



Nordkalk and Sustainability
Report 2013

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Nordkalk has been publishing environmental reports since 1996. This is the first time the report is called Nordkalk and Sustainability, reflecting our aim to describe our operations from a wider perspective. The main focus of the report remains on our actions to reduce environmental impacts in all our operations.



CONTINUOUS IMPROVEMENT

“We will do better today than we did yesterday, and we will do even better tomorrow.”

Engaging in environmental work, awareness of the environmental impacts of one’s own activities – both positive and negative – and responsible actions, are all basic requisites for accepting the fact that there is always room for improvement. This also applies to Nordkalk. This report will, in short, describe where we are today, our improvement efforts in 2013 as well as our ideas for future improvements.

The social acceptance of our activities must be based on insight, understanding and real facts. It is only through value-based communication that we can ensure that the surrounding society, the decision makers, the licensing and supervisory authorities as well as the public will understand the dependency between modern society and our branch, our products as well as our activities and their environmental consequences.

“Not a day goes by without lime”, as we say.

Certain environmental consequences of our activities are obvious to the eye and visible in the surrounding environment. A quarry

leaves a lasting mark on the nature that surrounds it. Noise, dust and other emissions are easy to perceive. We must, as a company and through consistent and well-documented environmental work, control these effects. We must also control other less visible environmental consequences, ranging from greenhouse effects to possible gradually developing environmental impacts.

When it comes to Nordkalk’s processes and customer needs, the basis for our actions continues to be in our raw material and knowledge that is required to develop even better environmental products for the needs of different industries, agriculture and society. We regard our activities as net environmentally friendly; the environmental benefits achieved with our products outweigh the environmental impact of our activities.

Environmental work is an investment in competitive strength

In a business environment, where environmental issues are strongly emphasised by the authorities and guaranteed by duties,

taxes or other similar overhead charges, it is clear that another incentive lies in ensuring the best possible handling of these issues. Correct and well-executed environmental work is an investment in competitive strength, which will also serve the company commercially. This means that all three dimensions of sustainability thinking benefit: the environment, society and economy.



Continuous improvement is supported by our ISO certified management system, which guarantees good quality in our businesses and operations (ISO 9001), ambitious protection of the environment (ISO 14001), and excellent health & safety work (OHSAS 18001).



Bertel Karlstedt
President and CEO

A BALTIC SEA COMPANY

Nordkalk is Northern Europe's leading supplier of limestone-based products for industry, agriculture and environmental care.

Nordkalk extracts limestone and processes it into crushed and ground limestone, concentrated calcite, and quick and slaked lime. Nordkalk's range of products also includes dolomite and wollastonite. Nordkalk has activities in nine countries and over 30 locations in the Nordic and Baltic Sea region. The company employs about 1,050 people. Nordkalk is a member of the Rettig Group.

Not just lime, but responsibility for a sustainable tomorrow

Nordkalk has developed products and concepts to help its customers reduce the environmental impacts of their processes. One such concept is FOSTOP® for reducing the phosphorus burden on the Baltic Sea. The concept consists of several products and applications, e.g. FOSTOP Structure for agriculture, which prevents phosphorus leaching into watercourses by changing the clayey soil structure and increasing water permeability. One of the goals is also to intensify the recycling of phosphorus as the availability of this nutrient, which is so vital for plants, is decreasing fast as the world's phosphorus reserves diminish. In addition to FOSTOP Structure lime, the concept consists of lime filters and hygienisation of sludge with lime stabilisation.

Nordkalk is committed to preserving the Baltic Sea

In 2012, Nordkalk joined the Baltic Sea Action Group (BSAG) in preserving the Baltic Sea with a five-year-long commitment, the goal being the reduction of the



The Project Born team toasts with pure tap water from Stockholm Water after the successful inauguration ceremony: Lars Wadmark (left) and Anne-Mari Aurola from Nordkalk, Johan Frank and Gunnar Schön from Stockholm Vatten, and Anna Thynell and Henrik Nordholm from Nordkalk.

phosphorus burden on the Baltic Sea. Together with other commitment makers we aim to save our Baltic Sea for future generations.

Concrete actions are the best way to help the Baltic Sea

Nordkalk's FOSTOP concept has been developed in Finland and Sweden. The full-scale testing projects, which started in Sweden, act as a pilot for both the concept and Nordkalk's BSAG commitment. Based on the results from tests, tailor-made applications of the FOSTOP concept will be launched in the other countries surrounding the Baltic Sea. A selection of our FOSTOP

applications is demonstrated in Project Born in Sweden.

An exhibition featuring Project Born was opened near Stockholm in September 2013. The project aims at increasing awareness of and providing information about the benefits of structural liming and lime filter drainage as methods for reducing phosphorus runoff into our seas and inland waters. The project and exhibition is a result of the co-operation between Stockholm Vatten (the Stockholm Water Company) and Nordkalk.

For further information, please visit www.projectborn.se.

PART OF SOCIETY: OUR STAKEHOLDERS



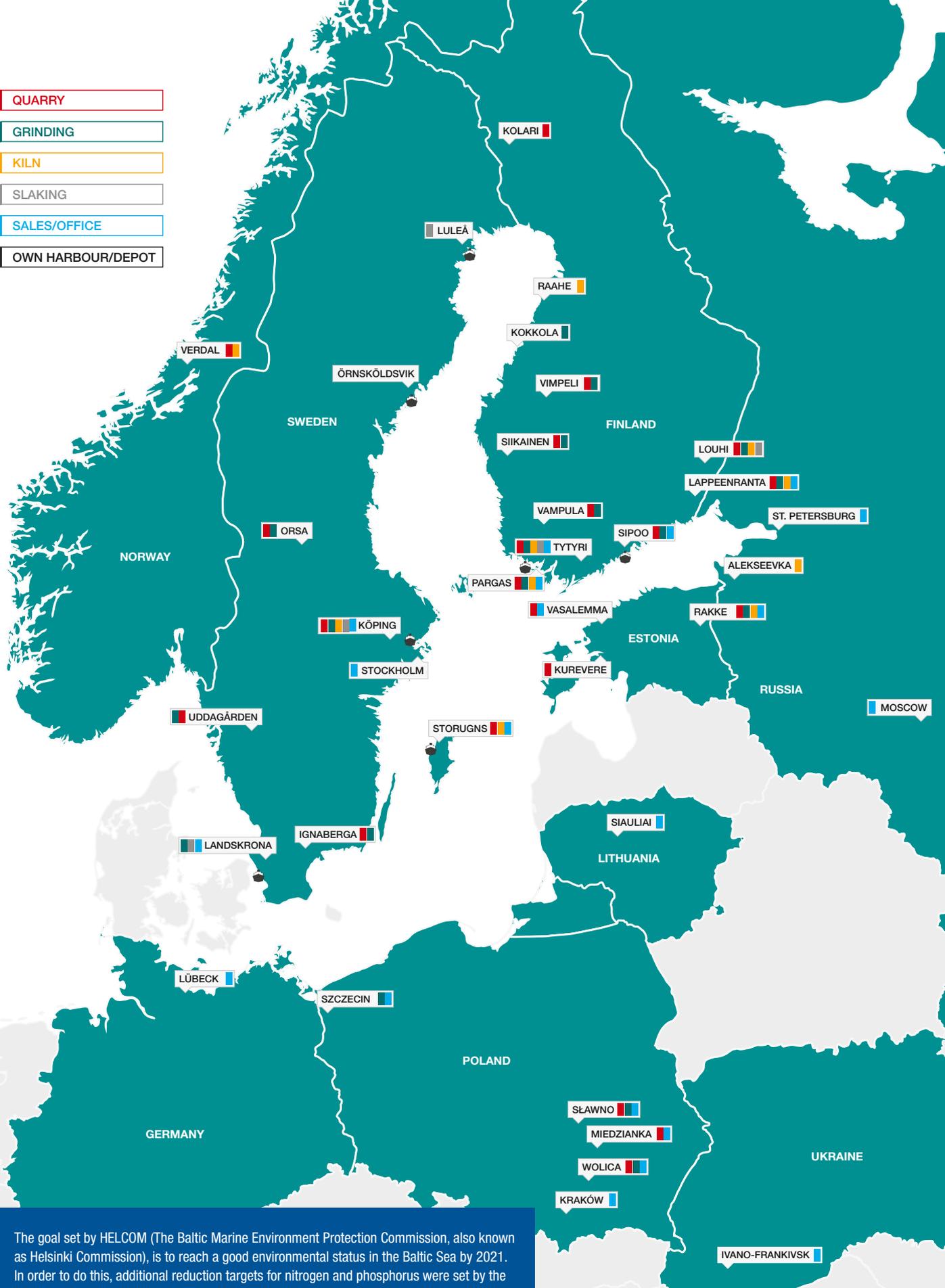
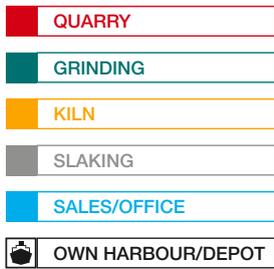
A company is part of the society around it and it plays a role in the lives of many people: a company is made up of the people who work there, and it needs customers in order for it to have a reason to exist. The product delivery chain requires the services of many suppliers – from material providers to transportation to administrative services. The owners and investors make it all possible; no company functions without funds.

