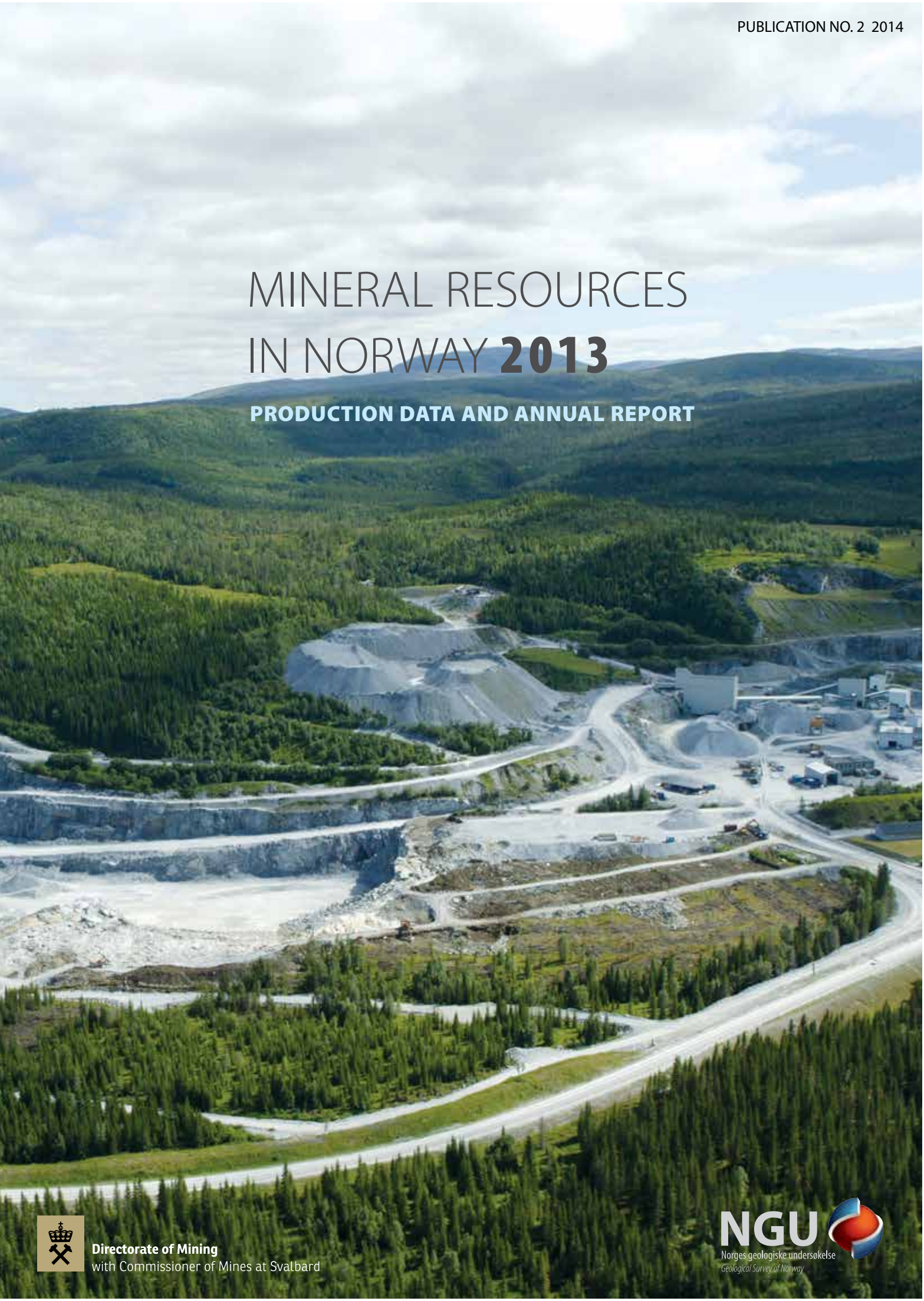
PUBLICATION NO. 2 2014

MINERAL RESOURCES IN NORWAY **2013**

PRODUCTION DATA AND ANNUAL REPORT



Directorate of Mining
with Commissioner of Mines at Svalbard

NGU
Norges geologiske undersøkelse
Geological Survey of Norway

Table of Contents

Outside cover: Air Photo: Tromsdalen, Verdal municipality, Nord-Trøndelag
Photo: Verdalskalk AS

Photo: Verdalskalk AS

Introduction

The publication Mineral Resources in Norway 2013 has been prepared by the Geological Survey of Norway (NGU) and the Directorate of Mining (DMF) based on the mining industry's own production and sales figures for 2013. The response deadline for data from the companies was set at 29th April, 2014. In all, 865 companies and 1169 producing quarries/mines have submitted data on the various types of mineral resource, as presented in a number of figures and tables in the report.

The mineral production data for 2013 have been compiled by Peer-Richard Neeb, Roald Tangstad, Lars Libach, Rolv Dahl, Gunn Sandvik, Geir Strand, Cecilie Bjerke, Rognvald Boyd and Eyolf Erichsen from NGU and by Peter J. Brugmans, Heidi Wennberg and Brit Kaasboll from the Directorate of Mining.

Trondheim, 22 October 2014

Morten Smelror
Director
Geological Survey of Norway

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Director,
Directorate of Mining with Commissioner
of Mines at Svalbard

Abstract

The Norwegian mineral and mining industry had a turnover of NOK 13,000 million in 2013, and exported products valued at NOK 7,600 million. Ninety-seven million metric tonnes of mineral raw materials were produced, almost the same as in 2012. The industry had 6,226 employees at 1169 producing quarries/mines operated by 865 companies. The turnover of coal production on Svalbard increased to NOK 1.300 million in 2013. Turnover of gravel, hard-rock aggregate and clay was NOK 5,400 million in 2013 and that of natural stone NOK 1,100 million. Turnover of industrial minerals was NOK 2,400 million in 2013 and that of metallic ores NOK 2,700 million.

The mining and quarrying industry had exports valued at NOK 7,600 million in 2013, corresponding to 58% of its turnover. Industrial mineral exports accounted for NOK 1,900 million, with ground calcium carbonate slurry, olivine, nepheline syenite and quartz/quartzite as the most important products. Natural stone exports included NOK 811 million for dimension stone and NOK 42 million for slate and masonry stone. Larvikite is the most important dimension stone, accounting for NOK 771 million of the export value. Export of hard-rock aggregate, offshore ballast and gravel accounted for NOK 1,100 million. Export of metallic ores had a value of NOK 2,400 million, mainly accounted for by iron, ilmenite and nickel. Export of coal to Europe had a value of NOK 1,200 million.

The mineral and mining industry is of great significance in outlying regions, with the highest turnovers in Rogaland, Møre og Romsdal, Finnmark, Svalbard, Nordland and Vestfold counties (except for Svalbard which has a special administrative status).

Quartzite from Kautokeino, Finnmark county –formed as a book by sculptor Martin Kuhn. Photo: Peer-Richard Neeb.

Introduction

The mining and quarrying industry comprises companies involved in extraction and processing of minerals and rocks, from bedrock and/or superficial deposits. Five main groups of materials can be distinguished:

- **Industrial minerals** (e.g. calcium carbonate rock (marble and limestone), olivine, nepheline syenite, quartz, graphite and dolomite)
- **Natural and dimension stone** (e.g. larvikite, granite, marble, dimension stone, slate and masonry)
- **Constructions minerals** (sand, gravel, hard-rock aggregate, offshore ballast, other types of offshore construction stone and clay)
- **Metallic ores** (e. g. iron, nickel, ilmenite (iron-titanium oxide) and molybdenum.
- **Energy minerals** (e. g. coal and peat)

All of the above materials are essential for every-day life: modern society cannot exist without using mineral raw materials such as iron ore for production of steel, limestone/marble for cement and paper, aggregate for road-building, sand and gravel for concrete, and coal for metallurgical processes and for energy production. Per capita annual consumption of minerals and mineral products in 2013 amounted to c. 13 metric tonnes, which over an average life-time, adds up to c. 1,000 tonnes/person.

The Geological Survey of Norway (Norges geologiske undersøkelse - NGU) and the Directorate of Mining with the Commissioner of Mines at Svalbard (Direktorat for Mineralforvaltning - DMF) established cooperation in 2006 with the aim of publishing an annual overview of mineral production statistics.

MATERIAL CONSUMPTION DURING A LIFETIME

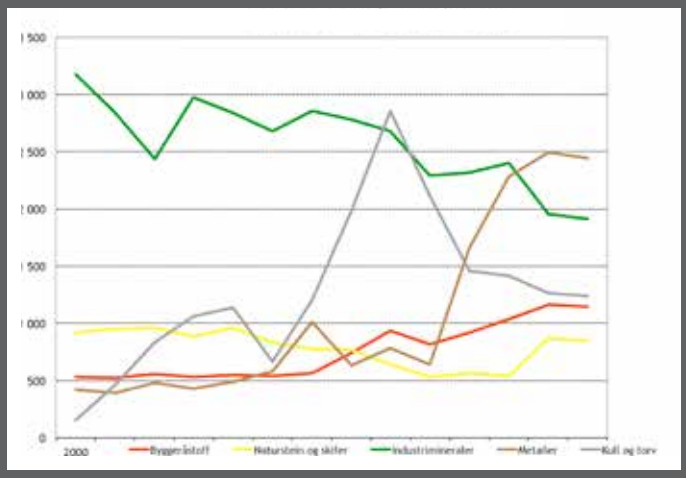
1000 TONNES

ANNUAL CONSUMPTION PER CAPITA

13 TONNES

Mineral products

Export value mill. NOK FOB (2013-kroner)



Iddefjord granite, Vigeland park, Oslo
Photo: Peer-Richard Neeb.

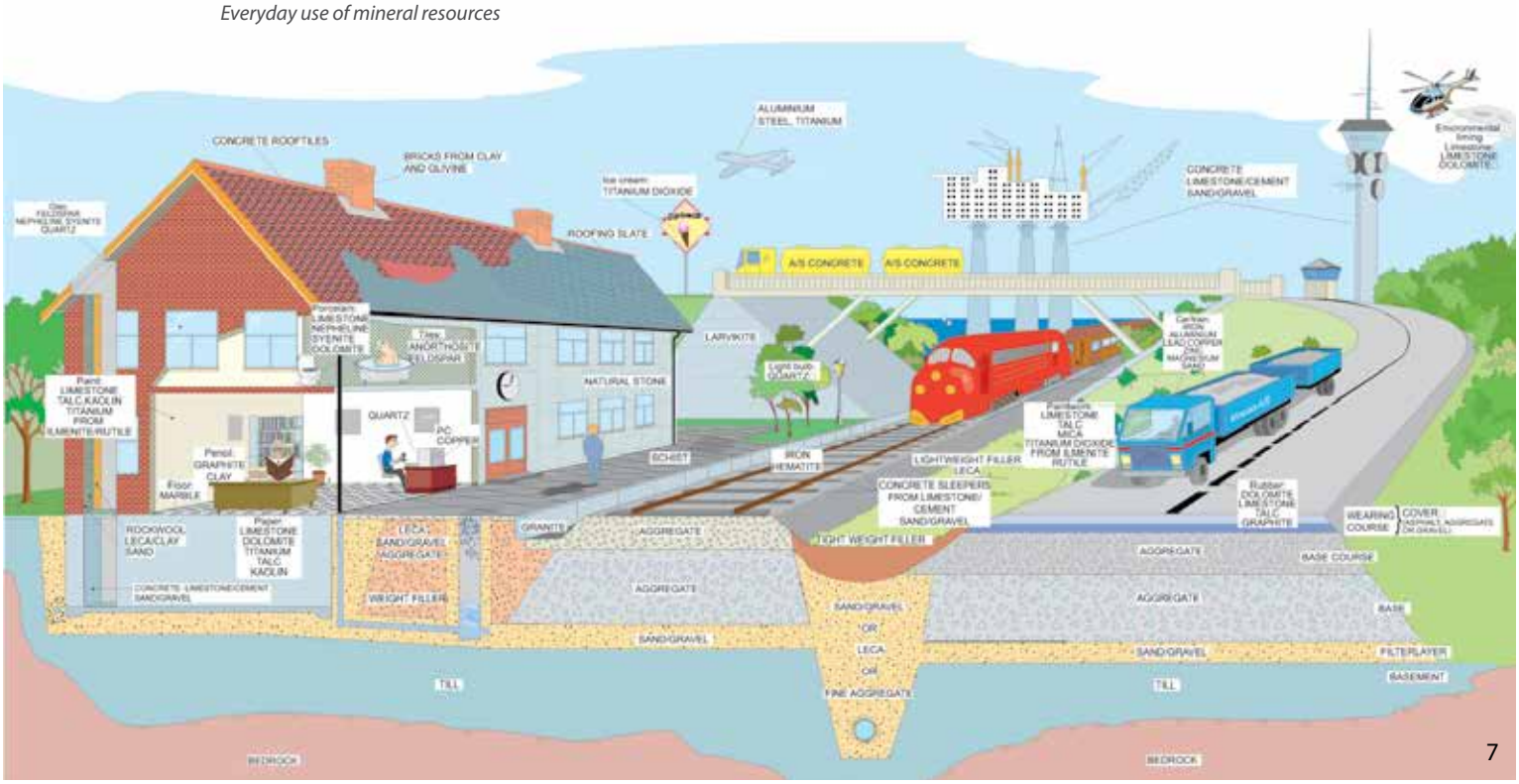
The primary goals in publishing the mineral production data include:

- **To demonstrate the importance of the mineral industry to the Ministry of Trade, Industry and Fisheries, to other ministries and public authorities and to the general public.**
- **To assist county and local authorities and industry in ensuring optimal land-use planning, including appropriate attention to mineral reserves in production and to resources which may be important in the future.**

NGU and the DMF have compiled the overview of mineral production data based on the response to enquiries to producers. The overview of producers is generated using data in the NGU Gravel and Aggregate Database, from lists of producers registered in the DMF database of operations subject to the Minerals Act and on annual feedback from municipalities and industry. Where fewer than three companies are involved, NGU and the Directorate have come to an agreement with the producers on how the figures can be presented in figures and tables. Data on total production tonnage, annual turnover and employment are given priority. The Minerals Act of 01.01.10 requires the submission of annual reports which form the basis for the information on operation and statistical parameters for 2013. Some gravel and hard-rock aggregate data, i.a. on use of the products and their transport, is also acquired from Norwegian Mining and Quarrying Industries EU statistics.

Peer – Richard Neeb
Project Leader/editor
Geological Survey of Norway

Everyday use of mineral resources



Web sites and databases

NGU maintains and continuously expands its national databases on Norway's mineral resources (www.ngu.no). Data on sand and gravel, hard-rock aggregate, natural stone, ore and industrial mineral deposits are all freely accessible at www.ngu.no, under the links: Resources and Maps & data.

The Directorate of Mining web site (www.dirmin.no) gives information on the Directorate as such and about the mining industry and related activity. The site also provides information on regulations related to acquisition and exploitation of mineral resources, and has links to the actual law texts. The site also has information on mining on Svalbard and the regulations which apply there.

NGU and the Directorate of Mining have developed an English-language internet portal (www.prospecting.no) in order to provide access to geological maps and data on deposits of industrial minerals, metallic ores and natural stone, and data on mining claims and protected areas, etc. The site provides an overview of approved permits, with the exception of older claims according to legislation pre-1972 and applications being processed but not yet approved. The overview is updated every Monday. For information regarding applications under consideration, contact the Directorate of Mining.

NGU has developed a provisional overview of mineral resources of national significance. These are deposits which have a substantial value, and which must be given appropriate attention in land-use planning processes.

Overview of the number of Norwegian mineral deposits for which NGU has information which is adapted for internet access.

RESOURCE TYPE	ADAPTED FOR INTERNET ACCESS
Industrial Minerals	2333
Metals	4569
Natural stone	1437
Aggregates	1854
Sand/gravel	8960
Stonetip	306
Total	19459

NUMBER OF MINERAL DEPOSITS
WWW.NGU.NO

19459

› *ngu.no*
› *prospecting.no*
› *dirmin.no*
› *ngu.no/mineralressurser*
› *ngu.no/grusogpukk*

Bruhagen quarry, Averøy municipality,
Photo: Jan Egil Nordgård. Gunnar Holt Kristiansund AS
Photo: Roald Tangstad

Important mineral deposits in production

Developments in the mining and quarrying industry

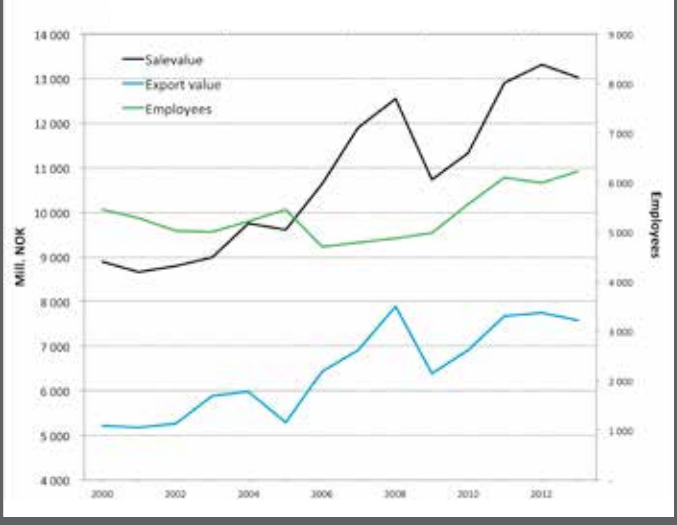
The past 30 years have seen substantial structural changes in the industry. Production of metallic ores represented 50% of the total production value from the industry in 1981, but fell dramatically up to 2003. Production of iron has subsequently shown a major increase. The production value of industrial minerals showed a major increase up to 2000 with a slight decline thereafter. Production of natural stone increased dramatically up to 1997, followed by a period of stable to slightly declining production, with an upturn in recent years. Production of hard rock-aggregate has shown a major increase since 2003, while gravel production had been variable, though with an upturn in recent years. Coal production on Svalbard increased up to 2008, followed by a period of decline due to changes in the market and lower prices in Europe: there has been a significant increase in the last year.

2013 saw increases in the production in particular of coal, natural stone (larvikite), hard-rock aggregate and gravel.
Most of the large export-focused companies within the norwegian mineral industry are today fully, or partially owned by foreign corporations.

The mining and quarrying industry is capital intensive, requiring a higher investment per employee than for industry in general. Approximately 58% of the total mineral production in 2013 (calculated on the basis of turnover) was exported, and the domestic share of production forms the basis for an important mineral processing industry. Profitability varies between different branches throughout the industry, and between individual companies within each branch. Industries based on domestic mineral production are calculated to have 4 employees for every employee in primary production, giving a total of ca. 30,000 employees. Norway's annual imports of mineral raw materials have a value of NOK 25 – 30,000 million. These employees of import is not included in this report.

Mineral products

Total sale- and exportvalue mill. NOK (2013-kroner)
- Number employees



EXPORT OF MINERALS

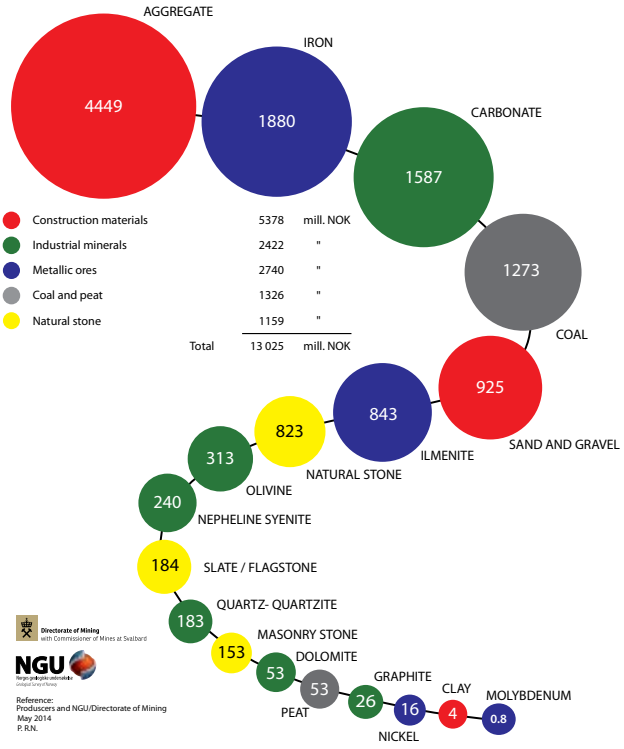
58 percent

THE MINING AND QUARRY INDUSTRY
TURNOVER 2013:

NOK 13,000 million

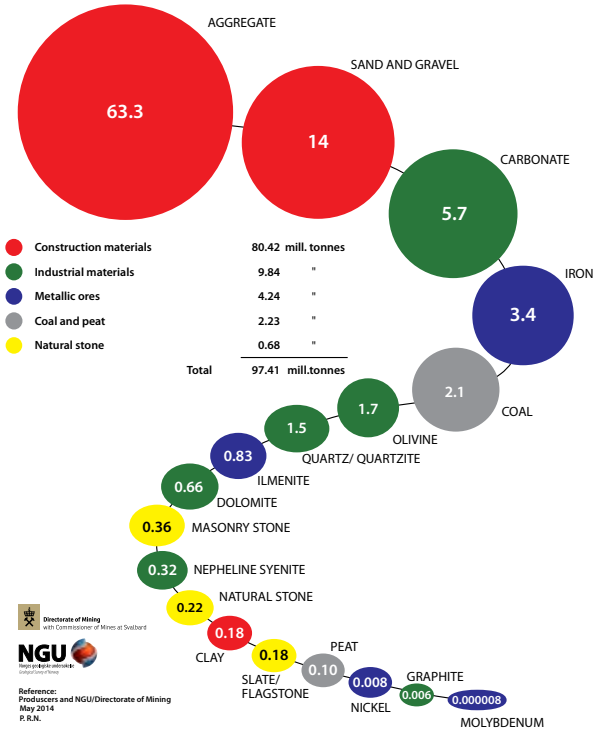
PRODUCTION OF NORWAY'S MOST IMPORTANT MINERAL PRODUCTS

(2013, FOB MILL NOK)



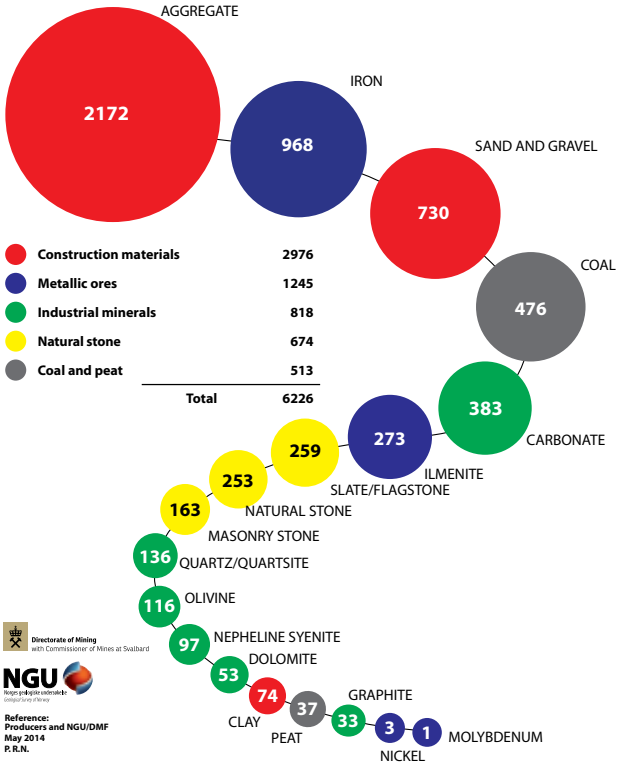
PRODUCTION OF NORWAY'S MOST IMPORTANT MINERAL PRODUCTS

(2013, mill. tonnes)



