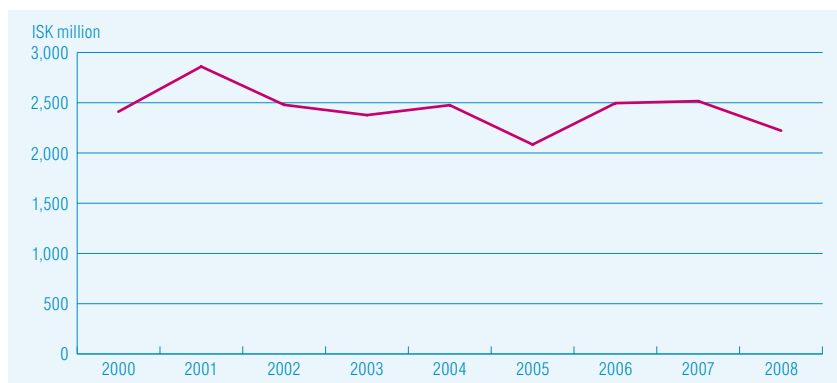
Quality community participation involves undertaking projects in co-operation with communities. Such projects should accord with the activities of the company in question. Landsvirkjun endeavours to take this idea into account at all times.

Landsvirkjun supports community concerns that benefit areas in which the company operates. In this regard, the company wishes to co-operate in projects where the interests of Landsvirkjun and its partners coincide and where both parties contribute. Landsvirkjun focuses on improving tourism and outdoor recreation infrastructure in the vicinity of its power plants and wishes to strengthen tourism and thereby co-operation in the field of culture, for example by staging exhibitions and other events at the company's centres of operation.

*General criteria at Landsvirkjun on participation in community projects, if they accord with the company's activities.*

- Landsvirkjun directs its efforts to projects that concern Icelandic society as a whole.
- Landsvirkjun, moreover, endeavours to specifically encourage the prosperity of communities located nearby the company's operating units.
- Co-operation in community projects is based on the interests of the parties being compatible and that both parties make a contribution.
- By participating in community projects, Landsvirkjun wishes to be involved in a positive manner in development, progress and humanitarian issues.
- Landsvirkjun co-operates in projects for youth, tourism infrastructure, environmental issues, education, culture and charitable causes.

### *Landsvirkjun's funding of research and development*



2008 Price level

# Electricity

Landsvirkjun seeks to ensure that the electricity produced by the company fully complies with the highest quality standards. Electricity quality, first and foremost, involves the company's ability to deliver electricity in accordance with contracts. Optimal operation of and maintenance of machinery in power stations are the foundation for enabling the company to meet contractual obligations. As a result, emphasis is put on preventive maintenance and monitoring all production units on Landsvirkjun's power stations.

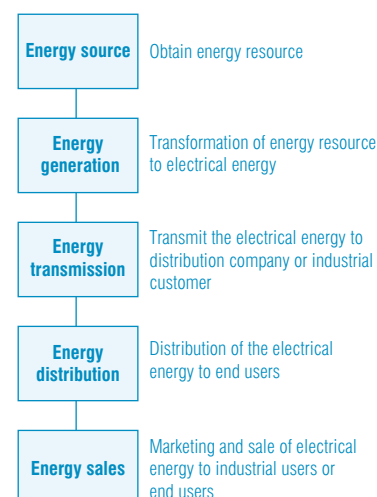
Installations are designed in accordance with the strictest safety, quality and environmental standards. Disruptions in power stations are recorded, and the goal is to reduce the number of disruptions from year to year.

The short-term and long-term reliability of operation is based on hydrology measurements together with the development of a

power system and operating criteria that allows units to be thrown off-line without customers becoming aware of such occurrences.