The surrounding society consists of immediate neighbours, but in a broad sense of all those who benefit from the products the company makes. In Nordkalk's case this issue impacts the basic prerequisites of life: limestone-based products are needed

to make our food grow, to clean the air we breathe and to keep our waterways healthy. Limestone has a role to play in the manufacture of a variety of products that we all use daily.

Authorities and decision-makers grant us the permits we need to conduct our business, and they verify that we adhere to rules and regulations. This role is also partly held by the media who interprets the company's doings on behalf of society – and voices the concerns of the society. Media can also have an educative role.

We affect many lives in many ways, and do our best to make sure that the effect is as positive as possible.



The goal set by HELCOM (The Baltic Marine Environment Protection Commission, also known as Helsinki Commission), is to reach a good environmental status in the Baltic Sea by 2021. In order to do this, additional reduction targets for nitrogen and phosphorus were set by the HELCOM Ministerial Meeting on 3 October 2013. For example, Finland's target for phosphorus reduction (tonnes/year) changed from 220 in 2007 to 330 in 2013. The same figures for Sweden are 290/530 and 220/320 for Estonia. (No target was set for Poland or Germany). According to the HELCOM Baltic Sea Action Plan, the maximum allowable input of phosphorus into the Baltic Sea is 21.716 tonnes. Structural liming tests in agricultural soil performed in Sweden and Finland, have resulted in more than 50% reduction of phosphorus runoff.

OUR TARGET: ZERO ACCIDENTS

Nordkalk's health and safety target is zero accidents, as specified in our Occupational Health & Safety Guidelines. Nordkalk applies the OHSAS 18001 standard, which requires us to continually improve the health, safety and security of our employees, visitors and other people affected by our operations.

Since zero accidents was set as Nordkalk's target in 2003, the trend has been positive, showing a decreasing number of accidents. In 2013 the number of reported occupational accidents was 35 (including accidents that did not cause absence from work = LTA 0), down from 42 a year earlier. The figures also include the accidents involving employees of Nordkalk's contractors, the subsidiaries KPAB in Sweden and Suomen Karbonaatti Oy on Finland, as well as the joint venture NorFraKalk AS in Norway. The reporting system is continuously developed. "See you safely" – a campaign against eye injuries initiated in 2012 – gave excellent results: in two years the number of eye injuries has dropped from 16 to 3.

2000 days without accidents at three locations

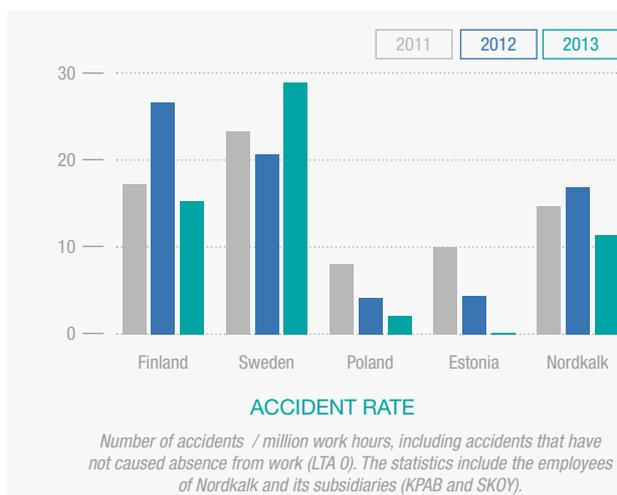
The personnel are encouraged to make safety observations, the number of which has steadily grown. Last year the number of safety observations was 1.7 per employee, which is more than in 2012 but below the target of two observations per employee. The joint venture NorFraKalk exceeded the target clearly with 14 observations per



Mariusz Łaskawski and Michał Stępień by the Wolica plant sign that reminds everyone about H&S every time they come to work.

employee. The safety observations indicate that employees have become proactive in increasing the safety of their own working environment and that the health and safety culture within the company has improved. Part of that culture is zero-tolerance regarding drugs and alcohol at work, which is applied in all Nordkalk countries.

Three production locations reached the milestone of 2000 days without accidents during 2013: Wolica in Poland, Kurevere in Estonia and Kokkola in Finland. The whole Estonian organisation has worked for over a year without accidents.



OUR PEOPLE: REFOCUSSED HUMAN RESOURCES

2013 was a year of changes aiming at a new and simplified operational model and improved capacity utilization. This restructuring activity took place mainly in Finland, where eight production units were combined into four and group functions were streamlined.

Codetermination negotiations concerning the entire personnel were conducted in Finland in the autumn. They resulted in personnel reductions of about 50 during the first half of 2014. A major proportion of the employment terminations will be implemented through retirement arrangements.

Organisations and operations were evaluated and cost revision carried out also in other Nordkalk countries, even though the change process was mostly initiated before 2013. In all, the total number of employees in the Nordkalk Group decreased from 1,083 to 1,071 in 2013 and will continue to decrease in 2014.

In Savonlinna, Finland, the mine and lime kiln at Louhi were reopened after a four-year shutdown, which offered 30 new jobs, including subcontractors. Also in Sipoo, Finland, the mine was reopened. Two lime kilns dating from the 1930s and 1940s will be closed down in Lappeenranta, Finland, in 2014. In Luleå in Sweden the lime kiln's long-term operations agreement ended at the end of 2013 and the staff of 10 was transferred to the new employer.

Safety, quality, productivity and the financial result

In Finland an incentive programme for production personnel was unified. It is based on safety, quality, productivity and the financial result. A work time bank was established to increase flexibility at grinding plants where seasonal variations are large. In the codetermination negotiations the personnel came up with many ideas for continuous improvement, which will lead to significant annual savings.

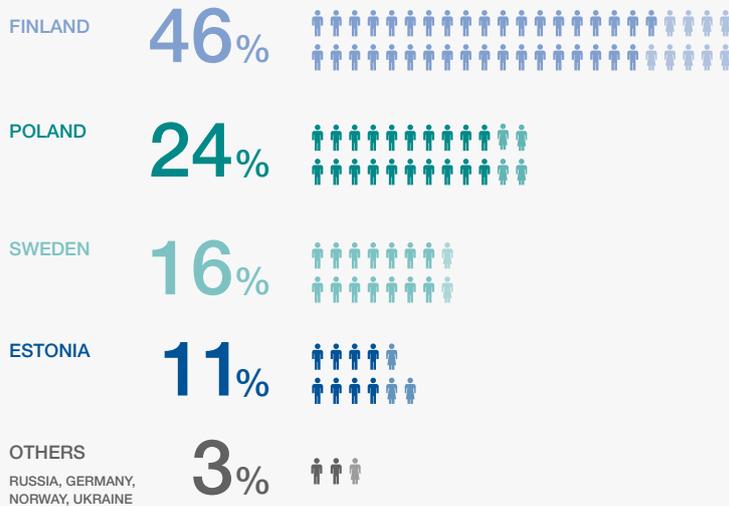
In the spring, Nordkalk conducted a personnel survey with a satisfactory response rate of 73%. In comparison with the results of the previous survey, the personnel's satisfaction had improved in Estonia, Poland and Sweden. Work in the field of health & safety was estimated to be successful and also much valued by the personnel.