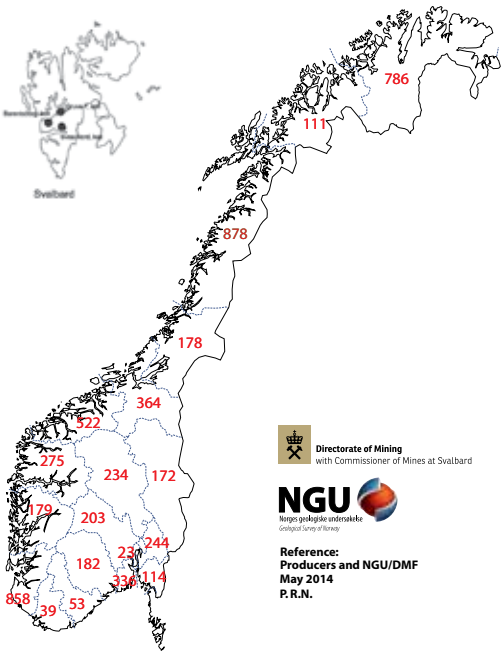
EMPLOYEES IN THE MINERAL INDUSTRY

2013

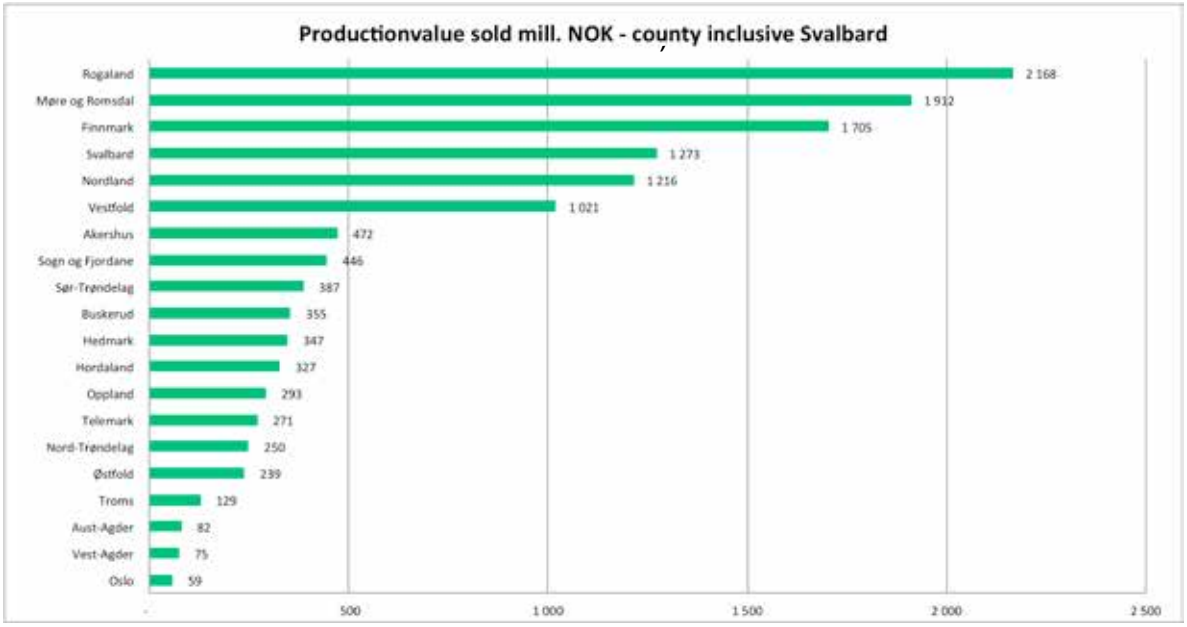


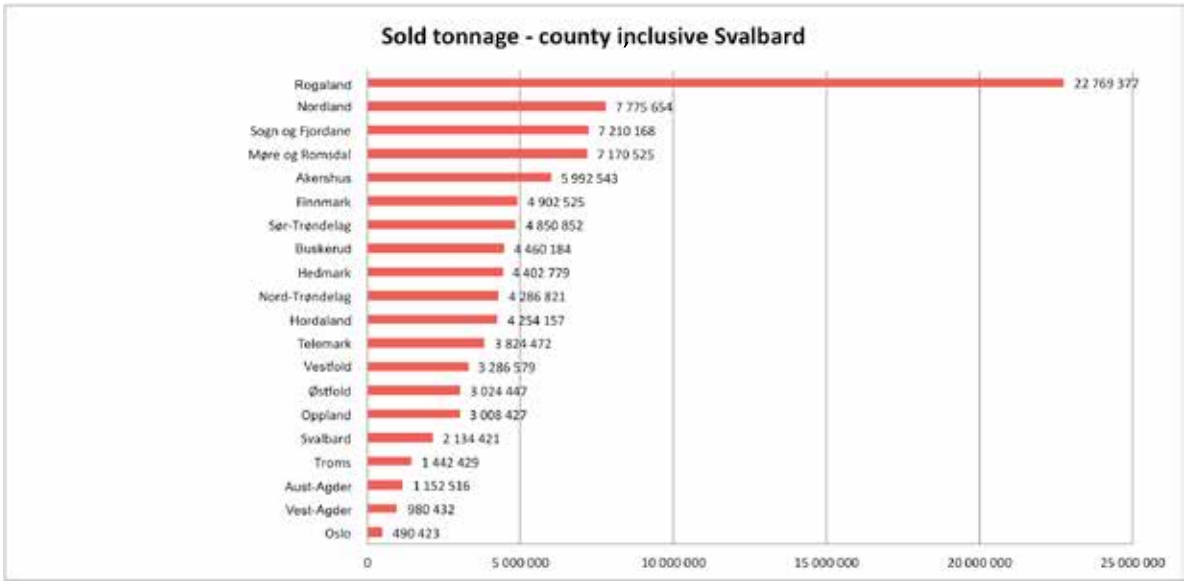
EMPLOYEES IN THE MINERAL INDUSTRY BY COUNTIES

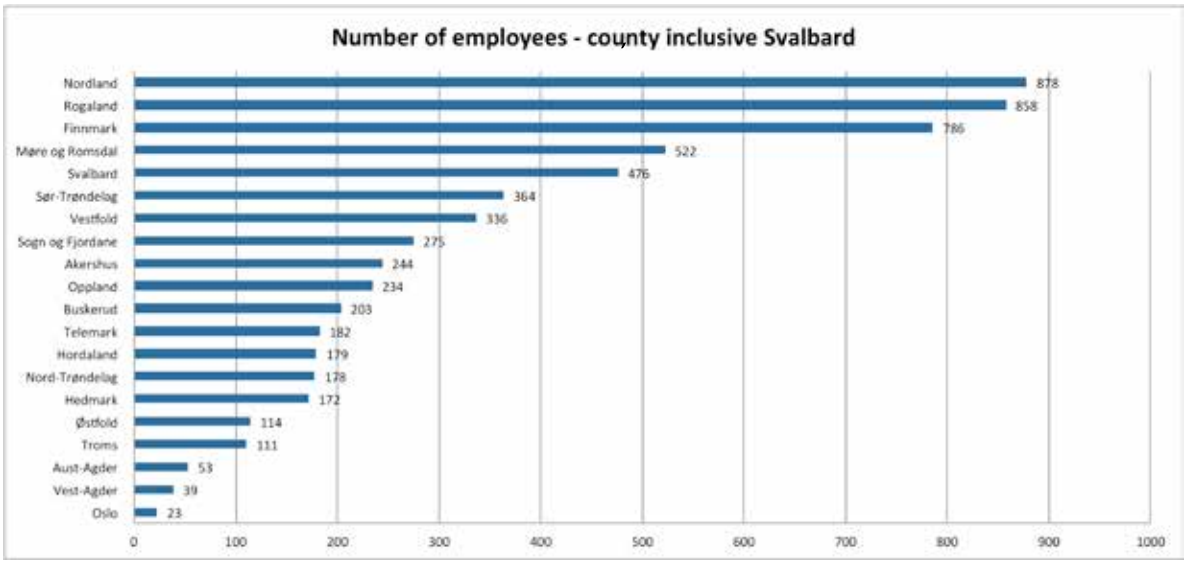
2013: 6226 employed,
and at Svalbard 426



Mineral production - county inclusive Svalbard







SALES:

97 million tonnes

TURNOVER:

NOK 13,000 million

EKSPORT VALUE:

NOK 7,600 million

NUMBER OF CONSTRUCTION PRODUCERS:

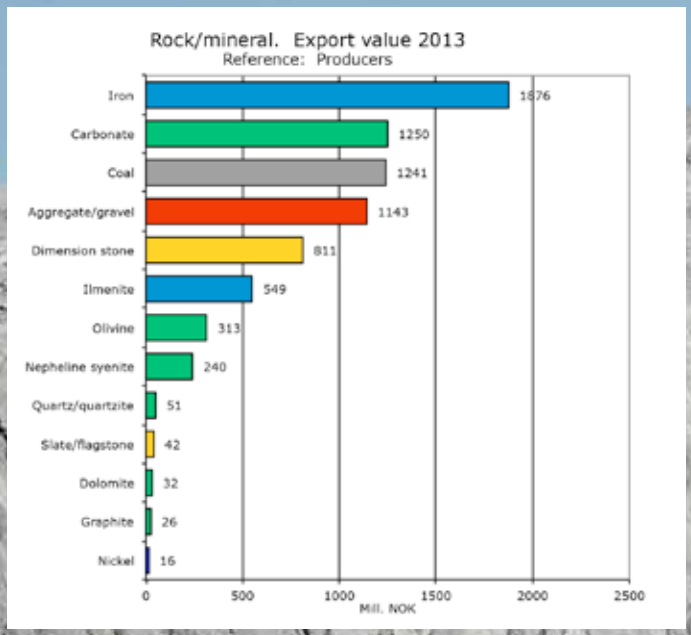
996

OTHER PRODUCERS:

173

NUMBER OF EMPLOYEES:

6226



Limestone production in Tromsdalen, Verdal municipality, Nord-Trøndelag
Photo: Verdalskalk AS

The Mining and Quarrying Industry in 2013

The mining and quarrying industry had, in 2013, a turnover of NOK 13,000 million and exports valued at NOK 7,600 million. A total of 97 million tonnes of mineral resources were sold, approximately the same tonnage as in 2012. Employment in the industry was 6,226 emplyees, at a total of 1,169 production sites, managed by 865 companies. Turnover of coal from Svalbard increased to NOK 1,300 million in 2013. Turnover of gravel and hard-rock aggregate and clay for the building industry was NOK 5,400 million in 2013.

Turnover of natural stone was NOK 1,100 million. Turnover of industrial minerals was NOK 2,400 million in 2013. Turnover of metallic ores was NOK 2,700 million in 2013.

The mining and quarrying industry is of great significance in outlying regions, with the highest turnovers in Rogaland, Møre og Romsdal, Finnmark, Svalbard, Nordland and Vestfold counties (except for Svalbard which has a special administrative status).

The total export value for the industry in 2013 was NOK 7,600 million, representing 58 % of the overall turnover. The export value for industrial minerals was NOK 1,900 million, of which calcium carbonate slurry, olivine, nepheline syenite and quartz/quartzite are the most important products. The natural stone industry exported stone blocks for NOK 811 million (of which NOK 771 million relates to larvikite), and slate/flagstone for NOK 42 million.

Exports of hard-rock aggregate, rock for ballast and gravel had a value of NOK 1,100 million, whereas exports of metallic ores (ilmenite, iron and nickel) amounted to NOK 2,400 million. Export of coal (to Europe) represented a value of NOK 1,200 million.

The mining and quarrying industry is a typical regional industry, especially strongly represented along the coast. The industry has reported staffing of 6,226 person-years at a total of 1,169 producing quarries/mines managed by 865 companies. Measured according to turnover, the most important mineral-producing counties are Rogaland, Møre og Romsdal, Finnmark, Svalbard, Nordland and Vestfold. Producing companies have reported exploration/mapping costs of NOK 91 million (Table 17). Foreign owned, and Norwegian companies not in production are not included in the table. The individual products are shown collectively and according to the producing county and individually in Tables 1 - 17.

Loading of limestone, Verdal Harbour
Photo: Verdalskalk AS

Industrial Minerals

Industrial minerals are minerals and rocks, which form a basis for industrial applications because of their non-metallic, chemical and/or physical properties.

Applications are numerous, and include many common products used in every-day life, such as paper, plastic, ceramics, glass and paint. The total turnover of industrial minerals in 2013 amounted to NOK 2,400 million, for a tonnage sold of 9.8 million tonnes. 818 persons were employed in this branch in 2013. Most of the production is exported. Calcium carbonate rock for cement, burnt lime, calcium-carbonate slurry, olivine, nepheline syenite and quartz are the most important products. According to the producers, the total export value amounted to NOK 1,900 million in 2013.

