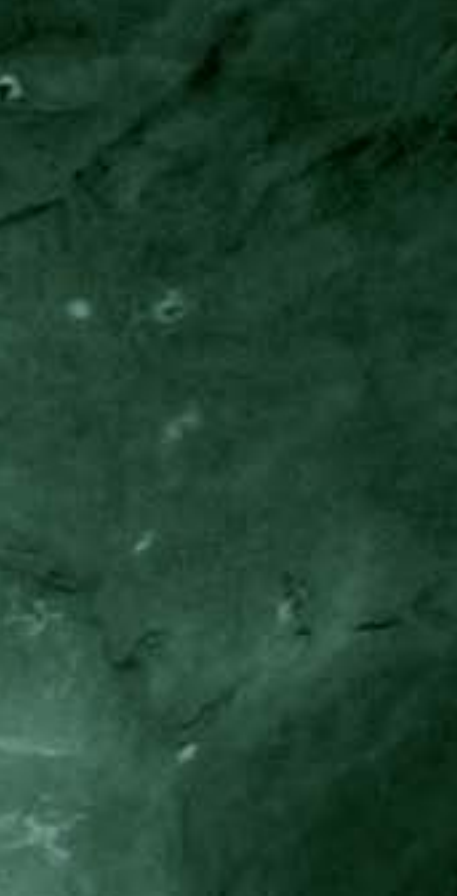


ANNUAL REPORT

2011







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# Posiva and nuclear waste management

Under the Nuclear Energy Act, a producer of nuclear waste is responsible for all required nuclear waste management measures and the associated costs. Teollisuuden Voima Oyj (TVO) and Fortum Power and Heat Oy (Fortum), being parties under the waste management obligation, are responsible for the on-site storage, processing and disposal of their own operating waste resulting from their power plant sites. Both plant sites feature an operational disposal facility into which the reactor waste generated during the operation of the plant is placed. Waste generated from the eventual decommissioning of the power plants is to be disposed of in the same facilities. Parties under the waste management obligation are also responsible for the interim storage of spent nuclear fuel at their power plant sites.

In order to provide for the measures required after the interim storage of spent nuclear fuel, TVO and Fortum established Posiva Oy in 1995 for the purpose of seeing to the disposal of the spent nuclear fuel belonging to its owners. The responsibilities associated with nuclear waste management remained unchanged after the establishment of Posiva. TVO and Fortum are still responsible for all the spent nuclear fuel they produce. In the first phase, Posiva's tasks include the performance of research, technical development and design work. Later, the company will assume responsibility for the construction of the repository and its operation until its final closure. Posiva is also responsible for establishing and maintaining communication with the

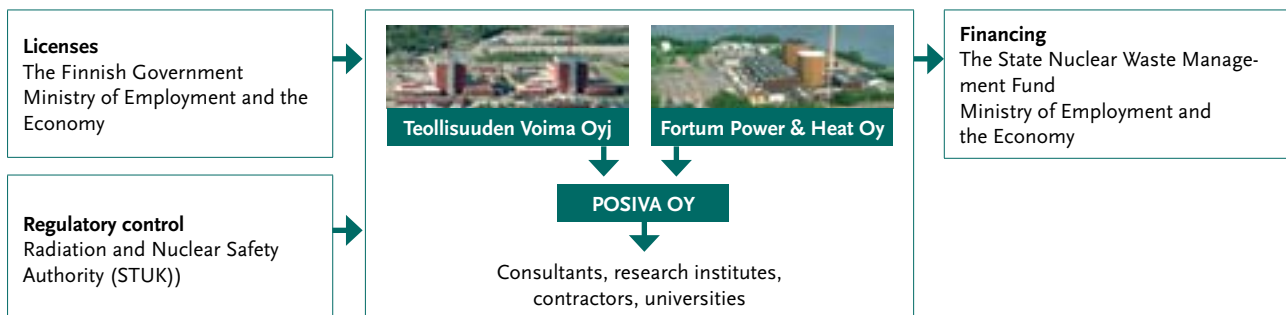
authorities relevant to the performance of its tasks as well as acquiring the required permits for the facilities it constructs and operates.

According to the decision-in-principle ratified by the Finnish Parliament in 2001, the spent nuclear fuel produced in the four current plant units of TVO and Fortum will finally be disposed of at Olkiluoto, Eurajoki. A further decision-in-principle was made in 2002 regarding the construction of the repository in expanded form so that it would also accommodate the spent fuel from the OL3 plant unit currently under construction.

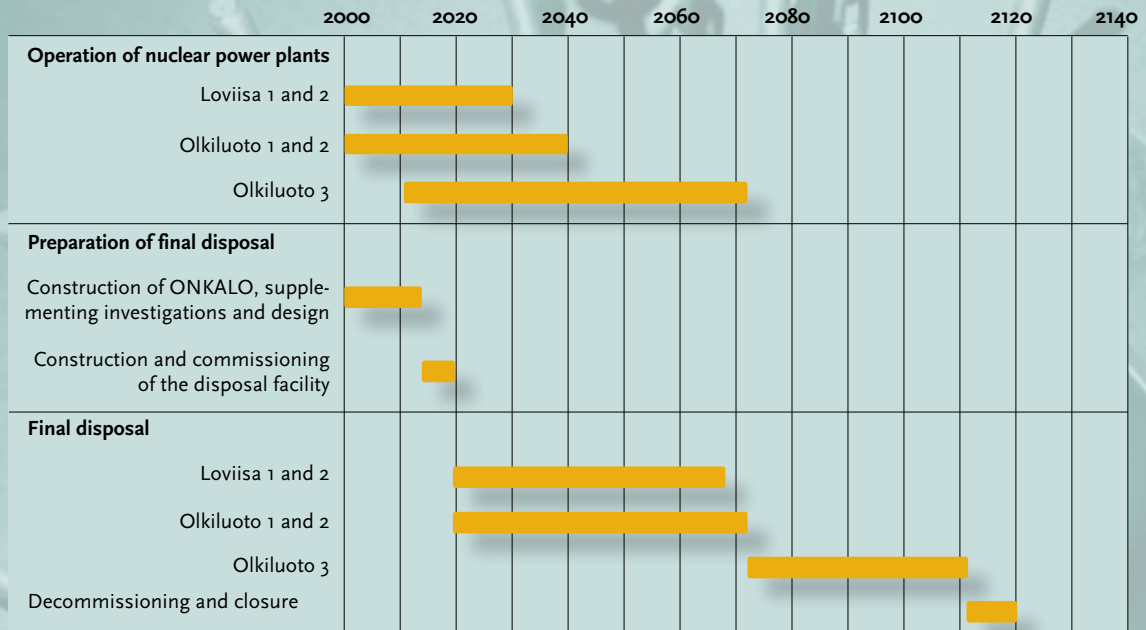
In August 2010, Parliament ratified the government's decision-in-principle regarding the construction of Olkiluoto 4 unit (OL4) on Olkiluoto, Eurajoki. In the same connection, a decision-in-principle was made regarding the expansion of the repository to accommodate the spent fuel from OL4, a total of 2,500 tonnes of uranium. According to the decisions-in-principle ratified by Parliament, spent nuclear fuel containing a maximum of 9,000 tonnes of uranium may thus be finally disposed of at Olkiluoto.

Posiva is preparing to submit the construction license application for the repository to the government in 2012, which would allow the commencement of final disposal operations according to the planned schedule in around 2020. Before that, the interim storage of spent fuel takes place at TVO and Fortum's power plant sites. At the end of 2011, the quantity of spent nuclear fuel in storage at Olkiluoto NPP amounted to 1,330 tonnes, while 522 tonnes were stored at the Loviisa plant.