Nordkalk's target is to have a yearly development discussion with each employee. During the year, several training and competence development activities were carried out in each country. Evaluation of core competences took place based on the company's strategic targets.

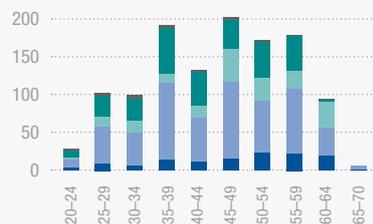


Nordkalk supports the personnel's wellbeing by encouraging physical exercise and cultural activities.

PERSONNEL BY COUNTRY AND GENDER (31 DECEMBER 2013)



PERSONNEL BY AGE



YEARS OF SERVICE



LONG-TERM OWNERS: VALUE FOR GENERATIONS

Nordkalk became a fully-owned Rettig Group company in August 2010, but the two companies' common roots in Finnish industrial history go much deeper.

The Rettig ownership in Nordkalk – then known as Pargas Kalkbergs Aktiebolag – started in 1907 and lasted until 1994, when Rettig Group sold its shares in Partek, to which Nordkalk then belonged. In 2003 Rettig Group acquired a small share in Nordkalk, following which it gradually increased its ownership.

Three business areas

Rettig Group consists of three business areas: Rettig ICC (Indoor Climate Comfort), Nordkalk and the industrial shipping company Bore. Nordkalk and Bore benefit from having the same owner through synergies based on increased co-operation. Since July 2013, Bore handles all of Nordkalk's sea transports, either with its own vessels or through contractors. The two companies also co-operate in developing a sustainable solution to the Sulphur Emission Directive that will affect all sea transports on the Baltic Sea, the English channel and the North Sea from the beginning of 2015. Nordkalk is developing limestone-based flue gas desulphurisation (FGD) solutions to be used in scrubbers on vessels.

An irreplaceable raw material

The Rettig Group's mission – **value for generations** – suits Nordkalk well. The limestone business is characterised by long-term investments and it is capital intensive. The lifecycle of a limestone mine is usually dozens, even hundreds of years, including responsibility for after-care. Extraction of the raw material requires heavy equipment and processes. On the other hand, the value generation is stable, thanks to the fact that limestone has many areas of application and is often an irreplaceable raw material.

Mission, vision and values

Nordkalk's mission and vision have been defined in co-ordination with Rettig Group and the two companies share common values. Rettig Management Policies and Procedures guide our activities, including business ethics, personnel, health & safety and environmental issues. In addition, Nordkalk has its own guidelines and instructions.

NORDKALK VALUES

Openness, Fairness,
Modesty, Trust and respect

NORDKALK'S MISSION

More clean water, food, energy,
and products with less
resources and emissions.

NORDKALK VISION

Northern Europe's leading
supplier of limestone-based
products. Growth in high-value
businesses and new markets.

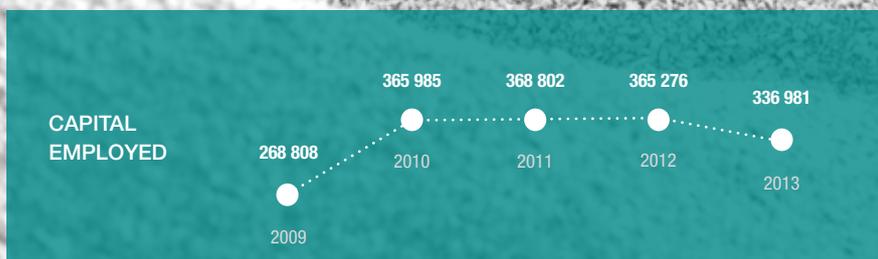
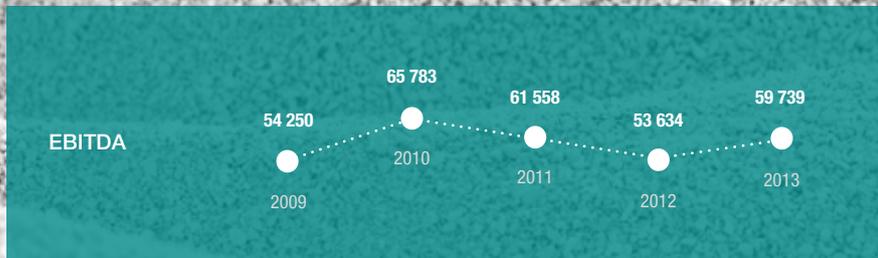
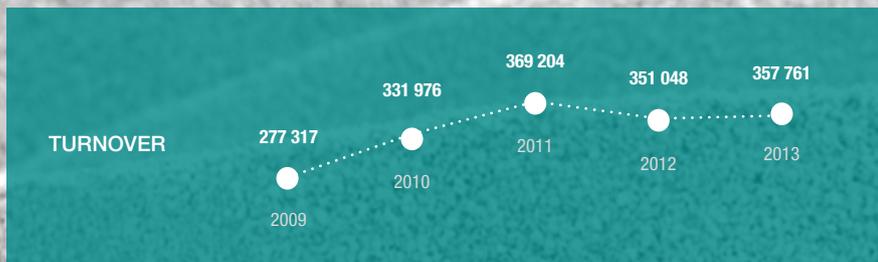


Otto Moberg

Limestone has been quarried for centuries. On Gotland, for example, lime kilns (photo right) were built already in the 17th century. In Pargas Nordkalk has been a source of work and prosperity since 1898, when a local farmer named Otto Moberg started Pargas Kalkbergs Aktiebolag. Many other Nordkalk locations also have a long history: e.g. Uddagården in Sweden dates back to 1882, Tytyri in Finland to 1897 and Rakke in Estonia to 1910.



NORDKALK GROUP EUR, THOUSANDS



2013 – A YEAR OF SLOW GROWTH

The macroeconomic uncertainty continued in 2013, and the market was somewhat unstable. Despite this, Nordkalk's turnover grew by 1.9 per cent to EUR 357.8 million (EUR 351.0 in 2012). EBITDA improved by 11.6 per cent as a result of several internal improvements (see pages 7 and 10), which contributed to improved cost efficiency and profitability. Only profitable and economically sustainable operations ensure that we can meet the expectations that society places on us.

Nordkalk delivers lime qualities needed in pulp cooking processes as well as raw materials for the manufacturing of the paper pigments GCC and PCC. Pulp mills were running at high utilisation levels throughout 2013, and the demand for limestone-based products was good. Nordkalk introduced some new products and was able to expand its overseas deliveries. Demand from the paper industry was more volatile but sales remained on the previous year's level.

Construction constitutes one of the oldest uses for limestone products. Aggregates are widely used in road construction and construction materials, and limestone

powder is the most frequently used construction filler in the world. Demand for limestone-based products in the Construction segment dropped in all countries where Nordkalk operates. The infrastructure building projects decreased, and in Poland sales to road construction projects were affected negatively by reduced EU funding.