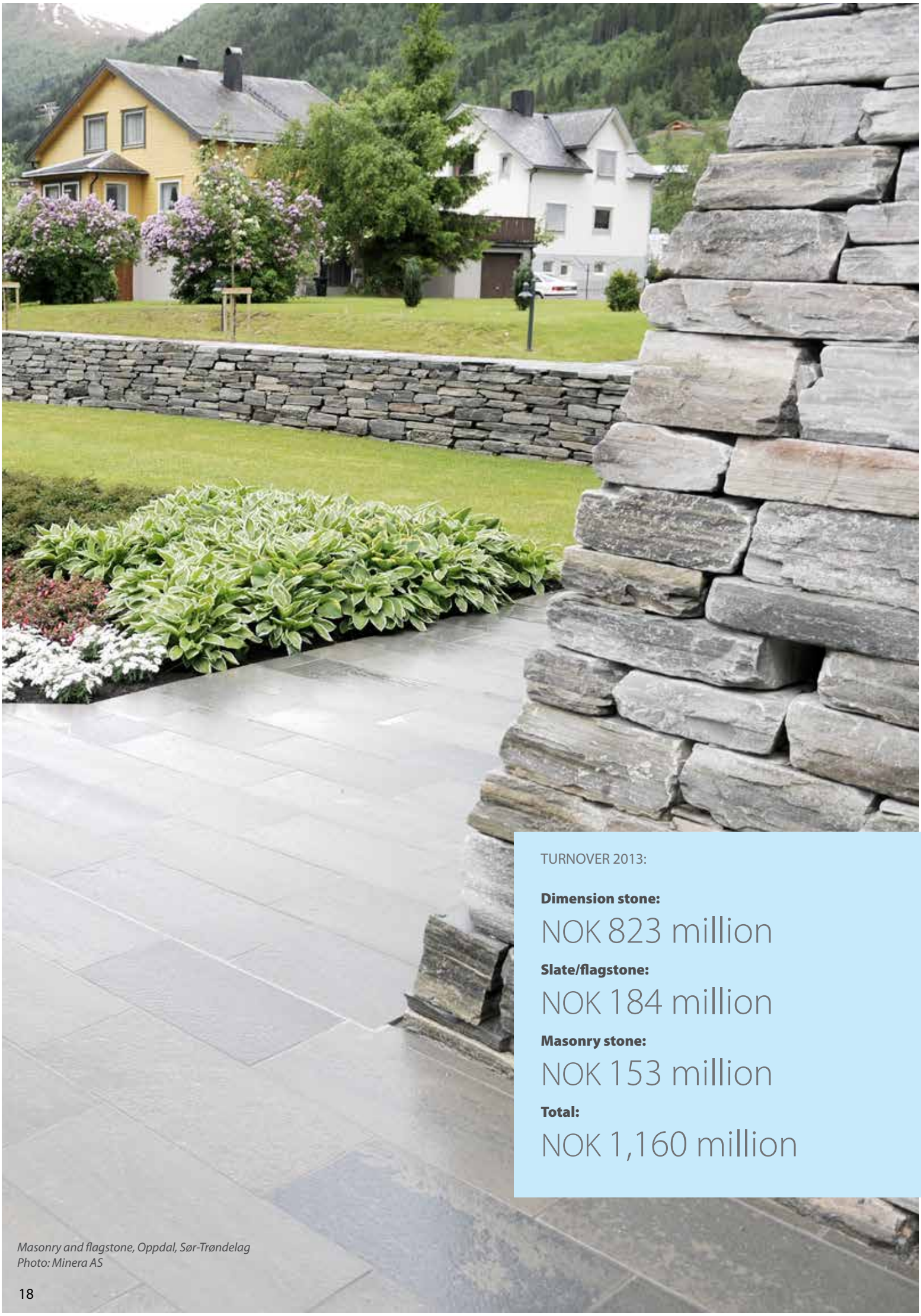
Norway is among the world's leading producers of olivine, nepheline syenite, high-purity quartz and titanium minerals. A total of 1.7 million tonnes of olivine were exported. Olivine is produced by Sibelco Nordic AS. The quarries at Raubergvika in Møre og Romsdal, and Bryggja in Sogn og Fjordane are not currently in production. Olivine serves as a flux in iron ore smelting, increasing production capacity in the smelting process. Olivine is also used in steel production to replace the magnesium carbonate mineral dolomite, thus strongly reducing CO^2 emissions. Olivine is also used to bind heavy metals in depots, eg Hjerkinn shooting range. Nepheline syenite is produced by Sibelco Nordic AS on Stjernøy in Alta municipality, and is mainly used in the glass and ceramics industries. The main owner of the company is UNIMIN/Sibelco, which has a large share of the world markets for quartz, feldspar, olivine, nepheline syenite and several other industrial minerals.

The Tellnes mine in Rogaland, owned by Kronos Worldwide, places Norway as Europe's largest and the world's 6th largest producer of titanium minerals. The main product is titanium dioxide pigment but parts of the ore are used to produce titanium slag and pig iron.

Fourteen companies produce calcite marble/limestone and 3 produce dolomite: they have altogether 436 employees.

Norway has become a major producer of calcium carbonate for fillers, with Brønnøy Kalk AS as the main supplier. The extracted carbonate rock is transported to Hustadmarmor AS in Møre where calcium carbonate slurry is produced. Most of the production is exported. Hustadmarmor is the world's largest producer of calcium carbonate slurry for the paper industry and is an important part of the Omya group. The data in the mineral overview include the turnover figure for calcium carbonate slurry. In addition, substantial amounts of carbonate rock are produced for other applications - cement production, burnt lime, environmental acid neutralization and ground marble/limestone for soil improvement: producers include Verdalskalk AS, Norcem AS -Heidelberg Cement Group, Visnes Kalk AS and Franzefoss Miljøkalk AS. The overall production value for these applications amounted to NOK 226 million in 2013. Regarding cement production and burnt lime, the value included is only that of the limestone/marble before burning. The value of the product increases with each stage of processing. A marble deposit at Kongsmoen in Flatanger municipality is expected to come into production within a few years.

Quartz and quartzite are produced by 5 companies, with 135 employees. In 2013, 1.4 million tonnes were sold, representing a value of NOK 183 million. Quartz is used as a raw material for the production of glass, ceramics and porcelain, and, in the metallurgical industry for a range of silicon-based products. High-purity quartz is used in semiconductor technology, quartz glass, solar cells and in the manufacture of fibre-optical cable. Elkem Salten is preparing to open a new quartz quarry near Nasa in Rana municipality. Norsk Mineral AS and the French company, Imerys, own The Quartz Corp, one of the world's two leading producers of natural high-purity quartz, based on techniques developed in Norway and pure sourses of quarts in Nordland, Finnmark og USA. The Quartz Corp AS plans to produce quartz at Svanvik in Sør-Varanger municipality, in addition to existing production in Hamarøy and Tysfjord municipalities. Talc has been quarried by Granitt og Kleber AS in Vågå municipality for further processing by Talkonor AS at Kvam in Gudbrandsdal. Production has now been closed. Graphite is produced by Skaland Graphite AS on the island of Senja, Western Europe's sole producer of high-quality flake graphite: the company is part of the LNS Group (Leonhard Nilsen & Sønner).



TURNOVER 2013:

Dimension stone:

NOK 823 million

Slate/flagstone:

NOK 184 million

Masonry stone:

NOK 153 million

Total:

NOK 1,160 million

Masonry and flagstone, Oppdal, Sør-Trøndelag
Photo: Minera AS

Dimension stone, slate/flagstone and masonry stone

Natural stone is defined as all stone that can be cut, split or hewn for use in buildings, in monuments and in recreational areas. Natural stone is further classified as dimension stone (granite, marble), slate/flagstone (schist, phyllite) and masonry stone (gneiss, granite and schist).

Photo: Minera AS

In 2013, the industry produced dimension stone representing a value of NOK 823 million, slate with a value of NOK 184 million and masonry stone with a value of NOK 153 million.

The industry provided employment for 675 people. The total export value of dimension stone amounted to NOK 811 million and the export value of slate was NOK 42 million. NOK 771 million of the export value for dimension stone was for larvikite. Larvikite, selected as Norway's national stone, is produced from several quarries in the vicinity of Larvik and dominates Norwegian dimension stone production.

Larvikite is a resource of unique quality, fetching high prices on the world market. There are now 5 producing companies, with 221 employees. Lundhs AS is the largest producer. Most of the production is exported as rough blocks to China, Italy, India, Spain, France,Taiwan and Belgium. New technology has made production more efficient, and the favourable location of the deposits, near the coast, adds to the profitability of the industry. Dimension stone is also produced from breccia in Sogn og Fjordane, anorthosite in Rogaland, granite in Nordland, Buskerud, Oslo, and Østfold, trondhjemite in Sør Trøndelag and a small tonnage of marble in the Fauske area in Nordland.

Slate/flagstone and masonry stone are produced from many different localities throughout the country. The producing companies numbered 74 for masonry stone and 32 for slate, with a total of 422 employees. The most important products for the industry are quartz schist from Alta and Oppdal and phyllite from Otta. All the material produced is processed near the quarries. 23 % of the production is exported.

Exports of larvikite are expected to increase, but slate producers now have harder competition. In recent years, the domestic market for dimension stone has become more competitive, and in particular import of stone from China has substituted much of the locally produced stone materials. In recent decades, the Norwegian stone industry has consolidated into fewer, larger units, especially within production of slate and larvikite. There are a lot of small construction firms that produce their own slate/flagstone and masonry stone. Producing companies have reported exploration/mapping costs of NOK 6 million (Table 17).

Offshore aggregate
Bruhagen quarry, Averøy municipality,
Photo : Jan Egil Nordgård. Gunnar Holt Kristiansund AS

TURNOVER 2013:

Hard-rock aggregates:

NOK 4.400 million

Sand/gravel:

NOK 925 million

Clay:

NOK 4 million

Gravel, hard-rock aggregate and clay

Hard-rock aggregate and gravel are used in building and construction. The resources are extracted from bedrock by blasting or from natural sand and gravel deposits. The material is crushed and sorted to the most appropriate size for use in buildings, roads and other constructions.

It can no longer be claimed that Norway has unlimited resourses of gravel and rock for crushing. Information on the deposits of gravel and rock for crushing is of major importance for area development planning. Areas with suitable deposits are frequently allocated to other purposes than material extraction in municipal land-use plans. It is essential that authorities have information about these deposits so that all aspects can be considered in the planning process. NGU's on-line Gravel, Aggregate and Stone-tip Database has proved to be very useful for this purpose.

Hard-rock aggregate can be used for the same building and construction applications as natural sand and gravel, but is more expensive due to the cost of blasting and crushing, and the additional energy needed. Nevertheless, consumption of hard-rock aggregate for such applications is increasing. This can partly be attributed to local scarcity of sand and gravel, but is also due to more demanding quality specifications, that cannot always be met by natural gravel.

Annual consumption of hard-rock aggregate and gravel per capita in Norway is currently 12 tonnes. To minimize transport costs, most sand/gravel and hard-rock aggregate production is local, near the place where the products are to be used. Of the total production, approximately half is used for road construction and 1/3 for concrete aggregate. The remainder is used as rock fill at construction sites, as well as rock fill and cover for sub-sea pipelines on the Norwegian continental shelf. NGU has mapped about 8,960 sand and gravel deposits, and 1,854 deposits for extraction of hard-rock aggregate: see NGU's Gravel, Aggregate and Stone-tip database is located at www.ngu.no/grusogpukk.

Reports have been received from 461 gravel producers and 531 hard-rock aggregate producers. The production value of gravel and hard-rock aggregate in 2013 was NOK 5,400 million, based on sale of 80.4 million tonnes. The industry employed about 2,976 persons, in 996 operations of widely ranging size.

