Nordkalk

Nordkalk & Sustainability 2016

Not just lime, but responsibility for a sustainable tomorrow.

Contents


Photo by @taulertola

Nordkalk's lifeline
This beautiful 53-year-old cable bridge is vital for Nordkalk and for everybody living and working in the Finnish town of Pargas and in the archipelago surrounding it. This bridge and several others connect the company to the mainland and to the world. Annually, about 340,000 tonnes of Nordkalk's products are transported to customers over this bridge. The bridge is approaching the end of its lifespan and will need to be replaced in the next few years.

Sustainability

Our values

- OPENNESS
- FAIRNESS
- MODESTY
- TRUST AND RESPECT

Profitable business in a responsible manner.

Nordkalk aims at long-term profitable business in a responsible manner. We are committed to a high standard of business ethics and integrity, as described in the Nordkalk Code of Conduct that applies to all employees.

Nordkalk complies with the laws of the applicable legal system including legal requirements and local rules. In addition, internal Rettig policies and Nordkalk guidelines specify how we operate in daily business. We refrain from any dealings with our competitors or other actors that could be harmful to our customer's interests. Training in competition compliance is offered on a regular basis in order to guarantee the personnel's knowledge and awareness of competition regulations.

We treat people with respect, and give them equal opportunities.

Nordkalk supports the United Nations' Universal Declaration of Human Rights and treats people with respect. We give them all equal opportunities for personal growth and professional development, regardless of their gender, age, race, ethnicity, disabilities, nationality, sexual orientation, religious beliefs, political affiliations, marital or economic status, or position within the company.

Nordkalk complies with recognised international labour standards as defined by ILO and the UN Global Compact covering human rights, labour, the environment and anticorruption. We do not under any circumstances accept child or forced labour at any of our operations or activities. We do not tolerate corruption or bribery.

We strive to outperform the demands set by legislation.

Nordkalk complies with environmental legislation and strives to outperform the demands set by the legislation. We endeavour to limit the negative impacts on the environment derived from our activities by means of continuous improvement, and by using the best available methods and techniques.

Nordkalk's success depends on the success of our customers. Understanding their businesses and needs leads to continuous improvement of our own as well as the customers' performance.

We aim at co-operation and good communication in the local communities where we act.

Nordkalk's limestone-based products contribute to the basic prerequisites of life: clean water and air and fruitful soil. We provide several industries with raw materials, without which our modern society would not exist.

Environmental Sustainability

The many aspects of limestone

Limestone can only be extracted in areas where limestone deposits exist. Before mining can start, geological studies establish the suitability of the deposit, followed by a thorough permit process to ensure control of environmental impacts. The mining stage can continue for decades, but after-care is taken into account from the beginning. Once mining has ended, either fully or in parts of the mine, after-care opens up new opportunities.

Pure and natural

Limestone is a pure and natural substance. It consists almost solely of calcium carbonate and can be used crushed or ground, or it can be refined into calcium oxide (quicklime) or calcium hydroxide (slaked lime).

Part of everyday life

Limestone is a versatile and mainly irreplaceable raw material that plays a role in the production of many essential products that are necessary for maintaining our current standard of living. Every day we use products that could not have been made without limestone-based products. In environmental applications, they are needed to provide society with the basic prerequisites for life – clean air, pure water and fertile soil.

Lime leads to high biodiversity

Mining areas provide an excellent environment for plants thriving in lime-rich soil, where several rare plants, such as orchids, can be found. While extraction is going on, rare species can be moved and replanted in new areas that correspond to natural conditions near the quarry, and later on re-established in the post-mining areas. Former mine areas can serve as new environments, or neo-landscapes, favouring unique biodiversity. For example, truffle cultivation has been tested in Pargas and on Gotland.

Culture as a side product

Some quarries offer such dramatic scenery as to make them popular touristic attractions. The Pargas quarry has also served as a unique concert venue for the Rowlit festival. Another concert venue is the Sipoo plant area, where an annual jazz concert is organised. Nordkalk's areas are used for photo sessions, TV programmes and even movies. The most famous of these is probably the show Amazing Race, which visited the underground Tytyri mine. Picture is from Lappeenranta, where a very popular police series Sorjonen was filmed for the Finnish TV in summer 2016.

Nordkalk participates in research projects

Nordkalk participates in research projects that studies the possibilities to improve the status of the environment. An example of this is a program to promote the nutrient recycling and improve the status of the Archipelago Sea (Raki2 2016-2019). The program granted the Aalto University financing to develop ways to gather nitrogen and phosphorus from liquid waste. Nordkalk is participating in the study.

Second life of a mine

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.

In Nordkalk's underground mine in Tytyri, Finland, in the parts where mining operations have ceased, there is The Tytyri Experience, with a museum, an exhibition area and a festival hall. Some of the empty mine shafts in Tytyri are used for the final storage of power plant ash, and the former mine also features a test laboratory for high-rise elevators.

Positive net balance

Limestone-based products are needed to keep the world going, and we at Nordkalk believe that the benefits of limestone clearly outweigh the negative impacts of operations. We have defined major environmental aspects and targets for proactive and protective measures. Read more about our environmental work:

- *Reducing environmental impacts*
- *Securing access to raw material*
- *Efficient use of natural resources*
- *Improving energy efficiency*
- *Planned water management*
- *Many possibilities in restoration*

Reducing dust, noise, vibration

Our operations are regulated by legislation and the limit values defined by authorities in permits, and by the company's own environmental objectives. They are part of Nordkalk's continuous improvement process in accordance with the ISO 14001 environmental management system. The surrounding environment and the employees' working environment are always taken into consideration in production planning.

Continuous improvements

Nordkalk has mines and production at 27 locations. Limestone is extracted and processed into crushed and ground limestone, calcium oxide (quicklime) and calcium hydroxide (slaked lime), as well as special products.

The operations can cause dust, noise and vibration. Nordkalk minimises these e.g. by using best available technologies (BAT) in investments and repairs.

Dust emissions can be controlled effectively. The air emitted by the grinding plants and lime kilns is purified using filters, which are also used at loading areas. Enclosed conveyor solutions prevent dust dispersion. Production areas and roads are asphalted in order to make cleaning as efficient as possible. Roads and stored stone material are watered during dry periods.

Sound insulation is improved by constructing noise barriers, planting trees and using various noise-damping materials at crushing plants, conveyor belts and loading places. In locations near residential areas, there are restrictions on night-time operations to avoid disturbances to the local residents.

Residential areas are taken into account when planning and carrying out blasting.

Vibration caused by blasting is measured; at Tytyri in Lohja, Finland, e.g. continuous measuring is carried out at three locations near the mine and at several temporary measuring points. On the basis of the results, necessary changes are made to blasting methods in order to reduce the amount of vibration.

Nordkalk has ensured the readiness of its production facilities for the demands of the EU's Industrial Emissions Directive (IED), set to enter into force in 2017, by making significant investments in Best Available Techniques (BAT).