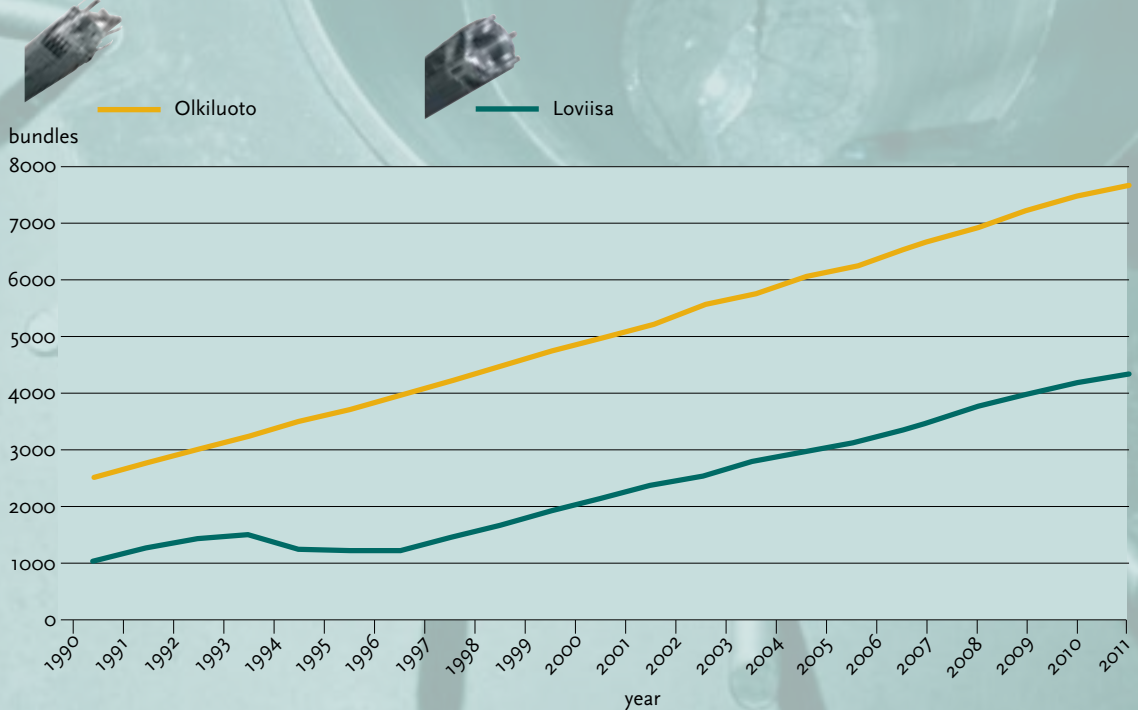
Organisation of nuclear waste management



### General schedule for final disposal



### Quantity of spent fuel



# Review by the President

## **Over the past year, Posiva progressed steadily according to plans and schedules.**

In its 16th year of operation, Posiva was busy preparing for the submission of the construction license application in 2012. Posiva's application will contain the required reports and plans related to the construction of the repository for spent nuclear fuel so that final disposal can commence in 2020 according to the decision made by the Ministry of Employment and the Economy in 2003. Demonstration of long-term safety is a key element in the application, and also its most demanding area. As part of this demonstration, we are performing various research activities at Olkiluoto to ensure the suitability of the bedrock for final disposal. A demonstration project has been launched in ONKALO for the purpose of providing a practical demonstration on determining suitable locations for deposition holes in the Olkiluoto bedrock. Due to the importance of the safety assessments and analyses of the license application, both Posiva and the Radiation and Nuclear Safety Authority (STUK) widely utilise global industry expertise.



The license application describes the implementation of final disposal, the required systems and equipment as well as the implementation method of the repository. The design of the encapsulation plant and disposal facility to describe these areas has proceeded as planned. The first facility related to final disposal operations, the ventilation building, was completed in 2011. The ventilation systems located in the building will provide ventilation for the deposition tunnels. The first piece of equipment related to final disposal operations, i.e. the prototype of the canister deposition hole boring machine, was delivered to Posiva in 2011. The detailed planning and designing of other machines in addition to the encapsulation plant and its equipment has already begun.

Activities in the ONKALO research tunnel are shifting from planning and excavation to the demonstration phase of final disposal. One tunnel matching the size of an actual deposition tunnel has already been completed in ONKALO. The excavation technique of the deposition tunnels was tested during its construction, and after the completion of the tunnel, the new hole boring machine was used to drill a canister deposition hole. After the completion of the 4-kilometre access tunnel, excavation activities have focused on technical and auxiliary facilities as well as raise boring of ventilation shafts. The remaining excavation and boring work will be completed during the first half of 2012.

While work in ONKALO proceeded according to plan, an unfortunate accident occurred there in early 2011. An experienced bedrock construction professional lost his life when he was caught under a block of stone while scaling the tunnel ceiling with an iron bar. This method is widely used in bedrock construction, but working methods at the tunnel have since been improved to increase safety.

Finland and Posiva have provided a practical example to other EU countries on how to prepare for and implement the final disposal of nuclear waste in the EU. The EU issued a new nuclear waste directive in July, defining a framework for all EU Member States regarding the responsible and safe processing of spent fuel and radioactive waste. Each Member State's national laws, decrees and regulations to implement the directive must be entered into force by 23 August 2013. Current Finnish legislation and Posiva's final disposal operations already fulfil all the requirements of the new directive. We hope that the new directive will encourage and activate the final disposal projects in other EU countries and perhaps elsewhere. This will provide opportunities for utilising the expertise of Posiva's personnel in new projects.

Posiva believes that it is possible to obtain the construction license in 2014, which would allow the company to commence the excavation work related to the construction of the encapsulation plant. To ensure readiness for the construction phase in 2014, all the blueprints and acquisition and production plans for the equipment and systems must be ready and all the required authority decisions obtained. Working towards this goal is the next step after Posiva has submitted the construction license application.

Posiva works in cooperation with SKB, a Swedish disposal company, and the companies have continued their bilateral contract for a further three years. SKB submitted its license application in March 2011. The application is currently being processed, but due to the differences in the license procedure in Finland and Sweden, it is likely that this will take longer in Sweden. We at Posiva should be prepared to continue with the project as the very first license holder. This will be an interesting challenge for the years to come.

Reijo Sundell  
President  
Posiva Oy

# The Board of Directors' Report for 2011

## Main events

### Licensing process proceeds according to plan

Posiva aims to submit the construction license application in 2012. In 2011, research and analysis work continued to ensure the timely availability of results and related reports. The feedback provided by the Radiation and Nuclear Safety Authority and other authorities for the preliminary licensing documentation submitted in 2009 was systematically reviewed in 2011, and steps were taken to ensure it is taken into account during the license submission phase. At the end of 2011, the preparation of all application material had been organised and advanced draft versions existed for most of the material. Currently unfinished system planning tasks have been allocated to responsible parties and scheduled to take place in 2012. The degree of completion of the licensing documentation is sufficient for submitting the license application on schedule in 2012.

### Canister deposition hole boring tests commence at disposal depth

The first of its kind, a full-scale disposal technology test was launched in ONKALO. The boring machine commissioned by Posiva for the purpose of boring the canister deposition holes was completed and delivered to Posiva. The machine commenced the boring of the first test hole in the demonstration tunnel at the final disposal depth (-420 m) towards the end of 2011.

