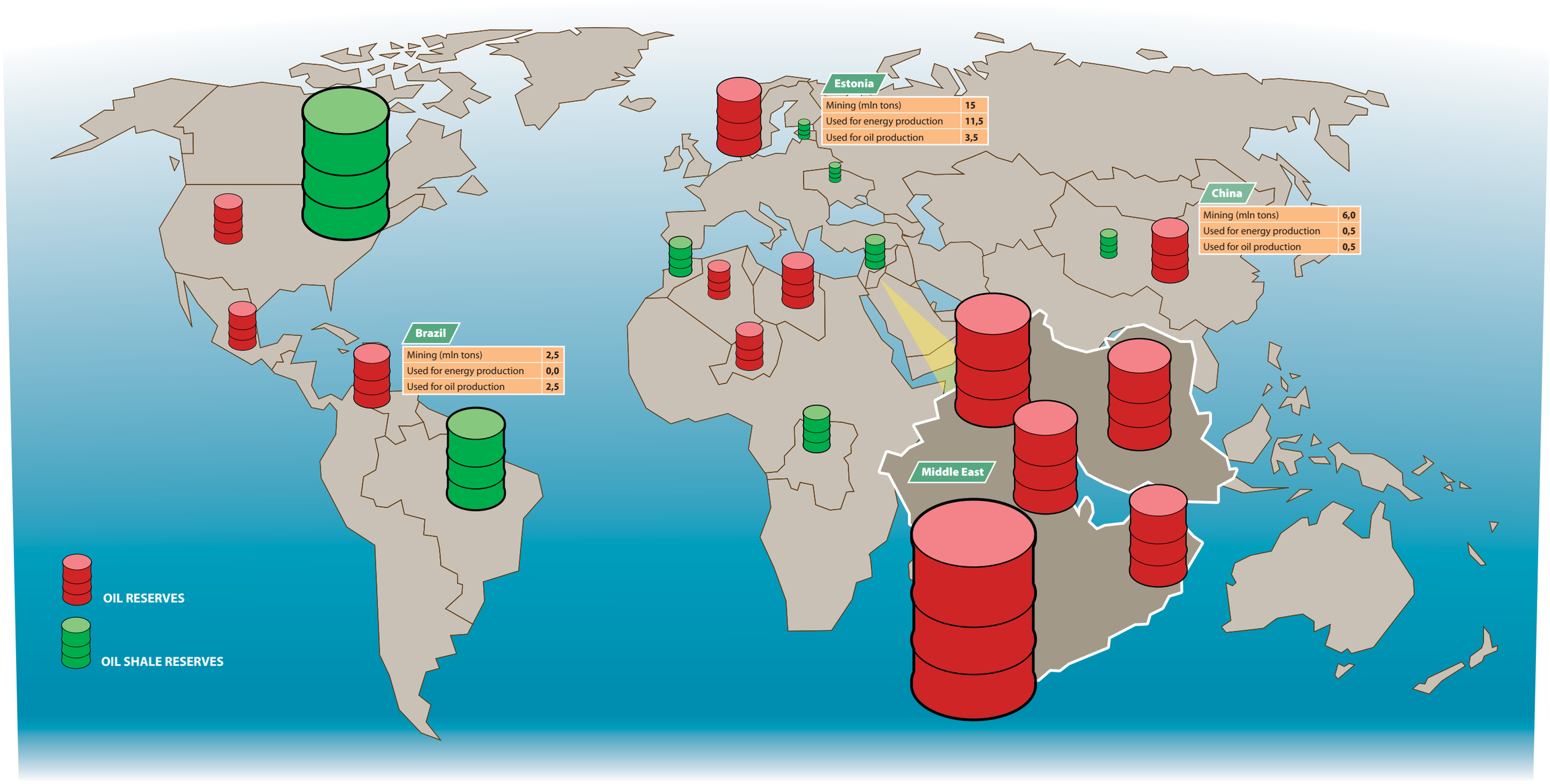
VKG

YEAR BOOK 2008

Oil and oil shale reserves worldwide.

Oil shale is found in many countries around the world, and its reserves are important, its processing, however, takes place in few locations. Estonia is the third country in the world, after Brazil and China, where an industrial processing of oil shale takes place. The main products derived from oil shale are fuels — both shale oil and shale gas.