Noise barrier at Miedzianka

Noise barriers or acoustic baffles are the best way to "fight" noise, which is emitted by transport, trucks, trains and loaders. In 2015, the Miedzianka Plant in Poland finished building 700 metres of wall baffles along its traffic routes.

The seven metres high walls are made of sound-absorbing material. They are located on the side of the plant closest to the private houses.

The measurements that were carried out after the installing of acoustic baffles fulfilled the requirements of the contract concerning the reduction of noise emissions. In 2016, additional actions were taken in order to further reduce noise emissions at night. As a continuation to the sound-absorbing barriers built a year earlier, two new environmental investments were finished. Special octagonal noise reducers were installed on the upper edge of the barriers. These octagonal noise reducers allow to lower the sound level by absorbing diffracted sound waves into the sound-absorbing mineral wool plate.

Another improvement was replacing an old steel element gate with acoustic panels. The noise measurements carried out after finalising the construction showed significant reduction of the noise level.

Securing access to raw material

Mining is strictly regulated

by laws that have to do with

- mining
- environmental and nature protection
- water
- land use
- building
- occupational safety
- use of chemicals
- environmental impact assessments.

Access to raw materials is at the heart of Nordkalk's operations. Prospecting – searching for new reserves – is continuous work, in order to secure stone reserves for generations to come.

Nordkalk has mines at 21 locations in five countries. The deposits represent different geological periods, varying in age from 180 million years to 1900 million years. This results in the stone having a variety of physical and chemical characteristics, enabling Nordkalk to offer the most suitable quality for each application.

Nordkalk extracts more than 13 million tonnes of stone yearly. It represents a small percentage of known reserves, but new ones need to be secured in the long term. A local limestone supply is necessary, because so many industries and environmental applications depend on it. Bringing in limestone from far away would be expensive and cause unnecessary emissions, and could lead to a retreat of industries from the Nordic countries.

Mining is strictly regulated, and the permit process can easily take several years. Permit applications involve extensive environmental studies to guarantee that negative impacts on the environment are kept to a minimum.

One aspect of opening a new mine, or the expanding operations, is the social acceptance of the plan. Prior to filing a permit application, Nordkalk organises meetings with the community, neighbours and authorities in order to address people's concerns and to take them into account .

Despite the clear benefits of the products - the absolute need for limestone - and protective environmental measures during operations, social acceptance is not easily gained. On the island of Gotland, Nordkalk has been preparing to open a new quarry since 2006.

Efficient use of natural resources

Material efficiency target 100%

Result in 2016: 96.6%

Target in 2017: ≥ 96%

Nordkalk strives to use all of its raw materials, aiming for 100% material efficiency, which is sound from both financial and environmental point of view.

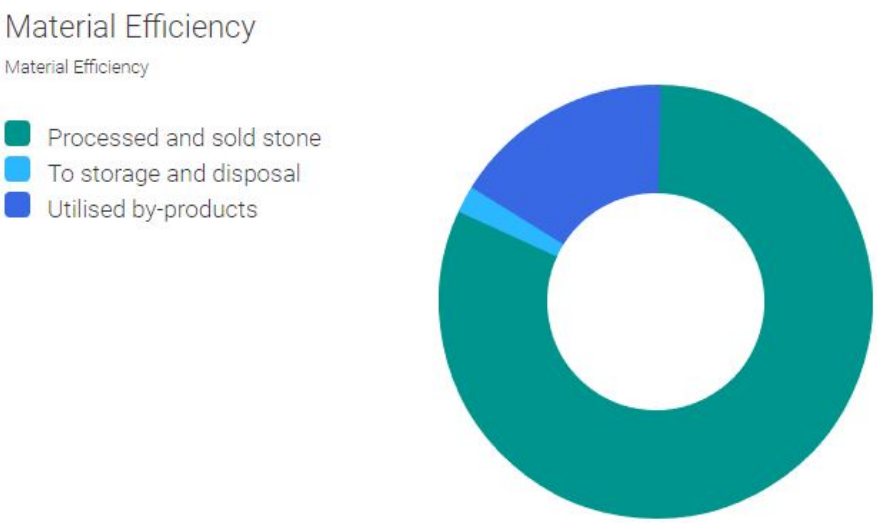
The material-efficiency efforts include using all by-products: wall rock that is extracted in addition to regular limestone, fine sand produced in the flotation process, filter dust, which builds up in all lime kilns and at grinding plants and residues created in lime burning and slaking. Nordkalk also assists its customers by handling their process by-products in a sustainable way.

In 2016, Nordkalk was able to raise the material efficiency rate from 94.3% to 96.6%, thanks to focus on sales of lime kiln dust and especially of wall rock.

Wall rock is used to build infrastructure, e.g. foundations for roads, airports and windmill parks. In addition to the Finland's domestic market, stone products are shipped e.g. to the Baltics and Russia for infrastructure projects.

All of Nordkalk's stone material is CE marked, which supports sales, as does the growing environmental awareness in the society. Paying a price for the transportation of stone is to be compared to starting to extract stone in untouched areas near construction sites and at the same time dumping previously quarried stone elsewhere.

Wall rock is typical of Finnish quarries for geological reasons. In the Lappeenranta and Pargas quarries, wall rock represents approximately one third of all quarried stone products.



Continuous improvement of energy efficiency

The production processes of the mining and lime industry are energy intensive. Quarrying, crushing, grinding and calcination of limestone all require significant amounts of energy. Nordkalk continuously strives for improved energy efficiency, which can be reached through optimised processes and capacity utilisation, and by making reduced energy consumption a priority in new investments and repairs.

Reduced energy consumption through optimised processes and capacity utilisation.

Automatic process optimisation into use at the kiln in Pargas

The automation system of the limekiln in Pargas was renewed in 2016; the new automatic optimization system adjusts the kiln's operation parameters for obtaining uniform quality and low energy consumption.

The system monitors constantly the measurements of the process and product quality in order to level out changes in the process. It also decreases the possibility for production interruptions. The automatic process optimization has been calculated to save annually up to 4000MWh heat energy.

Biofuel tested at Ignaberga in Sweden

In 2015, Nordkalk tested the use of biofuel at its facility in Ignaberga. The fuel is a surplus product from ecological feed production. The tests have given good results and so in 2016, Nordkalk invested in equipment to adjust the production and equipment for the switch from fossil fuels to biofuels. The stone drying in Ignaberga runs now 100% on biofuel.

The tests have given good results for both the environment and Nordkalk.

