Corporate magazine
Fingrid Oyj 2/2008

FINGRID

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Fingrid Oyj
11th volume
2/2008

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Published by
Fingrid Oyj

Photograph: Vastavalo

Printed by Libris Oy, Helsinki
ISSN 1456-2693

In this issue

Editorial

Current flows

These days, business enterprises tend to have carefully formulated values. The objective is to encapsulate the corporate procedures and principles in a few key words which can be communicated easily. The values are essentially related to corporate social responsibility, to the way in which the enterprise works with respect to its stakeholders.

In its efforts, Fingrid relies on transparency, impartiality, efficiency and responsibility. We aim to do everything so that all stakeholders can be sure that the company works not only cost-efficiently but also respecting ethical values. Since Fingrid has a vital duty and since our society is increasingly dependent on electricity, it is essentially important for us to attend to corporate social responsibility.

Fingrid carries responsibility each and every day by taking care of its basic duty: ensuring electricity transmission from power plants to regional electrical companies and industrial facilities. Our society relies on electricity, which is why there must be current at all times.

Responsibility involves cost efficiency and anticipation of capital investments. We keep the grid in a good condition and plan corporate finances and capital investments over a long time span. This promotes system security and the functioning of the electricity market.

Our performance in terms of service quality and operational efficiency has been rated highly in international benchmarking studies. Operating disturbances and outages in the main transmission grid have been really rare occasions in Finland. A high system security has been retained at reasonable grid fees.

Responsibility encompasses more than just reliable operations or good cost management. As a player engaged in the energy industry, we have a distinct responsibility for our environment. We have conducted much co-operation with authorities and research institutions in issues such as multiple uses of transmission line areas. This magazine (pages 20 and 23) presents the results of two environmental studies.

We also carry responsibility for continued expertise in electrical engineering and support related research and teaching in various ways. One practical example of this is the professorship donated to the Helsinki University of Technology. We are also an important sponsor to Electricity Museum Elektra in Hämeenlinna; the museum conducts close co-operation with schools of various levels.

Corporate social responsibility absolutely involves transparent and comprehensive interaction with stakeholders. We have arranged discussion and negotiation events for our stakeholders, we meet our customers regularly, and arrange hearing procedures to assess the environmental impacts of transmission line projects. Landowners are one crucial stakeholder group with which we cannot have too many contacts.

Fingrid's transmission lines running in Finland total some 14,000 kilometres. This is why we aspire good interaction with landowners. We have participated in the Farmari agricultural fair in many years. By participating in the fair, we are close to landowners and other visitors living in the countryside and in towns. Welcome to see us at Fingrid's stand in Lahti at the turn of July and August. We promise that there is sufficient energy at the stand to receive feedback from landowners and others!

Tiina Miettinen is Fingrid Oyj's Communications Manager.

Electricity without problems also tomorrow

We are increasingly dependent on electricity. Fingrid makes sure that electricity is available without problems in Finland. So that electricity transmission would be trouble-free also in the future, the company is making more capital investments in the grid in the next 10 years than ever before.

Text by Maarit Kauniskangas

Photograph by Päivi Bourdon and Juhani Eskelinen

In the early part of this decade, Fingrid's annual capital expenditure in the grid was approx. 40 million euros, while now the figure is 100 million euros and growing. By 2013, Fingrid will build more than 1,000 kilometres of new transmission lines and about 10 new substations alongside the upgrades and renovations of existing substations.

The major investments are necessary as electricity consumption is increasing and because the grid is ageing. The proper functioning of the electricity market also calls for further grid construction projects. Even though Fingrid's electricity transmission reliability in the Finnish grid represents international top class, there are regions where the grid needs to be renewed right away. As an exam-

ple, the connection built from Imatra to Turku in the 1920s is currently being modernised one part at a time.

However, most of the Finnish grid is considerably newer. A majority of the north-south connections date from the 1950s and 1960s, when large hydropower plants were completed in the north of Finland. Large-scale expansions were made to the grid in southern Finland most recently in the 1970s at around the same time when nuclear power plants were constructed in Finland. At that time, the so-called atomic ring was established to connect the large power plants to the grid. The modernisation of these parts of the grid, which are considerably newer than the line between Imatra and Turku, has also commenced by the renewal of substations.

Longer transmission distances

However, ageing of equipment and deterioration of structures over the years are not the only reasons why the grid is being revised. Before the electricity market was liberalised for international competition in the 1990s, electricity was primarily produced in local power plants, and the electricity transmission distances were fairly short. The electricity networks had also been built for this purpose. Since electricity is transmitted over long distances these days, there are more stringent requirements on the grid, which in turn influences electricity transmission reliability.

"We do not necessarily replace the ageing grid using a similar solution as originally, but we make preparations for a situation where the grid can respond to the future transmission needs as flexibly as possible. For this reason, the 220 kilovolt network in Ostrobothnia in Western Finland is gradually being converted to 400 kilovolt voltage. The next stage in this modernisation work is the 400 kilovolt connection between Seinäjoki and Tuovila due to be ready in 2011. As an example, comprehensive utilisation of wind power and increasing nuclear power production call for a flexible grid," says Fingrid's Executive Vice President **Kari Kuusela**.

"We do not necessarily replace the ageing grid using a similar solution as originally, but we make preparations for a situation where the grid can respond to the future transmission needs as flexibly as possible."

So that the electricity market could function with a minimum of disturbance, Fingrid and Svenska Kraftnät are reinforcing the electricity transmission capacity between Finland and Sweden by a submarine cable costing 300 million euros. The Fenno-Skan 2 cable will run at the bottom of the sea at a depth of more than 100 metres over a distance of almost 200 kilometres from Rauma in Finland to Sweden. The submarine cable interconnector is expected to be ready in 2011.

Regional projects

In recent years, there have been considerable regional differences in the increase in electricity consumption in Finland, and all growth has not concentrated in the population centres of Southern Finland.

"Electricity consumption in Western Lapland grows at annual rate of about 6 per cent while the growth figure in other parts of the country is only 1 to 2 per cent. Tourism is the main reason for this, because the tourist centres are growing rapidly. This is why we intend to construct some 240 kilometres of new 220 kilovolt grid in Lapland," says Kari Kuusela. Reinforcing the transmission connections in Lapland will cost more than 50 million euros.

Other regional projects include installation of new power transformers. The Kopula substation will be built soon in Western Uusimaa in Southern Finland. One to two new transformers will be added to the grid annually.

Preparations for additional nuclear power

Preparations for the future also include the recent completion of the new grid connections required by the third nuclear power unit in the region of Satakunta in Western Finland. This building project involved several subprojects, such as the transmission line between Olkiluoto and Huittinen, and the new substations at Olkiluoto

Fingrid accounts for only about 2 per cent of the consumer price of electricity. According to Kari Kuusela, an increase in transmission prices has no significant impact on the electricity bills of consumers.

and Huittinen. The construction work spanned 2005 to 2008.

"This was one of Fingrid's biggest transmission line projects ever. Instead of the earlier three transmission lines, six 400 kilovolt lines now run from Olkiluoto to the nearby substations. Until the completion of the third nuclear power unit, the additional lines will reduce losses in the transmission grid," says Kari Kuusela.

The construction of the potential sixth nuclear power unit has also been taken into account in Fingrid's long-term grid plans. The transmission grid will be reinforced in stages throughout Finland, and line projects close to the location of the new nuclear power unit will not be launched until a decision on the unit has been made.

Impacts of investments

The renewal of the transmission grid brings much work to the suppliers in the business over the next 10 years.

"Fingrid orders all work from suppliers but specifies the projects and also supervises the quality of work," Kari Kuusela describes the approach. However, with so many simultaneous ongoing projects, there may be some shortage of suppliers' capacity. Many professional employees will retire from work in the coming years. Kari Kuusela feels that the relevant businesses should hire much new workforce, because it seems that there will be work in sight for the entire 2010s.

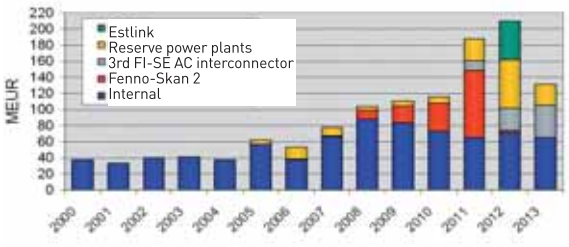
Such large-scale construction projects also vitalise the local business life in the relevant areas. "We have been studying the multiplicative effects caused by the Fenno-Skan 2 submarine cable project. The impacts are assessed both during the construction period and in terms of maintenance. We have concluded that the overall benefit is more than 20 million euros per year. Two thirds of the benefit goes directly to those operating on the electricity market and one third goes to the transmission system operators," Kari Kuusela says.

However, overheating in the construction industry in Finland together with a rise in prices have also left their mark in the schedules of Fingrid's projects. A couple of projects have been postponed by a year so that the costs could be brought under control.

In order to finance the major construction projects, Fingrid will need to take out loans and raise the transmission tariffs of electricity. At the beginning of this year, the company had to increase its tariffs by 4.5 per cent.

"However, grid transmission accounts for a very small portion of the consumer price of electricity, which is why the rise in the transmission prices will not be reflected very clearly in the consumer's electricity bill," Kari Kuusela points out. ■

Grid investments 2000–2013



Fingrid´s construction projects in the near future

- Fenno-Skan 2, submarine cable connection between Finland and Sweden. Complete in 2011.
- Reinforcement of the 400 kilovolt transmission connections in the north of Finland in 2008 and 2009.
- Tahkoluoto–Kristiinankaupunki 400 kilovolt transmission line, planning in 2008–2011.
- Third AC connection to Sweden. Planning in 2008–2010, implementation in 2011–.
- Increase in reserve power capacity by 250 megawatts. Implementation in 2010–.

Economic impact of **grid investments**

The foremost reasons for Fingrid's capital expenditure in the grid are the promotion of the electricity market by means of new cross-border connections, increase in electricity consumption, making preparations for the introduction of new power plants, and increased need for renovations resulting from the ageing of the transmission grid. Capital expenditure made to promote the electricity market occasionally raises some questions.

Matti Liski, professor of economics at the Helsinki School of Economics, what are the advantages of electricity market integration?

"Integration is worth while over the long term. A larger market gives economies of scale, intensifies production systems and gives an incentive to make new innovations. All this generates economic growth, although the immediate benefits cannot be seen right away."

It has been thought that the integration of the electricity market will raise electricity prices. "The price may remain below the market price in a closed market. Even though the rise in price may sting over the short term, it provides a healthy basis for a structural change in economy over the long term. Therefore, it is sensible for the entire national economy that the electricity market becomes integrated."

Matti Liski says that if market integration was stopped, there would no longer be an incentive to develop the energy production sector. Production technology has the same cost everywhere, and there are no practicable alternatives available.