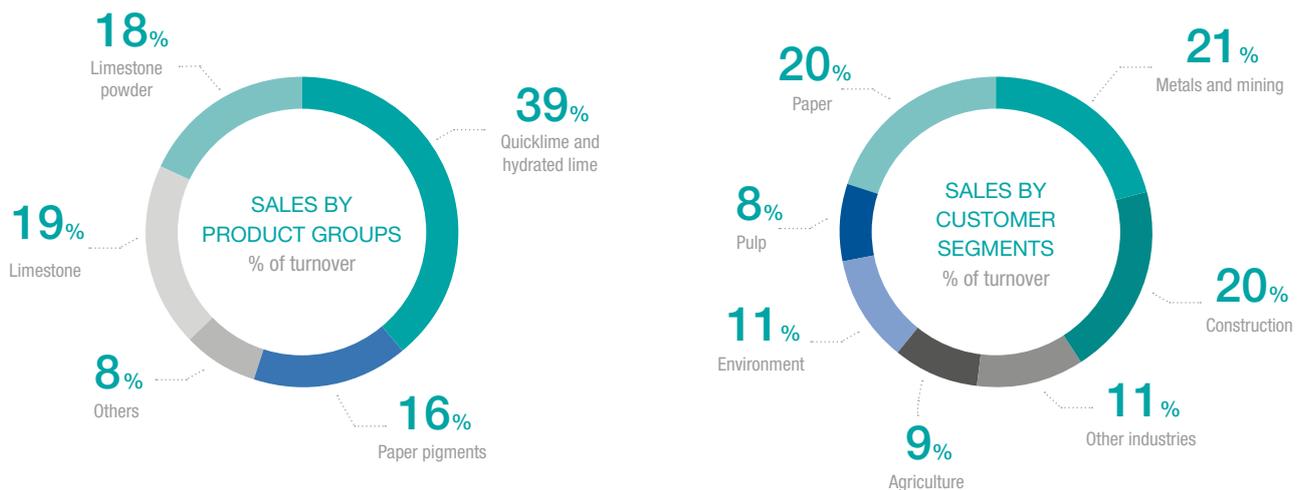
The metal and mining industries use quicklime and slaked lime to regulate the pH values in their processes as well as to neutralise waste water and slurries. In steel manufacture, quicklime helps to remove impurities. Total sales to the Metals & Mining segment were slightly higher than a year ago. The positive sales development is due

to improved capacity utilisation at some steel plants during the second half of 2013. The mining industry continued to have high production volumes and also increased its consumption of limestone-based products.

In the segment Environmental Care Nordkalk's products are typically used for municipal and industrial water purification and neutralisation of flue gases at power plants. In 2013 demand for flue gas desulphurisation (FGD) products was particularly strong as coal-fired power plants were running at a high rate.

In the Agriculture segment Nordkalk's products are used for soil improvement and as fodder lime for animals. Spreading lime on arable land reduces soil acidity (low pH), allowing plants to more readily absorb added fertilisers and nutrients released from the soil, which in turn decreases leakage of nutrients into waterways.

Demand for agricultural lime was especially good in Finland and Poland. Marketing and branding efforts and several new product launches in combination with favourable weather conditions also had a positive effect on demand. In Sweden sales of FOSTOP structure lime were weaker than in 2012, but interest is strong among farmers. In Finland the product was launched in the autumn of 2013.



LISTENING TO CUSTOMERS

Nordkalk works closely together with its customers. Close co-operation helps to provide customers with the right product with minimum environmental effects at the right price. Part of listening to the customer is a biannual customer survey, which plays an important role in the continued improvement of customer relations.

Nordkalk's customer segments and needs were thoroughly analysed in 2013, and many of the implemented changes target improved customer service and delivery accuracy. Process improvements from sales forecast to production planning and customer deliveries were achieved, and in Finland a new way to ensure the performance of the supply chain was established and organised. In Norway the joint venture NorFraKalk was able to improve the performance of its lime kiln.

A local supplier can offer the best logistical solutions

Our customers are increasingly interested in reducing the environmental effects of their operations, an aspect often included in contracts. More and more customers are showing an interest in the carbon footprint information of limestone-derived products. As a local supplier we are near to the customer and are able to offer the best logistical solutions. In international transports we rely on sea logistics in co-operation with Bore, another Rettig Group company.

For example, in the paper industry limestone-based paper pigments GCC (ground calcium carbonate) and PCC (precipitated calcium carbonate) have a competitive edge because they are made of local minerals. Due to the often short transportation distances, the environmental impact is smaller for calcium carbonate products compared to other pigments.

In the same way Nordkalk prefers to use local suppliers, and expects them to minimise the negative impact on the environment, as specified in our Supplier Code of Conduct that was updated in 2013. Our main suppliers are also assessed in terms of health and safety and energy issues. Approximately 80 per cent of Nordkalk's purchases come from the country of operation, and thus Nordkalk is able to successfully monitor its supply chains.

Innovating new business and growing profitably

Nordkalk's strategic key actions concentrate on improved cost efficiency, innovating new business and growing profitably.

The purpose of Nordkalk's Business Development and R&D functions is to develop new applications for limestone-based know-how and products, which in turn provide cost-effective alternatives to customers. Combined with new patented technologies, new solutions have been developed in several customer segments. In 2013, a new product portfolio was introduced to the polymer market. The expansion of pilot production capacity in Pargas in Finland will be completed in early 2014.

Limestone-based products are used increasingly for cleantech applications, i.e. for achieving a reduced burden on the environment. For example, in power plants, the use of different "waste-to-energy"

applications is growing as an energy source, and in this process Nordkalk's products are essential for flue gas cleaning and desulphurisation.

Another example of cleantech applications has to do with energy production based on oil shale in Estonia. The nascent flue gas from the production process is cleaned with quicklime.

In Estonia, agriculture products from Nordkalk's plant in Rakke received "organic" certification for organic liming and sustainable liming. This approval significantly increases opportunities for using limestone powder and provides the farmers with confidence that it is, indeed, an ecological product, hence suitable for organic farming.

In Poland, diversification of the customer base and product portfolio is continuing, e.g. through new applications for agriculture and industry. We are exploring new customer segments in an effort to improve raw material usage and add value. Meanwhile a revival of road construction project activity is expected in 2015 with new EU support in place.

New filler products were introduced to the Baltic and Russian markets. In Finland efforts to sell wall rock started to pay off as deliveries to new infrastructure projects took place. All Nordkalk's products for construction materials now have CE markings.

PRODUCT DEVELOPMENT IN CO-OPERATION

In spring 2012, Nordkalk began co-operation with GVK Coating Technology Oy on a polymer project. The aim of the co-operation was to create added value to their coatings with our new limestone-based filler. We knew from the start that our product would improve abrasion capacity, but the development work on the application showed that it has many other unique qualities as well. We decided to concentrate on the development of consumer paints, as that is where the biggest raw material savings are to be gained. It is possible to significantly reduce the volume of raw materials with a high carbon footprint (binders, titanium dioxide) in GVK's products. This way, both parties will profit economically while the environment will also benefit.

The co-operation is based on strong trust and therefore on the very open sharing of information between the two companies. This has enabled the fast development of products and applications. We have learned to understand the environmental impacts of paint production and been able to demonstrate the positive effects of our product.

In autumn 2013, the two companies entered into a sales contract and the production of our new filler will start in the beginning of 2014. The close co-operation continues not only based on our joint interest to ensure the starting of production, but also the continued development of our own product and new applications. Next, we will be looking for sustainable solutions for e.g. outdoor and industrial paints as well as varnishes.

Juuso Hakala
Development Engineer



Kaisa Kosonen from GVK tests the paint while her colleague Mika Hara and Nordkalk's Juuso Hakala observe.

Bunge is located 8.5 km north-east of the current processing plant in Storugns (in the photo), where the deposit of high-quality limestone is running low. Nordkalk applies for a prolongation of the permit at the current Klinthagen quarry, and has evaluated options for supplying limestone raw material to customers and other Nordkalk processing plants.

For further information on Bunge, please visit www.nordkalk.com.



INCREASED DIALOGUE WITH THE COMMUNITY

In recent years, in both Finland and Sweden, new mining companies have started or plan to start operations. While the employment opportunities are greeted with satisfaction by local communities, concerns about the environmental impact of mining are common. In some cases, this has led to strong anti-mining sentiment.