Improvements in 2016

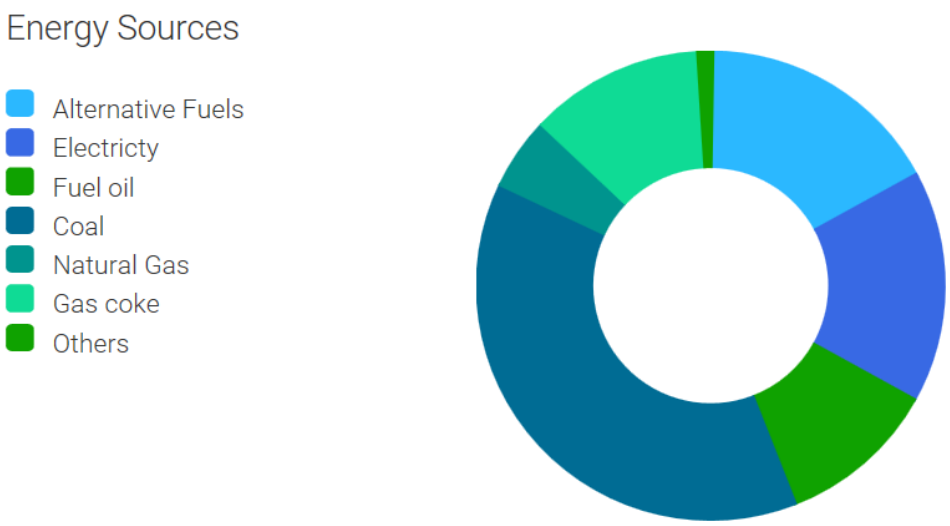
The most significant energy efficiency improvements in 2016 were related to

- Pargas kiln: Process optimisation and new textile filter improves energy efficiency
- Tytyri kiln: false air from the flue gas system was reduced with better sealing; process optimisation was updated.
- By changing mercury-arc lamps to LED lamps, energy efficiency of lighting improved at several locations.
- In Storugns and at KPAB, energy was saved by changing electric motors to more energy efficient models, improving lubrication and cutting down idling.
- In Rakke, lime grinding was optimised and waste heat is used to warm up the facilities.

Continuous improvement of energy efficiency

Nordkalk was granted climate investment support for the Ignaberga project by the Swedish Environmental Protection Agency in December 2015. The support was granted in the context of the Climate Leap (Klimatklivet), an effort to reduce greenhouse gas emissions. Nordkalk is one of twelve companies receiving support for "measures that demonstrate the greatest sustained reduction of greenhouse gas emissions per crown invested".

Read also how residual heat from lime kilns is used in district heating



About a third of the energy Nordkalk consumes comes from coal, which is used in lime burning, as are oil, natural gas and coke oven gas. Electricity is used for crushing and grinding, and fuel oil, natural gas and liquid petroleum gas for the drying process.

Nordkalk warms up the town of Köping

Since December 2013, Nordkalk in Köping has been supplying recovered residual heat to the town's district heating network. This heat allows the town to reduce its consumption of fuels for heating, which also reduces emissions.

During winter 2014/2015, as much as 65 per cent of district heat consumed within the town of Köping consisted of residual heat delivered by Nordkalk and Yara. This is a record in Köping, and shows how local industry can contribute to the circular economy.

A heat recovery unit installed in the flue gas channel of the rotary kiln makes it possible to utilise the residual heat from the kiln. Depending on operation conditions, up to 14 MW can be delivered to the district heating network. In 2015, Nordkalk delivered 41,000 MWh, which equals the amount of energy in about million litres of heating oil. In 2016, Nordkalk delivered 46,000 MWh, which equals the amount of energy in about 4.5 million litres of heating oil.

Planned water management

Pure water is one of life's essentials

Limestone-based products play an important role in water treatment, in the preparation of drinking water as well as in cleaning waste and process waters and treating natural waters.

Water is linked to Nordkalk's production, even though the limestone industry is not a big consumer of water in comparison with metals mining, which has processes requiring large quantities of water. Because limestone is used for water cleaning, any water relating to limestone processing is not dangerous to nature.

In quarries, water collects on the bottom as groundwater seeps in through cracks in the bedrock. Rain and melt water from nature also end up in the quarry. Thanks to the composition of limestone, this water is clean. Tytyri in Lohja in Finland and Miedzianka in Poland deliver water to the municipal water utilities.

If a quarry extends deeper than groundwater level, it can have an impact on groundwater levels in the surrounding environment. Many of Nordkalk's quarries are shallow and do not affect the groundwater level.

In Lappeenranta in Finland, calcite and wollastonite are processed in a flotation plant that recycles its water. The amount of water circulating in the closed system is about six million cubic metres. The system includes sedimentation ponds, where the flotation sand, a useful by-product of the process, settles to the bottom, and cleared water is reused in the process.

Quarry water can be utilized for other purposes, too: At some of the plants, it is necessary to wash stones to remove clay, for example. Also yards and vehicle wheels are often washed, for the purpose of reducing dust emissions.

Nordkalk sites have Water Management Plans. The guiding principle in each quarry is to carry out operations with an absolute minimal negative impact on both the surface water and groundwater.

In Uddagården in Sweden, water basins for quarry water were equipped with curved pipes, through which water is run forward. This simple solution helps catch any possible oil leaks from the machines as the oil floating on the surface of water cannot travel with the water through the pipe.

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Wellness efforts as part of the treatment of Klinthagen quarry

Today, the lake in Klinthagen quarry holds about 2.5 million cubic metres of water. When the quarry is fully broken out and the lake completely filled, the lake will accommodate about five million cubic metres and be Gotland's deepest lake and the second largest lake in terms of volume after Lake Bästeträsk.

An arched bridge has been built for more trout to be able to play further up the Klinthagen creek

In the autumn of 2015 a two-kilometre-long ditch was built to dewater the northern and central part of the quarry. When the pit is broken out ditches will also be constructed to carry water to the pit exit point and onward to Klinthagen creek. The ditches create a self-regulating system with natural sedimentation of the water extraction.

From the exit point the water will be transported to an area of maximally active wetland vegetation for further cleaning of the water downstream from the Klinthagen quarry and into the creek. Any limestone particles, clay particles and nitrogen resulting from limestone quarrying are removed, so that the water is crystal clear and has the same concentration levels as the natural creek water.

Fish conservation efforts will be carried out in the creek, to promote spawning fish and other aquatic organisms. Spawning gravel has been deployed and ditches adjacent to the sea and farmland have been cleared. An arched bridge has been constructed under a minor road so that more trout will be able to spawn further up the creek. To promote the fry's hatching period, small flows will be pumped out into the creek from April to midsummer. Information on how the trout's spawning territories evolve over time, will be collected by counting the numbers of spawning pockets every autumn until two years after completion of quarrying.

Many possibilities in restoration

One aspect of mining is its effect on the landscape: open pit mines are visible in nature. Nordkalk has a restauration plan for each of its mines. In some quarries it is possible to landscape areas that are no longer in use simultaneously with extraction in other parts; for example in the Karinu quarry in Estonia and Ignaberga and Uddagården in Sweden.

Once extracting has ended, the quarry can completely disappear from the scenery after it has been levelled out and vegetation takes over.

In deeper quarries, the aim of reclaiming is, besides safety, to contribute to the surrounding landscape and take the needs of the community into consideration. Old mine areas can serve as recreational or even nature conservation areas.

Elevator testing and mine museum underground

Many activities take place in Nordkalk's underground mine in Tytyri, Finland, in the parts that are no longer in mining use. The globally operating Finnish KONE Corporation has had a test site for high-rise elevators in the mine since 1998. There are nine test shafts, five of which were built recently. Two shafts have a depth of 317 metres. The test site is an important part of KONE's development activities.