### Posiva and SKB sign a contract to continue their cooperation

In September, Posiva and SKB, a Swedish nuclear waste management company, signed a three-year cooperation contract on the research and development of the final disposal of spent nuclear fuel between 2012 and 2014. The companies have worked on joint projects since 2001, promoting the efficient utilisation of their resources in encapsulating and final disposal technologies and proceeding towards the construction of their respective repositories.

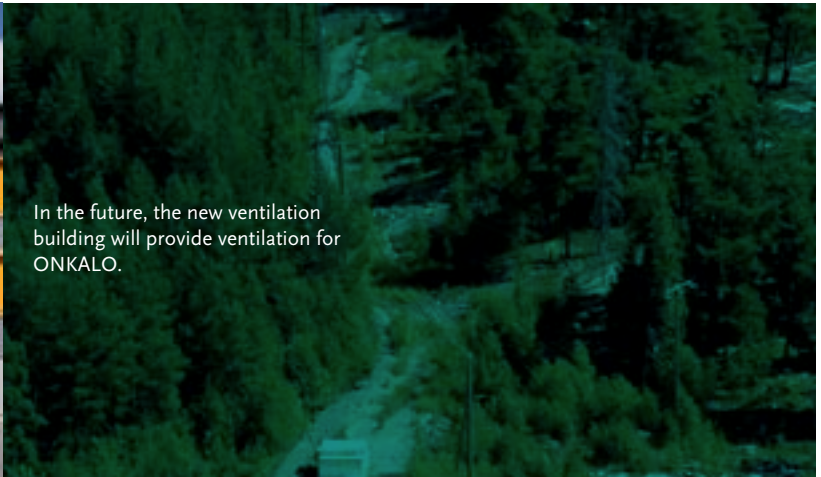
### ONKALO's ventilation building completed

The construction project that commenced in 2010 was completed and the facility was handed over to Posiva at the end of 2011. Some 20 metres high, the building will serve as the central facility that will provide ventilation for ONKALO. The capacity of the ventilation systems housed in the building will be sufficient to meet the needs of the final disposal facilities that will be constructed later.

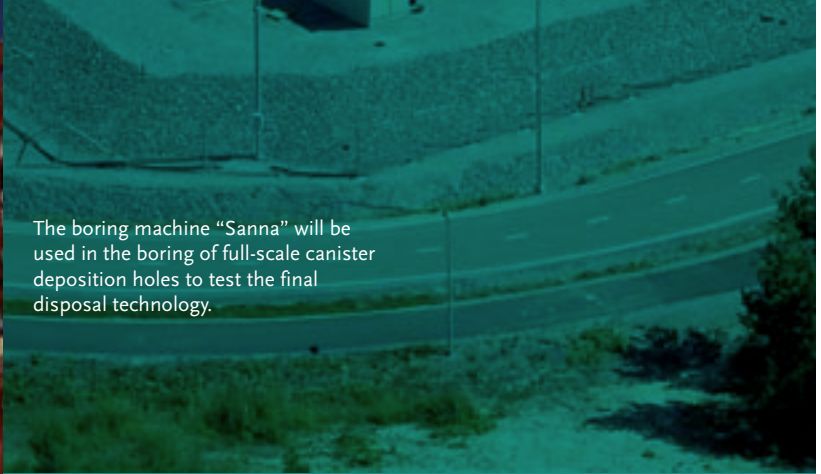
### Posiva's integrated management system receive the OHSAS 18001 certificate

Posiva's integrated management system is in place to ensure high-quality operations at each phase of operations. By certifying the system, Posiva demonstrates its commitment to the safety of its personnel and continuous safety development. OHSAS 18001 is an international standard that specifies requirements for occupational health and safety management systems.





In the future, the new ventilation building will provide ventilation for ONKALO.



The boring machine "Sanna" will be used in the boring of full-scale canister deposition holes to test the final disposal technology.

## Research

The investigations for confirmation of the Olkiluoto site suitability are close to completion. In early 2011, a demonstration project was launched in ONKALO. It is the last phase of the site selection programme for the spent fuel repository initiated by Teollisuuden Voima Oyj in the early 1980s, to which Imatran Voima Oy, later known as Fortum Power and Heat Oy, joined in the mid-1990s. As planned some three decades ago, the suitability of the site is verified by underground tests. These focus particularly on the site properties that may have a significant effect on the long-term safety of final disposal. Underground research commenced with geological mapping and sampling activities at the same time as the excavation of ONKALO in 2004. The current work aims at determining the suitability of the bedrock by means of detailed bedrock classification where long-term safety aspects are used as the basis for determining how the deposition tunnels and holes can be positioned in practice. Posiva intends to use this method in the actual repository operations, and the test is an important part of the work that supports the construction license application.

The suitability of Olkiluoto bedrock has been tested by geoscientific research activities spanning more than 20 years. Prior to the excavation of ONKALO, the research was mostly based on core drilling of deep boreholes from above the ground. In 2011 one more borehole, approximately one kilometre deep, was drilled, which is the 57th deep borehole at Olkiluoto, and will for the time being be the last borehole drilled from above ground. However, the analysis of research results and the mapping of bedrock properties will continue after the construction license application has been submitted, with the aim of further reducing any uncertainties related to the bedrock models created, and to fully utilise the knowledge available from the currently ongoing tests and most recent boreholes.



Visitors view core samples in the ONKALO research hall.

Most of Posiva's research work aims to assess the long-term safety of the repository. Together with the results from design and planning, it lays a foundation for the Safety Case to be included in the construction license application to demonstrate that the final disposal project fulfils the safety criteria required in the government decree and the instructions provided by the Radiation and Nuclear Safety Authority. The Safety Case will consist of about ten individual reports. In 2011, the main emphasis was on the reports on the performance requirements and the capacity of the repository system to meet them. Situations where the system may not work as expected, or where future conditions significantly deviate from those currently considered likely, will be reviewed separately.

## Final disposal technology

The planning and design work of final disposal technology focused on the preparation of materials for the construction license application and preparation for the implementation of final disposal.

The planning of final disposal operations and related equipment development has proceeded as planned. The planning of the canister transfer and installation equipment reached the prototype phase in 2011, and the preparations for equipment acquisition were completed. The planning of the bentonite buffer installation equipment commenced, and a model was selected for implementation planning.

Two test tunnels were excavated in ONKALO at disposal depth for the purpose of testing and demonstrating the final disposal technology. The requirements for the tunnel measurements and excavations match those of the actual deposition tunnels. The first demonstration tunnel was completed and equipped for testing. Demonstrations of boring of canister deposition holes commenced at the end of 2011, utilising the purpose-built machine. A new grouting method has been tested during the excavation of the second demonstration tunnel: instead of cement-based grout composition, colloidal silica is used in grouting. This method is developed in preparation for sealing the bedrock under the demanding conditions of the deposition tunnels.

The development of the disposal solution's engineered barriers focused on adding detail to the plans related to the manufacturing and emplacement technologies of clay components, i.e. the bentonite buffer and backfill, as well as practical testing thereof. A test installation was conducted in ONKALO to collect information on the behaviour of compacted clay as well as required instrumentations for the purpose of planning future full-scale emplacement tests. Large bentonite

Research organiser Juha Heine checks the heating of the test holes in the “Pose” niche.



objects were compressed by means of isostatic pressing with positive results. Clay blocks to be used as filling material in deposition tunnels were manufactured from different materials to test requirement compliance. Field tests were conducted to study tunnel floor backfill, particularly sealing, to verify the feasibility of the plan. Clay components require further development to control the possible effect of seepage waters on the clay materials in the emplacement phase.