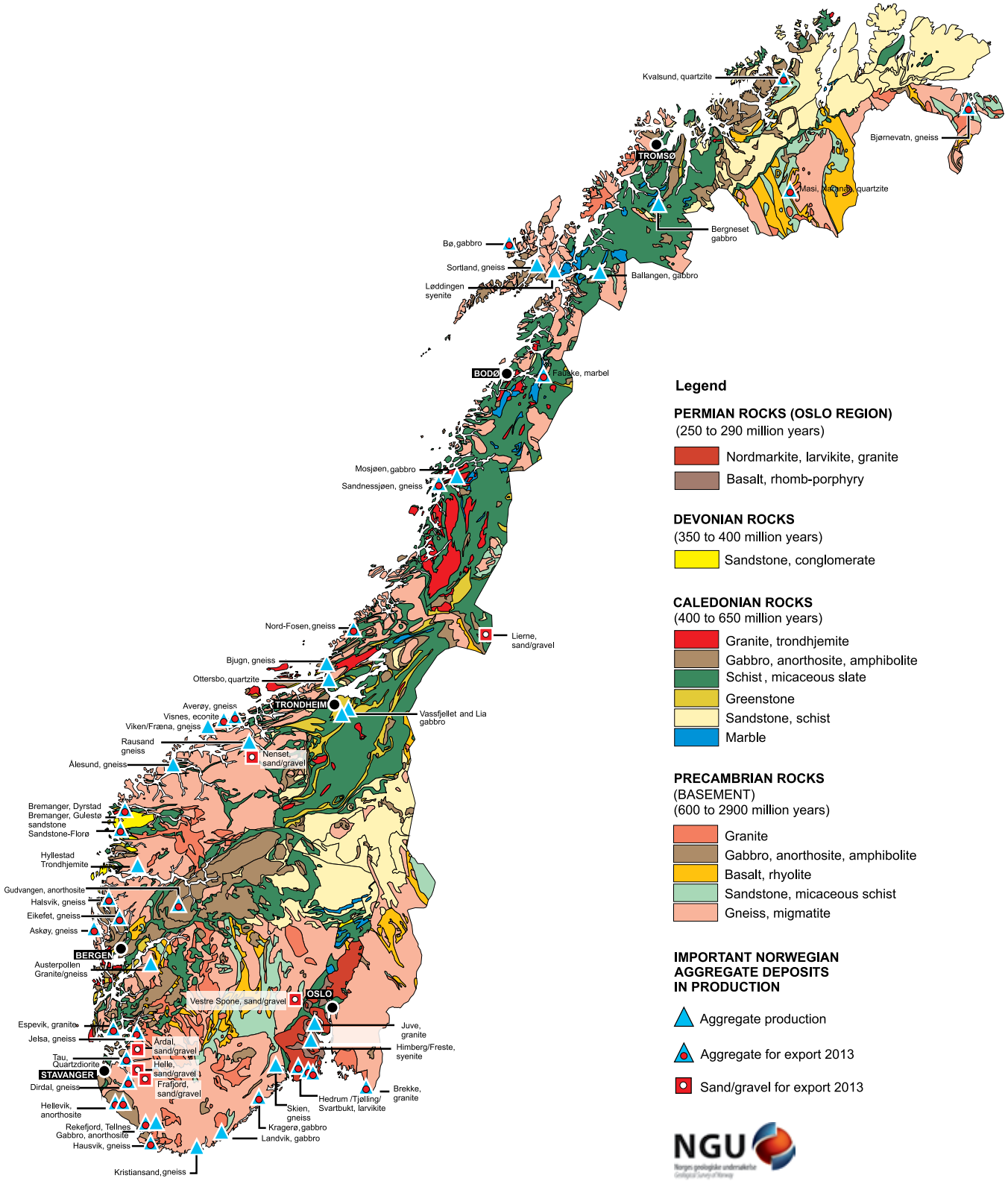
About 66 million tonnes of hard-rock aggregate were sold, with a total value of NOK 4,400 million. Sales of sand and gravel were 14 million tonnes representing a value of NOK 925 million, mostly for concrete and road construction (see Tables 12 and 13). Altogether, 26 % by volume of hard-rock aggregate production is exported, for use in road construction, asphalt, concrete and offshore applications. Exports to Europe have increased to 21.1 million tonnes in the last two years (22.6 million tonnes of hard-rock aggregate in 2012), with a combined value of NOK 1,100 million. The most important export destinations were Germany, Denmark, the Netherlands, the United Kingdom, Russia, Poland and the Baltic countries. In addition, another 5.7 million tonnes of hard-rock aggregate was produced for use on the Norwegian, British, Dutch and Russian continental shelf areas.

There are about 165 significant producers of gravel and hard-rock aggregate in Norway, with tonnages varying from 100,000 to 8.6 million tonnes annually. Of these 38 produce gravel and 127 produce hard-rock aggregate. The largest of these are located in southern Norway, including Feiring Bruk AS, Franzefoss Pukk AS, Lemminkaainen Industri AS, NorStone AS, Norsk Stein AS, NCC Roads Norge AS, Veidekke AS, Yeoman-Halsvik AS, Bremanger Quarry AS and Oster Grus og Sand AS. Sales included 1.8 million tonnes of recirculated asphalt, concrete and gravel/hard-rock aggregate (see Table 16). Gravel and aggregate are transported by trucks and by ship, with average transport distances for inland trade of 21 km for sand and gravel and 17 km for hard-rock aggregate. Producing companies have reported exploration/mapping costs for hard-rock aggregate and gravel of NOK 35 million (see Table 17).

Clay is used for the production of light-weight prefabricated building blocks, branded Leca: clay is quarried by Weber Leca Rælingen in Enebakk municipality, exclusively for the company plant at Rælingen in Akershus. Near Bratsberg in Bø,Telemark, clay is produced by Wieneberger AS for production of building bricks. The total value of the 177,000 tonnes of clay produced, before burning and processing, amounts to ca. NOK 4 million. The companies had 74 employees. Gravel, aggregate and clay production and transport data are compiled in Tables 1 to 17, according to product-type and county.

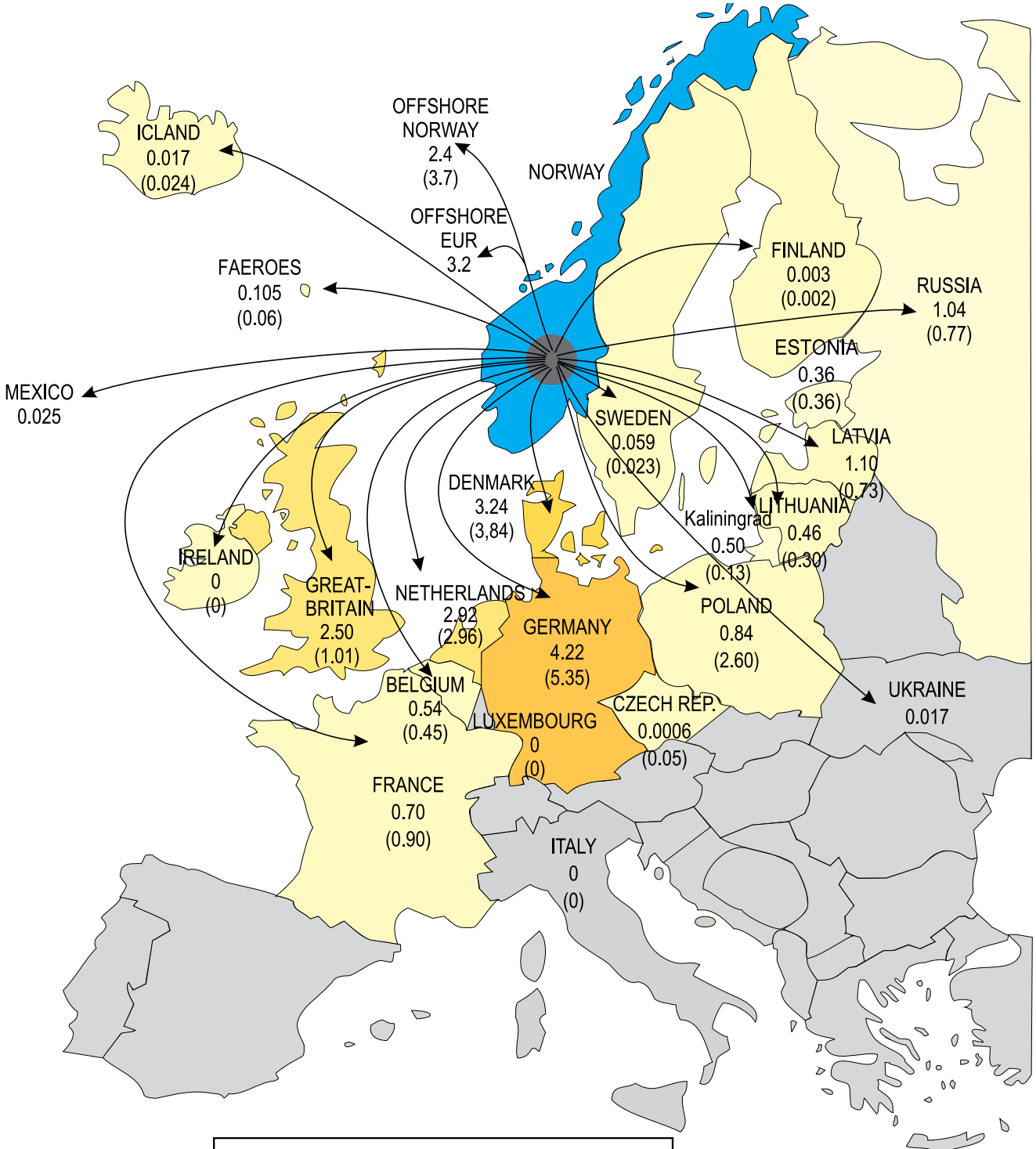
Bedrock map of Norway

with important aggregate deposits



Norwegian aggregate exported in 2013

Total production exported 21.1 mill. tonnes aggregate, armourstone, sand and gravel, plus 5.6 mill. tonnes aggregate for offshore use. Exportproduction values for 2012 i parentheses



Aggregate/armourstone 21 mill. tonnes
Sand/gravel 0.08 mill. tonnes
Ekport value 1170 mill. NOK/154 mill. EUR
Offshoreaggregate 5.6 mill. tonnes
Reference: Producers - NGU

Processing, hematite.
Photo: Rana Gruber AS

Iron pigment utilised
Photo: Rana Gruber AS

Iron ore transport, Ørtefjellmoen
Photo: Tor Arne Sandnes, SeNor

METALLIC ORES

Metallic ores are rocks that contain metal-bearing minerals in such a quantity that the metals can be extracted economically. Certain types of metallic ore, defined as ore in the Minerals Act, are also used as industrial minerals (pigment).

The total production value for metallic ores was NOK 2,700 million in 2013.The export value was NOK 2,400 million. 4.2 million tonnes of ore concentrate were sold. The industry had 1,245 employees in 2013. Three major metal mines are now in production. Sydvaranger Gruve AS and Rana Gruber AS produce iron and Titania AS produces iron and titanium slag as secondary products (see below).

Titania AS in Sokndal in Rogaland is Europe's most important producer of ilmenite (iron-titanium oxide) which, after further refining to titanium dioxide, is used as white pigment in paints, plastics and paper; some nickel concentrate is produced from the same deposit as well as titanium slag and pig iron. Norway has very large resources of titanium minerals. The rutile deposit at Engebøfjell in Naustdal municipality is among the world's largest. Nordic Mining AS is in the final stages of processing of a planning permit and of their application for a permit for tailings deposition, with the aim of establishing production of rutile and garnet.

TURNOVER 2013:

NOK 2,700 million

Sydvaranger Gruve AS exports iron-ore concentrate to the European market and to China. The company is owned by Northern Iron Ltd., which is 20% Norwegian owned but which is listed in Australia (on the Perth stock exchange). Rana Gruber AS in Nordland, which is owned by the LNS Group, produces, in addition to iron ore concentrate, speciality products requiring substantial processing, as well as traditional metallurgical products. Knaben Molybden AS has had a limited sale from the Knaben deposit in Vest-Agder county.

Nussir AS, Kvalsund municipality in Finnmark, has plans for noble metal production on copper. The focus of prospecting in Norway in recent years has been mainly on base metal and iron mineralizations in the Caledonides and on copper and gold mineralizations in Finnmark county. There has been significant interest in exploration for rare earth elements and other special metals, not least in the Fen intrusive in Telemark county.

Producing companies have reported exploration/mapping costs of NOK 19 million (Table 17). Foreign owned, and Norwegian companies not in production are not included in the table.

Energy Minerals, Peat and Coal

Energy minerals comprise all mineral compounds that release heat upon combustion, including oil, gas, coal, oil shale and peat.

Peat

Peat, in the sense of peat for fuel, is a humus- and carbon-rich substance formed under the water table in bogs all over Europe and was used extensively as a source of fuel throughout the Middle Ages. Peat formed in the period after the last Ice Age, c. 10,000 - 1,000 years ago. Production in Norway is now quite modest and is mainly used for soil improvement in market and private gardens. Production is restricted to so-called white moss bogs. Ten producers have submitted reports: these are located in Østfold, Akershus, Hedmark, Vestfold, Nord Trøndelag, Nordland and Finnmark counties. The total production of these producers in 2013 was 98,000 tonnes, with a value of NOK 53 million. The industry employed 37 persons.