Many possibilities in restoration

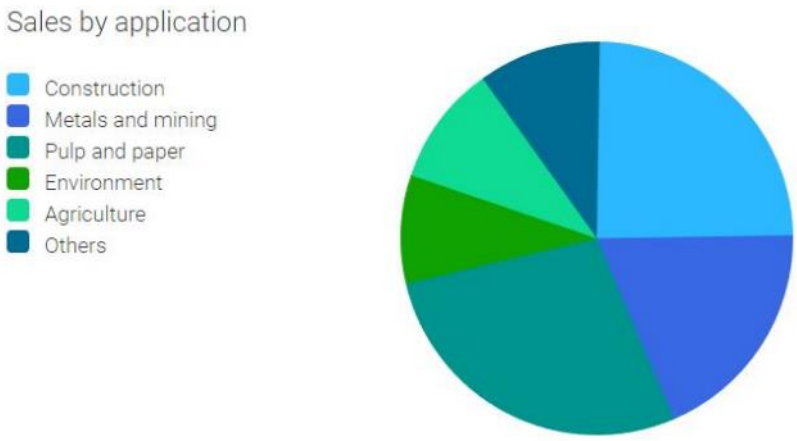
The city of Lohja operates a mining museum, The Tytyri Experience in the mine, including different activities, a museum and a festival hall. It makes for a unique venue to organise an event - 80 metres below the surface. More information on the Tytyr's website.

In Uddagården in Sweden and Storugns on Gotland Sweden, a motorsports track has been built in an abandoned part of the quarry, and at Storugns, a close by land area has been set aside for a wind power park.

Sustainable development is based on profitability

Profitability is the prerequisite for sustainable development that benefits all stakeholders. It means not only jobs and income; it enables companies to improve, invest and focus on innovation – to create knowledge and products that answer to the global issues of climate change and growing population requiring more resources.

Limestone is a versatile and often irreplaceable raw material. It is needed in several industrial fields as well as in environmental care and agriculture. The variety of applications helps us to balance economical fluctuations.



Investments in the future

In 2016, preparations for expanding excavations were ongoing at many of the current locations in order to secure the limestone reserves far into the future. One of the large projects is the expansion of the quarry in Lappeenranta in Finland. For this, the infrastructure of the Ihalainen industrial area has been renewed. Buildings have given way for the quarry; e.g. an old lime factory and some of Paroc's old buildings have been demolished. The alterations to city plan were handled in the town council of Lappeenranta in September 2016.

Information meetings have been arranged for the authorities and the close-by neighbours, at which the changes have been discussed. A new dust test point have been located in the nearby neighborhood. The results are reported to the neighbours monthly during the demolition work.

Sustainable development is based on profitability

In 2016, several environmental investments were done to ensure the different product units' readiness to use the best available technique (BAT) to minimize impact on the environment and restrict emissions.

Granulation plant in Poland

In Slawno in Poland, a new granulation unit started to operate in June 2016. The plant manufactures limestone granules for soil improvement. Nordkalk AtriGran granulated lime fertiliser was successfully launched onto the Central Europe market in June. The investment created about 30 new jobs into Slawno.

New lime spreader in Estonia

Nordkalk AS made an investment in a new lime spreader, which was taken into use in 2016. A big part of fields liming material in Estonia and Latvia is sold as a full-service solution i.e. lime is delivered spread onto the field. The new spreader does need-based spreading which is based on the GPS coordinates.

Financial Year 2016

Achievements in 2016

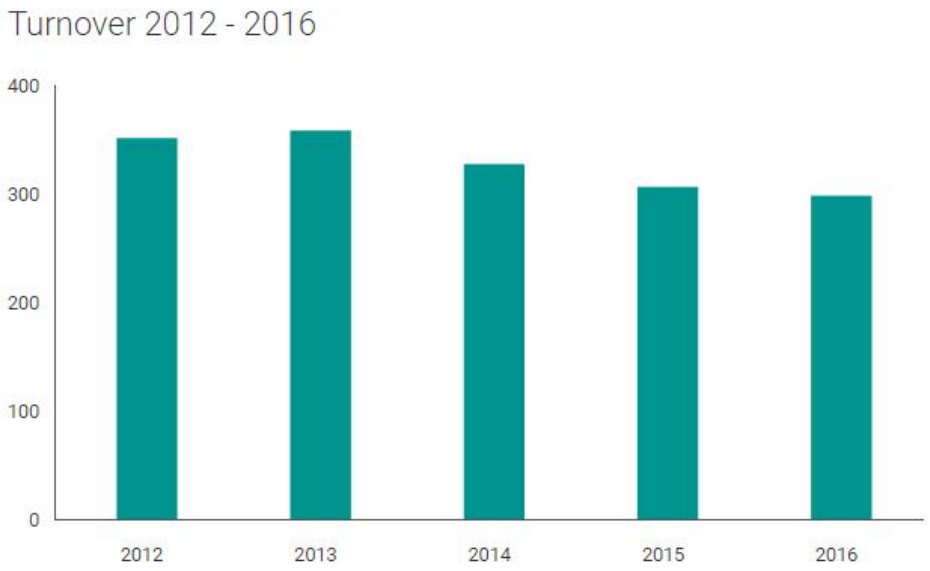
- Increased material efficiency
- Significant savings thanks to continuous improvement and efficient purchase actions
- New granulation plant and product in Poland

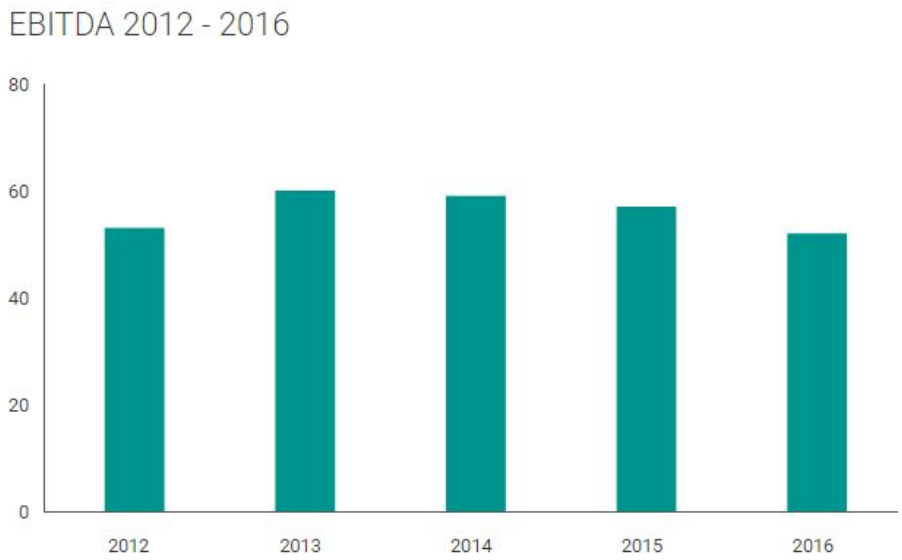
Challenging market conditions continued

Market conditions in Nordkalk's key markets continued to be challenging during 2016, driven by sluggish economies and oversupply of lime on the European market. Nevertheless, turnover increased in Finland, Nordkalk's largest market, and also somewhat in Poland, the third-largest market. Nordkalk's second-largest market, Sweden, lagged behind last year.