The production line reports for the engineered barriers of the disposal solution – the canister and clay components – were completed in 2011. These include a summary of the design basis, designs, manufacturing, emplacement and quality management in each step. The tests on the manufacturing technology of the deposition canister proved that the methods used produce a canister that fulfils the specified quality requirements. Test mouldings of a nodular graphite cast iron insert performed in 2011 have produced the best quality so far.

Posiva committed to continue the development of the KBS-3H horizontal disposal solution together with SKB in 2011. The continuation project will include a full-scale installation emplacement test in the Äspö bedrock laboratory. Results of the test will help assess the safety and feasibility of the disposal solution. The continuation project will run until the end of 2015.

## Construction

The fifth excavation phase of the underground rock characterisation facility ONKALO was completed and the construction schedule was reviewed. As a result, the excavation schedule of the technical rooms was brought forward. The excavation of the technical rooms continued immediately after the completion of the TU5 excavation contract. The excavation of the technical rooms as well as the first parking and maintenance halls were completed by the end of the year. The excavation of the access tunnel to the maintenance level (-460 metres) continued, reaching a length of 4,913 metres. The exhaust ventilation shaft was raise-bored during the autumn, and grouting of two other shafts continued towards the end of the year. The next contracts related to electrical and HPAC installations were postponed until 2012.

Construction above ground reached an important milestone in late autumn with the completion of the first contracts of the ventilation and hoist buildings.

Plant design produced planning documents and system descriptions to be included in the construction license application for the encapsulating and final disposal facility that will be submitted in 2012. They add more detail to the preliminary plans with precise planning analysis and modelling. One of the key activities has been the analysis of the canister shaft

shock absorber and the modelling of a situation where the canister lift falls. A test case has been designed to verify the results of the analysis in practice, and the test will be conducted in 2012. The first draft of main drawings of the encapsulating plant commenced based on the concept plans created by plant design.

Planning activities have focused on construction-phase plans and the planning of future contract phases. In 2011, plans were created in areas such as preliminary construction inquiries related to the construction of the technical rooms and the implementation of the ventilation and electricity installation contracts.

## International cooperation

Over the past decade, Posiva and SKB have completed almost 160 projects and regularly exchange information. New key joint projects were launched in 2011, such as the disassembly of the Äspö Prototype Repository and the continuation project on the KBS-3H horizontal disposal solution.

Posiva has been an active participant in IGD-TP (Implementing Geological Disposal Technology Platform), which comprises a number of European nuclear waste management organisations. The platform published its Strategic Research Agenda in early 2011, which aims at starting the operations of the first repositories for long-lived radioactive waste by the mid-2020s. Based on the SRA, the platform is preparing a plan for European-wide joint research activities. One of the first joint projects, the demonstration test for closure of the repositories, is about to begin. In cooperation with its Finnish partners, Posiva has assumed the main responsibility for the planning of the project.



View of ONKALO at final disposal depth.



Janne Laihonen presents tunnel reinforcements in ONKALO's research facility 3 ("Pose" niche).

In addition to cooperation with SKB and IGD-TP, Posiva has bilateral agreements with several similar organisations responsible for final disposal in Europe and elsewhere. Posiva also actively participates in projects initiated by the OECD's Nuclear Energy Agency.

## Corporate social responsibility and communications

Posiva's operations and the excavation of the research tunnel ONKALO in particular have attracted a lot of national and international coverage. Representatives of Finnish media have been provided opportunities to visit the tunnel. As regards foreign visitors, the most active group is Swedish stakeholders, many of which have visited ONKALO. SKB submitted its construction license application for a final disposal facility in March, triggering Swedish interest in the construction of an underground research facility at a final disposal site.

The most visible press release topic in 2011 was the announcement of the completion of the canister deposition hole boring machine dubbed "Sanna".

"Sanna" commenced the boring of the first full-scale test hole in the ONKALO demonstration tunnel towards the end of 2011.

The Posiva Tutkii (Posiva Researches) supplement was published five times and constituted a major communication channel in the Satakunta area.

Educational cooperation continued with the upper level at Eurajoki Comprehensive School. In addition, a Geology Day was organised for students in the second grade of Eurajoki Upper Secondary School. During the day, Posiva experts told the students about their education and work.

Posiva participated in the meetings of the cooperation team of TVO and the municipality of Eurajoki, as well as the meetings of a cooperation committee of neighbouring municipalities, presenting topical issues related to the final disposal project and the construction of ONKALO.

During the year, 55 groups of visitors and about 550 individuals came to see Posiva's operation in Olkiluoto. The visitors centre at Olkiluoto had over 17,000 visitors during the year. The visitors' centre has an exhibition on the final disposal of spent nuclear fuel.

## Environmental Management

The company manages environmental matters in line with the certified environmental management system and annual environmental programme. Posiva's assessment of environmental aspects was updated in the autumn. According to the assessment and as in previous years, the major environmental aspects in normal operations were related to ONKALO's construction, waste handling and the use of energy. An analysis of potential problem situations revealed that chemical spills pose the most significant environmental risk.

The excavation work in ONKALO produced some 125,000 m<sup>3</sup> of blasted rock in 2011, some of which was used for building works in the area as well as tunnel maintenance. A total of some 28,000 m<sup>3</sup> of water was used in constructing the tunnel. The average rate of leak water in ONKALO was approximately 33 l/min. The waters pumped from the tunnel (operational water and leak waters) were first led to sedimentation and oil separation and then to the sea via an open ditch. As in previous years, the quality of the water was regularly monitored.

The purpose of the environmental programme is to mitigate any negative environmental impact that may be caused by the company's operations. The actions carried out as part of the 2010 programme included the continuation of the development work for preventing environmental incidents. Preparations were also made in order to utilise district heating in the future to heat ONKALO, for example.

On 8 March 2011, the municipality of Eurajoki extended Posiva's environmental permit for the storage of blasted rock until the end of 2015.



Posiva stand at Olkiluoto's internal fair in December.



Collection of measurement data in ONKALO's research facility 3.

## Integrated management system

Posiva's management system consists of manuals providing an overview of Posiva's operations, as well as of supplementary process descriptions, codes of practice and instructions. The purpose of the integrated management system is to ensure that the relevant safety requirements at Posiva's nuclear waste facility are met and that Posiva's operations are safe, timely and cost effective.

In February 2011, after the management manual was approved by authority, Posiva published a new operations management system that describes the company's operations through processes. The process management model is deployed in order to enhance the use of resources and the attainment of goals throughout Posiva's disposal project. In the new system, the strategy process guides the main processes (project planning and cost management, RTD and investment and construction) and support processes that consist of administrative processes and quality and safety management processes. The revised integrated management system aims to ensure communication and interaction between different processes and clarify the division of work between the processes and the line organisation.

The coverage and feasibility of the management system was assessed twice by a management review and once by self-assessment. In the self-assessment the requirements of the IAEA on management systems (GS-R-3) and the requirements of the new YVLA.3 guide constituted the frame of reference used. Ten internal audits regarding the processes of the integrated management system were performed in 2011 for assessing the functioning of the system. In addition, supplier audits were performed with key suppliers.



ONKALO's research facility 3 ("Pose" niche) studies the effect of heat on rock spalling in the test holes drilled in the floor of the facility.

DNV Certification Oy recertified the ISO 9001 environment certificate, performed the periodic audit of the ISO 14001 environment certificate and the certification audit of the occupational health and safety system according to the OHSAS 18001 standard. Posiva received the OHSAS 18001 certificate on 23 December 2011.

## Risk management

At Posiva, any matters that may jeopardise or delay the attainment of goals related to final disposal are perceived as the most significant risks.