"A larger market intensifies the operations, encourages innovation, and gives economies of scale. The Nordic electricity market is already a good example of this. As an example, innovations in the production of energy from renewable sources obtains market-based subsidy as a result of an extensive and uniform transmission grid. Problems related to competition might also increase in a narrow market area," Matti Liski argues. ■

Text by Maarit Kauniskangas
Photograph by Eija Eskelinen

Transmission lines are erected for a need – **but why in our backyard?**

There are now more ongoing transmission line construction projects than normally in Finland. More and more landowners hence face a situation where a transmission line is erected in their backyard. What are the grounds for this? Fingrid's Land Use Manager Ilkka Alm **says that the final route of the right-of-way is determined as a result of many stages.**

Text by Pirjo Rautanen ■ **Photograph by** Juhani Eskelinen

There are many ongoing and pending grid construction projects in Finland. "By 2013, we intend to build about 1,000 kilometres of new transmission lines. This boom is the result of a need to reinforce the transmission grid. The present grid is also ageing, so it needs modernisation," Ilkka Alm says.

Transmission grid planning is a long process, spanning 20 to 30 years. Grid plans are drawn up in co-operation with other transmission system operators in Northern Europe as well as with present and future grid customers. Grid planning considers forecasts of electricity consumption and production as well as of the trend in electricity imports and exports. These plans are used to specify the future electricity transmission needs and the transmission lines which respond to the needs.

Routes marked in regional plans

When the long-term grid plans are known, the routes are marked in regional plans. Local authorities take the line reservations into account while drawing up master plans, among other things. With some of the transmission line reservations made in existing regional plans, the actual need to construct the line will not materialise until about 2020–2025. According to Ilkka Alm, the reservations made in regional plans clarify and guide the more detailed planning of the line route.

A specific challenge is caused by the Government decision concerning national land use guidelines, because more line structures will be placed on the land of the same landowners. The guidelines require that existing rights-of-ways must primarily be utilised for the routes of transmission lines.

"This is advantageous in terms of land use, but many surprising obstacles may also surface, such as residential and other buildings as well as areas with significant historical or environmental values. In these situations, you can only try to find the most acceptable solution in terms of society. Naturally, that does not always please everyone," Ilkka Alm states.

Environmental matters are an important consideration

Having served in land use duties for more than 20 years, Ilkka Alm sees a distinct difference between the former and present line route planning process.

"Over the years, society has imposed many new requirements and restrictions, such as increasingly strict consideration of environmental aspects. In fact, these are one of the most dominating factors in the planning of transmission line projects."

At least an environmental study is drawn up of each line project, and larger projects are subject to the environmental impact assessment (EIA) procedure prescribed by law. EIA is a multi-stage series of dealings involving many parties, used for ascertaining the environmental impacts of construction projects.

The objective is to include environmental matters in the planning pro-

Ilkka Alm is pointing to the Petäjäskoski substation, from where a 400 kilovolt transmission line is being built between Keminmaa and Petäjäskoski to the west, and a 220 kilovolt line between Petäjäskoski, Isoniemi and Vajukoski to the north.

cess as factors equal to economic, technical and social considerations. The EIA procedure also increases the opportunities of landowners to receive information and contribute to matters that are important to them, as early as in the planning stage. The EIA procedure is supervised by the relevant regional environment centre, which also serves as the contact authority.

In the first phase of the EIA process, an assessment programme is drawn up. This is a work plan of what impacts and alternatives will be studied and how. The assessment programme is presented to authorities and the general public, i.e. to those parties in the affected area whose interests or conditions the project may influence.

"At this point, the general public does not yet mean specific landowners," Ilkka Alm says. According to him, attendance in the public events varies depending on the locality and how active the local people are. Based on the remarks and statements given, the regional environment centre gives its statement for the drawing up of the assessment report.

The assessment report describes the environmental impacts of the project. It is presented in public in the same manner as the assessment programme. Subsequent to remarks and comments given, the regional environment centre again gives its statement and views of the potential alternatives, without recommending any of the alternatives. After the EIA procedure, Fingrid decides which alternative is chosen for further processing.

Route planned on the basis of field investigations

The next step is to apply for an investigation permit from the state provincial office, which gives the applicant a right to go to a landowner's land to study the planned line route. In the preliminary engineering phase and EIA phase, Fingrid has no detailed knowledge of the landowners.

"No one is favoured and no one is avoided, even though this is a common misconception," Ilkka Alm points out.

The relevant land areas and their owners are not found out in detail until the launching of field investigations. Landowners are informed of the investigation at least 7 days before the investigation. Based on the field investigations, the final line route and tower locations are planned and marked in the field.

Expropriation procedure

One of Ilkka Alm's areas of responsibility is to make sure that Fingrid has a right to construct a transmission line as planned. This calls for an expropriation permit and advance seizure permit. The most important precondition for the granting of an expropriation permit for the right-of-way is that the applicant, i.e. Fingrid, can present a general need for the line. The Energy Market Authority takes a stand on this in its construction permit.

The expropriation permit application is processed by the Ministry of Employment and the Economy, and the permit is granted by the Finnish Government. In some cases, the local surveying office may serve as the permit authority. The permit decision is preceded by the hearing of authorities and landowners. At this point, there may be quite a few requirements and proposals that need to be addressed.

Wishes of landowners are heard

"Landowners often wish to influence the line route or location of towers. We take these wishes into account wherever possible," Ilkka Alm says.

He says that the problem with the transfer of tower locations is that one change may cause a need to shift other towers, too. The transfer of the line route is always about precise fine tuning. When a parallel line is being planned, landowners often require that the new line should be placed in the same structures as the existing line.

"This would be a good thing for the landowner, because then there would not be a need to widen the right-of-way. However, you cannot suspend more phase conductors from an existing tower. This is why the existing

line should be dismantled first, and then a new line with tower structures suspending two transmission connections should be put into its place. But since the original objective was to increase electricity transmission capacity with a new line, it is often impossible to weaken the transmission capacity even more by removing the existing line from operation for several months for the duration of construction work," Ilkka Alm argues.

Compensation matters concerning the right to use the transmission line area are processed in the expropriation proceedings. The expropriation committee determines the amount of compensation to be received for the land areas. The committee is headed by a supervisory engineer employed by the National Land Survey of Finland. The other members are two trustees appointed by the local council.

"Fingrid is not involved in making decisions about the compensations," Ilkka Alm points out.

The compensations are determined on the basis of issues such as price of agricultural and forest land or future utility values. Moreover, farmers receive a compensation for disadvantage caused by towers located on arable land. Premature felling of trees in forests causes an increment loss, which is compensated. Loss of seeding stand is also subject to compensation.

Use of transmission line area

In the expropriation proceedings, a landowner receives a lump-sum compensation for the land area. If the landowner is inflicted disadvantage or damage later in conjunction with the maintenance of the transmission line, an agreement on the related compensation is made with the landowner separately in each case.

Fingrid does not own the land areas under transmission lines nor the trees located within these areas. These are the property of the landowner. Through expropriation, Fingrid has only acquired rights to use the transmission line area, and this imposes certain usage restrictions on the landowners.

"Fingrid clears trees in the transmission line areas at intervals of 5 to 7 years. If a landowner wishes to use the transmission line area for the growing of Christmas trees, for example, a separate agreement on such areas is concluded. In it, the landowner agrees to fell the trees before they grow too tall," Ilkka Alm says.

Transmission line is erected as a result of careful deliberation

A new transmission line is a sum of many factors. Its planning needs to consider restrictions and sanctions imposed by society, in addition to which all other wishes and views are taken into account wherever possible, says Ilkka Alm. Sometimes you need to make compromises.

"From the point of view of a landowner, the construction of a transmission line may sometimes seem despotism which tramples down the rights of private citizens. This is understandable because people often feel strongly about interfering with private property, no matter how comprehensive the benefits that society obtains. I can assure that we do not build the lines just to harass people. The need for and location of each and every line is weighed very thoroughly," Ilkka Alm emphasises.

"Landowners are an important and valued group of stakeholders for Fingrid, because our lines run on their land. We are neighbours, and we wish to be good neighbours. We endeavour to enhance our performance continuously, and I believe that we have also succeeded in this, although there is always room for improvement. This is why we do our utmost to make sure that everything runs even better for all parties concerned. Fingrid knows its responsibility," Ilkka Alm assures. ■

Fingrid participating in summer fairs

Fingrid is involved in two major events in Finland this summer: Farmari 2008 and FinnMETKO 2008 exhibitions. In both of these, Fingrid wishes to meet landowners, its vital stakeholders. Those living or working close to transmission line areas are also offered much useful information on living adjacent to a transmission line.

Farmari 2008 agricultural fair, the number 1 event in agriculture each year, is arranged in Lahti from 31 July to 3 August. The fair attracts 75,000 to 90,000 visitors each year. Fingrid is one of the main partners of the fair.

FinnMETKO 2008 is the largest professional fair for the heavy machinery business in Finland. Arranged in Jämsänkoski from 28 to 30 August, the fair presents almost 300 exhibitors. The event is expected to gather about 35,000 visitors.

Fingrid welcomes visitors to its stand in both of these events. At the stand, you can discuss with experts on issues such as multiple uses of transmission line areas and ongoing or pending line construction projects. There is also recent information and answers to puzzling questions which transmission lines may arouse.

The total length of Fingrid's transmission lines is approx. 14,000 kilometres. Most of the lines run on the land of private landowners, on a total of about 70,000 real estates. ■

Vegetable patch, berry bushes, cultivation, snowmobiling?

Use of transmission line areas often calls for permit

Text by Max Isaksson ■ **Photograph by** Sami Kuitunen

Many types of operations and activities are allowed near electricity transmission lines which traverse Finland. However, growing of berry bushes or building a road, for example, most often call for a specific permit.

When working close to transmission lines, make sure that the safety distances are sufficient (see photograph above).

Protective gauzes on planted areas need to be fastened carefully.

Fingrid's transmission lines total about 14,000 kilometres throughout Finland. The lines run in fields, forests, roadsides and population centres.

The lines do not prevent farming. You can still cultivate and graze under transmission line areas, and ordinary agricultural machinery can also be operated there.

The transmission line area can be used as a vegetable patch and for growing berry bushes, among other things. However, a certain degree of caution is required near transmission lines, and Fingrid's safety and other instructions must be followed.

Fingrid does not own the transmission line areas it uses; the land areas and trees always belong to the landowners. The company has expropriated a limited right of use to the transmission line areas for building and maintenance purposes. Fingrid also has a right to clear the right-of-way, manage too tall trees in the border zone, travel on the line area and use roads leading to the line. The transmission line also imposes certain usage restrictions on the landowners.

Safety first

The usage restrictions and permit procedures are not there to annoy people, but they are used to make sure that all activities near transmission lines take place safely. This is why various projects in the transmission line area call for Fingrid's permit or statement together with instructions on safety considerations close to the line.

Establishment of orchards and similar areas should also be agreed with Fingrid so that they can be taken into account while clearing the rights-of-ways. Projects undertaken in the line area include building of various types of structures such as shelters, fences, flag poles, hunting towers, electric lines, telephone lines, water pipes, sewers, ditches, soil extraction and dumping, and snowmobiling.

The building of a road in a transmission line area requires a permit from the landowner and Fingrid's state-

Grazing, and berry and mushroom picking are permitted in a transmission line area.

Projects subject to permit, statements

These are needed for permits and statements:

- A map indicating the location of the intended project and the transmission line.
- A layout drawing indicating the exact location of the project with respect to the transmission line.
- The name, address and telephone number of the applicant so that Fingrid can obtain additional information if this is necessary.