Out of Nordkalk's largest customer segments, demand improved in Construction in comparison to 2015, whereas Metals & Mining picked up towards the end of the year after a weaker start. Sales of GCC (a paper pigment produced by the subsidiary Suomen Karbonaatti Oy) decreased markedly in comparison to 2015.

Demand in Nordkalk's smaller segments, such as Agriculture and Environment, improved in 2016. As was the case with Metals & Mining, demand in the Pulp & Paper and Chemicals industries strengthened during the second half of 2016 after a slow start.




EBITDA 2012 - 2016
80
60
40
20
0
2012
2013
2014
2015
2016

Social sustainability: taking care of people

Life evolved around the company

"If one employed somebody, one's duty was to take care of him" , This was the principle applied by Emil Sarlin, Managing Director of Pargas Kalkbergs Aktiebolaget in 1905-55. In the first half of the 20th century, life in Pargas evolved around the company. It build roads, houses, and sports places; maintained schools, supported a hospital and social activities. The social facilities built in 1933 for the employees included a barn, a bathhouse, washing room, bakery, library and a handicraft room, among other things.

Nordkalk's success depends on the success of its customers and satisfaction of all stakeholders: employees, owners, suppliers and authorities who grant permits for the operations. Neighbours want to have a clean and safe business next door, society at large benefits of the availability of needed products and the financial stimulus created by a productive company.

Stakeholder groups consist of people who have different expectations towards Nordkalk. We treat all people according to our values, which apply in the whole Rettig Group: we believe in openness and fairness, and trust and respect are the most fundamental elements of our interaction and communication with different stakeholders. The fourth value, modesty, is the principle applied in listening to and understanding divergent views and opinions.

Nordkalk complies with local and international laws and regulations, such as international labor standards defined by ILO and UN Global Compact covering human rights, labor, the environment and anticorruption. We do not under any circumstances accept child or forced labor at any of our operations or activities. We do not tolerate corruption or bribery.

- *Personnel*
- *Health and Safety*
- *Community*
- *Supply Chain*

Supply Chain

Nordkalk's preference is to use local suppliers; approximately 80 per cent of Nordkalk's purchases take place in its countries of operations. The environmental impact of the short transportation distances is smaller and Nordkalk is better able to successfully monitor its supply chains.

Same rules apply to everyone

All purchasing for Nordkalk Group is performed complying with Nordkalk's Purchasing Guidelines. When starting a contracting process with a new supplier, a supply evaluation process will be performed: The supplier's background and reliability, ethical and financial, will be checked before the tender process can begin.

Suppliers are expected to commit to Nordkalk's environmental care and sustainability requirements, a high standard of business ethics and integrity. A supplier is expected to comply with the requirements set out in Nordkalk's Supply Code of Conduct, which the supplier is to sign as a part of the purchase agreement. Nordkalk expects all of its suppliers to work in the spirit of Nordkalk's values – Openness, Fairness, Modesty, Trust and respect.

Same health and safety rules and regulations apply to everyone who visits Nordkalk premises. In 2016, an electric access control and compulsory safety training was taken into use at Nordkalk's largest sites. Both apply to own personnel as well as to visitors to the sites.

Read more.

Efficient logistics

Nordkalk offers its customers extensive and economical logistics services. Our logistics chain is effective, fast and reliable.

Our products are transported by ships, trucks and trains. We administer ourselves the transports of about 60% of our total volume. We use many industrial harbours and our terminal network covers our whole area of operations in Northern Europe. The vessels that we are using are designed especially for the transport of quicklime. Thanks to their closed loading and discharging arrangements, work can proceed in any weather conditions. We have many contract transport companies offering the best possible equipment for transporting lime and we take care of both trailer and container transports around Europe.

We are experts on transporting lime.

Safety is always topic number one

Targets in 2017

- Accident rate under 5.5
- Safety observations more than 4/person
- Everybody is included in safety work

*accident rate = accidents per million work hours of own employees
* *LTA1 = accidents causing one or more days of sick leave.

Safety first – Nordkalk's long-term goal is zero accidents, and safety is an integral part of everything we do

The focus is on safety thinking, making employees more aware of how their attitude affects their own and that of their co-workers'. Safety management, processes and routines are constantly developed, as required by the OHSAS 18001 standard that Nordkalk complies with.

All Nordkalk employees are encouraged to pay attention to the work environment and report safety observations at work and when travelling. All safety observations are studied, and eventual corrective actions are taken within two months at the latest. Occupational accidents are reported as soon as possible in all Nordkalk countries. Health and safety is always topic number one at internal meetings.

At the top of the world in safety

Nordkalk received in spring 2016, a certificate of honour by the Finnish Zero Accident Forum (Finnish Institute of Occupational Health) for our safety work. Based on the results in 2015 Nordkalk was classified LEVEL I – In world's forefront.

Each year, the Zero Accident Forum awards safety level classifications to their member workplaces that have successfully promoted their occupational safety. The awarding of a safely level classification follows an examination of the frequency and seriousness of occupational accidents at a workplace. In addition, systems for investigating occupational accidents and reporting dangerous situations must be in order.

The certificate was accepted on behalf of Nordkalk by Production Director Kari Vyhtinen (left) and Safety Manager Juha Virolainen (right). One of Nordkalk's safety representative, Ossi Lindstedt also in the photo.

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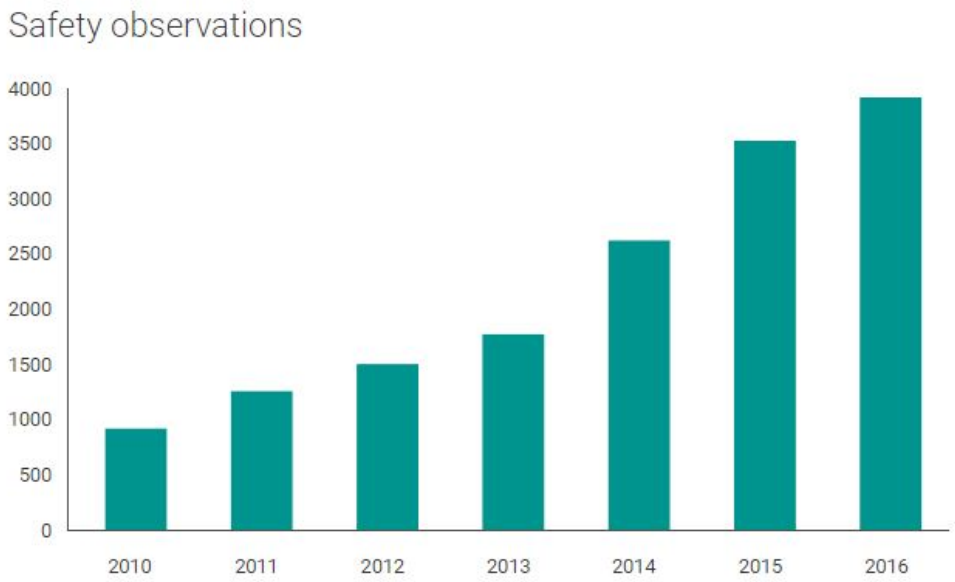
Health & Safety data

Achievements in 2016

- Accident rate decreased from 7.4 in 2015 to 6.5 (own personnel LTA1 per 1 million working hours)
- Record number of safety observations, in average 3.8. per person (3.5 in 2015)



Same rules apply to everyone

The health and safety rules and regulations are the same to Nordkalk's own personnel and all visitors to the Nordkalk premises.