Risk management is organised in a holistic manner in compliance with the operational targets set by Posiva's owners and with the principles of good governance. Posiva's risk management supports the materialisation of the company's strategic plans and its associated project plan in the long term and the action plan in the short term. Posiva's risk management is a systematic process where risks are identified and assessed, and their controls are systematically planned, implemented and monitored. Risk management is implemented at the strategic and operative levels in line with the instructions included in the integrated management system.

In 2011, the comprehensive risk management model developed in 2010 was implemented at the main process

level. Sub-processes assess the risks related to their respective operations and report on them to the main processes. The Operations Team reviewed strategic risks twice in 2011.

The company's most significant risks are related to international events and new requirements related to final disposal that will affect Posiva's progress. In addition, there are risks associated with the availability of expertise and with unexpected changes in costs due to issues such as changes in plans or increases in cost levels. Risks related to construction must also be taken into account. Due to an observed decline in the level of occupational safety, increased emphasis is now placed on the selection, guidance and management of subcontractors.

### Posiva's values

RESPONSIBILITY

RELIABILITY

OPENNESS

FAR-SIGHTEDNESS



The Board of Directors: Front row from left to right: Reijo Sundell and Jarmo Tanhua  
Back row from left to right: Sami Hautakangas, Pekka Leskelä and Veijo Ryhänen



The Operations Team from left to right: Timo Seppälä, Reijo Sundell, Elisa Vahteristo, Vesa Ruuska, Anja Smeekes, Erkki Palonen, Timo Äikäs, Juhani Vira.



## Administrative bodies

### BOARD OF DIRECTORS

Teollisuuden Voima Oyj  
Jarmo Tanhua, Chairman  
Veijo Ryhänen  
Fortum Power and Heat Oy  
Sami Hautakangas  
Pekka Leskelä

Jenni Takala, Secretary, Teollisuuden Voima Oyj  
(up to 31 August 2011)  
Ulla-Maija Moisio, Secretary, Teollisuuden  
Voima Oyj (since 1 September 2011)  
President Reijo Sundell and Executive Vice President  
Timo Äikäs have attended the Board meetings.  
The Board of Directors convened six times.

### PRESIDENT

Reijo Sundell

### OPERATIONS TEAM

Reijo Sundell, Chairman  
Members  
Markku Friberg, Safety Manager (up to 31 May 2011)  
Vesa Ruuska, Safety Manager (since 1 June 2011)  
Pertti Huovinen, Construction Director  
(up to 31 January 2011)  
Erkki Palonen, Construction Director  
(since 1 February 2011)  
Timo Seppälä, Communications Manager, Secretary  
Anja Smeekes, Financial Manager  
Elisa Vahteristo, HR Manager  
Juhani Vira, Research Director  
Timo Äikäs, Executive Vice President  
The Operations Team convened 24 times.

## Auditors

CPA Eero Suomela,  
nominated by PricewaterhouseCoopers Oy  
CPA Robert Kajander,  
nominated by Deloitte & Touche Oy

### COMMITTEES APPOINTED BY THE BOARD

#### Technical Committee

Teollisuuden Voima Oyj  
Liisa Heikinheimo  
Mikko Kosonen  
Juha Riihimäki  
Fortum Power and Heat Oy  
Jari Tuunanen, Chairman  
Ilpo Kallonen  
Harriet Kallio (since the second meeting)  
Jyrki Kohopää (up to the first meeting)  
Posiva  
Juhani Vira  
Timo Äikäs  
Pertti Huovinen (up to the first meeting)  
Erkki Palonen (since the second meeting)  
Kimmo Lehto, Secretary

The Committee convened six times.

#### Financial Committee

Teollisuuden Voima Oyj  
Klaus Luotonen  
Veijo Ryhänen  
Timo Palomäki  
Fortum Power and Heat Oy  
Tiina Tuomela, Chairman  
Sami Hautakangas  
Mikko Huopainen  
Posiva  
Reijo Sundell  
Anja Smeekes  
Jussi Palmu, Secretary

The Committee convened six times.

## Shares of ownership

Posiva Oy is a joint venture company owned by  
Teollisuuden Voima Oyj and Fortum Power and Heat Oy.  
Teollisuuden Voima Oyj owns 60% and Fortum Power  
and Heat Oy 40% of Posiva.



Posiva personnel at the Vuojoki Mansion in November 2011.

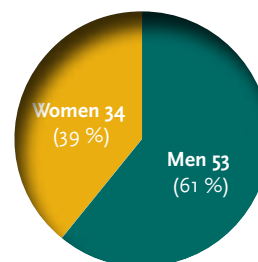
## Personnel and organisation

At the end of the year, Posiva had 94 employees (92 in 2011). The figure includes both permanent and temporary employment contracts. During the year, Posiva employed an average of 98 (96) persons, some of them on a fixed-term contract and on summer internships. During the year, the company recruited nine (five) new permanent employees, mainly to different specialist positions related to nuclear waste management. Four (four in 2010) persons left the company, one (one) of these due to retirement.

In 2011, internal personnel training focused on safety culture, further training related to the Safety Case, process management and occupational safety. The average number of training days per person in 2011 was 11.1 days per person (7.7). In total, 1,077 persons have participated in induction training on the ONKALO construction site, and the ONKALO construction site training days were organised for the fourth time. The course in nuclear waste management intended for new Posiva employees was integrated into the national course of nuclear waste management coordinated by Aalto University. In addition to internal training, Posiva employees participated in a national course in nuclear safety as well as in several external courses

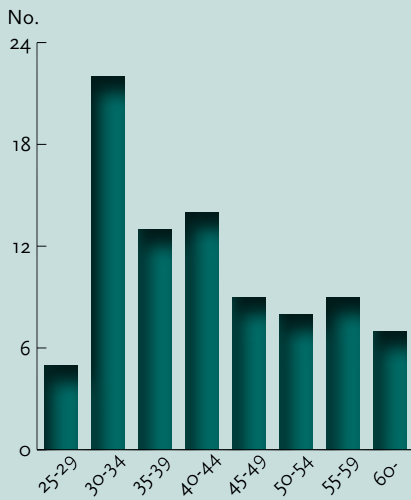
and seminars in their respective areas of expertise. Posiva participated in the Committee for Nuclear Energy Competence appointed by the Ministry of Economy and the Employment for preparing actions aimed at securing the availability of competence in nuclear energy sector. The committee will publish its report in 2012.

Employment matters were discussed in the HR relations meetings between personnel groups and Posiva Oy. Matters pertaining to the entire personnel were discussed in consultation meetings. The entire personnel of Posiva are included in a performance bonus scheme. Performance bonuses can be transferred directly to the Group's personnel fund.