The application must be sent to address: Fingrid Oyj, Lupahakemus, PL 530, 00101 Helsinki or by e-mail to address: risteamalausunnot@fingrid.fi

Further information and advice:

- Max Isaksson, telephone +358 (0)30 395 5123
- Heidi Oja, telephone +358 (0)30 395 5138
- Brochure "Living adjacent to a transmission line"

ment. The road can run under or parallel with the line. Fingrid's statement gives guidelines for the maximum permitted height of the road surface under the line as well as safety distances to the transmission line, towers and guys.

Electricity can "jump"

Safety of work must always be ensured near transmission lines.

Electrical accidents happen every year when the loader of a forest tractor hits an overhead line. There is even no need for a direct contact with the line, because electricity "jumps" over the air gap.

Sufficient distances must be kept to power lines, and transport routes need to be planned in advance. Storage and loading sites must be located outside the transmission line areas.

Transmission line towers have a protective zone of three metres from overground tower and guy structures. No excavation or dumping of soil is permitted within this zone. Also, it is not safe to use machinery in this zone. All those working close to transmission lines must be instructed to work safely near a line, and everyone must be required adherence to the safety distances. ■

Minimum distances while working close to a transmission line

Voltage level of transmission line	Minimum distance to machinery or load beneath phase conductors	Minimum distance to machinery or load in horizontal direction from phase conductors
110 kV	3 metres	5 metres
220 kV	4 metres	5 metres
400 kV	5 metres	5 metres

Fingrid among the most efficient transmission system operators

Fingrid received a high ranking in operational efficiency and service quality in an international benchmarking study among transmission system operators (TSOs). High productivity is reflected in issues such as low transmission prices of electricity. One of the future challenges of the company is to retain the high system security as the grid is ageing.

Fingrid participated in ITOMS (International Transmission Operations and Maintenance Study) for the seventh time. Fingrid was again one of the best TSOs in terms of electricity transmission reliability and cost efficiency.

Fingrid's success is based on the operating model applied to the construction and maintenance of the grid, and effective utilisation of advanced information systems. The quality of the company's services is high, because the number of operational disturbances and outages in Finland is at a low level.

The international study was carried out by UMS Group Inc. The study comprised the comparison of grid maintenance quality and costs of dozens of TSOs. The study has been carried out almost every second year since 1994, and it is considered as one of the most valued benchmarking studies in the electricity transmission industry.

The 2007 study concerned 29 TSOs around the world. Of the companies studied, 11 were from Europe, 8 from North America, 6 from Australia/New Zealand, and 4 from Asia/Africa.

The data was analysed in 19 sectors, and Fingrid was among the best quarter in almost all sectors. Fingrid's system security represented top level, and its costs were clearly below average. Fingrid was hence one of the three "Top Performers".

SAFETY IS THE KEY

in the management of yard trees in the vicinity of transmission lines

The sough of yard trees represents ancient, familiar safety to many Finns. But if the yard spruce or birch is growing next to an electricity transmission line, you should know one thing. A tree which reaches too close to the phase conductors is a safety risk which can cause serious injuries and damage.

Text by Maria Hallila ■ **Photographs by** FutureImageBank and Ari Levula

The area of transmission line areas managed by Fingrid totals about 33,000 hectares. There are only a few yard areas under or close to transmission lines. These account for some 2 per cent of the total area, says **Ari Levula**, Fingrid's Regional Manager for Western Finland.

He says that a situation where the route of a robust 110, 220 or 400 kilovolt transmission line runs near people's yards in the first place is the result of a trend of decades where housing has conquered new areas.

"The original idea was to construct the lines far from housing, mostly in forests and uninhabited regions. Over the decades, it's just happened that the yards of houses and summer cottages have gradually expanded and spread to the border zones of transmission lines and even under the line," says Transmission Line Specialist **Ossi Muuronen**.

"It may have started with the building of a parking place, a need for plantations emerged later, and then new structures were erected. It is important to remember that all types of construction in the transmission line area always calls for a permit from the owner of the line," he points out.

Bad neighbours

A transmission line and tall trees make bad neighbours. The taller the tree, the greater the safety risk.

"A tree which has grown – or fallen – too close to a phase conductor causes a short circuit between the phase conductor and ground. Such an earth fault generates an electric arc and strong 'electric shock' from the phase conductor to the ground," Ari Levula describes.

The electric energy released in the earth fault and the electric arc created by it may cause damage over a distance of several metres from the fault location. "Underground cables in the right-of-way and other conducting structures under the line may serve as 'conductors', through which the 'electric shock' may spread at dangerous intensity to nearby buildings," he says.

By clearing yard trees located close to transmission lines regularly and appropriately, Fingrid wishes to secure the safety of people and also the reliability of electricity transmission.

In order to eliminate risks caused by yard trees, Fingrid inspects and manages trees in yards situated close to its transmission lines at regular intervals. Still, regrettable surprises may happen sometimes. The most recent hazard caused by a yard tree happened last summer.

"A fast-growing aspen located in the yard of a summer house had grown too close to a transmission line. A threatening fire broke out in a boat shed as a result of an earth fault caused by the tree, and an electric distribution board and some other items in a residential building were broken," Ossi Muuronen says.

The impacts of the event were also reflected in the neighbourhood, where faults occurred in electronic equipment, among others.

The transmission line running near the yard dated from the 1960s, and the summer house with ancillary buildings had been built at a later date.

Big tree – big risk

Fingrid considers the management of yard trees as an important task which needs careful attention.

"The risk of personal injury related to yard trees close to transmission lines is considerably bigger than in a forest or elsewhere far from housing," Ari Levula says.

The goal is that yard trees would be managed at intervals of 5 to 8 years, which is the same interval as for other line areas and their border zones.

Yard trees are usually felled, but sometimes tree tops can be cut if allowed by a sufficient safety distance to phase conductors. Low-growing bushes and trees can be left in the right-of-way if they do not cause a risk before the next clearing.

Ari Levula says that the location of the transmission line area should be considered when plans for garden areas and plants are being made.

"The need for clearing can be avoided completely by choosing low-growing trees and bushes. Moreover, management of trees such as regular cutting of branches and top can help to avoid more extensive measures," Ari Levula points out.

Photograph by Veli-Matti A. Pitkänen

The scenery in a transmission line area can be diversified, say Ari Levula (on the left) and Ossi Muuronen.

Ossi Muuronen says that of deciduous trees, the worst companion for a transmission line is the aspen, which may grow up to one metre per year. Birch, a popular yard tree, also grows fast and is in the risk group in this sense.

Of coniferous trees, spruce and pine grow half a metre per year, which means that over a clearing interval of six years their tops grow three metres higher.

"We sometimes even need to fell slowly growing common junipers under the oldest transmission lines," Ossi Muuronen says.

"The rule of thumb is that nothing in excess of four metres in height must grow near transmission lines," he summarises.

Feelings and tales

Finns associate yard trees with a lot of emotions, memories, stories and traditions. Fingrid knows this and understands it very well. This is why the company considers good interaction with building owners and local residents as important.

"It would be important to make people understand that in the management of trees situated close to transmission lines, we are guided not only by the right but also the obligation of the owner of the transmission line to keep the trees in prescribed condition," Ari Levula and Ossi Muuronen point out.

Management of yard trees is an essential part of Fingrid's management programme for transmission line areas and their border zones. The company has been developing and specifying the programme in recent years on the basis of several environmental studies, among others.

Fingrid offers advice in matters concerning yard trees, and free felling assistance. Ari Levula and Ossi Muuronen emphasise that trees growing close to a transmission line should always be felled by professionals. To back up this opinion, they show a number of photographs of situations where a felled tree has fallen directly on a conductor.

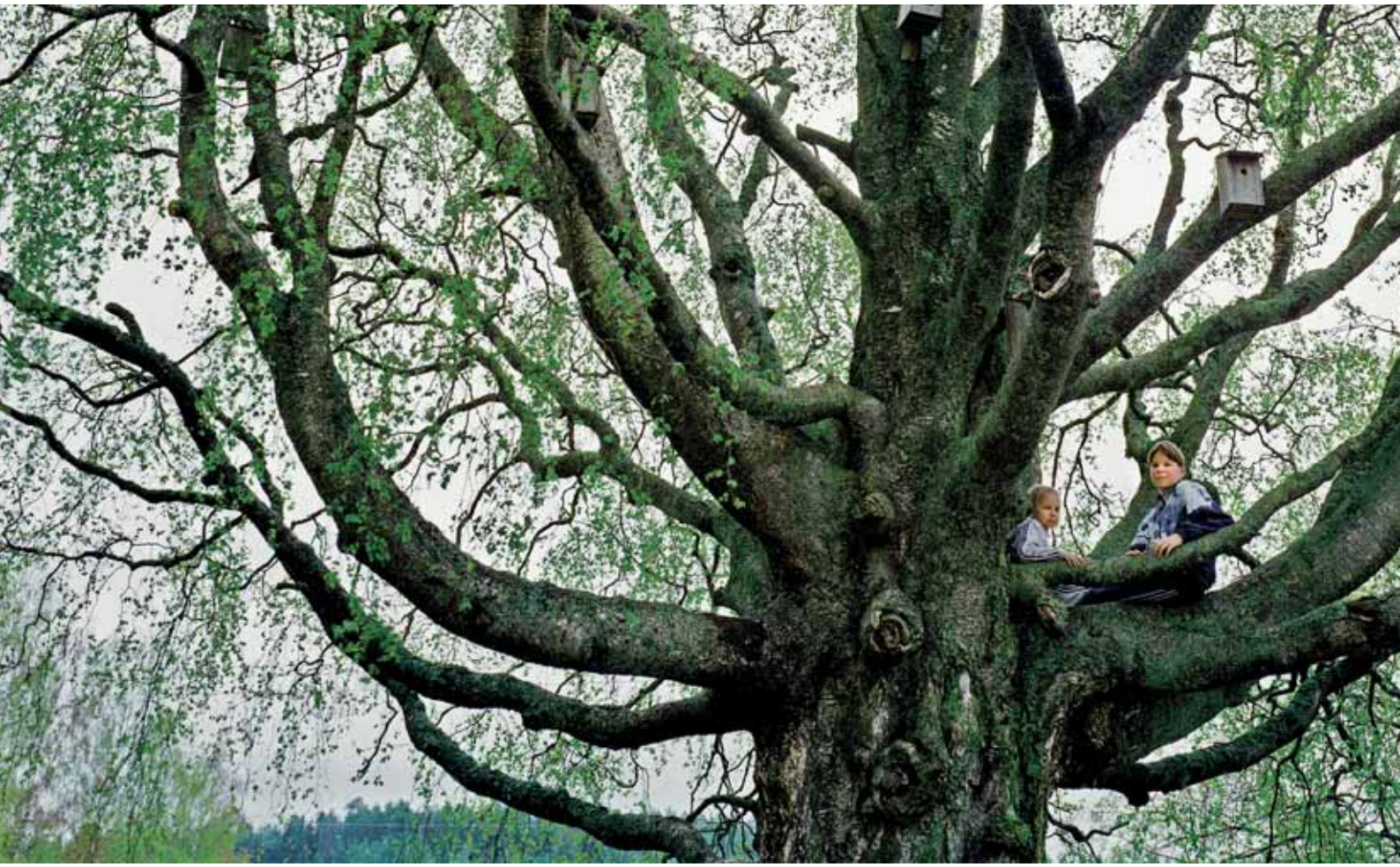
Fingrid has published brochure "Voimajohto ja pihapuut" on this topic. It can be ordered from Fingrid and viewed on the company's website at www.fingrid.fi. ■

Management recommendations for border zone trees can be found in **FOREST INFORMATION CARD**

Forestry Development Centre Tapio in co-operation with Fingrid has drawn up forest management recommendations for the border zones of transmission line areas. The forest information card (no. 04-006) in Finnish can be found on the website of both companies. Printed cards can be inquired from the two companies.