Coal

Coal accounts for 30.3% of global primary energy production and the generation of 42% of the world's electricity.

Coal was the source of energy which had the highest growth rate in 2013, except for the renewable sources. Coal's share of global primary energy rose to 30.3%, the highest share since 1969.

There are two internationally recognized methods for determination of global coal reserves. The first is used by the Federal Institute for Geosciences and Natural Resources (BGR) of Germany and is used by the International Energy Agency (IEA) as its main source regarding coal reserves. The other is issued by the World Energy Council (WEC) and is used by British Petroleum (BP) in the company's overview of the global energy situation.

Global reserves, according to BGR, are 1,040 million tonnes of coal, which, at current consumption rates, correspond to 132 years of supply. Coal reserves reported by WEC are lower 861,000 million, which corresponds to 109 years supply (World Coal Association).

Economically mineable coal deposits have been found in c. 70 countries. Application of new technology leads to cleaner combustion. The reduction in the price of coal on the world market from 2011 to 2013 is due to a combination of the effects of the global economic recession and the transition to use of new energy sources, especially shale gas. Globally, coal consumption is still very important, especially in China, where c. 120 coal-fired power stations are being constructed. China, USA, India and several countries in Africa have large reserves of coal.

Interest for coal production on Svalbard developed towards the end of the 19th century. There has been coal production on Svalbard with export to Norway and other countries since 1906, only interrupted by WWII. A total of c. 78 million tonnes have been produced since regular production began. C. 2/3 of the production has been from the Norwegian mines.

Two companies currently mine coal on Svalbard, Store Norske Spitsbergen Grubekompani AS (SNSG) has Gruve 7 in operation near Longyearbyen, and Svea Nord near the Svea Mine, and the Russian company,Trust Artikugol has a mine at Barentsburg, which was reopened for sale of coal in 2011. Svea Nord was opened in 2001 and had a sold production of 2.1 million tonnes in 2013, with a value of NOK 1.3 million. 476 persons were employed, including the staff of subcontractors.

The coal is shipped from the harbour at Cape Amsterdam, near Svea, using ships of 50,000 t (Handymax) and 82,000 t (Panamax). Important destinations include Rotterdam and Esbjerg. C. 85% of the Svalbard coal is used for energy production, 6% goes to the metallurgical industry and the remainder is used for cement production and other industries. SNSG exports coal to Germany, the Netherlands, Denmark, France, Turkey, Poland, and the United Kingdom: a minor tonnage produced at Gruve 7 fires the power station at Longyearbyen.

SNSG is continually searching for new mineable coal deposits, both at Svea and close to Adventdalen. Lunckefjell, northeast of Svea Nord, contains 8.4 million tonnes: development work will proceed through 2014 with full production planned for 2015 by which time the core area at Svea Nord will, according to current production plans, be exhausted.

Resources and reserves, in addition to those at Lunckefjell, include Svea Øst, Svea Nord rim zone, and Ispallen, all of which are planned to exploited using the infrastructure at Svea. The current production profile will allow Store Norske to produce coal up to 2030. Gruve 7, near Longyearbyen, has reserves for more than 20 year's production : the company is mapping future resources on Operafjell.

The company has reported exploration/mapping costs of NOK 20 million (Table 17).

Processingplant in Svea, Svalbard
Photo: Olav Grave, AF.

Management Tasks

The current Minerals Act came into application on 1st January, 2010. It has involved numerous changes in terminology and tasks, including the change in name from Mines Inspectorate to Directorate of Mining with Commissioner of Mines at Svalbard (DMF).

Claims according to the Minerals Act

The state is, according to the Minerals Act (which is based on older laws), the owner of all metals with a specific gravity higher than 5 g/cm3, and any minerals containing these metals, as well as titanium and arsenic and minerals containing these metals. It is not sufficient that the minerals contain only traces of the metal owned by the state. The element sulphur is, in addition to the above-mentioned minerals, the property of the state when it occurs as pyrite or pyrrhotite. Sulphur, in other forms, is owned by the ground owner. All other metals and minerals are the property of the ground owner. This includes both alluvial gold and bog iron ore. State ownership of various minerals is common throughout continental Europe. The online portal www.prospecting.no, a cooperative service provided by the Directorate of Mining and the Geological Survey of Norway (NGU), shows new, allocated permits and maintained permits, but not applications which are being processed and which may have seniority in the areas concerned (priority). The overview of approved permits is updated weekly.

Exploration permit

The term "claim" was replaced by "exploration permit", with the advent of the Minerals Act. An exploration permit for the state's minerals gives entitlement to exploration within a defined area and not as a right related to a defined deposit. The permit holder has a right to explore for, and to apply for an extraction permit for all the deposits of the state's minerals within the permit area. The maximum area of an exploration permit is 10 km². No side may be shorter than 1 km² and the boundaries must be parallel with the grid lines of the map in the UTM system. The minimum area of an exploration permit is 1 km². DMF may approve exceptions to this rule in special cases. Application may be made and acquisition approved, for an unlimited number of continuous areas. The interest for new claims decreased considerably in 2013. 171 new exploration permit applications were submitted, as against 1,740 in 2012. The areas covered were 1,763 km² and 15,559 km² respectively.

Extraction permit

An individual or company holding the exploration permit with the highest priority has the sole right to apply for an extraction permit, according to the Minerals Act § 29. The applicant must, in order to be awarded an extraction permit, document the finding of a deposit of the state's minerals, which is or may be, within a foreseeable period of time, economically viable.

The applicant must, in order to give a credible justification of the deposit's economic viability, provide documentation of the extent, geometry, content of valuable components (grades) of, and a viable mineralprosessing plan for the deposit. The extraction permit shall not have a greater extent than the deposit. The extraction area is granted and defined by the Directorate of Mining. An individual extraction area permit cannot exceed 1 km². The applicant may be awarded the number of extraction permits necessary to cover the deposit. The extraction area shall not have more than four corners. No extraction permits were allocated in 2013.

Pilot extraction

The Minerals Act stipulates that a permit is required for pilot extraction of both the state's and the ground owner's minerals. Such permits are granted by the DMF. Two such permits have been considered and granted in 2013.

Ground owners' minerals

Exploration or extraction of a ground owner's minerals may be carried out by the ground owner or by others who claim an agreement with the ground owner. Ground owners' minerals can, in effect, be divided into building materials (hard-rock aggregate, gravel, sand and clay), industrial minerals and natural stone. Exploitation of ground owners' minerals is regulated by the Minerals Act, as is the case for the state's minerals.

Operating license

The Minerals Act requires the granting of an operating license for total extraction of volumes in excess of 10,000 m³ of material. The license must be granted by the Directorate of Mining prior to commencement of the operation. The limit of 10,000 m³ of material does not apply to extraction of natural stone, which means that a license is required for any extraction of natural stone, regardless of the volume. An operating license can be granted only to the holder of an extraction permit. This applies to both the state's and the ground owner's minerals. The Directorate of Mining may determine conditions related to the license. Consideration of the granting of a license must include emphasis on the applicant's qualifications in relation to exploitation of the deposit. Granting of the concession must always include definition of the area to which it applies. DMF received 55 (44) applications for operating licenses in 2013. Thirty-one (27) applications were granted in the course of the year. The figures in parentheses relate to applications in 2012.

Ørtfjell
Photo: Rana Gruber AS

Sydvaranger Gruve AS
Photo: Rolv Dahl

Mineral deposits of national significance

NGU has prepared an overview of mineral resources of national significance. The criteria for classification of these resources as such are currently being revised and will be applied in the future, as of the next Mineral Resources in Norway 2014. Most of these resources are also of importance as sources of exports to Europe and the rest of the world.

Examples of such deposits in operation include nepheline syenite on Stjernøy in Finnmark, marble from Brønnøy in Nordland, graphite on Senja in Troms, larvikite from Larvik, ilmenite from Tellnes in Rogaland and gneiss for aggregate production from Jelsa in Rogaland.

The main criteria for selection of these deposits at present include:

- Mineral deposits with a confirmed or probable major potential for value generation in the future.
- Mineral deposits with unique properties which are of particular interest for the processing industry.
- Large deposits which have unique properties as building materials.
- Deposits of strategically important or "critical" raw materials.
- Deposits which are very important for Norway's national infrastructure.

Mineral deposits of national importance are very valuable (see page 33). It is thus of great importance for society that important mineral deposits are given satisfactory consideration in municipal plans. The manner in which this should be done will vary from deposit to deposit. Criteria have also been developed for deposits of regional and local importance.

NGU revises its overviews in its mineral databases as needed, in order to demonstrate the importance and value-creation potential of the deposits.

NGU's overview should contribute to a sound, long-term management of mineral resources at national, county and municipal levels. The Plan- and Building Law will still be the law which applies to land use in a specific area, i. e. to permits relating to use of mineral resources. There is still a need for mapping of new deposits.

A municipal plan shall, according to the Plan- and Building Law § 11-1, pay appropriate attention to municipal, regional and national goals in the municipality. Aims for land use shall be shown in the municipal plan's land-use section. Extraction of raw materials, e.g. sand, gravel and hard-rock aggregate, is one of the land-use objectives mentioned in the section on Buildings and installations (§ 11-7).

In accordance with § 6-1 of the Plan- and Building Law a Royal resolution has been approved concerning national expectations as regards regional and municipal planning (24.06.11). The following is stated in the section on Value creation and business development:
"The government expects that the planning process gives attention to mineral resources of national and regional importance so that these can be treated in a manner which does not limit future value creation."

The Directorate of Mining (DMF) has, according to the Minerals Act, the task of promoting and securing a, for society, acceptable management and use of mineral resources/building materials. NGU shall classify the deposits according to their importance and DMF has responsibility for resource management assessments. The Directorate is entitled to express an opinion in planning processes, according to the Plan- and Building law. It refers municipalities to NGU's Gravel and Aggregate database and other mineral database in relation to municipal plans. The municipalities are made aware of areas containing important deposits, which should be made available for exploitation.

Sydvaranger Gruve AS
Foto: Rolv Dahl

The value of mineral deposits of national importance in Norway

Norway has major deposits of mineral resources which, i.a. can contribute to Europe's supplies. Norway is already an important supplier of several resources to the European and other markets.

Examples include titanium minerals, iron ore, coal, ground marble, high-purity quartz, nepheline syenite, olivine, graphite, hard-rock aggregate and natural stone. Norway is also Europe's most important producer of aluminium, ferro-alloys, mineral fertiliser, manganese alloys and nickel metal, mainly based on processing of imported mineral raw materials.

NGU has calculated that known, investigated deposits of metallic mineral resources in Norway, using prices as of April 2012, have a value of c. NOK 1,400,000 million. Deposits of industrial minerals, hard-rock aggregate, gravel, coal and natural stone have been calculated to add approximately a further NOK 1,100,000 million, giving a total of NOK 2,500,000 million. Geological and production-related factors, labour and other costs related to their extraction will govern how much of the "in situ" value can actually be realised. Increased mapping and new discoveries will increase the estimates. Market prices and production costs related to extraction will determine the extent to which the resources can form a basis for profitable mineral operations.

MINERALS	"IN SITU" VALUE **NOK million**
CONSTRUCTION MATERIALS	467,000
NATURAL STONE	250,000
INDUSTRIAL MINERALS	400,000
COAL	23,000
METALLIC ORES	1388,000
TOTAL	2528,000

The value of mineral deposits of national importance in Norway, prices April 2012.