Landsvirkjun's water resources are managed so as to maximise economy and achieve the best possible utilisation of the water resources in Iceland used for electricity production. Landsvirkjun's reservoirs and diversions, as well as flow management in rivers that have been harnessed, is monitored, and the information made available to all. Operating limits are determined in consultation with stakeholders in order to take account, as far as possible, of their suggestions and indications of what is important to them. Examples of this are the stabilisation of flow for fishing in the River Sog, efforts to maintain Lake Thingvallavatn at a steady water level due to the interests of the National Park and minimized peaks in flow in Thjórsá to take account of interests relating to rod and net

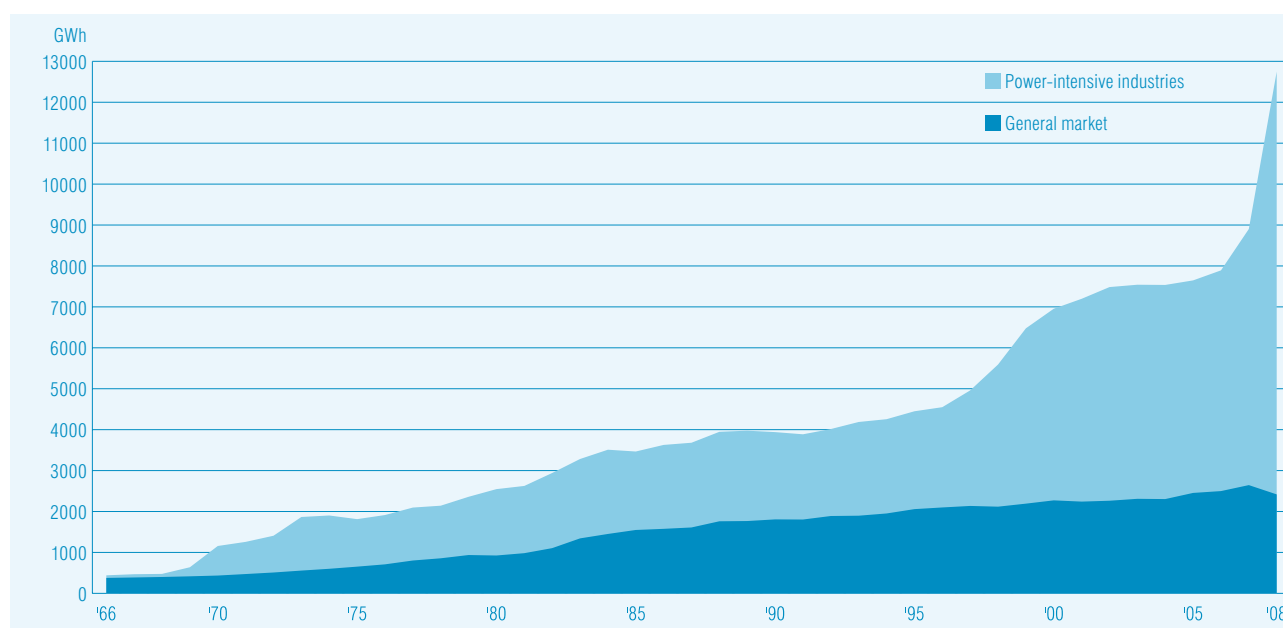
## Value chain of electricity generation



fishing. Moreover, Landsvirkjun has built fish passages and changed the design of its facilities to minimise the impact on farming and fishing.

One of Landsvirkjun's main objectives is to be a reliable service company. Service and

## Landsvirkjun's energy sales in 1966–2008





## Landsvirkjun's production, purchases and sales

	2008	2007
Total production .....	12,345 GWh	8,481 GWh
With hydropower .....	11,866 GWh	7,963 GWh
With geothermal power .....	479 GWh	518 GWh
Electricity purchases .....	402 GWh	422 GWh
Sales to general market .....	2,418 GWh	2,645 GWh
Sales to power-intensive industries .....	10,330 GWh	6,258 GWh
Sales increase .....	43.2%	12.8%

attitude surveys are performed on a regular basis and results compared with previous surveys.

Landsvirkjun regularly meets with its customers to discuss their needs and expectations. An example of results from meetings with customers is increased supply in the form of different contracts on the wholesale market, where an attempt is made to meet the varying needs of customers. Results of surveys are systematically processed, as are the results of meetings with customers, with the service being developed and arranged

in light of the customer's needs. Special criteria for the results of surveys have been predefined.

## The energy market

Landsvirkjun sells electricity wholesale to retailers, to the general market and to major users.

In addition to long-term energy contracts with traditional power-intensive industries, Landsvirkjun is aware that a competitive market for the wholesale and retail sale of

## Electricity production in Iceland

The share of hydropower in energy produced by Landsvirkjun is just over 96%.

Iceland's total electricity production in 2008 amounted to 16,467 GWh, of which Landsvirkjun's share is approximately 76%.