In Finland, there is an on-line safety video guiding in detail what is expected at the site e.g. in safety gear wise, which everybody entering Nordkalk's production sites shall watch, either online beforehand or at site.

An instructions booklet to chauffeurs is delivered to all transport companies and other contractors during e.g. audits conducted by Nordkalk. In case a person arrives at a Nordkalk site without the necessary safety gear, it will be provided to the person. Nordkalk personnel is obligated to react immediately to any breach of safety regulations and guide anybody on the premises about the safe way of working. All such incidents will be reported and included in the safety statistics.

In Finland, safety in plant and quarry areas was increased by implementing electric access control at all the largest sites. From the beginning of 2016 entering these sites has required a safety training and a separate access pass. Everybody entering the areas must watch a safety video, which gives instructions on e.g. safety gear. One can watch the video on-line before the visit or at location in the beginning of the visit.

Access control and safety training will gradually be implemented also at the other locations.

Together we can move mountains!

Targets 2017

- Development discussion activity 100%
- Everybody will make minimum 4 safety observations

At Nordkalk, we believe that our success depends on each of us, because we together as individuals are what make up Nordkalk.

We are proud of our professional competence and continuously develop our knowledge and skills. We aim for a good and safe work environment and the better well-being of our personnel. We are all responsible for creating a positive and innovative workplace atmosphere. We take care of the environment and work safely towards our common goals.

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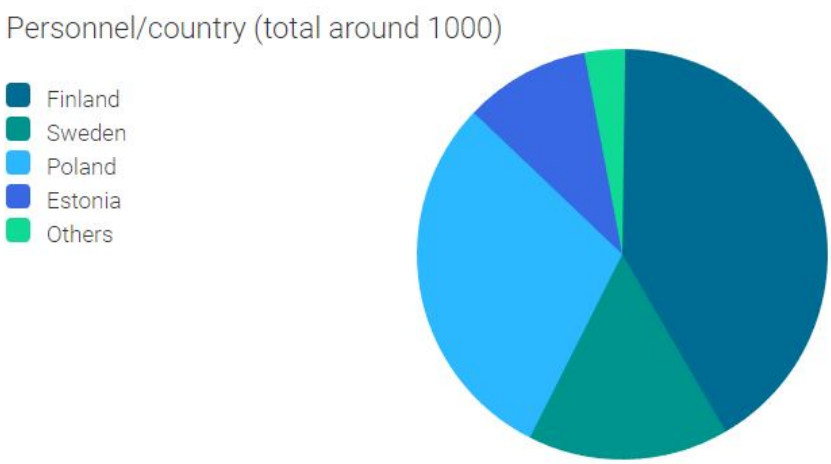
At Nordkalk, the development of wellbeing at work is methodical and is guided by quarterly changing themes. One of the central themes running through the entire year of 2016 was “Smoke free Nordkalk”. It was first implemented in Finland and it will expand to the other countries in the coming years based on the Finnish model. Support was offered to personnel to stop smoking and from the beginning of 2017, Nordkalk is a smoke free work place in Finland. This means that one is not allowed to smoke or use any other tobacco products during working hours at the work place or in its vicinity. The smoke free work place applies to the entire personnel, apprentices, visitors, co-operation partners and contractors.

The quarterly themes in 2016 were lifestyle, exercise and rest and the balance between work and free time.



Personnel development in 2016

In 2015 a new One Nordkalk operations model was implemented, with which the modes of operation were unified and simplified. In 2016, this model was further developed by e.g. implementing common tools to the entire company for example for digital reporting.

As a part of the One Nordkalk model, common Health & Safety targets with changing themes were established in all Nordkalk countries. Safety is emphasized in all we do; the personnel is encouraged to share best practices and make safety observations to increase efficiency and improve safety. In 2016, a record number of safety observations were made: in average 3.8/person. The result exceeded the target for the year, which was 3/person.

Wellbeing at work and personnel development

In 2016, Nordkalk continued investing in wellbeing at work and personnel development. Lectures on wellbeing and different wellbeing activities were arranged in all Nordkalk countries, special emphasis was paid on development discussions. The target for 2016 was 100%, which was not reached as the activity percentage was 98. We continue to pursuit the 100% target in 2017.

As a way of encouraging activity during the working day, exercise breaks were promoted. An exercise program installed a year earlier was now introduced to all Nordkalk countries: a program offering short exercise videos to the user at an interval chosen by the user e.g. once an hour, was installed to everybody who wanted it. The program found its way also to meetings. In the photo above, the company doctor is leading an exercise break in an internal meeting.

Co-operation with communities and schools

Nordkalk has active co-operation with schools and universities. For example, in Rakke in Estonia, Nordkalk has cooperated with a local school for four years. In 2016 Nordkalk was involved in giving monthly lessons in e.g. chemistry, geology and social science to the pupils. Also in Poland Nordkalk takes part in educational activities: e.g. in Sławno in Poland, Nordkalk organised in cooperation with PHACOPS (Association and Institute of Paleobiology of Polish Academy of Sciences) workshops for children from local schools and geological explorations for paleontologists from all over the world.

In Finland, the cooperation with schools that started in 2015 with a summer work scholarship program, continued in 2016. The program is directed at students at the age of 16-17 with an aim of offering the young valuable work experience instead of solely monetary compensation. A designated sponsor was appointed to guide and supervise the students at the workplace. The students worked with tasks improving health and safety and cleanliness by e.g. painting fences, steps and other risky places with safety colours and arranging tools into correct places.

In the photo the scholarship winners from left: Juuso karhu, Akseli Kuvaja, Jonathan Garavet, Ilmari Väisänen, Julianna Anttonen and Viivi Röntynen.