Nordkalk's plan to open a new limestone quarry in Bunge, in the northern part of Gotland, has caused controversy, and the legal permit process started in 2006 still continues. The quarry permission gained legal force already in 2009 but a process for terms, conditions and the final permit has been ongoing.

On 18 June 2013, the process was further prolonged as the Supreme Court in Sweden sent the case back to the first stage of the legal process, the Land and Environment Court. The Supreme Court demands that a common, comprehensive and final evaluation of the Natura 2000 issues take place according to the Habitats

Directive. Bunge is adjacent to two Natura 2000 areas, and a thorough environmental impact assessment has taken place as well as many other complementing studies on different environmental aspects. In the context of this evaluation, the terms and conditions will be re-examined together with the final permit.

The final outcome of the legal process is expected to be announced by 2016.

Transparency towards society

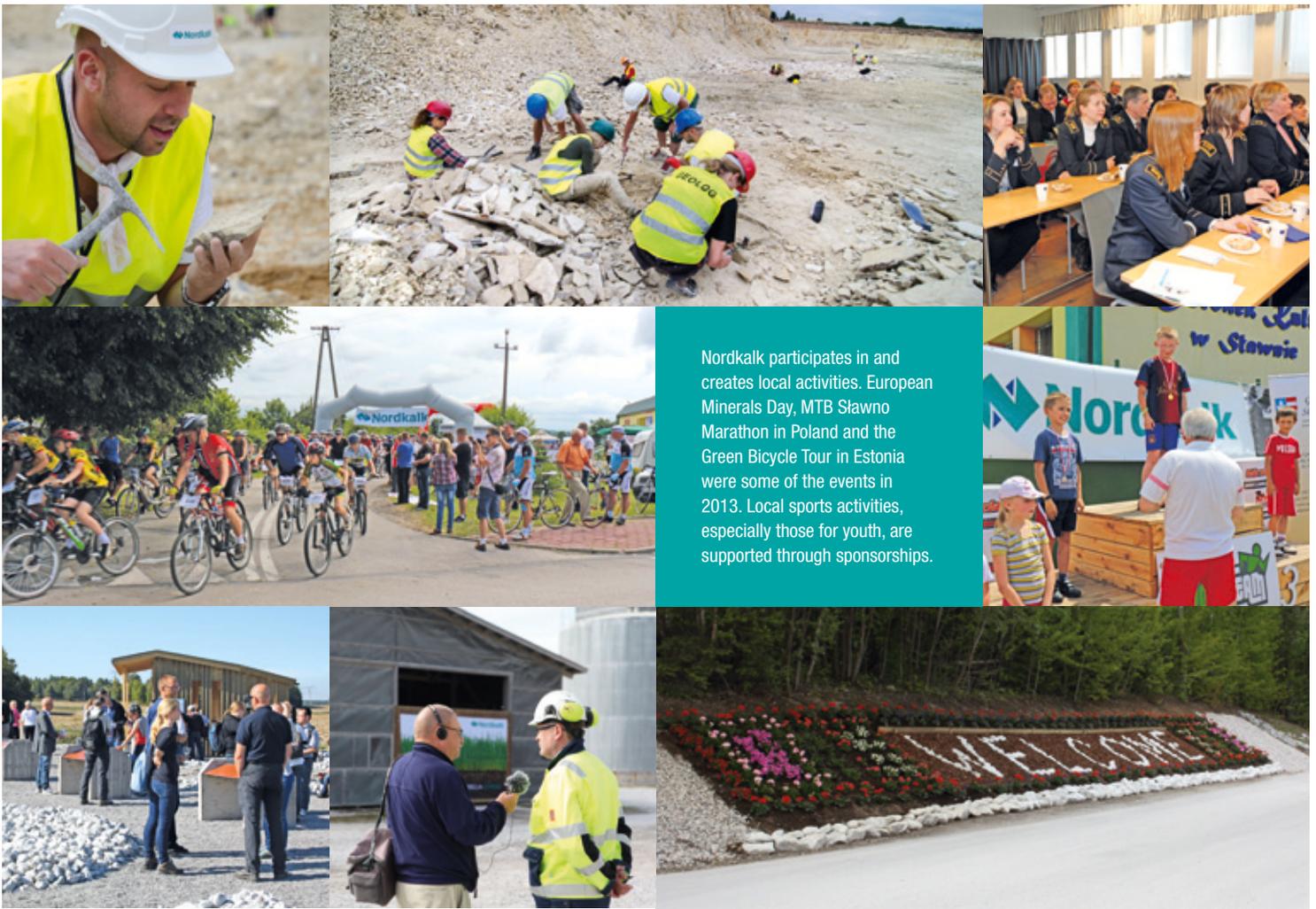
Nordkalk recognises the importance of earning the acceptance and support of society at large and the local communities where we operate. Our ambition is to be as

open and transparent as possible towards society. We strive to have a dialogue with our stakeholders through public events and increased communication.

In 2013, Nordkalk organised various events for the public to describe its plans for the Bunge quarry and to present its operations. The general public was invited to three meetings. Co-operation with local and national organisations and politicians was intensified; a seminar with members of the Swedish parliament took place during the year. Nordkalk's premises on Gotland have been visited by different stakeholders on several occasions. At the end of 2013, a meeting was also successfully organised with local residents and property owners in Buttle on central Gotland, regarding the drilling plans there.

Meeting neighbours in Lappeenranta

Nordkalk has applied for a change in its environmental permit in order to be able to expand the disposal area for wall rock in Lappeenranta in Finland. A related environmental impact assessment (EIA) involved meetings with neighbours. Plans were presented in the public meetings, and ideas for increasing the use of wall rock were discussed. Nordkalk's aim is to utilise all the wall rock, and efforts to materialise this have been intensified. The EIA was completed in February 2014.



Nordkalk participates in and creates local activities. European Minerals Day, MTB Sławno Marathon in Poland and the Green Bicycle Tour in Estonia were some of the events in 2013. Local sports activities, especially those for youth, are supported through sponsorships.

OPENING OUR DOORS TO THE PUBLIC

Mining companies around Europe and elsewhere opened their doors to the public in May 2013 when the fourth European Minerals Day took place in 20 European countries. Nordkalk organised various events in Estonia, Finland and Sweden, which gave the public an opportunity to learn about the versatility of limestone.

The lime quarrying and burning was restarted in the summer at Nordkalk's plant in Louhi in Savonlinna, Finland, after a four-year-long break. In this context neighbours were invited to visit the plant and learn more about the activities at Louhi and the use of limestone.

In Sweden, there is a permanent exhibition at the Blåse limeworks museum on Northern Gotland to provide information about Nordkalk's plans for Bunge and about why Gotland is so important for lime quarrying, in addition to describing the different uses for lime.

Project Born, a forum for information exchange about how to reduce phosphorus run-offs into waters was opened in September in co-operation with Stockholm Vatten near the Lake Bornsjön, the water reservoir of the city of Stockholm.

Co-operation with schools

Nordkalk has a long tradition of co-operation with different educational institutions. As in, for example, Estonia where Nordkalk is often the biggest or one of the biggest employers in a community; therefore, it is natural for the company to be involved with local schools by organising excursions to plants and quarries, competitions, lectures and family days, among other things. The objective is for young people to remain in the community rather than move away.

Nordkalk co-operates with a number of universities and high schools by e.g. offering internships to students and by enabling research work. For example, in summer 2013, research and archaeological excavation work was carried out by the Society of Friends of Earth Sciences PHACOPS on

the premises of Nordkalk's plant in Sławno, Poland, in which university students, PhD students and scholars from all over the world took part. New unique geological discoveries were made during the excavations.