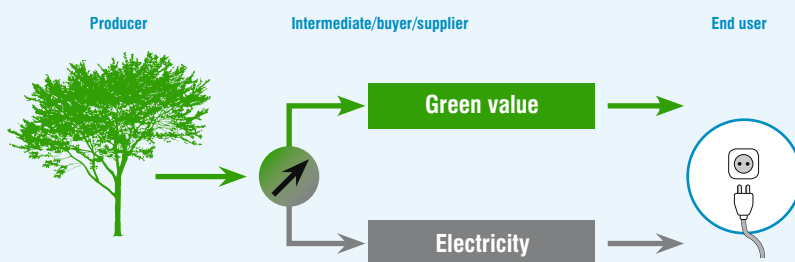
The company's share of hydropower electricity production was 96.3%, and its share of geothermal electricity production was 12.5%.

In Iceland, 75.5% of electricity is produced using hydropower and just under 24.5% using geothermal power.

electricity is developing. The company, therefore, keeps a watchful eye on possible trends and adapts its wholesale operations to the needs of these markets. Moreover, markets have opened up for new energy-intensive operations in the field of high-tech industries such as the further processing of aluminium and electronic data storage in server farms. The possibilities in all these fields are constantly under examination.

## Green certificates

Landsvirkjun sells green certificates, a sales commodity within the EU. The green certificates are used to encourage the sale of electricity produced from renewable energy sources. Electricity vendors in the EU can increase the proportion of green energy they transmit by purchasing these certificates from producers of clean energy.



### Certification of energy production from renewable energy sources

Landsvirkjun has received certification from a recognised certifier in Germany, TÜV SÜD, that its energy production uses renewable energy sources.

At the same time, attention is being paid to possible development of power projects with minimal environmental impact and investment. As an example, the first high-tech company buying electricity directly from Landsvirkjun will begin operations in Akureyri in 2009. Energy for this company can be obtained from Landsvirkjun's current power stations without further investment. The reason for this can be traced, among other things, to a reassessment of the production capacity of hydropower stations in light of a warming climate that increases the flow of water in rivers and glacial melt.

Major users are defined as those using at least 14 MW per year and having a utilisation period of around 8000 hours or more. This group includes Landsvirkjun clients that are categorised as belonging to power-intensive industries and high-tech industries.

The aluminium and ferro-alloy industries are defined as power-intensive. Energy is a high proportion of their production costs. What characterises this market is considerable and steady energy use as well as long-term contracts. Developments in the power-intensive industry market have most often been the reason for new power projects in Iceland. Landsvirkjun is the largest developer that sells energy in the power-intensive industry market. Thus, the company's electricity production is largely based on sound long-term sales contracts. Investments have gone hand in hand with a clear view and guarantee of sales far into the future. This has laid the foundations for the reliable profitability of the operation.

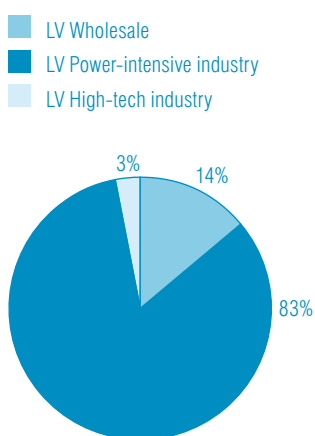
High-tech industries are also characterised by a high proportion of energy costs in their operation. Their energy needs, however, are generally much less than those of power-intensive industries. Moreover, high-tech industries provide a broader range of customers than power-intensive industries. Landsvirkjun is the only company that has signed sales contracts in this market, although competitors have stated their interest in selling to high-tech industries.

The third market is the wholesale market for energy. In this market, energy is sold to companies in the retail market, who in turn sell directly to end-users. Landsvirkjun is the only company involved in energy production for the wholesale market, with

the exception of energy production from small power plants.

The power-intensive industry market is by far the largest purchaser of electricity in Iceland. The high-tech market is a fast-growing market where many companies have declared their interest of making contracts with the production companies. The chart below shows the estimated division of Landsvirkjun's electricity sales in GWh in 2010.

*Estimated division of Landsvirkjun's electricity sales in 2010 by market*



### Power contracts

If all currently effective Landsvirkjun power contracts are examined, these can be roughly divided into three categories mirroring the characteristics of the market as outlined above, i.e. wholesale, sales to power-intensive industries and sales to high-tech industries.