Fingrid will also distribute the printed card at its stand at the Farmari 2008 and FinnMETKO 2008 exhibitions.

Yard trees reflect **LONG TRADITIONS**



Trees render a yard more cosy and comfortable. They often entail tales related to family history. The yard tree tradition reflects past times, when trees and forests had a vital role in the lives and beliefs of our ancestors.

Text by Maria Hallila
The photographs are from book "Puiden kansa" by Ritva Kovalainen and Sanni Seppo (2006).

The most common and traditional yard trees of Finns are birch, spruce, rowan and bird cherry.

"You can see other trees, too, in people's yards, including planted non-indigenous deciduous trees in the South of Finland," says architect **Harri Metsälä** who has studied the traditions of Finnish wood construction and use of wood species.

Example from the parsonage

Planting of yard trees is not a very old phenomenon according to Harri Metsälä. Earlier, people mainly spared natural trees growing near houses.

"Especially in Western and South-Western Finland, the village landscape was fairly treeless at the end of the 19th century: all trees had been logged for domestic and industrial use."

Harri Metsälä says that this can be seen in old photographs, too. Even firewood had to be transported over long distances.

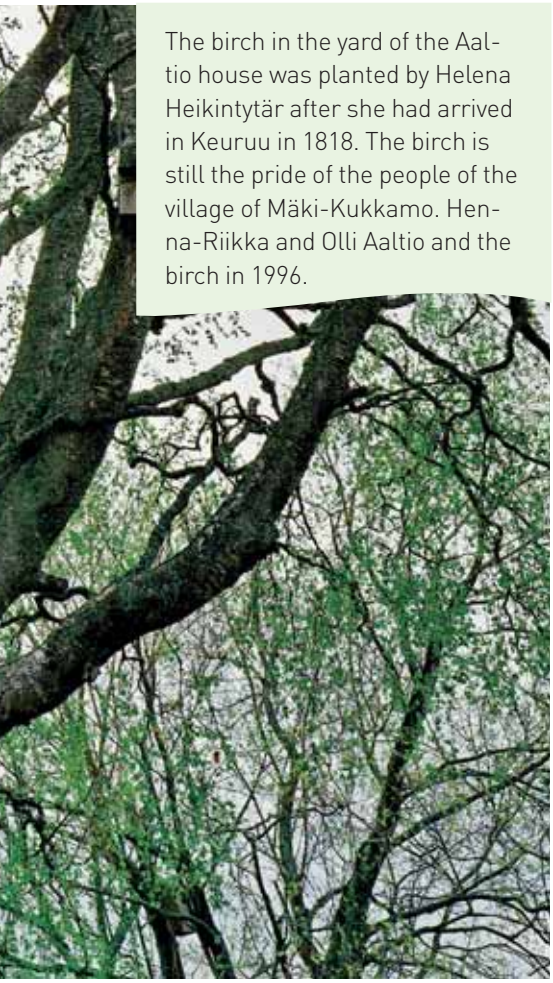
"In Eastern and Northern Finland, burn-beating reduced the number of trees."

Planted gardens and parks also spread to the countryside, following the example set by manor houses and parsonages.

"Later on, women's advisor organisations, 4-H Clubs, agricultural societies and other types of instruction inspired people to plant trees and other plants in their yards and to manage their forests."

Protection and symbolism

Yard trees are a pleasant sight but they are also of practical use.



The birch in the yard of the Aaltio house was planted by Helena Heikintytär after she had arrived in Keuruu in 1818. The birch is still the pride of the people of the village of Mäki-Kukkamo. Henna-Riikka and Olli Aaltio and the birch in 1996.

When the Vähätalo family moved to a new house in 2005, the trees dedicated to the children moved also.

"They provide protection against wind and rain, shadow, and they may also serve as lightning conductors. Trees bring life – birds and squirrels, among others," Harri Metsälä says.

However, he thinks that the yard tree traditions also entail a deeper respect for trees and forests.

"Trees used to be related to beliefs concerning fairies of houses and forests, and they also involve some Christian symbolism. As an example, the cross pattern of rowan and juniper berries is a sign of a holy plant; it was blessed."

Distant echoes

The relationship between people and their environment is one of the main themes in the works of photographer **Ritva Kovalainen**. She points out that trees had a deeper meaning for our ancestors than what we can even imagine.

"The roots of our relationship with the forest reach to the distant mythical era. At that time, there was a sacrificial tree in almost every yard, and people's destinies were bound to that tree. Whatever happened to the tree also happened to the family which respected it. The tree was a means of keeping contact with the dead and fairies. The tree received sacrifice, and people turned to it when they needed help in illness".

According to Ritva Kovalainen, trees bring glamour to our lives: culture, tradition, magnificent atmosphere which only comes about slowly from the force of nature.

"You can't buy old trees; that is why they are a sign of true wealth," she points out.

Tales of modern people concerning their relationship with trees and forests reflect a long tradition. "We still carry with us echoes of old beliefs."

Ritva Kovalainen thinks that yard trees are very special to their owners. They may involve many types of family legends. Yard trees may also have been planted to celebrate some special event.

"Some trees are dedicated to a certain person, such as a child upon birth. In some families, all children have their own dedicated tree beside which they grow up – protected by their own tree." ■

Reliable electricity supply **is a lifeline in agriculture**

There are fewer and fewer farms in Finland, but at the same time the sizes of farms are growing and agriculture is using an increasing volume of technology powered by electricity. Uninterrupted electricity supply is vital, because the functions of farms are more vulnerable than earlier.

Text by Liisa Joensuu ■ **Photographs by** Juhani Eskelinen and Liisa Joensuu

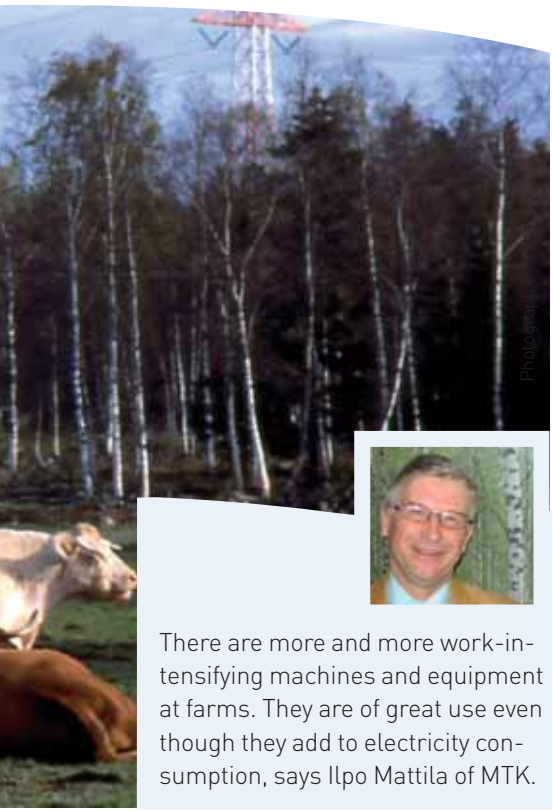
Traditional farms are becoming increasingly rare. The remaining farms grow their size by merging with smaller ones, by introducing technology which uses electricity, and by developing businesses outside agriculture. One third of all farms already rely on multiple sources of livelihood, and the number of such farms is on the increase.

"Even though the number of farms is getting smaller, the average number of cattle in dairy farms is growing, and automation attends to functions such as milking and washing of milking machines. Instead of the traditional morning and evening milking, the milking robot now milks cows throughout the day. Farms are using more and more electric equipment for instance for air conditioning, heating, cooling, feeding and manure removal," says **Ilpo Mattila**, Head of Section of the Central Union of Agricultural Producers and Forest Owners of Finland (MTK).

Reliable electricity supply is especially important for chicken farms. The breeding facilities must remain at even temperature at all times, and great changes are not permitted in ventilation or moisture level, either. Many chicken breeders are prepared for potential power failures by having aggregates driven by internal combustion engines, because a power failure of just a few minutes can result in the loss of thousands of birds.

Entrepreneurship at farms increasing

Finnish agricultural production consumed 872 gigawatt hours of electricity in 2006. The average consumption by dairy farms is 92 megawatt hours,



There are more and more work-intensifying machines and equipment at farms. They are of great use even though they add to electricity consumption, says Ilpo Mattila of MTK.

but the range is wide based on the size of the farm and number of cattle.

"The electricity consumption of dairy farms of a similar size may vary between 20 and 200 megawatt hours also depending on the degree of automation. As an example, heating with wood chips decreases electricity consumption. The volume of electricity required by dairy farms will probably not increase, because horse stables are taking the place of cattle farms. There are already more horse stables than dairy farms in Finland, and stables do not need as much electricity as cow houses or piggeries."

Energy accounts for 5 to 10 per cent of the production costs in agriculture; with the largest dairy farms this may be up to 20 per cent. Ilpo Mattila says that feed, seed and fertilizer costs and fuel oil expenses are clearly higher than electricity costs.

"Farms engaged in agriculture or forestry also carry out processing, for example cheese making or sawing. Functions which are outside agriculture or forestry come about constantly. A farm may provide accounting services, machinery contracting, excavation work and ploughing services. All these require electricity directly or indirectly; as an example, machinery needs heated maintenance and storage facilities," Ilpo Mattila says.

Machinery contracting is the biggest ancillary business sector in terms of number of entrepreneurs and turnover. Farm tourism is the second biggest sector. The holiday houses are increasingly high-standard and consume more electricity than before.

Transmission grid feeds electricity also during storms

Fingrid carries statutory responsibility for the functioning of the entire power system in Finland. Fingrid's grid has been constructed as a ring network so that a failure in any individual line does not interrupt electricity transmission except for the consumers connected to the line in question.

"Wide rights-of-ways and clearing or trees in the transmission line areas ensure that trees cannot fall on the lines. This is why even severe storms do not disturb electricity transmission in the nation-wide grid. Most of the disturbances occur in the distribution networks, which typically use 20 kilovolt overhead lines," says **Timo Kaukonen**, Fingrid's manager of power system operation planning.

In Fingrid's 110 kilovolt network, there are about 2.3 line faults per 100 kilometres in a year. Disturbance situations in the nation-wide transmission grid are reflected in an outage of only about 1 to 2 minutes experienced by consumers each year. The average duration of outages resulting from disturbances in all networks and experienced by consumers is approximately 2 hours per year.

Just under half of the disturbance situations in the nation-wide grid are resulted by lightning, with the automatic protective equipment usually clearing the fault in a second, or in some cases in a minute. ■

Grid connections of Olkiluoto 3 completed

The new grid connections of the third nuclear power unit at Olkiluoto are complete. The building project involved several subprojects, such as the transmission line between Olkiluoto and Huittinen, the new substation at Olkiluoto and upgrading of the existing substation, and the Huittinen substation.