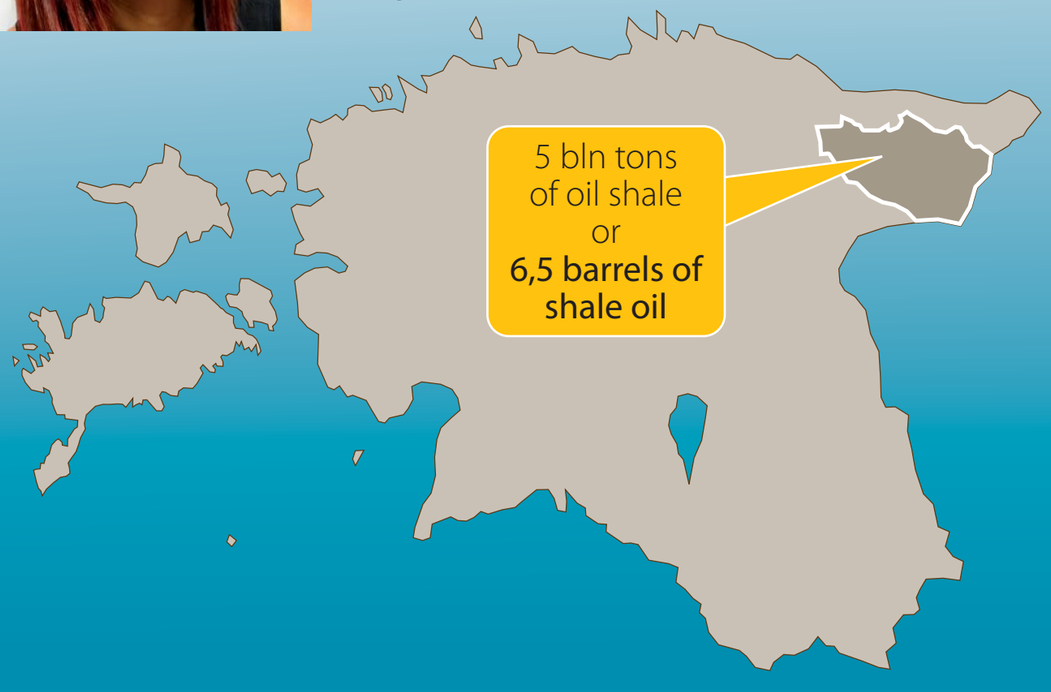


Oil shale in Estonia

There are 5 bln tons of oil shale, or 6,5 barrels of shale oil in Estonia.
Shale oil is not only fuel oil.

APPLICATION FIELDS OF SHALE OIL:

- **marine fuels**
- **fuel oils**
- **alkylresorcinol - based tyres and noise-attenuating mats**
- **2-methyl resorcinol, 99,6 % purity, component of hair colour**



VKG as the biggest Estonian producer of shale oils and chemicals

VKG covers the whole production chain, starting with the mining and processing of oil shale up to the manufacturing and marketing of the most sophisticated chemicals.

VKG

- The biggest Estonian chemical enterprise
- Operates since 1924
- At present employs over 1 300 people
- 2008 net profit is 16,5 Mln EUR
- In 2009 a new plant based on SHC technology will be built
- Production forecast for 2009: appr. 300 000 tons of crude shale oil

ACTIVITY FIELDS OF THE COMPANY:

- Oil shale mining
- Production of shale oils and chemicals
- Production of synthetic resins
- Production and distribution of heat and electricity
- Repair, assembling, transport and water supply services.

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Introduction

Key areas

Segment review

Message of the President of the Board

Yes, the year 2008 was quite turbulent for VKG as well.

Terrifying shocks of oil prices, hard time investment banking is facing, rising unemployment and decreasing consumer demand – all these matters made the world around us less stable.

But, no matter what, VKG could resist the difficulties to this day.

It is true that drastically changing economical situation made the company several times to revise its production costs and to reset its previously established goals. So, by the end of 2008 the decision was made to postpone (until the stabilization of the situation) many previously planned big investments, as the construction of a cement plant and of a new turbogenerator. Company sacrifised the realization of the both important and expensive projects to achieve more important objectives, which are the new oil shale processing factory and its own mine.

The startup of the new factory is planned to take place in autumn, 2009 and the mine should start its operation in 2012. The majority of company's resources are now directed to achievement of these goals, whereby the investments made during the period of a quick development contribute a lot. Of course, an object started at a favourable time would cost a lot to the enterprise in a difficult period, but forthcoming difficulties are to be get over, as new production would let the enterprise to move to a new level. So, irrespectively to what is ongoing in the world economics, we have a good reason to wait for good news in 2009, too.

Changing world, huge amount of choices to be done regardless to the ongoing operation, quickly appearing and disappearing opportunities make their impact on VKG as well, but in a less degree, as the major choices have been already made by the enterprise. When all previously fixed goals will be achieved, the former stable situation of the company would turn into real wealth, and the results of previous work would become apparent.

Priit Rohumaa
Chairman of the Board.




High points of the period

- End 2007 — VKG presented to the wide public its plan to construct in Kohtla-Järve a modern cement plant enabling the utilization of the mineral part of oil shale remaining unused during its procession;
- VKG Oil AS started the construction of its new plant based on the solid heat carrier technology, which is planned to be finalized in the midyear 2009;
- VKG Oil launched the production of pure phenols on an industrial scale;
- VKG obtained an exploring and mining permit for 350 mln tons of oil shale in Ukraine, in Boltyshki deposit, a Ukrainian daughter company has been established;
- VKG Elektriehitus, daughter company of VKG, opened its new production facilities in Kohtla-Järve and Tallinn;
- In May 2008 the sulphur recovering unit of VKG Energia started its operation, its price amounts to appr. 150 mln kroons;
- In August VKG Oil AS put into exploitation its new shale oil refinery unit, which eliminates the most dangerous liquid residues of oil shale industry — fuuses;
- In September Ida-Viru County Administration initiated a detail planning aiming to build a conveyor, based on the application of VKG Kaevandused OÜ;
- In October VKG Kaevandused OÜ bought in Las-Vegas, the USA, the first tunnelling machine for VKG mining;
- In early October VKG Energia OÜ started with construction works to install a new turbine-generator set. During the construction works a new 27 MW steam turbine, an electric power generator and a cooling tower will be erected;
- Since October Mr. Jürgen Hilger, former production and process manager from Dotternhausen, Germany, has been employed by VKG Tsement OÜ, his task is the construction and start-up of VKG cement plant.


Andres Veski, Member of the Board of VKG Energia OÜ, on the opening ceremony of the sulphur recovery unit.


Member of the Board of VKG Tsement OÜ, former Production and Technical Director of the cement plant in Dotterhausen.


Residents of Kohtla-Järve town on the tour, organized by VKG, to a cement plant in Bernburg, Germany.


Construction of a plant based on Solid Heat Carrier technology at VKG Oil AS.

VKG R & D

Strategic Development

The year 2008 put to a strong proof the best skills of economic forecasting in the fields of fuels and chemical industry – almost all profit ratings and analysis made within previous years had to be revised at least twice. The first time the reason was a dramatic increase of oil price in the first half year, and the second time its drastic collapse in the last quarter. As even the most technically interesting and innovative ideas should rest on a strong economical foundation, such abnormally quick fluctuations establish rough new limits for every kind of new business developments.