Increased activity in social media

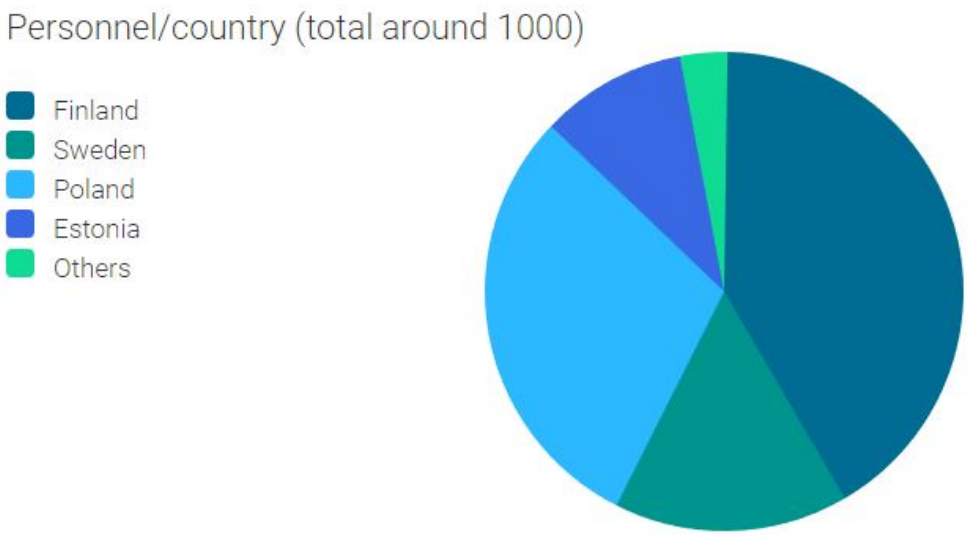
Co-operation with Nordkalk's neighbours and the rest of the communities was highlighted in 2016, and we met with our neighbours at many locations.

Nordkalk was active on social media with a goal of increasing visibility for the company and interactive intercourse with also other people than the closest neighbours. On social media, Nordkalk shares information on its history as well as on the current activities, the products and the benefits of liming to farmers and the environment.

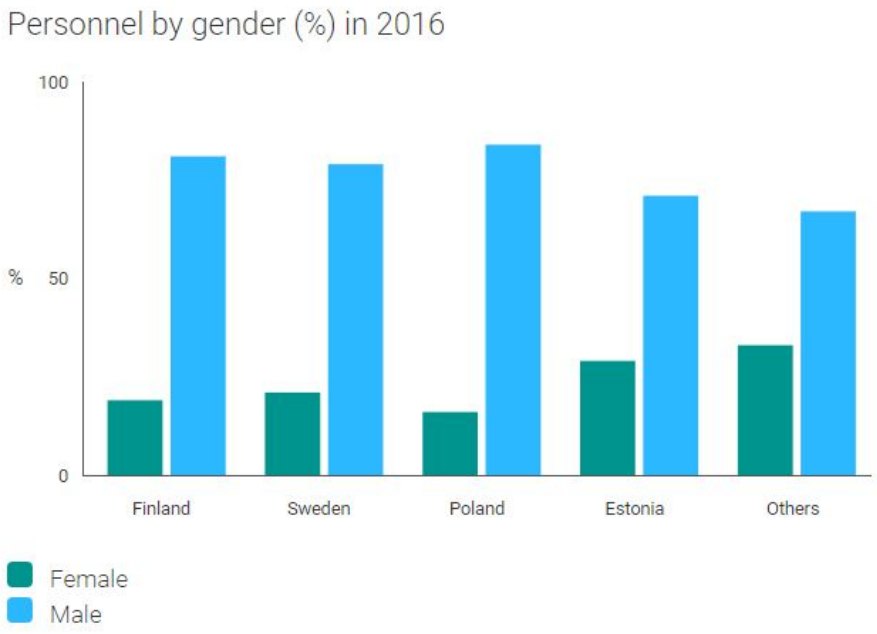
Personnel data

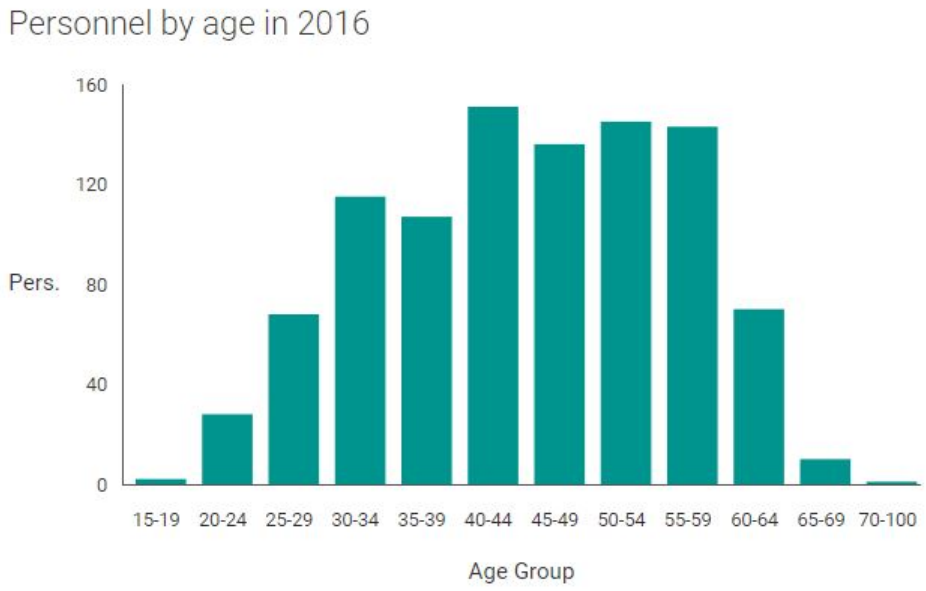
Highlights in 2016

- Development of One Nordkalk operation model and unification of different modes of operation.
- Development of well being by common themes.
- Invested co-operation with schools and communities.



The number of personnel was 976 in the end of 2016. Many new employers started at Nordkalk, however, long careers are not a rarity at Nordkalk. In 2016, 28 % of the personnel has worked in the company for over 20 years. One of them is Irja Salumets, who has worked over 40 years at the Rakke plant in Estonia.




Personnel by age in 2016
160
120
Pers.
80
40
0
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-100
Age Group

Over forty years long career

Today, decades long careers are not that common anymore, but at Nordkalk we have several examples of such careers.

Irja Salumets has worked at Nordkalk and its predecessor Rakke Lubjatehas for 42 years. She came to the Rakke lime factory's (Rakke Lubjatehas') laboratory in August 1974 from the Tallinn Polytechnic Institute (nowadays Tallinn University of Technology). During the years, Irja has worked in many different quality and technology related posts. Currently she works as Chief Technologist with quality assuring, quality and products certification as her main responsibilities.

According to Irja, the explanation to her long career may be in thoroughness, learning ability and stubbornness. She studied in the Chemistry faculty for five years, but knew little about the production processes of limestone based products when she first started at the Rakke lime factory. She learned at work; the most important teachers were the senior colleagues and Soviet Union's leading lime production expert, professor Monastõrjov's textbook that Irja says she still uses today.

Working comes naturally to Irja and in her opinion one should not think one knows everything. In addition to the willingness to learn, what lies behind Irja's long career is that she has always found her work interesting. She is also pleased that the company as a whole and also the laboratory have evolved into modern facilities.