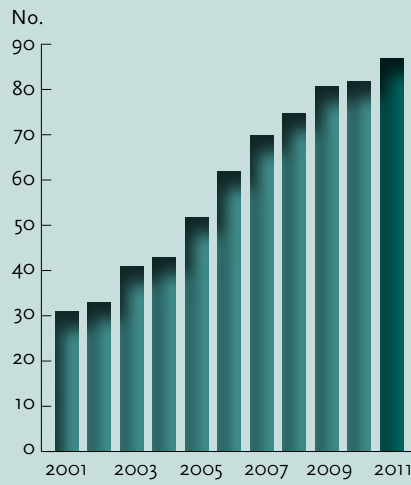


Gender distribution

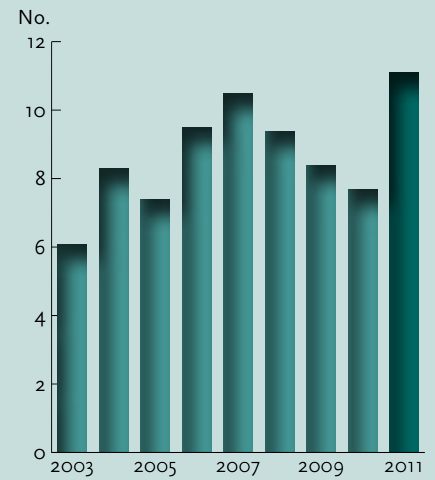
Age structure of Posiva personnel



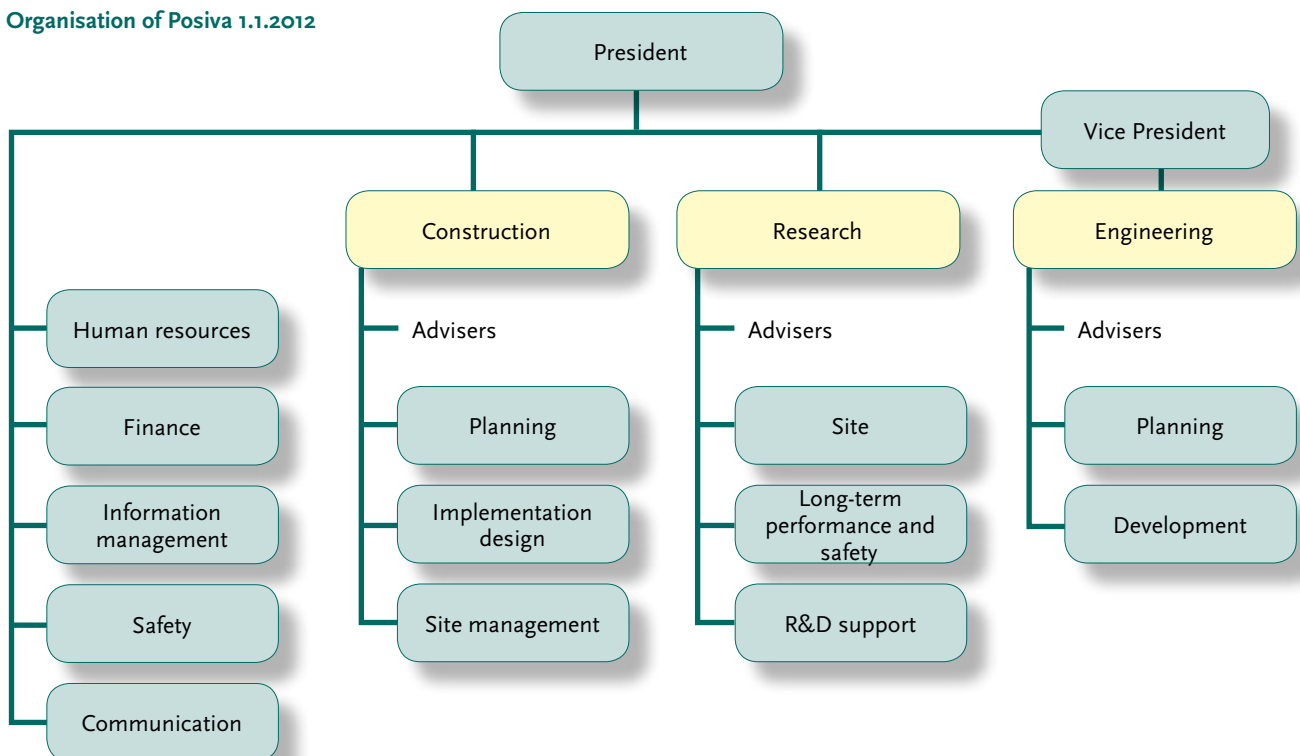
Number of employees



Number of training days per person



Organisation of Posiva 1.1.2012





The ONKALO construction site at Olkiluoto.

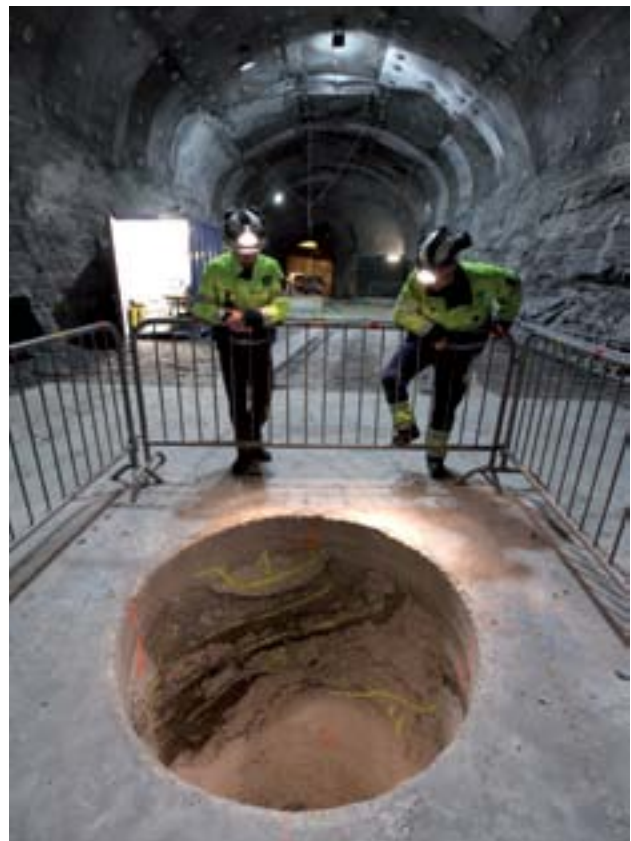
## Office premises

Posiva has offices in Eurajoki at Olkiluoto and at the Vuojoki Mansion. At Olkiluoto, there are Posiva employees working at the central office and in the ONKALO office building.

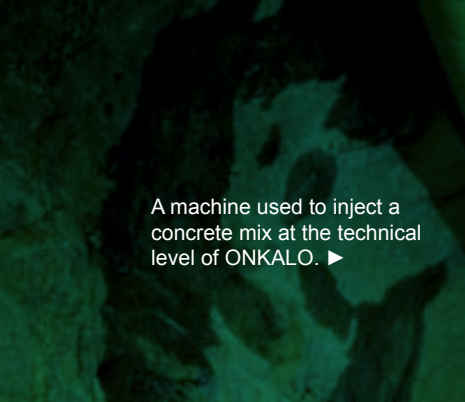
## Economy and finance

Posiva's shareholders bear the costs related to its main line of business, i.e. the management of spent nuclear fuel from the Olkiluoto and Loviisa power plants, as well as the research and development necessitated by it. Charges made by the company account for most of its revenue. In addition, the company carries out minor assignments for its owners and external customers. The company's sales amounted to EUR 68.6 (60.5) million, of which the main line of business accounted for EUR 68.5 (60.5) million.

Posiva attends to the nuclear waste management tasks stipulated in the Nuclear Energy Act on behalf of the power generation companies, its owners. Consequently, the company charges for the annual costs arising from this, including the acquisition cost of property, plant and equipment. Since the nuclear waste management costs will not accrue income in the future for the



A test hole drilled for the rock spalling tests in the ONKALO research facility 3.



A machine used to inject a concrete mix at the technical level of ONKALO. ▶



▲ The demonstration tunnel, excavated according to the design of the deposition tunnel, at final disposal depth.



companies with waste management obligations, nor for Posiva, Posiva's nuclear waste management costs have been deducted in total as annual costs, including the acquisition cost of property, plant and equipment. The companies with waste management obligations make provisions for the cost of nuclear waste management by paying annual nuclear waste management fees to the State Nuclear Waste Management Fund.