The first half year lasted in a positive and even euphoric mode – the financial situation enabled to deal with long-term prospects activities, as well as long-time strategic planning. As an example - the analysis of VKG's energetic strategy, conducted by Finnish engineering institution VTT, forecasting and simulating different possible future scenarios for inner and outer heat and power system management at VKG.

In the second half year the situation in the oil market forced to make fast and sometimes not very pleasant modifications in the routine production activity, whereby the most affected were planning of development activity and investing. The crisis of the financial world stopped or postponed or delayed many projects already in progress or well-prepared.

A good thing was that within a favorable period of economical increase VKG engaged extensively to map the possible future scenarios and investigate promising development directions. Based on this knowledge, it would be possible upon the recovery of the financial world and the rise of oil prices to quickly and operatively reposition the development activity of the enterprise and to unfreeze suspended projects according to present circumstances.

Below are listed some examples of the investments and development activities of the VKG in 2008.

Herebelow you can find some examples of the investments and development activities of the VKG enterprises in 2008.

Expansion of shale oils production.

Construction of the new oil plant with the capacity of 0,9 mln tons continued in 2008 according to the schedule - by the end of the year the main part of production buildings and the concrete and steel structures for equipment were installed. Majority of the process equipment for oilshale processing department was procured, delivered to the construction site and partly installed. Oil recovery and distillation unit was 80% completed. Construction and installation works were implemented according to the fixed timetable and budget, and the planned time of plant commissioning is mid-2009. The construction of the oil plant is still the first priority in VKG investments, and neither finalizing time nor budget have been modified following to the situation in the financial world.

In Ukraine feasibility study was started for taking into exploitation of the oil shale deposit Boltyshki according to the VKG mining-lease. A contract was made with the worldwide biggest German company ThysseKrupp, producing open-cast mining equipment, to compose a geologic model of the deposit, to make on this base an assessment of field reserves and to make a principal planning for an oil shale open cast with the capacity of 5 mln tons per year. The primary project of the open cast together with the assessment of the necessary investment and oil shale production cost will be finished in mid of 2009.

A new off-Estonian development destination was started in Serbia with the pre feasibility study of the potential of Aleksinaci oil shale deposit in cooperation with mining engineers of the Belgrad University. Based on the data available, a deposit characteristic has been drawn up, and the most potential field has been located for further more detailed research.

There was no development in 2008 in activities related to Russia, as the situation with oil shale reserves in Slantsy region and the oil shale actual mining is still unclear.

Cement plant

Finding out possibilities for using large amounts of the mineral part of oil shale has been for a long time one of the development priorities at VKG. It was very important to find out a solution enabling to use spent shale and oil shale ash – residual by-products of the oil production process - not in dozens of tons but in hundreds thousands of tons.

In 2006 the Austrian engineering company Austroplan was contracted for defining a process of cement production using oil shale processing residues and by-products as a raw material and oil shale gas and heavy shale oils as a fuels. A description of the process and technology was drawn up, first economical calculations of possible plant efficiency, investment cost and project feasibility were made.

In the beginning of 2007 the VKG shareholders approved a further action plan, and according hereto an advanced market research and economical analysis were effected, and engineering works started to draft documentation for international technology tender. Also, the assessment of environmental impact from the cement plant was made. The chosen plant with capacity of 2500 tons of clinker per day produces over one million tons of cement per year, the investments amount is estimated to be 2,5 billion Estonian Kroons.

In 2008 an international tender for plant technology took place, there were three tender participants, worldwide leading companies – FLSmith from Denmark, Polysius and KHD from Germany. Within the tender process all three participants worked out a reliable process for cement production based on VKG raw materials and made an offer for engineering works, equipment production and plant start-up. At the same time an inside Estonian tender was held to find a contractor for civil engineering and erecting works.

In connection with sudden changes in the financial and construction materials markets VKG decided in the beginning of 2009 to temporarily freeze the most part of activities related to the construction of the cement plant until the economical situation changes. The activities related to authorizations and recourse assurances are still ongoing.

Shale oil refining. Production of high quality diesel fuel.

Unlike in Estonia where most of the oil shale is used for power production, oil shale is considered worldwide mainly as „alternative crude oil" and as potential raw material for liquid fuels – first of all motor fuels. VKG operates currently the best scheme of shale oil upgrading among oil shale processing plants worldwide which enables producing high-quality marine fuels and fuel oils. The upgrading includes oils preparation, chemicals recovery from the process water, distillation and coking.

In the longer term VKG aims to improve the quality class of shale oils, i. e. to start producing of pump-ready EURO V diesel fuel and components of motor fuels instead of fuel oils. In 2008 project was started to define the best refining technology. In cooperation with the Finnish engineering company RINTEKNO technical conditions for the refining process were formulated, as well as requirements to products and configuration of future refinery. The discussions were started with 4 well-known owners of oil refining technology and producers of hydrogen-treating catalyst.

Although the experience of shale oil industrial refining is practically missing in the world, it is possible to use an analogy to traditional crude oil refining processes and, based hereon, to design an appropriate and industrially acceptable process of motor fuel production from Estonian oil shale.

In 2009 VKG applies a state support through the governmental agency Enterprise Estonia to effect an applied research for design refining technology. Goal is to establish shale oil refinery in Estonia by 2015, when the quality requirements to liquid fuels, including marine fuels, would become more rigorous once again.


Jaanus Purga, VKG R&D Director, at his desk.


Jaanus Purga takes part in an oil shale symposium in Colorado.


VKG Directors in a visit at the cement plant in Dotterhausen; first on your right is Mr. Jürgen Hilger, Production and Process Director of the plant, who is now employed by VKG.


Jaanus Purga and Nikolai Petrovich, President of the Board of VKG Oil AS, in Brazil, visiting oil shale industry in Petrobras.


Layer of oil shale from Ojamaa mine belonging to VKG.