Photograph by Päivi Bourdon

■ At the new Olkiluoto substation (from the left): Kari Kuusela of Fingrid, Simo Joki-Korpela of TVO and Mikko Niinivaara of ABB.

The construction work spanned 2005 to 2008. The 400 kilovolt transmission connection between Olkiluoto and Huittinen was commissioned at the end of 2007, but some finishing work was still done at the site in the spring, and two towers were also replaced.

This was one of Fingrid's biggest transmission line projects ever. Instead of the earlier three transmission lines, six 400 kilovolt lines now run from Olkiluoto to the nearby substations. Until the completion of the third nuclear power unit, the additional lines will reduce losses in the transmission grid.

The contractor for the transmission lines built from the Olkiluoto substation was the Finnish enterprise Eltel Networks, which utilised international expertise. The towers were made in China, the insulators in Russia, the suspension accessories in Spain, the phase conductors in Bahrain, and the overhead earth wires in Finland.

The new substation at Olkiluoto was built and the existing substation was renovated by Fortum Service, and the contractor for the Huittinen substation was ABB. The total costs of the projects were approx. 36 million euros. Almost 100 kilometres of new 400 kilovolt transmission lines were built within the project. ■

Flexibility

in electricity consumption

Risto Lindroos is looking forward to new services on the market. These could, among other things, control direct electric heating on the basis of the prevailing price level.

There are distinct peaks in electricity consumption. At certain times, such as early in the morning and in the evening when heating systems which store heat are switched on, consumption figures go up. If more time-related flexibility is available to consumption, everyone wins. More even electricity use reduces the need for peak power production, which brings down the costs and also benefits consumers. There is already technology for this, but new electricity services are still needed.

Text by Tiina Miettinen ■ **Photographs by** Vastavalo and Juhani Eskelinen

Just over a year ago, the Finnish Ministry of Trade and Industry appointed a work group to study the demand flexibility of electricity. The work group completed its proposal in March. Fingrid's representative in the group was Corporate Adviser **Risto Lindroos**.

"The essential question is how we can have sufficient electric power in Finland during consumption peaks. It is much more sensible to shift electricity consumption away from these peak hours than to construct more production capacity just for these peaks," Risto Lindroos says.

Demand flexibility of electricity refers to the transfer of consumption to another point in time, away from the peak hours and peak prices. The ultimate idea of demand flexibility is that consumers could benefit by reducing their electricity consumption as the price rises. Demand flexibility also reduces the risk of potential power shortage situations, where network operators would have to cut consumption in order to reach an equilibrium.

"So far, we have not had such power shortage situations. However, you need to remember that even though the power system lives by the hour, the price to small-scale consumers has always been the same irrespective of the hour of the day. If the electricity price during the peak consumption hours was higher for the consumers and if consumption was cut during heavy demand and high prices, we could reach savings in the costs of peak power, which would ultimately also benefit consumers," Risto Lindroos argues.

Electricity consumption varies greatly between the different hours of the day. Consumption rises rapidly in the morning, with the peak achieved at around 7 or 8 o'clock, after which

consumption decreases at noon. As it gets darker and as people return home after work, consumption begins to rise again, decreasing at around 8 o'clock in the evening. The third peak is reached when the night-rate electricity loads are switched on from 10 in the evening onwards.

Remote-read hourly recording meters needed

The work group analysed thoroughly the introduction of remote-read electricity meters capable of hourly metering and related adaptation of the electricity market and regulations, even though remote-read meters alone do not add to the demand flexibility of electricity. However, such meters are required if the goal is to expand demand flexibility to the small-scale users of electricity.

The new type of electricity metering is spreading rapidly in Finland. At the end of 2007, small-scale consumers had some 616,000 remote-read meters, which accounts for about 20 per cent of all meters of small-scale consumers. According to a study, there could be as many as 1.4 million remote-read meters at the end of 2010, in other words 44 per cent of the meters of small-scale consumers.

In terms of demand flexibility, electricity users can be divided into three groups: large-scale industries, medium-sized users, and small-scale users such as those using electricity for heating. Large-scale industries already vary their consumption based on the situation prevailing on the electricity market. Those using electricity for heating are a distinct and uniform group in terms of demand flexibility, because its usage pattern of night-rate and day-rate electricity provides a good basis for expanding demand flexibility to this group.

"Industries also have potential for additional flexibility. Increased use of certain renewable forms of energy such as wind power, which varies rapidly, will elevate the need for flexibility. I think we inevitably need more demand flexibility in electricity use," Risto Lindroos comments.

"Electricity sellers should sell products with which consumption can be shed during a high price."

The work group estimated that the demand flexibility potential existing in industries is about 500 megawatts and that of electric heating about 300 megawatts. The potential in industries depends on the price level of electricity and the prevailing production situation in industries.

It is challenging to estimate the flexibility potential of electric heating, because it depends on many issues such as number of relevant locations, controlled power, time of day, and ambient temperature.

New electricity products

The work group suggests the expansion of hourly remote-read metering so that at least 80 per cent of the usage locations in each distribution network should have an electricity meter capable of hourly metering at the beginning of 2014. Attention should also be paid to the speed of data transmission in the metering system. Balance settlements of electricity should shift over to the use of hourly-metered data instead of the present estimating type profiles.

There is also a need for more products enabling demand flexibility on the electricity market. The number of such products can be increased further in the electricity exchange. In the group of small-scale users, hourly metering and balance settlement based on it enables hourly pricing of electricity, which means that the most expensive electricity can be avoided. It can be said that the pricing of night-rate and day-rate electricity as well as the related control of heating loads become more dynamic.

"Electricity sellers should sell products with which consumption can be shed during a high price. Nowadays, consumers have full supply of electricity at all times, but there could be services where direct electric heating, as an example, would be controlled on the basis of the prevailing price level."

Risto Lindroos points out that the available technology is beginning to enable demand flexibility, but electricity sellers are required an active approach in the development of relevant products. The consumers' electrical equipment should also be grouped so that it would be applicable to load shedding.

"Remote-read hourly meters open the doors to comprehensive product development for the group of small-scale users," Risto Lindroos says.

Staggering of night-rate loads improves system security

Finland has traditionally applied two-rate pricing to electric energy, with the purpose of shifting consumption to the night time, in other words create demand flexibility. The work group considers that this two-rate pricing should continue, but the switching on of the night-rate loads should be staggered better than now. If all night-rate loads, such as electric heating which stores heat in single-family houses, switches on at almost the same time at 10 o'clock in the evening, electricity production has some difficulty in following the change.

Simultaneous switching on of night-rate electricity loads increases electricity consumption by as much as over 1,000 megawatts. In Finland, such a power change is very great: it corresponds to the production of one large electricity production unit or three times the total consumption of Tampere, the second largest city in Finland.

Simultaneous switching on of electricity loads complicates the maintaining of system security in the grid and increases the need to adjust the power system. This is why Fingrid has recommended that distribution network operators stagger the switching on of their night-rate electricity loads over a period between 9 o'clock in the evening and midnight. In this way, the change in the loads can be levelled out. ■

The kestrel is a beneficial bird to farmers – it is often referred to as a flying mole trap. A kestrel family eats hundreds of moles during its nesting season from April to July. Even though the kestrel is not very shy, people should not stay near a nest for a length of time so that the mother can hatch the eggs and tend to its nestlings in peace.

Kestrels nest **in transmission line towers**

A bird house installed on a transmission line tower is a suitable nesting place for the increasingly rare kestrel. Bird houses have been installed on transmission line towers and their suitability has been studied at Fingrid's initiative in six areas in Southern Finland since the spring of 2004.

Text and photographs by Pertti Koskimies

The kestrel is a slim falcon slightly smaller than a crow, with a long tail and long, pointed wings. A reddish brown back distinguishes it from other small birds of prey.

The kestrel lives in farming areas, and it is specialised in preying on moles, mice and other small animals. One of the best ways to identify the kestrel is the way in which it catches its prey: it hovers in one place in the air, and once it notices a catch, it dives right down.

There are kestrels throughout Finland. In the mid-20th century it was still the most numerous falcon in Finland. However, subsurface drainage of fields, biocides and other forms of agricultural intensification impaired its hunting grounds and supply of prey.

Due to its diminishing populations, the kestrel is classified as a near threatened species which may

become endangered if the decline persists. The nesting population varies depending on the size of mole populations. Most kestrels do not have place fidelity but they nest in the spring in areas where there is at least reasonable supply of moles. There are approximately 5,000 nesting pairs of kestrels in Finland.

Falcons in bird houses

One reason for the plight of the kestrel is that the pine marten has become more common in Finland. The kestrel does not build a nest itself, but it tends to nest in old crow's, magpie's or squirrel's nests made of twigs. Pine martens destroy many of the nests located beside fields.

The kestrel also accepts a bird house which is open at the front. Bird enthusiasts who put rings on birds have fixed more than 5,000 bird houses on barn walls in Finland in recent years. Kestrels have nested successfully in these, because the pine marten does not prey in the middle of open field areas. Thanks to the bird houses, the number of nesting kestrels has increased in different parts of Southern Finland.

However, since barns are no longer needed, they are disappearing from fields, which means a shortage of safe nests for kestrels. Also, fields rarely grow trees which would be almost as safe hanging places for bird houses.

Further south in Europe and in North America many birds of prey have learned to nest in transmission line towers, which could serve as safe places for kestrel houses in Finland.

The suitability of transmission line towers for kestrel houses has been studied at Fingrid's initiative since the spring of 2004. A total of 100 bird houses were installed in six areas in Southern Finland. The areas are located in South-Western Finland, South-Western Häme, Western and Eastern Uusimaa, Kymenlaakso, and South Karelia.

Of these areas, Kymenlaakso already housed an abundant kestrel population in bird houses installed on barn walls, but in the other areas the kestrel was very rare. Of the years monitored, 2004 and 2007 were bad mole years in Southern Finland while 2005 and 2006 were good years.

Transmission line tower is a safe nesting place

In 2004, no kestrels nested in the bird houses on transmission line towers, but in 2005 there were nine pairs, in 2006 six pairs and in 2007 five pairs. Moreover, there were individual falcons, which were not nesting, in several bird houses. The broods in the bird houses installed on transmission line towers were as large as in bird houses on barn walls.

The study indicated that transmission line towers are suitable nesting places for kestrels. It is likely that the number of falcon pairs settling in the tower bird houses will grow in the near future. It takes some time before the birds learn about the new type of nesting place; it took 10 to 20 years before the kestrels accepted the bird houses installed on barn walls. The mother falcons only live a few years and they change their habitats on the basis of the mole populations, which slows down the adoption of new types of nesting places.

The kestrel study continues throughout 2008. ■

Bird studies on transmission lines

Fingrid has commissioned several bird studies in recent years. Bird counts in transmission line areas in Southern Finland indicated that several endangered and rare bird species, such as red-backed shrikes and wood larks, nest in such areas.

A new study will be launched this year, surveying valuable bird and nature areas near a new line planned on the coastal areas of northern Gulf of Bothnia. Migratory routes of birds at a coming transmission line area are being investigated at Ridasjärvensuo in Hyvinkää in Southern Finland.