Both long-term and short-term power contracts are available in wholesale, with short-term contracts applying to durations as short as one hour.

The contracts offered by Landsvirkjun

consist of wholesale contracts and base load contracts. The wholesale contracts are generally effective for one or three years. These are suitable for meeting irregular energy use. The base load contracts are effective for six to twelve years. Energy delivery is steady throughout the effective term of such contracts.

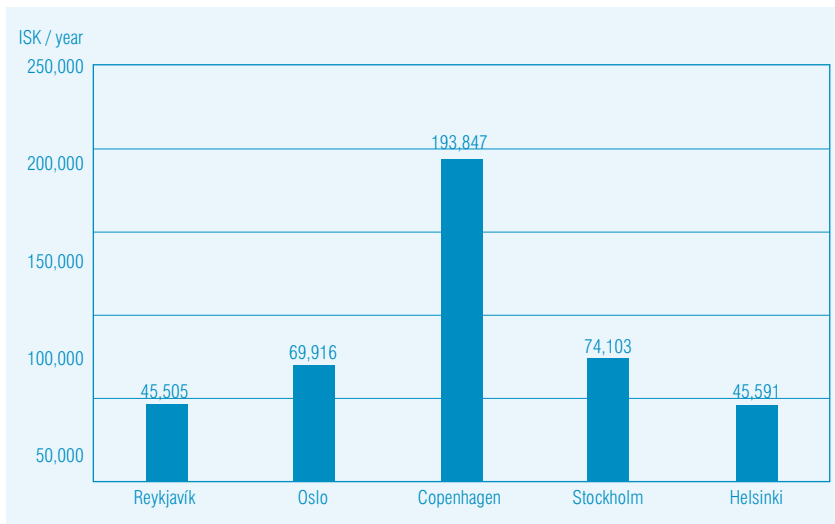
Contracts with power-intensive industries are long-term, up to 40 years, where the buyer must buy most of the contracted electricity whether it uses it or not. Payment is guaranteed by an international parent company with prices being connected to world prices of aluminium. High-tech companies will typically make 10 year contracts with prices being higher than for the aluminium industry and guarantees being limited.

The energy price to power-intensive industries versus the price to the general market has traditionally been a delicate subject in Iceland, with many claiming that the public subsidises the foreign-owned large industries' energy use. The following diagram on page 21 shows real-term lowering of prices to the public and phenomenal growth in sales to large industries at the same time. This shows that the concerns outlined above are unfounded.

Furthermore, according to information from Samorka, household electricity expenses in Reykjavík are now the lowest among capital cities in the Nordic countries.

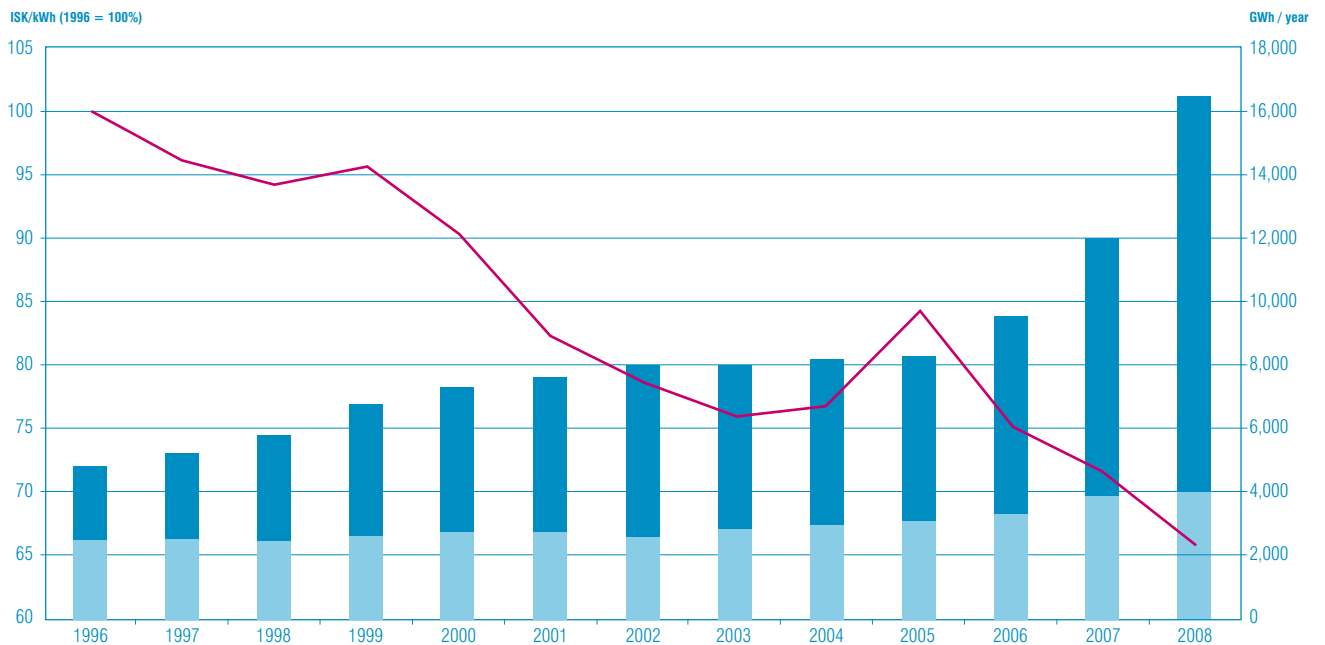
## Electricity prices in the capital cities of the Nordic countries