Industrial mineral deposits

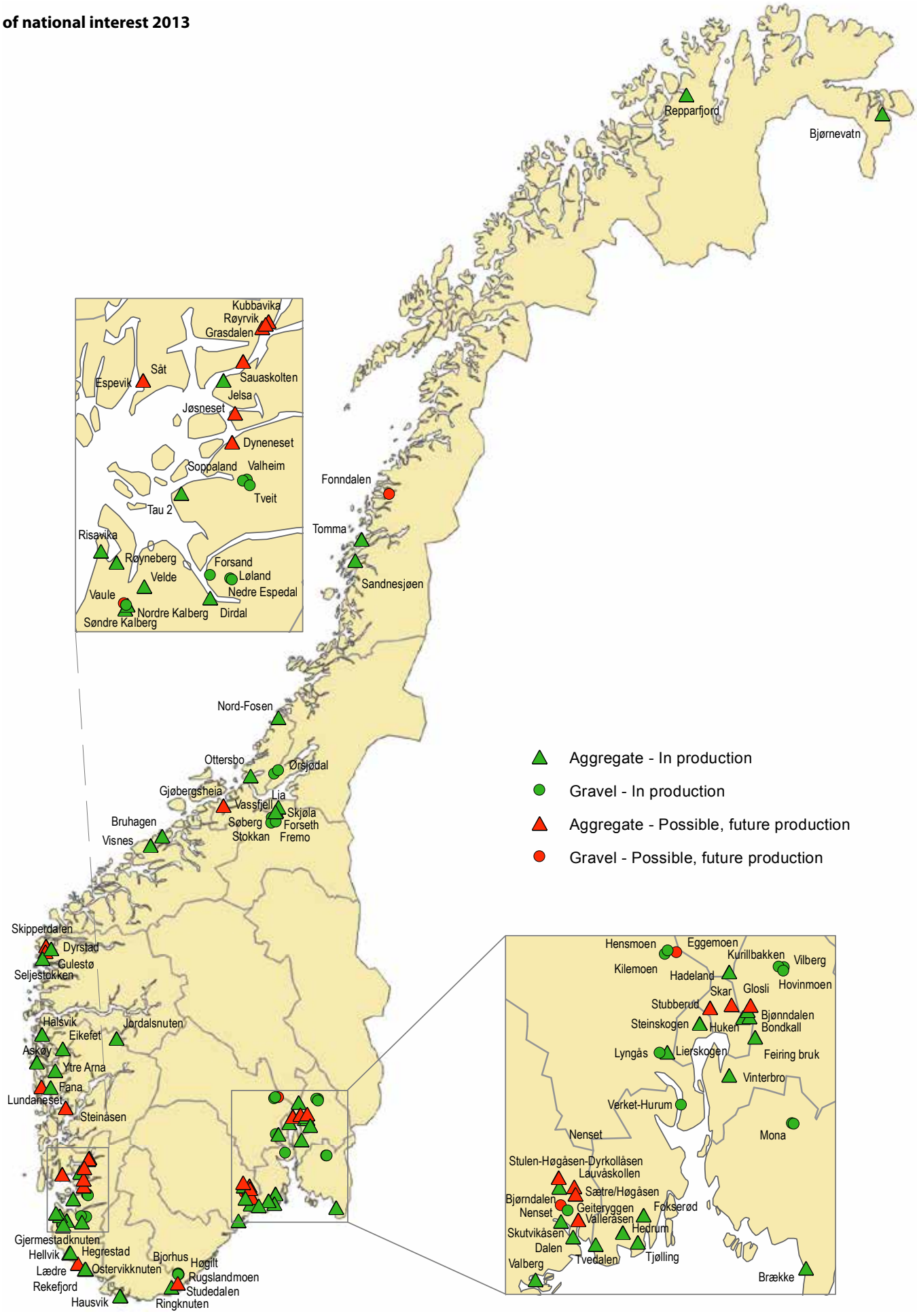
of national interest 2013

Natural stone deposits

of national interest 2013

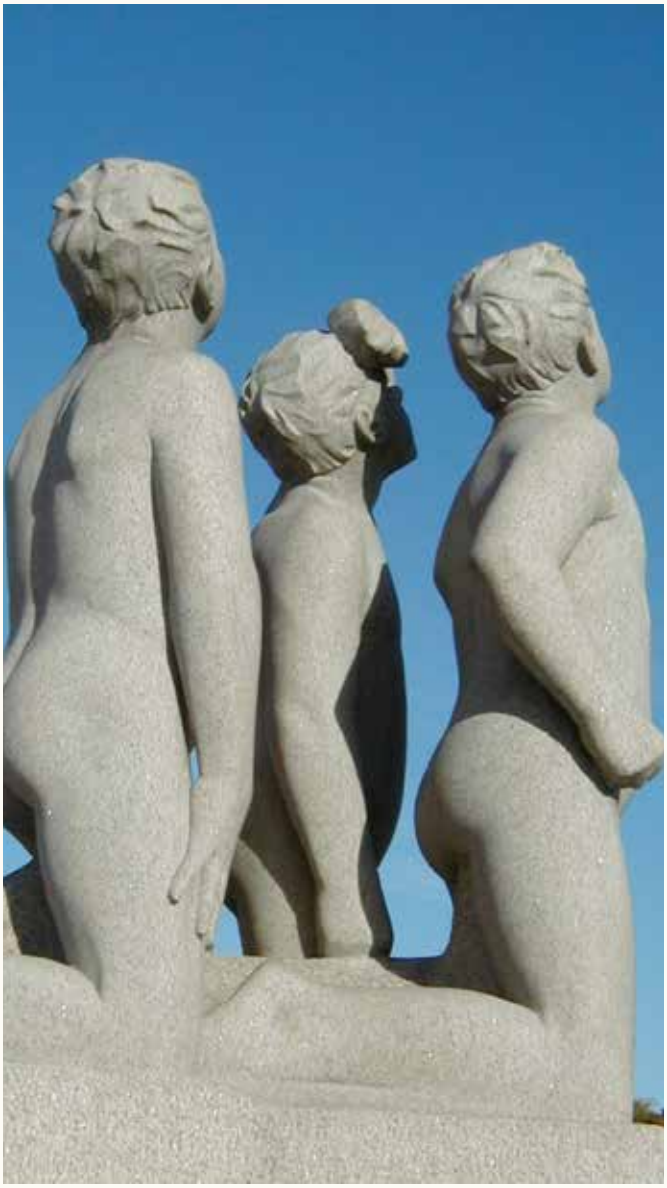
Sand, gravel and hard rock aggregates

of national interest 2013



Metallic ore deposits

of national interest 2013



Iddefjord granite, Vigeland park
Photo: Peer-Richard Neeb.

Challenges for the future

Norway has a varied geology, offering great potential for mineral production. The long coastline, and proximity to the European market are important competitive advantages. Norway is a considerable mineral producer by European standards and will probably become even more important.
Norway itself has a high consumption of mineral products - 13 tonnes/inhabitant in 2013, and the mining and quarrying industries are responsible for important value creation, with major spin-off contributions, in the regions of Norway.

Data has been collected from all registered producers operating in 2013 showing that they have had exploration/mapping costs of NOK 91 million in their search for new resources of all types of mineral raw materials (Table 17) (NOK 85 million in 2012). NGU has used an additional NOK 51 million in its mineral resource mapping programmes in South- and North Norway in 2013. Foreign-owned and Norwegian companies not in production are not included in the table.

Strong economic growth in Asia over time, especially in the World's two most heavily populated nations, China and India, has led to shortages and high prices for many natural resources. The recession led to a major reduction in exploration activity in 2009 but the rise in resource prices in 2010/2011 led to a siginificant increase in exploration by both Norwegian and foreign companies. Recent years' focus on shortages of certain types of resource has led to an increase in the need for geoscientific knowledge, relating to the location of economic mineral deposits and the processes

leading to their formation. NGU will contribute to the exploration and development of new mineral resources for the future. The Directorate of Mining/ NGU portal www.prospecting.no is a tool for companies in their assessment of new, potential exploration areas for metallic ores, industrial minerals and natural stone.

Norway is known for many types of mineral resource: ores of the metals titanium, iron, nickel, copper, molybdenum, the industrial minerals olivine, high-purity quartz, graphite and ground marble, the natural stones larvikite and anorthosite with colourful Schiller effect and Devonian sandstone, gneisses and white anorthosite and for use as hard-rock aggregate. These resources are important for Europe. Norway has a potential for several types of mineral resource and new deposits. Innovative technological research on the use of these raw materials, for example in combination with natural gas, could provide a basis for new domestic processing industries. The mineral and mining industry faces some major challenges, including:

- **Exploration and development of future mineral deposits.**
- **Increased research efforts in all areas - from understanding of the deposits, via processing of the products to utilisation/ deposition of tailings.**
- **Competition for skilled employees.**
- **Securing the availability of future mineral deposits in planning processes for area development.**
- **Continuing efforts to minimize environmental impacts.**

Quality standards for mineral products are continually being heightened. Producers can either raise the quality of their products by process improvements or by finding new deposits with a higher natural quality. These developments require higher expertise in both producing companies and research institutions.

Extraction of minerals commonly leads to land-use conflicts. Mining companies must, however, locate at the site of the deposits and cannot move elsewhere. The mineral industry uses a very minor land area on a national scale. Information from producers shows that mines/quarries and associated buildings represented only 0.03 % of Norway's land area in the last year (Table 17). Most of this area is related to extraction of metallic ores, gravel and hard-rock aggregate.

It could be considered that society has had too little focus on important aspects of management of mineral resources. This is clear when we compare public management of mineral resources with the efforts made in relation to other types of natural resource or sectors, including land-use, forestry, agriculture and nature reserves. While there is extensive land management consideration in relation to these types of resources and the areas where they occur, mineral resources are typically omitted from area development plans, despite the tremendous value they may represent. This is yet another reason for mapping currently known deposits as well as areas with a potential for new deposits in greater detail. Two companies are currently planning new operations, Nussir ASA in Kvalsund municipality and Nordic Mining ASA in Naustdal municipality, but both are dependent on deposition of tailings to fjords and have applied for waste-deposition permits. The Government is following this issue and has stated: "The Government will create positive conditions for the mining industry in Norway. The Sundvolden platform states that the mineral industry may deposit tailings in the sea, but that it will require rigorous standards and dependable environmental monitoring. This presumes that alternative solutions for tailings disposal do not give a better solution.

The European Union has focussed on the need for securing a sustainable supply of the mineral resources needed by industry, using, among other instruments, a strategic research plan for exploration, production and environmental challenges. New basic data must be collected and existing information presented in a better manner. Mineral statistics from Norway are reported to the EU annually, also, preferably, including all prospecting costs. A long-term European raw materials strategy will also include the potential found in Norway. It is therefore highly appropriate that a new Mineral Act came into effect in 2010 and that the previous government issued its Mineral Strategy for Norway in 2013. The new government, in its Sundvolden declaration, has associated itself with the main elements in the Mineral Strategy.

Possible future mineral resourses

of national interest 2013

INDUSTRIAL MINERALS

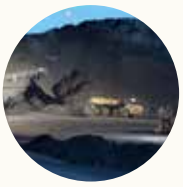
are minerals and rocks, which form a basis for industrial applications because of their non-metallic, chemical and/or physical properties. Exceptions are fossil fuels, water and gemstones. Applications are numerous, and include many common products used in every-day life, such as filler in paint, paper and plastic and as the major components in ceramics, glass and cement.

NATURAL STONE – DIMENSION STONE, SLATE/FLAGSTONE AND MASONRY STONE

is defined as all stone that can be cut, split or hewn for use in construction and monuments. Dimension stone is extracted from the bedrock as large, rectangular blocks, which are further divided by sawing or splitting to dimensioned slabs or blocks.

Slate is (in industrial terms) used for thin slabs of rocks split along natural foliations. Flagstone is defined as thicker slabs split along unevenly distributed foliation planes. In Norway, "slate/flagstone" production includes quarrying and processing of mica schist, quartz schist and phyllite.

Masonry (predominantly for drywalls) are roughly formatted stone blocks made from schist, gneiss and granite.



ENERGY MINERALS

are defined as minerals which can release energy on combustion. The coal deposits on Svalbard and peat from throughout Norway belong to this group. Coal is used in metallurgical processes and as an energy source in cement manufacture. Peat is also used in market gardening and in agriculture.

CONSTRUCTION MATERIALS – SAND, GRAVEL, HARD-ROCK AGGREGATE AND CLAY

Sand and gravel are used interchangeably as a common name for unconsolidated deposits for use in the building and construction industries. Geologically, these terms are defined according to grain size: sand – 0.06-2 mm, gravel – 2-64 mm and stones 64-256 mm. Hard-rock aggregate is crushed rock. The most commonly used rocks for this type of aggregate are gneiss, granite, quartzite, gabbro and syenite. Clay has grain sizes in the clay fraction - < 0.002 mm.