Co-operation with industry organisations

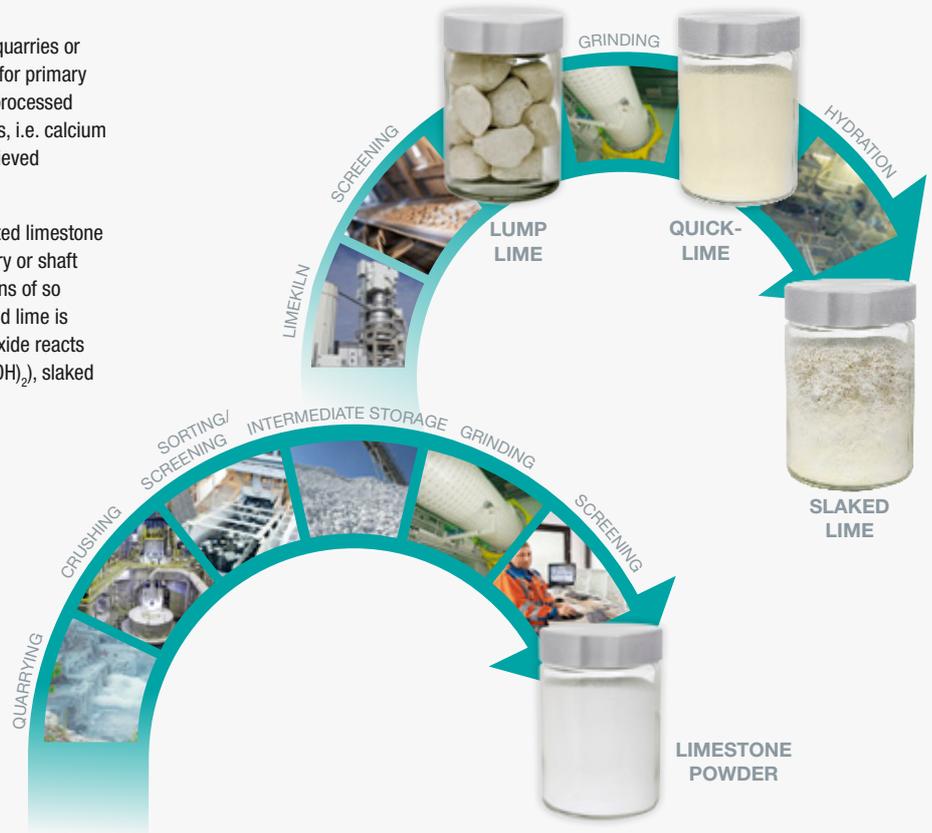
Nordkalk participates in the work of lime and mining industry organisations both on a national and international level. Discussions with authorities and decision-makers mostly take place through these organisations. In Estonia, for example, a significant increase of resource tax was cancelled after industry organisations acted on the matter. In Finland, Nordkalk participated in the project "Mine 2030", which emphasises sustainable mining and its social dimension.

OUR PROCESSES

Limestone is extracted from the bedrock in either quarries or underground mines. The stone is then transported for primary handling and sorting, after which it goes on to be processed further elsewhere. Carbonate or limestone products, i.e. calcium carbonate (CaCO_3), consist of crushed, ground or sieved limestone.

Quicklime is produced by heating crushed and sorted limestone to a temperature of some $1,100\text{ }^\circ\text{C}$ in either a rotary or shaft kiln. Quicklime (CaO) is sieved into different fractions of so called lump lime, or ground to a fine powder. Slaked lime is made by adding water to quicklime. The calcium oxide reacts with the water to produce calcium hydroxide ($\text{Ca}(\text{OH})_2$), slaked lime, which is a dry powder, light in colour.

Nordkalk excavates and processes a natural and non-toxic mineral.



MINIMISING ENVIRONMENTAL IMPACT

Nordkalk is actively working to minimise the impacts of its operations on the surrounding environment as well as on the employees' working environment. The operations cause vibrations, noise and dust and the quarry changes the landscape. If the quarry extends deeper than the groundwater level, it can have an impact on groundwater levels in the surrounding environment. The majority of Nordkalk's quarries are shallow and do not affect the groundwater level.

Nordkalk has set several environmental targets. One of them is a risk assessments for each location, of which Lappeenranta and Tytyri in Finland, Köping in Sweden, Miedzianka in Poland and Rakke in Estonia were covered in 2013. The rest of the units are scheduled for assessment in 2014.

No significant new risks were discovered in the assessments. Use of products containing oil, and potential leaks from machinery as well as fires are risks that could, in a worst-case scenario, lead to contamination of the soil. In addition it was noted that if a filter is broken, it will cause mostly aesthetic inconvenience, which has to be taken into consideration because we operate in densely populated areas. All the risks are taken into account in preventive programmes, which help us to continuously improve our performance.

In Finland, the Ministry of the Environment suggested voluntary risk evaluations, so-called stress tests, to all metal mines and some other significant mines. Among Nordkalk's mines, Lappeenranta and Tytyri were the ones to participate in the tests last summer. They received mostly positive feedback.

Best Available Techniques

Nordkalk applies BAT (Best Available Techniques) as specified in EU's Directive on Industrial Emissions (IED). The BAT conclusions for Reference Document for the Production of Cement, Lime and Magnesium Oxide was published in spring 2013, establishing the limit-values that will be in force within four years. The IED was implemented by most EU member states in January 2013. In Finland implementation in the national legislation is expected

to be finalised in summer 2014. One of Nordkalk's targets for 2014 is a comparison of the BAT conclusions regarding the performance of kilns to ensure that kilns are in compliance with the new legally binding requirements. Any necessary improvements will obviously be implemented.

The new period in ETS, EU's legislation on emissions trading for 2013–2020, began in 2013. The lime industry is granted free emission allowances based mainly on the benchmark principle (0.954 tonne CO_2 per produced tonne of quicklime), because the industry belongs to the category "significant risk of carbon leakage": in case of purchasing all emission allowances for lime production, the competition from countries outside the EU with no cost burden for emissions would interfere with the lime market in the EU.



Thanks to the composition of limestone, the water collecting in the quarries is clean. In Miedzianka, Poland, it is pumped into a clarifying dam, and from there it is released to the local river. In the Pargas quarry in Finland, part of the water is directed into the town's raw water reservoir. Also the Tytyri mine in Lohja, Finland, delivers water to the municipal water utilities.

MANAGING WATER ISSUES

Water issues related to our operations are ensured and covered by thorough planning and implementation, supported by scientific and empirical studies and data.

The extractive industry involves particular water issues. The limestone industry is not an enormous consumer of water but a big quarry handles up to millions of cubic meters of water every year. The guiding principle in each quarry is to carry out mining operations with an absolutely minimal negative impact on both the surface water and groundwater. That principle is well known and used by Nordkalk. The target is that each site has a Water Management Plan by the end of 2014.

Each plan should include a description and specification of all the kinds of water that

the plant impacts. Monitoring obligations are specified in permits. Additional water analyses are proposed in the plan. The adequacy of the plan will be reviewed on a regular basis based on monitored results to ensure that sustainable work involving water handling issues continues.

Diverse water handling at Miedzianka

Miedzianka in Poland is one of Nordkalk's biggest quarries, and it also handles the largest quantity of water among Nordkalk's quarries. Because the quarry is deep – reaching about 80 meters below the groundwater level in parts – some groundwater seeps into the quarry, in addition to rain water that drains into it. There are two wells in the plant area from which water is used to cover the needs of our own workers and production, and which also provide drinking water for the communities of Piekoszów and Ch ciny. A portion of the water is sold, and a portion is supplied free of charge within the area of our mining influence.

In the quarry, excavation requires that drainage water be collected in the settling basin at the bottom. From there the water is pumped up to the surface into the clarifying

dam, from which the clarified water is transferred by gravity to the river Hutka. Miedzianka is obliged to keep an approximately 4-km-long section of the river Hutka clean.

As far as wastewater is concerned, a storm water sewer and an industrial wastewater sewer are located in the plant area. They have intermediate settlers and final purification systems. There is also a treatment plant for domestic sewage, where domestic wastewater from the plant and the residential area Skalka is treated.

Monitoring of water and wastewater is performed on the basis of water permits. The mining waste directive includes additional requirements related to the monitoring of surface and groundwater. Any work that may cause contamination by oil is carried out in a manner that prevents contamination.