Construction of a production unit for pure phenols, VKG Oil AS.


Reception by the Fund for Development of Tallinn Technical University, distribution of VKG Scholarships.


Cement plant in Dotterhausen.

VKG environmental activity

One of the priorities of Viru Keemia Grupp is prevention or minimizing of the environmental impact resulting from production activity. In our everyday activity we follow the requirements of legal acts, consider corresponding opinions of different parties involved, and we are a reliable partner of local municipalities and authorities. We use oil shale resources sparingly, implementing the best facilities available and try to extend the application chain of oil shale in production. We believe our cooperation with research institutions to resolve environmental problems available is very important.
Within last few years a big work was done in relation with environment. Hundred million kroons have been invested and important changes for the better have taken place.
The legislations of the European Union and the Estonian Republic and an increasing production demand present more and more severe requirements to enterprises, and thereby new purposes. The most important environmental areas of focus were in 2008 minimization of emissions into the atmosphere, organization of waste collection and treatment industry, as well as activities related to the treatment of rainfall and waste water.
Viru Keemia Grupp invested in 2008 in actions of environment protection about 200 mln kroons.

2008 projects:

One of the most important finished project is the construction works of sulphur recovery unit in VKG Energia AS. The unit cost amounts to 140 mln kroons and is operation-ready in May, 2008. It is a very important step to minimize sulphur emissions got during energy production. The sulphur recovery unit enables binding of more than 65% of sulphur containing in fuels burnt in Northern Heat Power Plant, and minimizes herewith to a great extent the amount of emissions of sulphur oxide, most important pollutant, into the environment.

VKG Oil AS has finalized its filtration unit of shale oils. The process integration enables to liquidate many sources of air pollutants, to minimize emissions and production losses. The application of the new flow configuration results in finely dispersed solid fuel – filter cake.
Other actions to minimize emissions are investments into the tank park and into the reconstruction of oil shale heavy oil cycle. In 2008 the tank park was constructed, and trap units were installed in the shale oil warehouse and the distillation unit. Owing to this work, the emissions of hydrocarbons, hydrogen sulphides and phenols are considerably minimized.

Viru Vesi AS has finalized the first stage of the reconstruction of tar extraction unit, amounting to 21 mln kroons. New flotation equipment enables a primary purification of process wastewater and guarantees the required wastewater quality in the outlet of the oil separation unit. During the second stage sedimentation tanks will be added to the tank park available, where it will be separated from wastewater the main part of suspended matter (stones, sand) and free oil. Due to these sedimentation tanks it is possible to minimize the amount of sediments in the tanks of the tank park.

In 2007 a new semicoke deposit site, made according to requirements, is ready. On this deposit site semicoke is stored in compliance with the standards set, and the deposit site gravitational water is collected. The deposit site operator is VKG Oil AS, and its yearly exploitation cost amounts to 10 mln kroons. In the year 2009 it is necessary to solve questions related to the storage of ash from the new oil plant and the heat power plant.

Among the research works of 2008 it can be underlined the compiling of "Temporary drying solution for the II stage of the semicoke deposit site" by AS Pöyry Entec AS, the elaboration of "Procedure of common storage of oil shale ash and semicoke" by IPT Projektijuhtimise OÜ and the research "Different possibilities and practice of semicoke and ash storage" effected by Tartu University.

The main directions of the environmental activity for the next year are minimization of pollutants emission into the atmosphere, especially of hydrogen sulphides, questions of semicoke and ash storage and problems related to the closure of the wet disposal site.

Viru Keemia Grupp operates focusing on how to make oil shale processing and all its activity even more environment-friendly.


Meelis Eldermann, VKG Technical Director.

Meelis Eldermann greeting sportsmen on Chemical Worker`s Day.


Meelis Eldermann at his desk.


Notebook.

2008 investments

The volume of the concern`s investments in 2008 was appr. 1,2 bln kroons, and more than half hereof took the construction of a new plant based on Solid Heat Carrier technology.

The main investments applications are development activity (over 900 mln kroons including the oil plant) and projects aiming the environment (appr. 200 mln krooni).

Considering the enterprises of the concern, the main investments were made at VKG Oil AS, concern`s enterprise processing oil shale, where the total amount of investments including the construction of the new shale oil plant approached to 900 mln kroons. The investments at VKG Energia OÜ made appr. 150 mln kroons, at VKG Transport AS – 80 mln, at VKG Kaevandused OÜ – over 40 mln kroons.

The most important projects among those realised in 2008 are:

- the new oil plant at VKG Oil AS, with abt. 600 mln kroons spent in 2008, and considering the corresponding expenses of previous years – amounting to 700 mln kroons; the construction will go on through the first half year 2009. The start-up of the plant is expected to take place in the second half year 2009;
- VKG Oil AS investments into environment were extended in 2008.
  Important projects (totally amounted to over 130 mln kroons) are a new filtration unit for shale oils contributing to nature protection and process optimization; reconstruction of tank storage and loading system of finished production equipped with recovery of harmful vapours;
- in March 2008 VKG Energia OÜ finished the construction of a sulphur recovery unit. The unit price amounted to abt. 130 mln kroons, 53 mln hereof were invested in 2008.
- VKG Energia OÜ acquired a new turbine generator set at the price of 45 mln kroons; its installation started in autumn 2008. This project required appr. 100 mln kroons, including previous years;
- VKG Energia OÜ proceeds with the renovation of the boilers and turbine generators available, which required this year over 20 mln kroons;
- VKG Transport AS acquired this year rail cars to the amount of over 65 mln kroons;
- VKG Transport AS spent appr. 10 mln kroons for cars and semitrailer trucks;
- this year Viru Vesi AS finished the construction of a new oil recovery unit with the price of 24 mln kroons; in 2008 the project required over 15 mln kroons;
- annual investments of VKG Elektrivõrgud OÜ into reconstruction of power transmission lines and electric power substations, as well as into other works required abt. 20 mln kroons in 2008;
- VKG Kaevanduse OÜ acquired in the USA for the future Ojamaa mine its first tunnelling machine at the price of abt. 40 mln kroons.