Fingrid's profit in the early part of the year improved slightly

Revenue of the Fingrid Group in January-March 2008 was 115 million euros (101 million euros in 2007). Revenue rose due to increased sales of balance power. Operating profit without the change in the fair value of derivatives was 40 million euros (35 million euros). The operating profit grew mainly because of reduced maintenance management costs and purchasing costs of loss energy.

The operating profit in accordance with IFRS was 38 million euros (33 million euros), which contains 2 million euros (-2 million euros) of negative change in the fair value of electricity derivatives. The IFRS profit before taxes was 29 million euros (25 million euros). The equity ratio was 27.9 (26.2) per cent at the end of the review period.

The financial position of the Group continued to be good. The net finance costs of the Group were 8 million euros (8 million euros). Financial assets recognised at fair value in the income statement, and cash and cash equivalents amounted to 223 million euros (211 million euros) at 31 March 2008. The interest-bearing liabilities, including derivative liabilities, totalled 952 million euros (965 million euros), of which 732 million euros (750 million euros) were long-term and 220 million euros (214 million euros) were short-term.

The counterparty risk involved in the derivative contracts relating to financing was 9 million euros (6 million euros). The company has an undrawn revolving credit facility of 250 million euros.

Moody's Investors Service updated Fingrid's credit opinion on 29 January 2008. The rating stayed the same. The long-term rating is Aa3 and the short-term rating is P-1. The future outlook is stable (Stable Outlook).

The Group's income flow is characterised by seasonal fluctuations, which is why the financial result for the entire year cannot be directly estimated on the basis of the three-month result. The profit of the Fingrid Group for the entire year without the change in the fair value of derivatives is expected to decrease somewhat on the previous year. ■

More than 1.4 million euros of feed-in tariff for peat power paid in 2007

Electricity produced from peat has been subsidised in Finland by means of feed-in tariffs since May 2007. The additional price allowed by the feed-in tariff, paid to electricity producers who use domestic fuel peat, was almost 1.5 million euros during the first invoicing period.

The Finnish act on the feed-in tariff of electricity produced from fuel peat in condensing power plants came into force in Finland in May 2007. The act gives priority in the running order of power plants in the Finnish power system to condensing power plants which fire domestic fuel peat over condensing power plants which use coal, natural gas and fuel oil. The act will be valid until the end of 2010.

The act stipulates that it is Fingrid's duty to acquire funding for the feed-in tariff system by levying a feed-in tariff fee on electricity consumption which is connected directly or indirectly to the Finnish transmission grid. Within Fingrid, this duty has been assigned to Fingrid Verkko Oy, a subsidiary fully owned by Fingrid.

The consumption fee of the feed-in tariff is invoiced to the grid customers afterwards for six-month periods. The first invoicing period was exceptionally from 1 May to 31 December 2007.

Once Fingrid has received the relevant consumption fees from its grid customers, Fingrid pays an additional price in accordance with the feed-in tariff to electricity fed into the grid by condensing power plants and condensing power plants with bleeding which use domestic fuel peat and have a generator capacity of at least 120 megavolt amperes.

The power plants covered by the feed-in tariff system are the Haapavesi power plant of Kanteleen Voima, Pietarsaari power plant of Alholmens Kraft, Seinäjoki power plant of Vaskiluodon Voima, and Toppila power plant of Oulun Energia.

The total costs during the first invoicing period were approx. 1.7 million euros and electricity consumption in the same period about 55 terawatt hours, which means that 0.031 euros per megawatt hour was charged from the grid customers as a consumption price. A file showing the itemised revenues and costs during the first invoicing period can be found on Fingrid's website under Services/Feed-in tariff for peat.

Since last December, the price of coal has been so high that no additional price to be paid to producers by virtue of the act has been created during the first three months of this year. ■

Photograph by Juha Eskelinen

The delivery contract for the submarine cable was signed in Helsinki on 10 April. Shown in the photograph are (from the left) Tom Martinsen (Nexans Norway AS), Ingela Hålling (Svenska Kraftnät), Mikael Odenberg (Svenska Kraftnät), Jukka Ruusunen (Fingrid), Anne-Lise Aukner (Nexans Norway AS), and Kari Kuusela (Fingrid).

Nexans to supply the submarine cable between Sweden and Finland

Fingrid and Svenska Kraftnät have chosen Nexans Norway AS as the supplier of the new submarine cable between Finland and Sweden (Fenno-Skan 2). The value of the contract is approx. 150 million euros. Fenno-Skan 2 will be commissioned at the end of 2011.

The delivery contract for the cable was signed at the beginning of April. The actual cable manufacture at Nexans' factory in Halden, Norway, will commence in the autumn of 2009. The laying of the cable will begin in the spring of 2011, lasting throughout the summer.

Nexans was chosen as the supplier through strict competitive bidding. The company has 90 years of experience in the electric cable industry globally. Nexans has industrial operations in more than 30 countries, and it works in the global market employing 22,000 persons.

The submarine cable project is progressing as planned. The foremost official permits required by the project have been obtained after a cross-border line permit for the cable was granted in Sweden in April. The cross-border line permit in Finland was obtained in the autumn of 2007 and the water management permit in January this year.

Fenno-Skan 2 is one of Nordel's five priority cross-sections in the Nordic countries, costing a total of one thousand million euros. All of these cross-sections are due to be ready around 2010. Fenno-Skan 2 will be commissioned at the end of 2011. ■

Fingrid's Rovaniemi office moved

Fingrid's Rovaniemi office moved to new facilities to the fourth floor of Shopping Centre Revontuli in April. The offices of Energiapolar, Rovakaira, Rovaniemen Energia and Rovaniemen Verkko are located on the same floor. The new address is Koskikatu 27, 96100 Rovaniemi.

Field gentian preserved on transmission line areas in South-Western Lapland

The field gentian in 2005, when it bloomed in great numbers. All individual plants are not nearly as large as this; there may also be single-flower individuals only a few centimetres tall.

As natural meadows are becoming increasingly rare in Finland, plants and butterflies which favour meadows have found new habitats at roadsides and on transmission line areas. Fingrid and the Lapland Regional Environment Centre are carrying out a joint project involving a management experiment and monitoring of the highly endangered field gentian, which is specially protected under the Finnish Nature Conservation Decree. The project takes place on the Keminmaa-Isohaara transmission line in South-Western Lapland.

Text and photographs by Piia Juntunen

The management experiment and monitoring of the field gentian takes place on a transmission line area with meadow-like plants, located adjacent to the Kallinkangas nature conservation area.

Before this, the significance of transmission lines for biological diversity has been studied primarily in Uusimaa in Southern Finland. The endangered field gentian (Gentianella campestris) grows in Southern and Western Finland as well as in the Keminmaa and Tornio regions in Lapland.

The habitats preferred by the field gentian have traditionally been meadows and fields where the growth has been kept low by cutting or grazing. Such areas have almost disappeared in the past decades because of changes which have taken place in agriculture. The field gentian also grows in open patches in forests, on roadsides and on transmission line areas in regions with lime in the ground.

Of the 46 known habitats of the field gentian in South-Western Lapland, 4 are located under high-voltage electricity transmission lines. By far the largest one of all sites is on the Keminmaa-Isohaara transmission line, where thousands of individual plants have been counted in the best years. The field gentian can also be encountered on the Taivalkoski-Keminmaa and Isohaara-Taivalkoski transmission lines.

Field gentian benefits from clearing

The biggest threat to the occurrence of the field gentian in South-Western Lapland is that its habitats become stocked with young growth. The plant thrives under transmission lines primarily because these areas are cleared of vegetation at regular intervals. It can be assumed that more frequent clearing and removal of clearing waste away from the habitats contributes to the welfare of the field gentian under power lines.

It is also important that the soil surface is broken occasionally; this is necessary so that the field gentian can grow saplings at intervals of two years. In order to shoot up, its seeds require bare mineral soil, but the seeds probably do not retain their germination capacity for more than a few years.

The seeds of the field gentian germinate in the spring, and in the first summer it just grows an unnoticeable rosette of leaves. In the next summer, the overwintered rosette of leaves turns into an inflorescence, which produces seeds towards the late summer for the next generation. In other words, the population dynamics of the species depend directly on the success of the annual bloom.

The Lapland Regional Environment Centre and Fingrid Oyj together with experts of the University of Oulu have planned a management experiment for the field gentian at its largest habitat adjacent to the Kallinkangas nature conservation area in Keminmaa. The area is situated close to housing, and the area is traversed by several paths, which the field gentian seems to like in particular.

In the management experiment, the transmission line area is cleared of vegetation more frequently than normally over a distance of 200 metres. The line is cleared at intervals of three years outside the flowering period, and clearing waste is removed aside. An adjacent strip of 200 metres in the transmission line area is also monitored, but its growth is treated in the normal manner, i.e. cleared every 6 to 7 years with the clearing waste left in place.

The plant monitoring related to the management experiment is carried out by the Lapland Regional Environment Centre, which is sponsored by Fingrid. The monitoring programme was launched in August 2005, when the individual plants in the chosen areas were counted precisely for the first time. In the autumn of 2005 and spring of 2006, Fingrid conducted normal clearing work on the Keminmaa-Isohaara transmission line and had the clearing waste removed aside in the test area.

Good preliminary results

The year when monitoring began was the best for the growth of the field gentian in a long time. It was estimated that a record number of almost 8,000 individual plants were growing in the entire habitat of one kilometre. On the other hand, the next summer was exceptionally dry. When the monitoring period began, there had not been any rain in South-Western Lapland for seven weeks. Drought was probably the main reason why only 51 individual field gentians were encountered in the monitored area. However, these followed an even distribution between the test area and control area, like in the first year of monitoring.

The third monitoring summer of 2007 was highly varied in terms of weather in Keminmaa, and there was rain almost weekly. In August, 145 thriving field gentians were discovered in the monitored area, and their distribution between the test area and control area was more uneven than in the previous year. In the test area, from where clearing waste had been removed in conjunction with clearing carried out in 2005–2006, considerably more individual plants were counted than in the control area where the clearing waste had been left in place. The monitoring results to date are presented in the table.

At this point in the monitoring programme, it seems that the field gentian has thrived better in the test area from where clearing waste has been removed. However, the monitoring programme is only in its initial stages, and coincidence may play a great role in the occurrence of the field gentian. If there are clearly more individual plants in the test area also in the coming years, the experiment can be regarded as successful, and the management procedures can be expanded to other habitats of the field gentian.

One thing that is certain on the basis of monitoring extending over three years is that the field gentian populations vary very drastically. The test area will be cleared and the clearing waste will be removed from it next time in the spring of 2009, when three years will have elapsed from the previous clearing.

Monitoring is used for evaluating the success of management procedures. The information obtained can be utilised when assessing the need for management in other locations and when planning management methods. The monitoring programme will continue at least in 2008, 2009 and 2010.

Number of individual field gentians in the test area and control area

	Action 2005–2006	2005	2006	2007	Subsequently
Tower area 12–13	Clearing + waste removal (experiment)	1744	26	118	3-year clearing interval + removal
Tower area 13–14	Clearing only (control)	1846	25	27	normal clearing interval

Grid ABC

This article series deals with the main operating principles, equipment units and components in the main grid. The articles published in the series previously can be viewed on our website at www.fingrid.fi.