## Extent of research and development operations

Posiva's current operations mainly consist of preparation for the licensing and implementation of the project. In 2011, a total of some EUR 52.7 (43.9) million, accounting for 76.8% (72.6%) of sales, was used for R&D to support the preparation. The research and development activities encompass, besides ONKALO, surveys above ground, the development of encapsulation technology and the planning and design of the repository.

## Key indicators

Due to the company's principle of operations, the presentation of key financial indicators is not meaningful

for illustrating the company's financial position or financial performance. The financial statements do not show a profit or loss.

## Events after the end of the financial period

No events having an impact on business developments have taken place since the end of the financial period.

## Assessment of probable future developments

The company's operations are expected to continue during the current financial period primarily as they did in the previous year. Sales are expected to increase somewhat compared with the previous financial period.

## Distribution of profits

The company does not have any unrestricted equity, which is why no dividends can be distributed.

# Financial statements

## INCOME STATEMENT

	1.1. - 31.12.2011	1.1. - 31.12.2010
<b>Turnover</b>	68,622,212.91	60,518,853.76
Other income	462,704.52	131,665.21
Personnel expenses	-6,604,676.32	-6,042,381.93
Depreciation	-362,256.18	-374,453.01
Other expenses	-62,148,762.45	-54,202,286.38
<b>Profit/loss from operations</b>	-30,777.52	31,397.65
Financial income and expenses	34,300.20	-27,987.22
<b>Profit/loss before extraordinary items</b>	3,522.68	3,410.43
Extraordinary items +/-	0.00	0.00
<b>Profit/loss before appropriations and taxes</b>	3,522.68	3,410.43
Income taxes	-3,522.68	-3,410.43
<b>Profit/loss for the financial year</b>	0.00	0.00

## BALANCE SHEET

ASSETS	31.12.2011	31.12.2010
<b>Non-current assets</b>		
Intangible assets		
Intangible rights	9,115.31	10,544.25
Other non-current expenditure	1,047,846.50	1,352,485.83
	1,056,961.81	1,363,030.08
Tangible assets		
Buildings	84,801.86	88,335.28
Machinery and equipment	158,804.75	184,414.10
	243,606.61	272,749.38
Investments		
Other shares and holdings	208,771.50	208,771.50
Other loan receivables	4,158,661.25	4,499,316.69
	4,367,432.75	4,708,088.19
<b>Total non-current assets</b>	5,668,001.17	6,343,867.65
<b>Current assets</b>		
Current receivables		
Trade receivables	170,283.92	119,024.45
Loan receivables	340,655.44	333,126.78
Other receivables	0.00	479,378.67
Prepayments and accrued income	1,859,676.94	1,614,761.90
	2,370,616.30	2,546,291.80
Cash and cash equivalents	21,141,906.46	15,922,459.40
<b>Total current assets</b>	23,512,522.76	18,468,751.20
<b>Total assets</b>	29,180,523.93	24,812,618.85
<b>EQUITY AND LIABILITIES</b>		
<b>Equity</b>		
Share capital	1,682,000.00	1,682,000.00
Retained earnings/loss	0.00	0.00
Profit/loss for the financial year	0.00	0.00
	1,682,000.00	1,682,000.00
<b>Liabilities</b>		
Non-current liabilities	6,243,245.67	6,641,882.10
Current liabilities		
Advances received	1,820,235.86	2,300,641.10
Trade payables	9,873,970.51	7,425,593.75
Other current liabilities	757,991.03	732,078.14
Accruals and deferred income	8,803,080.86	6,030,423.76
	21,255,278.26	16,488,736.75
<b>Total equity and liabilities</b>	29,180,523.93	24,812,618.85

## CASH FLOW STATEMENT

€1,000	2011	2010
<b>Cash flow from operating activities</b>		
Operating profit/loss	-31	31
Adjustments to operating profit/loss *	362	374
Change in working capital **	4,941	2,737
Interest received	209	146
Interest paid	-174	-173
Taxes paid	-2	-2
<b>Operating activities</b>	<b>5,306</b>	<b>3,113</b>
<b>Cash flow from investment activities</b>		
Acquisition of intangible and tangible assets	-27	-18
Proceeds from sale of intangible and tangible assets	0	1
Acquisition of shares	0	0
Withdrawals of loans granted	333	326
<b>Cash flow from investing activities</b>	<b>306</b>	<b>309</b>
<b>Cash flow from financing activities</b>		
Withdrawals of long-term loans	221	221
Repayment of long-term loans	-613	-607
<b>Cash flow from financing activities</b>	<b>-392</b>	<b>-386</b>
<b>Change in financial assets</b>	<b>5,220</b>	<b>3,036</b>
Financial assets January 1	15,922	12,886
<b>Financial assets 31 December</b>	<b>21,142</b>	<b>15,922</b>
<b>* Adjustments to operating profit/loss</b>		
Depreciation and write-downs	362	374
Gain (-) or loss (+) from divestment of non-current assets	0	0
Intangible assets total	362	374
<b>** Change in working capital</b>		
Increase (-) or decrease (+) in non-interest-bearing receivables	181	-359
Increase (+) or decrease (-) in short-term non-interest-bearing liabilities	4,760	3,096
Intangible assets total	4,941	2,737



# NOTES TO FINANCIAL STATEMENTS 31 DECEMBER 2011

## GENERAL INFORMATION ABOUT THE COMPANY

Posiva Oy is a joint venture company owned by Teollisuuden Voima Oyj and Fortum Power and Heat Oy. Copies of the financial statements are available at [www.posiva.fi](http://www.posiva.fi) and at Olkiluoto, FI-27160 Eurajoki.

## ACCOUNTING PRINCIPLES

### Measurement principles and methods and accrual principles and methods

#### Measurement of non-current assets

Intangible rights, other non-current expenditure as well as property, plant and equipment are capitalised at immediate acquisition cost less depreciation/amortisation according to plan. The depreciation/amortisation according to plan equals the maximum amounts allowed under the Finnish Business Tax Act.

The acquisition costs of property, plant and equipment acquired for nuclear waste management prescribed by the Nuclear Energy Act have been deducted in their totality as annual costs because nuclear waste management costs will not accrue income in the future for the companies with waste management obligations or for Posiva.

The depreciation/amortisation periods for other non-current assets are as follows:

Intangible rights	Straight-line depreciation over 10 years
Other long-term expenditure	Straight-line depreciation over 10 years
Computer software	Straight-line depreciation over 5 years
Machinery and equipment	Reducing balance depreciation at 25%

#### Research and development costs

The research and development costs have been recognised as annual costs during the year in which they were incurred.