Anatoli Tchepelevich in the laboratory keeping in hand phenols with high purity level.


Renovated tank storage park at VKG Oil AS.

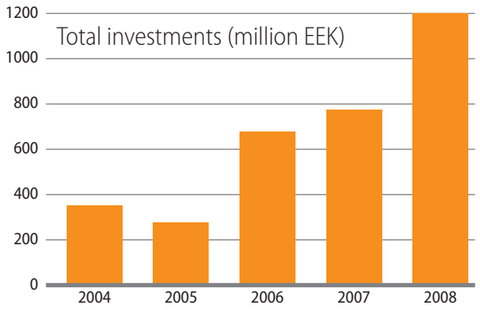

Semi-coke hills.

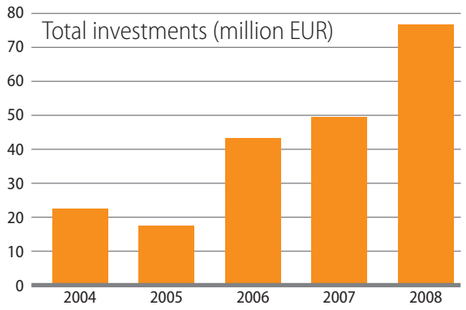

Greenery on semi-coke hills.

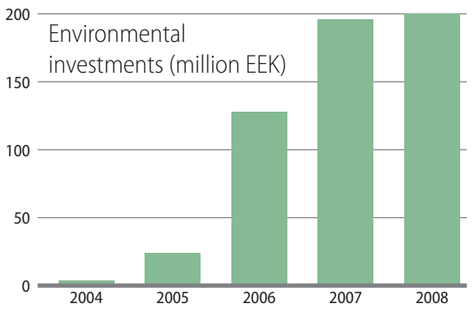
Consolidated statement of profit and loss

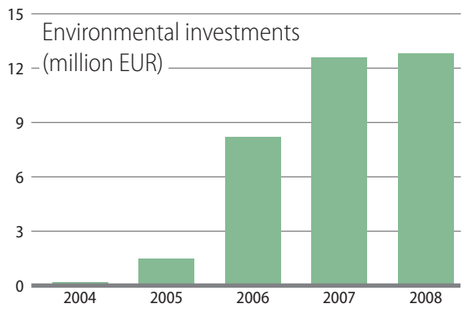
Consolidated income statement

	(thousand EEK)			(million EUR)		
	2006	2007	2008	2006	2007	2008
Sales revenue	1 503 614	1 787 066	2 057 947	96 098	114 214	131 527
Targeted financing	428		1 177	27		
Cost of goods sold	980 644	1 178 282	-1 550 313	62 675	75 306	-99 083
Gross profit	523 398	608 784	508 811	33 451	38 908	32 519
Marketing expenses	34 039	39 384	46 262	2 175	2 517	2 957
Overhead expenses	180 248	176 746	138 264	11 520	11 296	8 837
Other operating income	13 992	14 594	35 670	894	933	2 280
Other operating expenses	18 367	29 700	51 143	1 174	1 898	3 269
Operating profit	304 736	377 548	308 812	19 476	24 130	19 737
Financial income and expenses	-3 409	-81 424	-48 929	-218	-5 204	-3 127
Profit before taxes	301 327	296 124	259 883	19 258	18 926	16 610
Extraordinary expenses						
Income tax	2 300	2 200	2 100	147	141	
Net profit for the financial year	299 027	293 924	257 783	19 111	18 785	16 475









Consolidated balance sheet

Consolidated balance sheet

	(thousand EEK)			(thousand EUR)		
	2006	2007	2008	2006	2007	2008
ASSETS						
Cash at bank and in hand	52 282	68 039	19 322	3 341	4 348	1 235
Derivative instruments						
Shares and other securities		1 550			99	0
			221 339			
Trade receivables	162 512	185 679	170 351	10 386	11 867	10 887
Non-trade receivables	28 485	29 735	29 745	1 821	1 900	1 901
Prepayments	1 848	4 428	3 976	118	283	254
Total inventories	105 461	174 197	210 493	6 740	11 133	13 453
Total current assets	350 588	463 628	655 226	22 407	29 631	41 877
Long-term financial investments	36 442	72 553	71 331	2 329	4 637	4 559
Tangible assets	1 880 422	3 095 781	3 958 808	120 181	197 856	253 014
Intangible assets	500	212 515	210 404	32	13 582	13 447
Goodwill	75 644	39 308	39 308	4 835	2 512	2 512
Total fixed assets	1 993 008	3 420 157	4 279 851	127 376	218 588	273 532
TOTAL ASSETS	2 343 596	3 883 785	4 935 077	149 783	248 219	315 409
LIABILITIES AND EQUITY						
Debt obligations	234 921	224 379	275 350	15 014	14 340	17 598
Prepayments from purchasers	1 928	4 548	1 619	123	291	103
Trade creditors	135 052	133 592	225 845	8 631	8 538	14 434
Tax liabilities	19 990	24 308	33 687	1 278	1 554	2 153
Accrued expenses	26 773	24 419	41 854	1 711	1 561	2 675
Short-term provisions	130	9 497	33 227	8	607	2 124
Other liability			11 828			
Deferred income from targeted financing	1 067	1 205	1 099	68	77	70
Other prepayments	13 806	507	2 787	882	32	178
Total short-term liabilities	433 667	422 455	627 298	27 716	27 000	40 092
Loans bonds and financial lease	478 947	948 892	1 312 114	30 610	60 645	83 859
Deferred income from targeted financing	6 719	7 085	7 144	429	453	457
Other long-term liabilities		20 571	30 606	0	1 315	1 956
Long-term liabilities	485 666	976 548	1 349 863	31 040	62 413	86 272
Total liabilities	919 333	1 399 003	1 977 161	58 756	89 413	126 364
Minority interest		387	1 002		25	64
Share capital	108 073	100 000	100 000	6 907	6 391	6 391
Reserves	681 583	1 010 368	1 543 302	43 561	64 574	98 635
Retained earnings	380 580	1 080 103	1 059 899	24 323	69 031	67 740
Profit for the financial year	299 027	293 924	257 783	19 111	18 785	16 475
Own shares (minus)	-45 000			-2 876		
			-4 070			
Total equity	1 424 263	2 484 782	2 957 916	91 027	158 807	189 045
TOTAL LIABILITIES AND EQUITY	2 343 596	3 883 785	4 935 077	149 783	248 219	315 409