Agnieszka Dryjas
Environmental Manager

MORE PRODUCTION WITH LESS ENERGY

Nordkalk is continuously working to improve energy efficiency and to implement new, advanced energy solutions. Energy is a central aspect of Nordkalk's Operating Guidelines, and taken into consideration when making new investments. Nordkalk has defined targets for improvement of energy efficiency in all operations.



Target: to reduce energy consumption by 5% by 2016 compared to 2008.

Markus Fagervik and Esko Niemelä at the Tytyri lime kiln in Lohja, Finland.

Traditionally, coal, oil and natural gas have been used as energy sources for lime burning. Electricity is used for crushing and grinding, fuel oil and liquid petroleum gas for the drying process. However, Nordkalk is constantly exploring new alternative fuels for production processes. Utilising recycled fuels, or waste-to-energy opportunities, reduces the use of non-renewable resources, and the use of biofuels helps to reduce carbon dioxide emissions from fossil fuels used in production processes.

In Finland, a three-year long development project for implementing solid biofuels in lime burning ended. During the project, four full scale trials with different fuels were carried out at the Pargas lime plant.

New energy solution for Rakke

At Nordkalk's production plant in Rakke, Estonia, preparations are under way in order to replace natural gas with energy gas produced at two facilities, which Cortus Energy is going to build. A Memorandum of Understanding has been signed, covering terms for the supply of energy gas for a minimum of 10 years. Gas supply from the

first plant is expected to start in early 2015 and full scale delivery is expected to begin in 2016.

Cortus and Nordkalk also collaborate in Köping, Sweden, where Cortus has built a 0.5 MW test facility. Even though the focus for full-scale implementation has moved to Rakke, the test plant remains in Köping for further development and testing.

The Rakke plant was modernised in 2012 and 2013 was the first full operating year with new energy efficient technology. The plant's energy consumption per lime tonne produced has decreased by more than 20%, and it is now an efficient production plant with a minimised environmental impact.

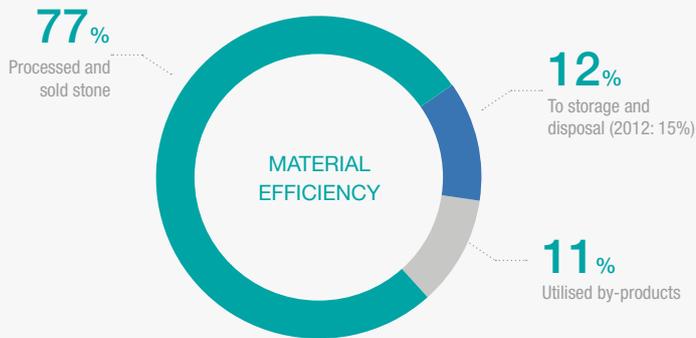
Helping to keep the town warm

Nordkalk's processes generate waste heat, which is being utilised more and more. In Lappeenranta, Pargas and Tytyri in Lohja, Finland, waste heat from the lime kilns has been utilised in the communities' district heating networks for many years. At the end of 2013, the plant in Köping initiated

deliveries of recovered waste heat from the lime burning process to the district heating network.

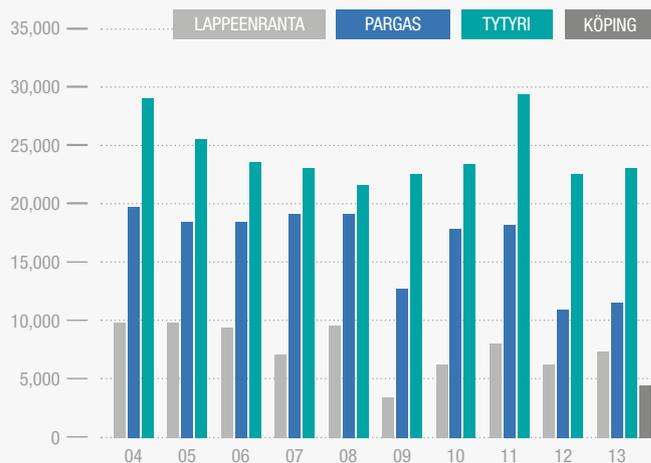
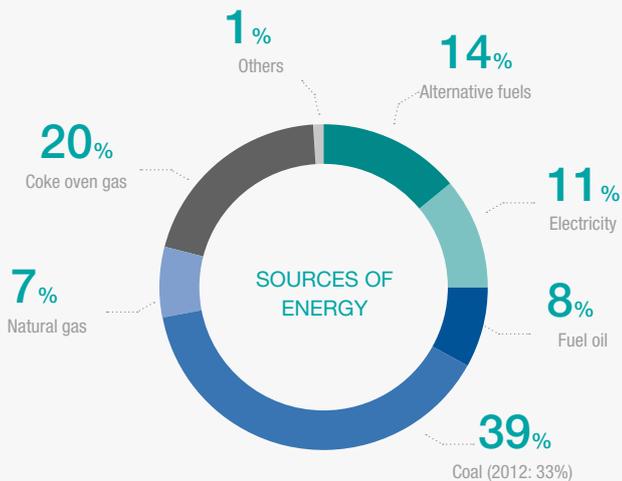
The capacity of the equipment in Köping is 14 MW. The new equipment has a significant positive effect on the environment: it utilises heat that would otherwise be wasted. General district heating decreases emissions compared to each household creating its own heat using fossil fuels.

In Finland, Nordkalk participated in a two-year project concerning the utilisation of industrial waste heat. The project, coordinated by the government energy agency Motiva Ltd, found out that more efficient use of waste heat could reduce the Finnish industries' energy costs by as much as EUR 200 million. However, the use of waste heat in district heating requires significant investments in delivery equipment, and the storing of the heat is problematic. Nordkalk continues to develop solutions that improve the utilisation of waste heat from its production processes.



Nordkalk seeks to use its raw material as efficiently as possible, including commercialising by-products. These include wall rock that is extracted in addition to the proper useful stone, sand produced in the flotation process, filter dust, which builds up in all lime kilns and at grinding plants, and fines produced in lime burning.

Nordkalk's intensified efforts to utilise wall rock started to pay off for example in the Lappeenranta quarry in Finland, where the material efficiency rate increased from 71.9% to 88.5% during 2013. Wall rock is mainly used for infrastructure construction. The use of wall rock should be promoted by ensuring that existing stone material is used before extracting from quarries in untouched areas.

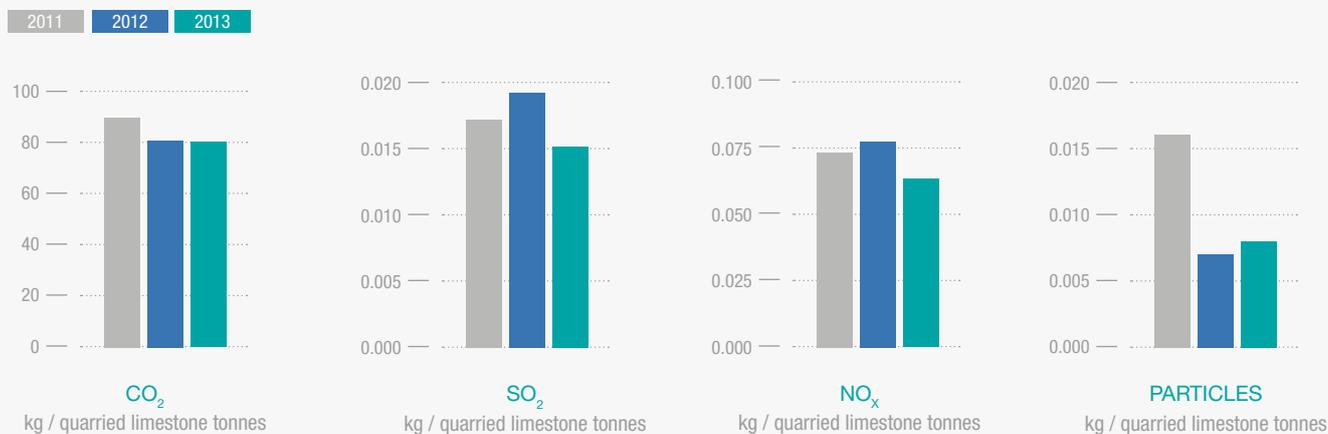


WASTE HEAT OF LIME KILNS USED IN DISTRICT HEATING NETWORKS (MWh)

Use of coal increased in 2013, mostly because production concentrated in plants running on coal. Correspondingly the use of other energy sources decreased. Use of natural gas decreased, mostly due to closure of a site and reduced production at another site using gas. Because of technical reasons it was not possible to use alternative fuels at the sites where most of production took place last year.