Home use excl. heating, 4000kWh/year – Feb. 2009



## Relative price of electricity to homes in Reykjavik, adjusted using the consumer price index together with the development of electricity generation in Iceland 1996–2008

■ Price to homes in Reykjavik  
■ Public market  
■ Power-intensive industry





*Timeline: steps towards social responsibility*

Property and finance	Society	Year	Environment	Management and legal
ISAL power contract		1965	Hydrological and geological research for prospective projects	Act on Landsvirkjun
	Art in new power stations International tendering	1966		
		1967		
		1968		
Búrfell		1969	Cofounder of Landvernd (NGO)	
	Landsvirkjun's employee union Youth jobs in summer	1970	Land reclamation	
Thórisvatn reservoir	Holiday cottages for employees	1971		
		1972		
		1973	Cooperation with Council on Nature Conservation	
		1974		
First highland roads		1975		
		1976		
Sigalda		1977		
Icelandic Alloys power contract	First labour contract for power projects	1978		
		1979		
	Subsidies for fish farming Subsidies for electric heating	1980		
Hrauneyjafoss		1981		Conservation of Thjórsárver
Full integration of power system		1982	Land reclamation in heaths at Blanda	
		1983		Law on the electricity sector Landsvirkjun becomes national company Akureyri becomes co-owner
		1984		
		1985		
Krafla aquired		1986		
		1987		
		1988		
		1989		
	Company medic-care for employees	1990		
Blanda		1991		
		1992		
		1993		Law on EIA
		1994		
	First female members on the Board First woman Chairman of the Board	1995	First project undergoes EIA	Quality management system
		1996		
Nordurál power contract Kvísilaveiða diversion		1997	Policy on environmental management	
Háganga reservoir	Sponsoring of Professorship at University of Iceland	1998	All employees receive training in environmental issues	Law on research and utilisation of underground resources
Sultartangi		1999		
Fjarski	Cooperation projects on environmental work in summer First woman head of division Art exhibitions in power stations	2000		Formulation of new company policies
	Policy on gender equality	2001		
Vatnsfell	Main sponsor of the National Museum Study and research grants to students	2002	Environmental stipulations in tender documents	
Alcoa power contract	Sponsor of professorship at University of Akureyri	2003		ISO 9001 certification Framework plan for utilisation and conservation of the highlands
	Prize: Weights that tip the scale Alcoa, Landsvirkjun sustainability initiative Cooperation on education on energy in schools	2004	ISO 14001	Certification of safety of power system
Landsnet	Working group on sustainable development	2005		New law on energy
		2006	Green book-keeping	
First high-tech power contract Kárahnjúkar	Icelandic Quality Award Renewable energy studies (RES)	2007	First environmental management report	State becomes full owner of Landsvirkjun
Landsvirkjun Power		2008		ISO 27001 certification Law distinguishing between ownership and right to utilisation of resources
	Report on social responsibility Volunteer teaching at the University of Iceland	2009		ISO 14001 certification OHSAS 18001 certification





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