## NOTES TO THE INCOME STATEMENT

	2011	2010
<b>1. Turnover</b>		
Income, main line of business	68,549,764.14	60,479,560.08
Income, auxiliary line of business, shareholders	45,361.07	15,287.45
Income, auxiliary line of business, other companies	27,087.70	24,006.23
Total	68,622,212.91	60,518,853.76
<b>2. Other income</b>		
Rental income	74,051.36	64,946.25
Subsidies received	388,653.16	66,071.54
Other income	0.00	647.42
Total	462,704.52	131,665.21
<b>3. Personnel</b>		
Average number of personnel	98	96
Number of employees on 31.12.	94	92
<b>Personnel expenses</b>		
Wages and salaries	5,445,748.26	5,017,543.96
Pension expenses	893,350.78	779,967.60
Other compulsory personnel expenses	265,577.28	244,870.37
Total	6,604,676.32	6,042,381.93
<b>4. Depreciation</b>		
<b>Depreciation plan</b>		
Planned depreciation is the maximum depreciation allowable under the Finnish Business Tax Act.		
<b>Planned depreciation</b>		
Intangible rights	1,428.94	1,595.72
Other long-term expenditure	304,639.33	307,985.75
Buildings	3,533.42	3,680.64
Machinery and equipment	52,654.49	61,190.90
Total	362,256.18	374,453.01

## NOTES TO THE INCOME STATEMENT

	2011	2010
<b>5. Other expenses</b>		
Rents	2,732,696.45	2,824,670.43
Infrastructure services	5,199,967.06	5,851,194.86
Research services	28,849,299.26	25,894,078.44
Research facility expenses	19,132,474.51	13,542,009.99
Other expenses	6,234,325.17	6,090,332.66
Total	62,148,762.45	54,202,286.38
Acquisition costs of fixed assets used for nuclear waste management are booked as annual expenses under Section 5:1 of the Accounting Law.	20,203,480.67	13,594,666.74
<b>Auditors' fees</b>		
Audit fees	12,000.00	18,000.00
Auditors' statements	0.00	600.00
Total	12,000.00	18,600.00
<b>6. Financial income and expenses</b>		
<b>Interest income and other financial income</b>		
Interest income from long-term investments	109,213.22	116,575.50
Other interest and financial income	99,509.94	29,083.31
Total	208,723.16	145,658.81
<b>Interest and other financial expenses</b>		
To others	174,422.96	173,646.03
Total financial income (+) and expenses (-)	34,300.20	-27,987.22

## NOTES TO THE BALANCE SHEET

<b>7. Non-current assets</b>	Intangible rights	Other non-current expenditure	Intangible assets total
<b>Intangible assets</b>			
Acquisition cost 1.1.2011	43,923.50	3,260,179.14	3,304,102.64
Increase	0.00	0.00	0.00
Acquisition cost 31.12.2011	43,923.50	3,260,179.14	3,304,102.64
Accumulated planned depreciation 1.1.	33,379.25	1,907,693.31	1,941,072.56
Planned depreciation	1,428.94	304,639.33	306,068.27
<b>Book value 31.12.2011</b>	9,115.31	1,047,846.50	1,056,961.81
	Buildings	Machinery and equipment	Intangible assets total
<b>Tangible assets</b>			
Acquisition cost 1.1.2011	138,183.20	851,838.91	990,022.11
Increase	0.00	27,045.14	27,045.14
Decrease	0.00	0.00	0.00
Acquisition cost 31.12.2011	138,183.20	878,884.05	1,017,067.25
Accumulated planned depreciation 1.1.	49,847.92	667,424.81	717,272.73
Accumulated depreciation from deduction	0.00	0.00	0.00
Planned depreciation	3,533.42	52,654.49	56,187.91
<b>Book value 31.12.2011</b>	84,801.86	158,804.75	243,606.61
<b>Investments</b>		2011	2010
Other shares and holdings		208,771.50	208,771.50
Other loan receivables		4,158,661.25	4,499,316.69
Intangible assets total		4,367,432.75	4,708,088.19

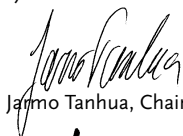
## NOTES TO THE BALANCE SHEET

	2011	2010
<b>8. Prepayments and accrued income</b>		
Prepaid rent	1,769,360.00	1,548,190.00
Other deferred income	89,800.00	64,265.00
Other prepaid expenses	516.94	2,306.90
Total	1,859,676.94	1,614,761.90
<b>9. Share capital</b>		
Share capital 1.1.	1,682,000.00	1,682,000.00
Changes in share capital	0.00	0.00
Share capital 31.12.	1,682,000.00	1,682,000.00
<b>10. Debts falling due in more than five years</b>	5,052,643.22	5,228,472.96
<b>11. Accruals and deferred income</b>		
Accrued interests	2,266.63	1,982.07
Accrued wages and salaries	1,707,745.37	1,597,186.37
Estimate of expenses not yet charged	7,093,068.86	4,431,255.32
Total	8,803,080.86	6,030,423.76
<b>12. Commitments</b>		
<b>Rent liabilities</b>		
Rent liabilities falling due in less than a year	442,340.00	442,340.00
Rent liabilities falling due later	4,865,740.00	5,308,080.00
Total	5,308,080.00	5,750,420.00

Posiva has rented an area of land for the final disposal of spent nuclear fuel from Teollisuuden Voima Oyj. The rental period is from 1 July 2003 to 30 June 2013. The rental agreement is subject to notice in case the land is not suitable for the final disposal of spent nuclear fuel. The rent is monitored every two years according to cost-of-living index. The rent was EUR 449,190.53 in 2011 (EUR 394,999.24 in 2010).

## SIGNATURES TO THE ANNUAL REPORT AND FINANCIAL STATEMENTS

Helsinki, 28 February 2012




Jarmo Tanhua, Chairman



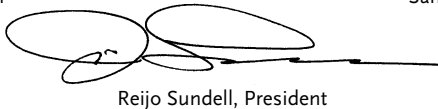
Pekka Leskelä



Veijo Ryhänen



Sami Hautakangas



Reijo Sundell, President

## AUDITORS' REPORT

To Posiva Oy's Annual General Meeting

We have audited the accounts, the financial statements, the annual report and the management of Posiva Oy for the financial year 1 January – 31 December 2011. The financial statements include the balance sheet, income statement, funds statement and the notes to the financial statements.

The responsibilities of the Board of Directors and the President

The Board of Directors and the President are responsible for drawing up the financial statements and annual report as well as for giving correct and necessary information that is in accordance with Finnish regulations governing the preparation of financial statements. The Board of Directors is responsible for organising proper monitoring of accounting and financial management. The President is responsible for ensuring that accounts are in compliance with legislation and that financial management has been organised in a reliable manner.

The responsibilities of the Auditor

We are obligated to issue a statement on the financial statements and the annual report on the basis of our audit. The Auditing Act prescribes that we are obligated to observe the principles of professional ethics. We have performed the audit in compliance with the good auditing practice observed in Finland. Good auditing practice requires us to plan and perform the audit to obtain reasonable assurance as to whether the financial statements and the report by the Board of Directors are free from material misstatement and whether the members of the Board of Directors or the President are guilty of an act or omission that may result in liability for damages, or have violated the Finnish Limited Liability Companies Act or the Articles of Association.

An audit involves the performance of procedures to obtain audit evidence relating to the amounts and disclosures in the financial statements and the review by the Board of Directors as well as other information presented therein. The procedures selected depend on the auditor's judgment, including the assessment of risk of material misstatement due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements and the review by the Board of Directors. The auditor evaluates internal control in order to be able to design audit procedures that are appropriate in the circumstances, but not for the purpose of issuing a statement regarding the effectiveness of the company's internal control. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of accounting estimates made by the executive management, as well as evaluating the overall presentation of the financial statements and the review by the Board of Directors.

We believe that we have obtained a sufficient amount of appropriate audit evidence to provide a basis for our statement of opinion.

Statement of opinion

We therefore state that the financial statements and the annual report present true and sufficient information about the result of the Company's activities and its financial standing, as stipulated in the Finnish regulations governing the preparation of financial statements and the annual report. The annual report is consistent with the financial statements.

Other statements of opinion

We recommend that the financial statements be adopted. We recommend that the members of the Board of Directors as well as the President be discharged from liability for the financial year audited by us.

Helsinki, 21 March 2012

PricewaterhouseCoopers Oy  
Authorised Public Accountants

Deloitte & Touche Oy  
Authorised Public Accountants



Eero Suomela  
CPA



Robert Kajander  
CPA

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