Transmission lines adapt to the surrounding scenery and background especially when viewed from the air so that it is not always easy to distinguish them while in motion. They can hence constitute a safety risk for aircraft.

The international aviation law and the Finnish Civil Aviation Authority give stipulations concerning the placement and marking of structures which may compromise aviation safety. This is why transmission line towers located close to airfields in particular are painted in white and red colours familiar in other high masts so that the towers almost resemble a lighthouse.

In addition to the colouring of towers, safety measures include the installation of power line obstruction markers on the conductors in some locations. The markers are installed on the topmost conductors, overhead earth wires. The obstruction markers are red or white balls made of plastic, having a diameter of about 1 metre. Red and white balls are placed alternately at a distance of 30 to 40 metres from each other.

The power line obstruction markers are relatively heavy, which means that a crane truck is needed in their instal-

Power line markers and lights

Transmission lines are usually suspended by high towers, and they rise above the surrounding vegetation and structures. Both pilots and birds may find it difficult to see transmission lines from the air. This is why the conductors are sometimes provided with power line markers and lights, or the towers may be painted with high-visibility colours. There are two types of power line markers: obstruction markers and bird markers.

Text by Marcus Stenstrand and Mikko Jalonen ■ **Photograph by** Juhani Eskelinen

lation work. The line must also be de-energised for the duration of the work. Typical sites where power line obstruction markers are installed include areas close to airfields and crossings of air routes of light aircraft.

Obstruction lights in the dark

Lines and towers must also be discerned during the dark hours, especially close to airfields. This is why the structures are provided with obstruction lights. As an example, obstruction lights have been installed on the towers and conductors beside Ring Road III in the Helsinki region. The lights at the top of the towers work like normal lights, i.e. they are powered by the electricity network. Naturally, the lights installed on the conductors cannot have separate lines for electricity supply, but they derive their power from the conductor to which they are attached.

Transmission lines create an electric field around them. When the voltage of the line is high enough, a distinct potential difference is created between the conductor and a point which is very close to the conductor in the direction of the radius of the conductor. By means of a capacity coupling, this can provide energy for low-current high-voltage lamps. The lamps used are cold-cathode low-pressure neon discharge lamps which produce red light.

Due to their method of implementation, the lights are on always when there is an electric current in the transmission line; in other words, they do not have separate automation for switching on and off. If the transmission line is made dead for example for maintenance work, the obstruction lights on the conductors go off. However, the lights on the towers are still lit, because power to them is supplied separately.

If several adjacent obstruction lights on the conductors are out of order or if the line needs to be de-energised because of maintenance work, the Civil Aviation Authority is informed of this every time. Air traffic is hence not jeopardised as a result of missing lights.

Smaller bird markers

The phase conductors used in the transmission lines in Finland are often bundle conductors, where one phase contains two to three conductors at a distance of a few inches from each other. The average diameter of a single conductor is 15 to 35 mm, so birds have no great difficulties in making out the phase conductors.

On the other hand, individual overhead earth wires only have a diameter of 10 to 20 mm, so spotting them in good time before a collision may be difficult for birds. For this reason, Fingrid has installed bird markers on the earth wires at some routes of migratory birds, in the vicinity of nesting areas and other special locations. Fingrid decides where to place the bird markers, so it should be informed of detected collision locations.

A bird marker is composed of two hemispheres made from orange plastic, forming a hollow ball with a diameter of approx. 20 cm. The hemispheres are provided with hinges at one edge, and inside the ball there is a spring-activated mechanism which locks the ball into place when a conductor is pushed between the hemispheres from the side with no hinges.

This structure makes it possible that bird markers can be installed on a live wire as live work. In installation, a rope accepted for live work is passed through the ball, and the other end of the rope is thrown over the overhead earth wire from the ground. After this, the ball is pulled up to the earth wire, and when the unhinged mouth of the ball goes around the earth wire, the spring inside the ball is released, pressing the ball to the wire. The installation of the bird marker is ready after the rope is pulled out. Power line bird markers are usually installed on one overhead earth wire at intervals of about 20 metres. ■

Landscape towers transformed **into corporate emblem**

Graphic designer Ilmo Valtonen emphasises that the visual frame of reference of the enterprise must show everywhere where the enterprise appears.

Ilmo Valtonen, one of the most rewarded graphic designers in Finland, designed Fingrid's logo and emblem in 1996. The emblem, which has been in use for more than 10 years, is still vibrant in a slightly modified format.

Text by Pirjo Rautanen ■ **Photographs by** Tuija Sorsa

Over a period of some 20 years, Ilmo Valtonen has designed hundreds of emblems and visual approaches for enterprises whose visual message reaches Finns every day. Among these enterprises are the Finnish Post, Finnish football league, Elisa, Rautaruukki, Valtra, Etera, Finlandia Hall and Lahti Symphony Orchestra.

Fingrid's emblem was prompted visually by transmission line towers designed by **Antti Nurmesniemi**.

"I asked him whether I could use the shape of the landscape towers in the design of the emblem and logo. He gave quite a surprising answer: 'Even lakes have waves which anyone can depict.' This was his way of giving an affirmative reply. However, I thought that it was important that I ask for the permission, because you need to respect designers' rights to their own works," Ilmo Valtonen points out.

Essence and advantage of electricity

Ilmo Valtonen describes the symbolism involved in the shapes, colours and typography of Fingrid's emblem as follows:

"The four colours – blue, red, yellow and green – symbolise the essence of electricity and the benefit it gives. They also render the overall appearance distinguishable and fresh. Blue is an electric colour in itself. It is also something very Finnish. Red and yellow refer to light, warmth and action, and green to ecology."

According to Ilmo Valtonen, the vertical direction of the logo describes a transmission line tower, and the three tower triangles in the emblem symbolise the transmission grid. "Three is a central digit in electricity transmission – the three phases of electricity."

> "The goal in everything has been visibility and strengthened identity."

Changes to emblem

Fingrid's emblem underwent a slight revision recently. The emblem was highlighted and strengthened. This was mainly a cosmetic update. The change was primarily due to a need to diversify the use of the emblem in various media applications. The logo is now in a horizontal direction, and its colours have been fine-tuned to present-day requirements.

"Minor changes seem easy, but the entire emblem must be treated in the same way as if you were starting from an almost clean slate," Ilmo Valtonen describes the modification work.

Visual frame of reference in everything

Ilmo Valtonen has also designed Fingrid's new appearance used in events, for the first time at Fingrid's stand at the Farmari agricultural fair in August.

He points out that the visual appearance of events is designed much too often without an underlying visual idea.

"The visual frame of reference of the enterprise must show everywhere where the enterprise appears. You need a clear concept under which you can build various themes. It is a joy to see stands which clearly look like the enterprise in question and are therefore identifiable," the designer says with enthusiasm.

Fingrid's new visual appearance used in events highlights the emblem, logo and power line markers used on transmission lines, lifted above the entire stand. These can be seen far, and they guide visitors to the stand. The live size of the power line markers used on overhead earth wires becomes concrete to the viewers, who normally only see them as small dots against the sky.

"The goal in everything has been visibility and strengthened identity," Ilmo Valtonen summarises.

Many irons in fire

As counterbalance to work, Ilmo Valtonen has many other interests in various fields, such as teaching.

Outdoors, he follows a small white ball on beautiful greens, enjoying successful games.

Of his professional achievements, Ilmo Valtonen raises the state award in design granted to him in 2004. He perceives his own work as an extraordinary privilege of involvement in many projects. ■

Ilmo Valtonen also likes to do things with his hands. The computer screen shows a Nuffield 4/65 tractor renovated by him.

Visitors with their hosts at the new Olkiluoto substation.

Occupational safety **is about co-operation**

Working with electrical equipment always involves risks. This is why adherence to occupational safety guidelines is of the essence. Fingrid works constantly to promote occupational safety. This year, focus has been placed on issues such as use of personal protective equipment.

Text by Minnakaisa Ahonen ■ **Photograph by** Päivi Bourdon

Good occupational safety has always been a main consideration for Fingrid. Occupational safety includes professional operations in the vicinity of electrical equipment and adherence to working methods which conform to safety regulations.

Co-operation with those building and maintaining the transmission grid and also with landowners is essential when trying to attain a level of zero accidents at Fingrid's sites. Feedback and ideas received from the stakeholders as well as lessons learned from past events are the key in the promotion of occupational safety.

In recent years, Fingrid has focused on proactive occupational safety by arranging training and inspections and by paying specific attention to enhanced safety at joint workplaces.

As an example, we have concentrated on climbing safety. All new transmission line towers are designed and equipped so that risks during erection and risks caused by falling are minimised.

Personal protective equipment into use

From the beginning of this year, Fingrid's personnel and personnel of our service providers have used personal protective equipment at work sites more systematically than before. In addition to a helmet, high-visibility clothing must be used in site areas or switchyards.

The same requirement concerns the use of safety footwear at sites. For our suppliers, this year is still a period of transition, but the new regulations already apply to Fingrid employees. From the beginning of 2009, all those working on Fingrid's electrical equipment will follow the same rules.

In the near future, we will develop event monitoring, focus on the assessment of risk factors, and analyse past events.

One new project is to devise occupational safety indicators describing the occupational safety level of work ordered by Fingrid. In order to obtain

Peak power costs 10.5 million euros in 2007

The costs of providing for the consumption peaks of electricity in Finland totalled 10.5 million euros last year. By virtue of an act which came into effect at the beginning of 2007, the costs of the arrangement are collected from the users of transmission services in conjunction with fees levied on transmission service and cross-border transmission service.

One of Fingrid's duties is to maintain a system which secures a balance between electricity production and consumption by ensuring that condensing power capacity, which is under a threat of being closed down, will be kept in readiness for use.

The condensing power plants participating in the maintaining of peak power are kept in a starting readiness of a maximum of 12 hours during the winter period.

The system is financed through separate fees which Fingrid can collect from the users of transmission services in conjunction with fees levied on transmission service and cross-border transmission service.

The costs are allocated so that one half are levied from electricity transmission from Russia and Estonia and half are allocated to the transmission service in the grid tariff.

On the basis of the average production (75 terawatt hours, TWh) and assumed imports (from Russia 11 TWh and from Estonia 2 TWh), it was estimated that the energy-based fee for Finnish generation in 2007 would be 0.07 €/MWh and for imports from Russia and Estonia 0.40 €/MWh. The actual Finnish generation in 2007 was 75.4 TWh, imports from Russia 10.2 TWh and imports from Estonia 1.9 TWh.

The small surplus in Finnish generation in 2007 will be equalised at the end of the agreement period. Since imports were clearly below what was assumed, the deficit will be adjusted in proportion to the energies invoiced to the importers for 2007.

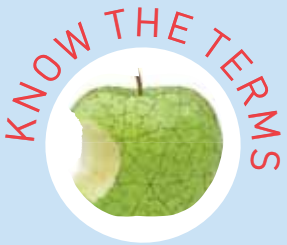
The average generation and import estimates forming the basis of the peak load power fees for 2008 will be kept the same as in 2007. Electricity generation and imports vary depending on the Nordic electricity market and water reservoir situations, which is why it is only possible to calculate the exact costs and revenues afterwards. The accumulated payments made for 2008 will be equalised at the beginning of 2009. ■

the key figures, we request our suppliers to submit information on hours of absence caused by accidents and an estimate of the work hours required by a job within the entire contracting chain.