Irja is planning to continue working at least another couple of years. In 2016, the West-Viru County Government nominated Irja a "Good Employee" for her long career at Nordkalk. A similar acknowledgement was given to another Nordkalk employee Ivan Poznjak, who has worked 36 in the company. Criteria for the "Good employee" nomination is at least a 10-year-long career, a significant contribution to the development of the organisation and social activity.

The Governor Marko Torm presented Irja with the Good Employee acknowledgement on Estonia's Entrepreneur Day on 6 October 2016.

Part of the Community

Rettig Group's value of openness is the foundation for Nordkalk's communications with neighbours, local communities and society at large. We believe that by showing people what we do and who we are, we gain and strengthen social acceptance of our activities.

The best way to meet with neighbours is to organise community events and meetings – open doors to the public. Nordkalk organises meetings with its neighbours in connection with different changes such as environmental permit applications, and open house events in connection especially with events for the general public. In summer 2016, Nordkalk arranged a bus tour to the quarry and the production area to all who were interested in connection to the Jukola orienteering relay organized in Lappeenranta.

In 2016, Nordkalk's activities were shared with the general public also on social media. Norkdlak shares photos from the past and now as well as information on topical issues, use of the products and its personnel. This is a way for Nordkalk to increase understanding toward its activities, which is a prerequisite for the so called social acceptance.

Co-operation with schools and experts

Nordkalk co-operates with a number of schools and universities by e.g. organising excursions to our plants, offering internships to students and by enabling research work, as well as offering job opportunities during vacation times. For example, in Rakke in Estonia, one form of cooperation with a local school involves Nordkalk's specialists giving monthly lessons in e.g. chemistry and geology.

In Finland, a summer work scholarship programme continued in 2016, directed at students at the age of 16-17. In Sławno in Poland, an international workshop for paleontologists was arranged. The group (photo) visited the quarry in Sławno, where they could learn about the

world of late jurassic era and the evolution of living organisms. The town of Sławno is planning a visitor’s centre to this geologically important area.

Water and heat to communities

Companies provide society with needed products and services, and their surrounding communities with employment opportunities. In Nordkalk's case, some communities also benefit from by-products created in production. In Pargas and Tytyri in Finland, as well as in Köping in Sweden, Nordkalk delivers recovered residual heat from the lime kilns to the district heat network. In 2016, Nordkalk delivered about 72500 MWh residual heat to the district heat networks in Köping, Pargas and Tytyri. This would be enough to warm up 3600 households using heating oil for a year.

Sponsoring focuses on local and environmental causes

Nordkalk's sponsoring activities focus on the local communities where the company operates. The spotlight is on children and youth and supporting their leisure activities, mostly sports.

In summer 2016, Nordkalk was one of the sponsors to the Jukola orienteering relay organised in Lappeenranta in Finland. We delivered also aggregates to the event for road building and limestone based products for water treatment.

Our sponsoring activities extend to environmental projects, in collaboration with research institutions or organisations. In 2012, Nordkalk made a 5-year-long commitment to the Baltic Sea Action Group (BSAG). Nordkalk's objective is to reduce the phosphorus burden on the Baltic Sea with the help of the Nordkalk Fostop® products.

Limestone for generations

Limestone mining is a long-term business, and many of Nordkalk's sites have been in operation for decades. Communities have grown around the mines and keep prospering thanks to them. Our society depends on the supply of limestone, which Nordkalk guarantees by continuously prospecting for new reserves. In Sweden, preparations for opening a new limestone quarry in Bunge

on Northern Gotland have been going on for more than ten years, due to a prolonged legal process.

In Lappeenranta in Finland, an expansion process of aggregate piling areas was finalised in autumn 2016. The process started in 2012 with assessment of environmental impacts. Supreme Administrative Court overruled a appeal against the environmental permit meaning that Nordkalk got the right to elevate and expand the existing area as well as establish a new piling area. The court ruling has now affect on the current activities as all the side products are being utilised in Lappeenranta due to several infrastructure projects. However, the ruling ensures the continuation of the operations in the case that side products will need to be piled sometime in the future.

Nordkalk warms up the town of Köping

Since December 2013, Nordkalk in Köping has been supplying recovered residual heat to the town's district heating network. This heat allows the town to reduce its consumption of fuels for heating, which also reduces emissions.

A heat recovery unit installed in the flue gas channel of the rotary kiln makes it possible to utilise the residual heat from the kiln. Depending on operation conditions, up to 14 MW can be delivered to the district heating network. In 2016, Nordkalk delivered 46,000 MWh, which equals the amount of energy in about 4,5 million litres of heating oil.

The town of Lohja acquires water from Nordkalk

More than one million cubic meters of groundwater is pumped up yearly from the underground mine. About half of the water is delivered to the municipal waterworks, where it represents 23 per cent of all raw water received. It is filtered through a sand bed before being led to the water distribution system.

The Tytyri plant itself uses some 30.000 m3 of water annually, also from the mine, but through a separate pumping station. The surplus water – about half a million cubic meters – is directed to the nearby lake Lohjanjärvi. This is mostly groundwater, but it includes a small portion of storm water gathered from the plant area. Yearly quality measurements show that the water released into the lake corresponds to household water quality.

In Tytyri, there is also The Tytyri Experience including a museum and other activities. The Tytyri Experience is operated by the city and visited by more than 10.000 people annually.

KONE Corporation’s high-rise elevator test laboratory is located in old mine shafts. One of the elevators is used to transporting visitors to the Tytyri Experience.

Lime stops phosphorous runoff – work for healthier Baltic Sea

In 2012, Nordkalk joined the Baltic Sea Action Group (BSAG) in preserving the Baltic Sea with a 5-year-long commitment with the goal of reducing the phosphorus burden on the Baltic Sea with Nordkalk's Fostop® concept.

In agriculture, liming reduces the soil's acidity, which improves the plants' living conditions and allows them to use nutrients more efficiently, resulting in bigger crops and reduced nutrient runoff into watercourses.

In addition to traditional soil-improvement lime, Nordkalk's Fostop® concept tackles the challenge of phosphorous runoff. Fostop is used for the structure liming of fields, the stabilisation of sludge, and for lime filters and drains that help to reduce leakage and contribute to the recycling of phosphorus. This is extremely important because world's phosphorus reserves are estimated to last only for a few more decades.

In Sweden, where the state grants environmental subsidies to farmers for curbing phosphorus runoff, Nordkalk's Fostop Structure is a well-established method. One of Nordkalk's many phosphorus-related research projects is also under way in Sweden. It involves structure liming and testing Fostop filter drains in the fields surrounding lake Bornsjön near Stockholm. The project is being carried out in co-operation with Stockholm Water and the Swedish University of Agricultural Sciences.

In Finland, Structural liming has been tested in smaller scale in laboratories and on the fields. These tests help optimizing the correct spreading amounts for the Finnish soil types. Structure lime has been tested on the Finnish market since 2015.

Nordkalk's commitment is ending, but work to reduce the phosphorus burden on the Baltic Sea and other water courses will continue. Even though, there wasn't enough time to launch structure lime to the Polish and Baltic markets, we aim to increase the awareness of the environmental and crop benefits of liming in these areas, too.