Oil shale mining

Oil shale is found in many countries around the world, and its reserves are important, its processing, however, takes place in few locations. Estonia is one of three countries in the world, together with Brazil and China that effect oil shale processing in industrial scale. The main products derived from oil shale are fuels – both shale oil and shale gas. VKG Company is the biggest oil shale processor in Estonia knowing to appreciate this natural resource and to deliver the products manufactured hereof to customers. VKG covers the whole production chain, starting with the mining and processing of oil shale up to the manufacturing and marketing of the most sophisticated chemicals.

VKG holds a permit to mine 75 million tons of oil shale, which covers the company demand for the next 20 to 25 years. Mining fields are situated in as yet unused territories and in the most favourable locations. The oil shale they contain satisfy ideally the demands of VKG. VKG Kaevandused OÜ is responsible for oil shale mining within the company. The Ojamaa underground mine, established in 2007, is located to the south of VKG industrial territory and holds oil shale deposits estimated at 57 million tons. Ojamaa underground mine is planned to be opened in the beginning of 2012, and it will reach its maximum capacity by the end of 2012 with an annual oil shale output of 2,5 mln tons. At present time, drivage is being effected to open the mine, and preparatory works to create communications are being done. The method used in oil shale mining has proven to be quite effective in Estonia; it is the room-and-pillar method, which prevents cave-ins. It is planned to use in Ojamaa mine the most contemporary mining equipment and operation methods with proven efficiency.

Usnova, the second VKG Kaevandused mining field, is located to the east of VKG industrial territory extending to the Narva River, the border between Estonia and Russia. At the Usnova mining field an open cast mining is used, its deposits are estimated at 17 million tons of oil shale.

In order to continue its oil shale supply after the available mining fields have been exhausted, VKG aims to apply for a permit to mine oil shale in new mining fields near Uus-Kiviõli, Oandu and Seli. The total volume of these oil shale deposits is 437 million tons.

In December 2007, a permit was issued to VKG for exploring and mining ca. 350 million tons of oil shale in the Boltyshki deposit in Ukraine. The Boltyshki site is the only Ukrainian oil shale deposit with a big industrial potential, its total volume of oil shale reserves is estimated to be 3.8 bln tons. Due to many restrictions, the volume of excavated reserves is considerably smaller. The Boltyshki deposit is located 250 km to south from Kiev, in the Kamensk district of Cherkassy Region. Oil shale is here deposited deeper than Estonian one – 40 to 120 meters beneath the surface. The calorific value of the registered oil shale is 2000 to 2500 kcal / kg, what is equal to the same index of Estonian oil shale. The shale oil output is also similar to Estonian one. The goal for near few years is to thoroughly examine the oil shale deposits. To examine the local situation, the Company established in Ukraine its subsidiary, Slantsekhim Ltd, and 4 first people were employed. In prospect, an oil shale processing complex can be established, with processing capacity 5 mln tons of oil shale yearly or even more.

Trilobite petrified in a piece of oil shale.

Oil shale tunneling machine.

Signing of the contract to buy a first Estonian tunnelling machine (Los-Angeles, USA).

Underground drivage works.

Oil shale processing

The oil shale won underground and in open casts is transported by rail to VKG industries situated in Kohtla-Järve, where it goes to shale oil factories of VKG Oil. VKG Oil has 3 oil plants using vertical Kiviter retorts. Altogether VKG Oil uses 49 retorts, where the retort with the lowest capacity can process 40 tons of oil shale daily, and the biggest and the most powerful one – 1000 tons. The vertical Kiviter retorts are characterized by high efficiency and service reliability. In recent years, VKG made large investments in the automation and mechanization of the operation in its plants, which boosted considerably their productivity. In its plants VKG Oil extracts up to 80 % of energy potential of its raw material in form of shale oil and shale gas, and it is a very high rate for production units. From one ton of oil shale it can be extracted appr. 16,5 % of crude shale oil and appr. 500 m3 of shale gas. In 2008, VKG Oil processed 1,7 mln tons of oil shale and produced 220 000 tons of crude shale oil. The crude shale oil is refined from mechanical impurities, tar water containing oil shale phenols is separated, and then shale oil is distilled into different fractions. The final products of oil shale processing are various heating oils for boilers and additives to marine fuels, oil coke used in the electrode industry and shale oil bitumen used in road construction. The shale oil produced by VKG Oil is used in all Baltic Sea ports. Due to its high qualities, this oil is in demand by all the ships navigating in severe conditions of the Arctic Ocean and the Baltic Sea.

Oil coke is produced by coking shale oils distillation residue, and it is used as a quality raw material for manufacturing anode masses and electrodes. Oil coke has low sulphur content, good graphitization, low content of harmful contaminants, such as vanadium, nickel, zinc and natrium. Electrodes made from oil coke have relatively low electrical resistance and low specific loss.

Oil shale unloading.

Winners of the Enterprise Award by EAS.

Renovated loading unit for shale oil.