Further information: www.fingrid.fi

We develop constantly documentation relating to occupational safety as well as ways to improve safety. We also maintain Internet and Extranet sites providing detailed information on both occupational safety and general safety relating to work carried out close to our grid.

The basic information on safe working available on our websites covers issues such as operation of machinery close to transmission lines and tips for farmers for fastening protective gauzes on fields. ■



This column presents and defines new terminology in the electricity transmission business.

EIA ■ What does it mean?

EIA stands for environmental impact assessment. This is a statutory procedure for assessing the environmental impacts of the various implementation options of a construction project – such as a transmission line or motorway.

The EIA procedure does not make execution decisions or grant permits, but it intends to provide information for decision-making. The assessment report and the statement of the competent authority given of the report are considered in subsequent decision-making and permit processing.

The Finnish EIA decree lists those projects where EIA must always be applied. In transmission line projects, an assessment procedure is required of all overhead lines with a voltage of at least 220 kilovolts and a length of more than 15 kilometres. 110 kilovolt transmission lines are subject to a more concise environmental investigation.

Environmental impacts are construed broadly, and the assessment covers the impacts of the transmission line during its construction and operation on the soil, water, air, climate, flora, fauna, interactions between them and biological diversity, community structure, buildings, landscape, townscape and cultural heritage and the utilisation of natural resources.

Impacts on human health, living conditions and public amenity must also be ascertained. In transmission line projects, these issues may include potential health and social impacts caused by electric and magnetic fields as well as impacts on housing and recreation.

The assessment procedure begins by the delivery of **the assessment programme** to the competent authority. The programme describes the project, presents its alternatives and environmental impacts to be studied, as well as arrangement of communications and contribution.

The competent authority announces the assessment programme by displaying it on the notice boards of the affected municipalities. The announcement is also published electronically and in local newspapers. The announcement contains information on the project, the party in charge of the project, and how citizens and other parties can present their comments on the assessment programme. The announcement also declares where the assessment programme and the statement to be given by the competent authority of the programme are displayed. In many cases, the assessment programmes and reports are presented in events arranged for the general public.

The competent authority gives its statement of the assessment programme, indicating the issues which require revision. The statement also includes a summary of the comments presented by others.

The environmental impact **assessment report** presents the studied environmental impacts of the project and its alternatives so that the alternatives can be compared with each other. The assessment report also presents measures needed to prevent adverse impacts.

Once the assessment report is ready, there is a similar hearing process as with the assessment programme. The EIA procedure finishes with a statement given by the competent authority concerning the assessment report and its sufficiency.

Further information:
www.ymparisto.fi

Text by Tiina Seppänen

Grid Quiz

Competition to the readers of Fingrid Magazine

Answer the below questions and send your reply by fax (number +358 (0)30 395 5196) or mail to Fingrid no later than 15 September 2008. Address: Fingrid Oyj, PL 530, 00101 HELSINKI, FINLAND. Mark the envelope with "Verkkovisa".
We give 10 high-quality and elegant Sagaform hamburger presses as prizes. The winners are decided by drawing lots among all those who have given the right answers. We will inform the winners in person.
The answers to the questions can be found in the articles of this magazine.

What is the total length of transmission lines that Fingrid will build by 2013?
- ◯ 700 kilometres
- ◯ 1,000 kilometres
- ◯ 1,400 kilometres

When working under the phase conductors of a 400 kilovolt transmission line, the minimum distance of machinery and load to the conductors must be:
- ◯ 3 metres
- ◯ 4 metres
- ◯ 5 metres

The prey that has a decisive influence on the size of the kestrel population is:
- ◯ mole
- ◯ shrew
- ◯ frog

Since May 2007, Finland has been using a feed-in tariff to subsidise electricity production where the energy source is:
- ◯ wind
- ◯ peat
- ◯ municipal waste

There are distinct peaks in electricity consumption. Simultaneous switching on of night-rate electricity loads increases electricity consumption in Finland by more than:
- ◯ 400 megawatts
- ◯ 1,000 megawatts
- ◯ 1,250 megawatts

The towers of the recently completed 400 kilovolt transmission line between Olkiluoto and Huittinen were made in:
- ◯ China
- ◯ Japan
- ◯ Norway

Last year, Fingrid participated in the international benchmarking study concerning the quality and efficiency of transmission system operation for the:
- ◯ second time
- ◯ fifth time
- ◯ seventh time

Fenno-Skan 2, the submarine cable between Finland and Sweden, runs over a distance of almost 200 kilometres at the bottom of the sea at a depth over:
- ◯ 50 metres
- ◯ 70 metres
- ◯ 100 metres

Name _____

Address _____

Post office _____

E-mail address _____

Telephone number _____

Winners of prizes of the Grid Quiz in the previous Fingrid magazine (1/2008): Jukka Eronen, Reijola; Petteri Genas, Vaasa; Olle Hansson, Tukholma; Markku Hauta-aho, Lahti; Ari Hämäläinen, Durban; Arto Köykkä, Muhos; Seija Lohikoski, Espoo; Ossi Savolainen, Espoo; Martti Uppala, Rovaniemi; Mikko Vehniäinen, Vaala.

Energiakolmio is new portfolio manager for Fingrid's loss energy

Fingrid Oyj and Energiakolmio Oy have signed a three-year contract on portfolio management for Fingrid's loss energy. Energiakolmio, an energy consultant based in Jyväskylä, Finland, was chosen as the portfolio manager on the basis of international competitive bidding.

Energiakolmio will carry out price hedging in accordance with Fingrid's strategy on the derivatives market, aiming at an optimum result for Fingrid. The service also covers trading in the emission rights of Fingrid's reserve power plants, and portfolio management reporting.

Losses are always created in electricity transmission. The losses in the Finnish electricity transmission grid total just over 1 terawatt hour per year, which accounts for about 1 per cent of all electricity consumption in Finland.

The costs of loss energy procurement constitute a significant cost item for Fingrid (44 million euros in 2007). The objective of Fingrid's portfolio management is to hedge itself against sudden changes in market prices and hence secure an even and predictable grid tariff.

Loss energy purchases are hedged in full in advance by spreading the hedging over several years. "We follow a cautious and conservative strategy in price hedging. Energiakolmio carries out the hedging action and its timing independently in accordance with the given strategy. We feel that this is a suitable procedure for a transmission system operator on the electricity market," says Fingrid's Senior Vice President **Reima Päivinen**.

Arto Lepistö is Fingrid's Chairman of the Board

Fingrid Oyj's Annual General Meeting was held in Helsinki on 18 March 2008. Arto Lepistö, Industrial Counsellor, Head of the Energy Market group of the Ministry of Employment and the Economy, was elected the new Chairman of the Board.

The Annual General Meeting accepted the financial statements for 2007, adopted the income statement and balance sheet, and granted discharge from liability to the members of the Board of Directors and to the President. In addition to the Chairman of the Board, the Annual General Meeting also elected the Deputy Chairmen and other Board members as well as their personal deputy members for 2008.

Photograph by Vastavalo

Holy power cut

Occasionally, there is a power failure at our summer house. For some reason, power cuts are more common there: I cannot remember a single time in the past 10 years that power supply would have been interrupted in my town apartment.

Instead, I do remember such incidents especially from my childhood. In the evening, suddenly, the lamps would go off, and we would get the candles from the green cabinet in the kitchen. In their dim glimmer, we would wait for the situation to be restored to normal. I guess there was a service number even then where you could phone to inquire about the expected length of the failure. However, I do not remember ever ringing that number, let alone finding any – well – enlightenment to the matter until an hour or two had passed.

Am I complaining about operating disturbances in electricity supply? Absolutely not. Instead, I'm glamorising them. I can always remember the first reaction of my big sister when the lights had gone off: "Great! Something extraordinary!"

Why such liking to a thing that complicates everyday life?

One reason may be that something extraordinary "unites". A family becomes closer together. It becomes a reality TV team or a survival team. In routine everyday life, we all are busy with our own chores. But when a torch is needed after the lights have gone off, that is surely a shared project.

Something extraordinary is "exciting". Everyday life does not have to be boring. But, by definition, it cannot be hair-raisingly intensive, either. Everyday life is composed of routines, habits, repetition, automation, the self-evident. In an extraordinary situation, all this changes instantly. Nothing is given, nothing is taken for granted. No one can take an indifferent attitude towards the situation. Glitches in the infrastructure of life raise your awareness of you being alive and of how important that is.

Sacred is something no one may interfere with and no one else can monopolise. It is this very prohibition or restriction rather than the positive, shared things that unite a community. Sacred is that from which the members of the community are jointly separated.

A power failure or any extraordinary situation is a little sacred. What is sacred is the (missing) electricity. Nobody has it, and nobody can acquire it suddenly. This welds a family or a group of friends closer together.

Sacred is also "exciting" in that it involves an ingredient of mystery. Sacred does not become void to something we already know. This also applies to extraordinary situations: even though a forecast can be given of the restoration of the situation to normal, we are still fundamentally at the mercy of the situation. This is an uncontrolled state, with existing knowledge and skills not being sufficient to control it. An extraordinary situation, like sacred, is governed by forces beyond us.

If you can accomplish sacred just by cutting electricity supply, why are we Lutheran instead of believing in power failures?

Sacred always involves prohibition. You cannot touch a cult object, or maybe priests can but only under strict ritual codes. A power failure is not based on a taboo but on an interruption caused by causal reasons. There are pre-determined holidays in the calendar for celebrating sacred things and events, but this would not be sensible in the case of blackouts.

The truths behind a power cut – a rat biting a cable, a malfunction in a phase – are banal by nature. The "mystery" in them is mere lack of knowledge of the ending of the outage. This renders it bad sacred. We do not come to any unsolved thing larger than life. Sacred is about metaphysics, a power cut is about physics.

So, we can forget about the embryonic hopefulness about the creation of a new religion. We will not have a power failure church after all. Even though electricity distribution disturbances are not to be hoped for, it would be a pity if they ceased to exist altogether. Experiencing a power cut at intervals of a few years belongs to small-scale human rights. It is a sudden bonus appearing amidst everyday life, a sort of a haphazard or miniature holy day, which is a phenomenon healthier than all that lying and use of power that are linked with many established religious institutions. ■

Tuomas Nevanlinna is a writer, columnist, debater and translator as well as a member of co-op Lektio, living in Helsinki. He has written books such as "Antero joutuu luontoon" (Teos 2004), "Nurin oikein" (Teos 2006), and "Kuninkaista ja narreista" (Kirjapaja 2006).

“What are those balls up on the power line?”

The answer to this and many other questions can be found at our stand C 208 at the Farmari 2008* agricultural fair.

You can learn more about the nation-wide electricity transmission grid, whose lines total 14,000 kilometres in Finland. There is information on issues such as utilisation of transmission line areas as well as neighbourhood with transmission lines.

*Farmari 2008 in Lahti 31 July to 3 August

Just in case you cannot be there, we’ll let you know that power line markers are installed on transmission lines on migratory routes of birds and to secure aviation safety.

FINGRID

Keeping the lights on in Finland

Fingrid is responsible for the nation-wide electricity transmission grid in Finland. We make sure that Finland obtains electricity without disturbance.

www.fingrid.fi

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