Waste heat from lime kilns is used for district heating in Lappeenranta, Lohja and Pargas in Finland, and from December 2013 also in Köping in Sweden. In 2013, the volume of delivered waste heat increased slightly, and was equivalent to the amount required to heat and provide warm water to more than 2,200 single-family houses.

EMISSIONS IN AIR IN NORDKALK GROUP



Nordkalk's production processes form particles or dust, and flue gases from the process contain oxides of nitrogen (NO_x), carbon dioxide (CO₂) and varying amounts of sulphur dioxide (SO₂). The figures are based on measurements and calculations for Nordkalk's plants throughout the Group.

In 2013 some of Nordkalk's plants had filter problems, which resulted in increased particle emissions.



The after-care of areas that are no longer in use in the Karinu quarry in Estonia is taking place simultaneously with extraction in other parts of the quarry. Some of the steepest sides have been evened out and stone heaps removed. Bird-rich areas are created as water is allowed to collect at the bottom of the quarry. A few years following the after-care programme it might even be difficult to tell that there ever was a quarry in Karinu – or what do you think?

AFTER-CARE OFFERS MANY POSSIBILITIES

Important raw materials are extracted in mines over the course of several decades. Once the active mining process has ended, it is time for after-care, giving the area new value – for the community as well as for the environment.

In the parts of Nordkalk's underground mine in Tytyri, Finland, where mining operations have ceased there is a museum and a festival hall. In the past two years a pop-down restaurant has attracted people to dine underground. One of the old mine shafts in Tytyri serves as a test laboratory for high-rise elevators, and some empty stopes are used for final storage of power plant ash. At Storugns on Gotland a motorsports track has been built in an abandoned part of the quarry, and close by, land has been assigned to a wind power plant. Concerts, such as the yearly jazz festival in Sipoo, Finland, have been held in mining and plant areas. The spectacular landscape of the operating quarry in Pargas has been eternalised in pictures and advertisement films, as well as in movies. It is possible to use the lime-rich soil, for example, for truffle cultivation as has been done on Gotland.

Environmental neo-landscapes

Limestone-rich mining areas provide an excellent environment for plants thriving

in lime-rich soil, where several rare plants and living organisms can be found. The old and abandoned mined areas are valuable as new environments, or neo-landscapes, favouring unique biodiversity.

The Environmental Centre of Finland has, over the course of several years, carried out research on moss and lava at most of the Nordkalk's quarries in Finland. The survey revealed several rare and, to some extent, endangered species. Esivere in Estonia is another example of the fact that plants thrive in the lime-rich soil of quarries. In order to save the orchids growing in Esivere, Nordkalk has protected some areas in the vicinity of the mine. Nordkalk's aim is to collect the biodiversity information from locations and utilise the information in our plans to support and re-establish the natural occurrence of endangered species in our post-mining areas.

In Vimpeli in Finland rare flowers, four plant formations of field gentians, were replanted in 2012 in co-operation with the environ-

mental authorities. The areas were carefully prepared to correspond to natural conditions. All four populations have survived, and three of them are thriving, which is very encouraging. Equivalent replanting projects will be carried out in the future.

Aiming for new neo-landscapes as quarrying proceeds

Nordkalk's Mine Closure Guidelines define how to carry out after-care. For each mine, a plan is drawn up and it pays regard to the characteristics of the mine and the environment, where the quarry is enhanced to positively contribute to the surrounding landscape. The aim of these plans is also to better take the needs of the community into consideration in the future. Many aspects should be taken into account, for example the use of land and water, and perhaps preparing the area to serve as a recreational or even nature conservation area. What is common to all the varying uses is the preparation of an area so that it favours the growth of natural biodiversity.

ENVIRONMENTAL TARGETS AND IMPROVEMENTS IN 2013

Nordkalk has set several targets for continuously improving its environmental work. This is done within the framework of the environmental management system maintained in co-operation with line organisations. The practical work to decrease the environmental impacts is carried out at the production plants, which have their own targets and follow-up.

The table shows the essential targets for the environmental work and some examples of their implementation.

TARGET	MEASURES
<p>Increase the utilisation level of quarried stone to 95% by 2016 and develop new fields of application for by-products.</p>	<p>Material efficiency (= utilisation percentage of all quarried material) within Nordkalk Group was 87.9% in 2013. It improved in general, and many locations have reached 100% efficiency.</p> <p>In Finland, due to the geology, we are forced to quarry more wall rock, especially in Lappeenranta and Pargas. The utilisation of wall rock advanced quite well in Lappeenranta, where the material efficiency rate was 88.5%. In Pargas the rate was 71.5%. The third biggest producer of by-products were the flotation plants, and 18% of the flotation sand was utilised. For all other quarries in Finland, the figure was 93.4%.</p> <p>At the calcite flotation plant in Lappeenranta, the process was enhanced, resulting in improved yield.</p> <p>In an experimental testing at the Rakke plant in Estonia, by-product from the kiln was processed (crushed and mixed) and used as agricultural fertilizer.</p>
<p>Reduce energy consumption by 5% by 2016 compared to 2008.</p> <p>Reduce the use of fossil fuels in lime production.</p>	<p>In general, process improvements took place at many locations to enhance energy efficiency. In Finland also buildings' energy usage was reduced by for example installing new doors.</p> <p>A new cross (recuperative device) was installed in the lime kiln at Louhi in Finland, leading to energy saving of approx. 5%. Also at the Pargas lime kiln the cross was renewed.</p> <p>At the slaking plant in Tytyri, Finland, the automation was renewed.</p> <p>In Vasalemma quarry in Estonia, a channel was excavated so that water now flows mostly by gravity, which saves up to 20% energy.</p> <p>In Köping, Sweden, an investment was made in delivering recovered waste heat from the lime kiln into the district heating network.</p>
<p>Reduce dust, noise and vibrations caused by production.</p>	<p>In general, cleanliness is emphasized at the sites, which reduces dusting.</p> <p>Filters and/or parts of them were replaced and improved at several locations. In Vimpeli, Finland, a new filter was installed in a production line, leading to reduced particle emissions. A remarkable reduction took place also in Raahe, Finland, where flue gas ducts of the lime kilns and filter channels were renovated and improved.</p> <p>In Rakke a screen was installed to help keep the raw material cleaner. The screen made it possible to change the FiRak plant's flue gas filters, which improved the reduction of dust emissions many times over.</p> <p>In Landskrona and Luleå in Sweden, as well as in Tytyri in Finland, parts of loading equipment were renewed to reduce dusting.</p> <p>In Köping, Sweden, an investment in the control steering system of the plant was carried out, which improved environmental and quality control. Also an investment in an additional power supply was made, in order to secure the operation of the electrical filter in case of an interruption of electricity supply.</p> <p>Several investments in noise reduction were made in Storugns, Sweden, at the production site and in the harbour. In Miedzianka, Poland, a two-year-long project to reduce noise was started.</p>
<p>All Nordkalk's quarries have an after-care plan. Closed quarries are given new fields of application, allowing them to serve society also in the future.</p>	<p>After-care often takes place simultaneously with extraction in other parts of the quarry. For example, in Miedzianka trees were planted in a 9 hectare area, including 5000 pines, 3000 spruces and 1000 birches. The planted area comprises the southern scarp of the excavation area and part of the southern disposal area.</p>



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