View to the territory of VKG Oil AS from a window of a new plant under construction.

Oil shale chemistry

Besides energy carriers shale oil and shale gas, VKG Oil also produces oil shale chemicals. The retort water separated when processing the oil shale is directed into dephenoling units, where phenol compounds are extracted from the water. To ensure the widest use of oil shale phenols, total phenols are extracted in the phenol rectification unit. The most valuable part hereof are alkylresorcinols with their high reactivity; they can be widely used as raw material in the synthesis of chemical products. These chemicals are used in various compounds, for example, in car, rubber and construction material industries, in pharmacy and perfumery. In 2007, VKG Oil started extracting 2-metylresorcinol from total oil shale phenols. It is mainly used in production of hair colours. Use of oil shale as raw material for chemical industry makes VKG Oil a unique oil shale processing company in the world.

The oil shale chemistry is the main activity not only for VKG Oil, but also for an another unit within the company – VKG Resins. VKG Resins uses oil shale chemicals to produce adhesives, resins and construction chemicals. The company plants in Kohtla-Järve and Kiviõli produce industrial adhesives for resin-bonded chipboards and veneer in Estonia and neighbour countries. Additional production facilities started in 2007 allow to offer phenolformaldehyde resin to veneer producers in Latvia, Finland, Russian Federation and others. The high quality of products of VKG Resins enabled wood processing companies to expand to the Japanese market, and the quality requirements to products in this market satisfy the highest world standards.

Anatoli Tchepelevich – "father" of the phenols production.

Elements of the production unit for phenols.

Industrial territory of VKG Resins AS.

Reactor of VKG Resins AS.

Oil shale power industry

While shale oil produces energy in heating boilers and engines of VKG customers, shale gas creates values within the company itself. All the shale gas from VKG Oil is used by the energy producer of the company, VKG Energia. VKG Energia owns 2 power stations with installed heat capacity of 700 MW. The power stations of the company can burn both shale gas and oil shale. It lets to cover thermal demands of VKG itself, as well as heat requirements of its neighbouring production plants. The heat power generated covers also needs of residents of Järve city district of Kohtla-Järve. In order to use its production capacities more effectively, VKG Energia acquired 41 % of shares in joint stock company Kohtla-Järve Soojus, heat supplier to the city of Jõhvi and Ahtme city district of Kohtla-Järve. In 2007, the design of heating main was started in order to ensure heating water transport from VKG Energia power stations into the district heating network of the cities Jõhvi and Kohtla-Järve. The electrical capacity of VKG Energia power stations is 47 MW, and it is quite enough both to cover power consumption in VKG and to sell energy to other customers.

VKG Elektrivõrgud, also a part of VKG, owns the distribution network covering the territory between the cities of Narva and Sillamäe. This region with appr. 100 000 residents gets its electricity supplied through the network of VKG Elektrivõrgud, 430 km hereof are high and medium voltage transmission lines, and 380 km are low-voltage transmission lines. Yearly VKG Elektrivõrgud reinvests big amount of money in maintenance and good condition of lines, substations and other units, and it allows to drastically decrease the share of energy losses and to improve the working safety of the power network. Beside old customers the company wins every year new energy consumers, and it increases the operation efficiency of VKG Elektrivõrgud. Together with meeting the demands of private clients and small enterprises, VKG Elektrivõrgud plays an important role in meeting the demands of big production plants located in Narva and Sillamäe.

Andres Veski, Member of the Board of VKG Energia OÜ, on the opening ceremony of the sulphur recovery unit.

Chimneys of VKG Energia OÜ.

Power supply networks belonging to VKG Elektrivõrgud OÜ.

Semi-coke and ash hills.

Infrastructure enterprises

All above mentioned production sectors of the company have been directly connected to production of goods. But the operation of subsidiaries described in this chapter is based on rendering services to other production units within and outside the company. An enterprise with a large experience of rendering repair and assembly services, Viru RMT, was established on the base of the previous repair and assembly unit of the former oil shale processing plant. The company is dealing with maintenance and repair of technological equipment, producing of metal constructions and pieces, rendering assembly services, repair and assembly of all types of communications, as well as maintenance of automation systems in daughter companies within VKG. Since 2003, Viru RMT started rendering services in construction of water and wastewater networks, designing of automation control systems and maintenance and development of their software.

VKG Transport, daughter enterprise within the company, as one of the biggest Estonian transport enterprises, renders both international and domestic motor transport and railway services in the field of logistics. Carriage rolling stock of VKG Transport consists of more than 1300 railroad tanks to transport light and dark oil products and chemicals. The enterprise transports hazardous cargo, effects repair and maintenance of railway tracks, forwarding services, rent of rolling stock and tanks wash.

VKG Elektriehitus joint stock company (until 27.03.2007 Narva Elektriteenused) belongs to VKG since July 2006 and renders complex electrical services (mainly in electrical construction) to network enterprises and owners in Ida-Viru County and across Estonia. The customers of the enterprise are VKG Elektrivõrgud (former Narva Electricity Supply Networks) and VKG Energia. The biggest clients are the Port of Sillamäe, Sillamäe Thermal Power Station, Sillamäe Oil terminal and other companies having own objects in the port territory or in the Sillamäe free economic zone, where Narva Elektriteenused is the general contractor for the construction of external power supply networks. The enterprise acts as well as a subcontractor for electric works on other regional construction sites.

The services of water supply, wastewater cleaning and preliminary cleaning of process water of the enterprises belonging to the company is the responsibility of Viru Vesi joint stock company, subsidiary of VKG. This enterprise is also dealing with supply of ground, lake and circulation water to customers, maintains sewerage systems, communications, water supply networks and wastewater pumping. The major industrial customers of Viru Vesi are Kohtla-Järve Soojus, Nitrofert, Velsicol Eesti, Silbet and daughter companies of VKG.


Company cars belonging to VKG Transport AS.


Assembly works on the territory of VKG effected by Viru RMT OÜ.


Electrical installation at VKG Elektrivõrgud OÜ.


Viru Vesi AS flotation unit.

Tank car of VKG Transport AS.


Administrative Director of VKG Elektriehitus AS being awarded as "The best employer in Narva".

Assembly works at VKG Oil AS.


Flotation unit at Viru Vesi AS.

Sponsor activity

The existence of an organization is dependant on public support. Thus, one of VKG's priorities is to actively participate in different regional activities and support community initiatives. Within the industrial concern we pay particular attention to cooperation with our employees and within the city to different projects relevant to local target groups.

Scholarships granted by VKG

In 2003 VKG started awarding its scholarship to students at Tallinn University of Technology. The scholarship is meant to support successful undergraduate students majoring in Chemical and Environmental Technology at the Faculty of Chemical and Materials Technology of Tallinn University of Technology.

Beginning with the academic year 2005/2006, VKG has also been cooperating with the Virumaa College of Tallinn University of Technology (the college is situated in the city of Kohtla-Järve). Students that are majoring in Production Engineering and Entrepreneurship, Automatic Control Systems and Fuel Technology are entitled to apply for this VKG scholarship. For the years 2005-2008, VKG has allocated a total of EEK 275 000 for these scholarships.

On 21 September 2006, VKG signed the so-called "Protocol of Common Intentions," which establishes the stipulations regarding VKG's participation in the Paul Kogerman Doctoral Scholarship Program.

Supporting the traditions of Kohtla-Järve as an industrial city

In 2008, on the initiative of VKG, Chemists' Day was held for the 8th time in the city. The party in the oil shale city, held on the last Saturday in May, is meant for oil shale industry employees and their families. The festival program contains a concert, different competitions and inter-company activities. Chemists' Day is a major source of entertainment for the entire city and always attracts several thousand spectators.

In cooperation with the city government, VKG has organized a party for industrial veterans, for the 4th consecutive year. According to tradition, the party is held in the community cultural centre of Kohtla-Järve, in the first week of October. The veterans are entertained with a gala concert and a champagne reception. The event usually attracts more than 400 industrial veterans.

VKG also supports sports. The main recipient of sponsorship from VKG is the Estonian Wrestling Federation. VKG has been the main sponsor of the Estonian Wrestling Federation since 2005-2008. A part of the sponsoring help has been allotted to Heiki Nabi, a world champion in Greco-Roman wrestling, to cover his travel expenses to China.

VKG is always open to reasoned sponsorship requests as a part of our social responsibility. Though the corporation's sponsorship and investment priorities (i.e. environmental protection and wrestling) have been clearly defined, we also provide sponsorship for smaller projects.


Honouring of Heiki Nabi, World Champion, in the airport of Tallinn.


Heiki Nabi competing.


Chemical Worker's Day, May 2007.


First-form Pupil's Day, August 2008.


President Arnold Rüütel taking part in Chemical Worker's Day.


Signing a support agreement for a doctorate study grant n. a. P. Kogeman, 2008.


Senior's Day, October 2008.


Handing over of scholarships n. a. VKG at Tallinn Technical University.

Contacts

Viru Keemia Grupp AS
Chairman of the Board Mr. Priit Rohumaa
Reg. nr. 10490531
Järveküla tee, 14
30328, Kohtla-Järve, Estonia
Telephone: + 372 334 2700
Fax: + 372 337 5044
E-mail: info@vkg.ee
www: www.vkg.ee

VKG Oil AS
Member of the Board Mr. Nikolai Petrovitš
Järveküla tee, 14
30328, Kohtla-Järve, Estonia
Telephone: + 372 334 2319
Fax: + 372 334 2717
E-mail: vkgoil@vkg.ee

VKG Resins AS
Member of the Board Mr. Jaanus Purga
Järveküla tee, 14
30328, Kohtla-Järve, Estonia
Telephone: + 372 334 2403
Fax: + 372 334 2500
E-mail: resins@vkg.ee

VKG Transport AS
Member of the Board Mr. Raimond Niinepuu
Järveküla tee, 14
30328, Kohtla-Järve, Estonia
Telephone: + 372 334 2535
Fax: + 372 334 2719
E-mail: transport@vkg.ee

Viru RMT OÜ
Member of the Board Mr. Juri Rõbakov
Järveküla tee, 14
30328, Kohtla-Järve, Estonia
Telephone: + 372 334 2651, + 372 334 2566
Fax: + 372 334 2718
E-mail: rmt@vkg.ee

VKG Energia OÜ
Member of the Board Mr. Andres Veske
Järveküla tee, 14
30328, Kohtla-Järve, Estonia
Telephone: + 372 334 2852
Fax: + 372 332 7620
E-mail: vkgenergia@vkg.ee

VKG Kaevandused OÜ
Member of the Board Mr. Toomas Põld
Järveküla tee, 14
30328, Kohtla-Järve, Estonia
Telephone: + 372 334 2762
Fax: + 372 337 5044
E-mail: vkgkaevandused@vkg.ee

Viru Vesi AS
Juhatuse liige Mr. Marti Viirmäe
Elektriku tee,3
30328, Kohtla-Järve, Estonia
Telephone: + 372 334 2812
Fax: + 372 334 2844
E-mail: vesi@vkg.ee

VKG Elektrivõrgud OÜ
Members of the Board Mr. Ahti Puur and
Mr. Georgi Gering
Kerese tee, 11
20309, Narva, Estonia
Telephone: + 372 71 666 01
Fax: + 372 71 666 00
E-mail: vkgev@vkg.ee

VKG Elektriehitus AS
Member of the Board Märt Viileberg
Kerese tee, 11
20309, Narva, Estonia
Telephone: + 372 716 6622
Fax: + 372 716 6600
E-mail: elektriehitus@vkg.ee