METALLIC ORES

is the term used to describe rocks which contain minerals with metals with a specific gravity higher than 5 g/cm³ in such a quantity that they can be exploited with profit. Norway has traditions for mining of metals back to the 1600s, with Røros (copper), Løkken (copper, zinc) and Kongsberg (silver) among the oldest and best known.

APPENDIX

TABLE 1: Mineral statistics 2013

			EXTRACTION TONNES			SALE/DELIVERED TONNES			SALES VALUE(FOB NOK)			No. of empl.
Product	No. of producers	No. of firms	Production	Waste rock	Total	Domistic	Export	Total	Domistic	Export	Total	Total
CONSTRUCTION MATERIAL												
Sand/gravel	461	409	14 079 715	68 749	14 148 463	13 918 758	65 465	13 984 223	920 513 373	4 546 929	925 060 302	730
Hard-rock aggregate	531	454	65 175 499	1 579 169	66 754 668	45 240 252	21 018 317	66 258 569	3 309 922 470	1 138 784 011	4 448 706 481	2172
Clay	4	4	177 208	0	177 208	177 208	0	177 208	3 866 148	0	3 866 148	74
Total	996	867	79 432 422	1 647 918	81 080 339	59 336 218	21 083 782	80 420 000	4 234 301 991	1 143 330 940	5 377 632 931	2976
No. of firms: 788												
DIMENSION STONE												
Larvikite	10	5	198 423	2 323 676	2 522 099	1 525	202 671	204 196	3 424 120	771 294 711	774 718 831	221
Granite	8	7	16 596	9 168	25 765	5 255	1 400	6 655	8 037 347	3 700 000	11 737 347	14
Gneises	1	1	200	0	200	200	0	200	20 000	0	20 000	0
Marbel	2	2	237	0	237	20	217	237	84 000	311 000	395 000	5
Anortositt	2	2	12 100	168 000	180 100	18	11 430	11 448	90 000	36 128 000	36 218 000	13
Total	23	17	227 556	2 500 844	2 728 401	7 018	215 718	222 736	11 655 467	811 433 711	823 089 178	253
No. of firms: 17												
SLATE/FLAGSTONE/MASONRY STONE												
Slate/flagstone	32	30	137 385	341 759	479 143	82 569	17 193	99 762	142 030 912	41 608 270	183 639 182	259
Masonry stone	74	72	344 197	305 449	649 644	357 512	84	357 596	152 607 066	200 000	152 807 066	163
Total	106	102	481 582	647 208	1 128 787	440 081	17 277	457 358	294 637 978	41 808 270	336 446 248	422
No. of firms: 86												
INDUSTRIAL MINERALS												
Carbonate	15	14	5 603 410	1 478 432	7 081 842	5 566 142	136 420	5 702 562	337 473 380	1 249 927 714	1 587 401 094	383
Dolomite	3	2	679 946	56 852	736 798	358 765	302 424	661 189	41 410 894	32 136 573	73 547 467	53
Quartz/quartzite	5	5	1 392 465	53 000	1 445 465	1 230 544	220 000	1 450 544	131 626 000	51 000 000	182 626 000	136
Nepheline syenite	1	1	530 000	380 000	910 000	0	320 000	320 000	0	240 000 000	240 000 000	97
Olivine	2	1	1 657 972	123 000	1 780 972	0	1 702 000	1 702 000	0	313 300 000	313 300 000	116
Graphite	1	1	30 564	8 188	38 752	22	6 185	6 207	71 820	25 503 630	25 575 450	33
Total	27	24	9 894 357	2 099 472	11 993 829	7 155 473	2 687 029	9 842 502	510 582 094	1 911 867 917	2 422 450 011	818
No. of firms: 23												
METALLIC ORES												
Iron	3	3	9 549 232	16 367 455	25 916 687	1 000	3 408 269	3 409 269	3 200 000	1 876 421 807	1 879 621 807	968
Ilmenite	1	1	3 327 890	8 972 843	12 300 733	367 586	458 540	826 126	294 378 166	548 863 427	843 241 593	273
Nickel	1	1	34 075	91 876	125 952	0	8 459	8 459	0	16 372 883	16 372 883	3
Molybdenum	1	1	0	0	0	0	8	8	0	800 000	800 000	1
Total	6	6	12 911 197	25 432 174	38 343 372	368 586	3 875 276	4 243 862	297 578 166	2 442 458 117	2 740 036 283	1245
No. Of firms: 4												
ENERGY MINERALS												
Coal	2	1	1 854 883	0	1 854 883	66 899	2 067 522	2 134 421	32 000 000	1 241 000 000	1 273 000 000	476
Peat	10	10	67 928	35 604	103 532	98 852	0	98 852	52 664 502	0	52 664 502	37
Total	11	11	1 922 811	35 604	1 958 415	165 751	2 067 522	2 233 273	84 664 502	1 241 000 000	1 325 664 502	513
No of firms: 11												
Total	1169	1027	104 869 925	32 363 220	137 233 143	67 473 127	29 946 604	97 419 731	5 433 420 198	7 591 898 955	13 025 319 153	6226
No. of firms total: 865												

TABLE 2: Production value sold NOK 2013 - county inclusive Svalbard

COUNTY/REGION	Construction material	Natural stone	Industrial minerals	Ores	Energy minerals	Total
01 Østfold	229 184 895	4 105 000			5 722 600	239 012 495
02 Akershus	471 597 802					471 597 802
03 Oslo	58 374 000	400 000				58 774 000
04 Hedmark	305 007 464		5 727 160		36 353 000	347 087 624
05 Oppland	217 868 142	61 508 661	13 280 000			292 656 803
06 Buskerud	350 603 185	3 934 000				354 537 185
07 Vestfold	239 538 480	774 718 831			6 750 000	1 021 007 311
08 Telemark	174 206 325	3 927 000	93 073 000			271 206 325
09 Aust-Agder	76 166 718	5 325 105			40 000	81 531 823
10 Vest-Agder	73 780 635	500 000		800 000		75 080 635
11 Rogaland	1 233 321 700	60 841 000		873 590 438		2 167 753 138
12 Hordaland	262 070 852	65 339 918				327 410 770
14 Sogn og Fjordane	420 086 742	26 083 000				446 169 742
15 Møre og Romsdal	307 248 980	12 573 364	1 592 305 362			1 912 127 706
16 Sør-Trøndelag	327 396 016	58 983 347			256 902	386 636 265
17 Nord-Trøndelag	177 679 428	13 266 800	57 710 323		975 000	249 631 551
18 Nordland	257 772 335	1 895 000	275 478 716	678 200 000	2 567 000	1 215 913 051
19 Troms	103 117 341	50 000	25 575 450			128 742 791
20 Finnmark	92 611 891	66 084 400	359 300 000	1 187 445 845		1 705 442 136
21 Svalbard					1 273 000 000	1 273 000 000
Total	5 377 632 931	1 159 535 426	2 422 450 011	2 740 036 283	1 325 664 502	13 025 319 153

TABLE 3: Sold tonnage - county inclusive Svalbard

COUNTY/REGION	Construction material	Natural stone	Industrial minerals	Ores	Energy minerals	Total
01 Østfold	3 012 975	3 412			8 060	3 024 447
02 Akershus	5 992 543					5 992 543
03 Oslo	490 273	150				490 423
04 Hedmark	4 340 589		31 390		30 800	4 402 779
05 Oppland	2 920 175	39 252	49 000			3 008 427
06 Buskerud	4 456 179	3 505			500	4 460 184
07 Vestfold	3 047 083	204 196			35 300	3 286 579
08 Telemark	2 484 255	8 077	1 332 140			3 824 472
09 Aust-Agder	1 140 811	8 705			3 000	1 152 516
10 Vest-Agder	977 012	3 412		8		980 432
11 Rogaland	21 841 837	63 347		864 193		22 769 377
12 Hordaland	4 109 415	144 742				4 254 157
14 Sogn og Fjordane	7 125 004	85 164				7 210 168
15 Møre og Romsdal	4 581 550	25 654	2 563 321			7 170 525
16 Sør-Trøndelag	4 795 571	53 727			1 554	4 850 852
17 Nord-Trøndelag	3 079 002	16 457	1 186 862		4 500	4 286 821
18 Nordland	3 129 021	1 252	3 178 582	1 451 661	15 138	7 775 654
19 Troms	1 436 202	20	6 207			1 442 429
20 Finnmark	1 460 503	19 022	1 495 000	1 928 000		4 902 525
21 Svalbard					2 134 421	2 134 421
Total	80 420 000	680 094	9 842 502	4 243 862	2 233 273	97 419 731

TABLE 4: Number of employees - county inclusive Svalbard

COUNTY/REGION	Construction material	Natural stone	Industrial minerals	Ores	Energy - minerals	Total
01 Østfold	108,3	2			4	114
02 Akershus	243,9					244
03 Oslo	22	0,8				23
04 Hedmark	147,8		5		19	172
05 Oppland	125	104,8	4,2			234
06 Buskerud	200,3	3				203
07 Vestfold	110,4	221			5	336
08 Telemark	129,2	4,2	49			182
09 Aust-Agder	43,9	8,9			0,2	53
10 Vest-Agder	37	1		0,6		39
11 Rogaland	548,7	22,8		286		858
12 Hordaland	142	37,3				179
14 Sogn og Fjordane	244	30,6				275
15 Møre og Romsdal	192,1	4,3	325,9			522
16 Sør-Trøndelag	195,8	167,8			0,1	364
17 Nord-Trøndelag	127,4	22	28		0,4	178
18 Nordland	211,2	7,1	235	417	8	878
19 Troms	77	0,5	33			111
20 Finnmark	70,2	36,6	138	541		786
21 Svalbard					476	476
Total	2976,2	674,7	818,1	1244,6	512,7	6226

TABLE 5: Sold tonnage in 1000 tonnes, 2002 - 2013

Rock/mineral	2002 ktonnes	2003 ktonnes	2004 ktonnes	2005 ktonnes	2006 ktonnes	2007 ktonnes	2008 ktonnes	2009 ktonnes	2010 ktonnes	2011 ktonnes	2012 ktonnes	2013 ktonnes
Olivine	3 100	3 300	3 400	3 100	2 923	2 562	2 554	1 267	2 560	2 237	1 650	1 702
Nepheline syenite	330	320	330	320	335	312	346	270	327	330	320	320
Quars/quartzite	1 140	1 100	1 200	1 100	834	1 041	1 025	773	1 055	1 163	1 083	1 451
Talc- soapstone	43	48	32	34	63	65	37	23	6	8	8	
Feltspar (anorthosite)	210	530	510	270	65	65	62	48	56	25		
Graphite	14	-	6	9	9	3	4	5	6	8	7	6
Carbonate	5 500	6 300	6 300	6 300	6 220	7 521	7 395	6 151	6 146	5 956	5 856	5 703
Dolomite	570	570	600	610	762	750	741	544	604	652	643	661
Total industrial minerals	10 907	12 168	12 378	11 743	11 211	12 319	12 164	9 081	10 760	10 379	9 567	9 843
Ilmenite	827	859	870	810	850	882	915	671	864	869	831	826
Molybdenum												
Nickel concentrate	14	8	8	8	8	6	9	7	7	8	8	8
Iron	480	390	590	700	620	630	746	896	3 105	2 532	3 421	3 409
Total metallic ores	1 321	1 257	1 468	1 518	1 478	1 518	1 670	1 574	3 976	3 409	4 260	4 243
Coal	2 200	2 800	2 900	1 620	2 359	3 223	3 429	2 437	1 685	1 639	1 326	2 134
Peat	-	-	-	-	78	159	498	291	148	101	93	99
Total energy minerals	2 200	2 800	2 900	1 620	2 437	3 382	3 927	2 728	1 833	1 740	1 419	2 233
Dimension stone	380	330	340	390	802	299	287	240	323	271	195	223
Slate/flagstone	160	250	260	470	105	88	165	78	77	88	111	100
Masonry stone	-	-	-	-	166	207	574	315	249	347	332	358
Total natural stone	540	580	600	860	1 073	594	1 026	633	649	706	638	681
Hard-rock aggregate	35 000	36 000	37 000	38 000	45 888	52 968	53 973	51 465	54 708	64 436	67 305	66 259
Sand/gravel	15 000	15 000	15 000	15 000	13 484	15 315	15 066	13 051	13 112	14 343	14 288	13 984
Clay	450	370	230	230	320	319	279	224	201	193	198	177
Total construction materials	50 450	51 370	52 230	53 230	59 692	68 602	69 318	64 740	68 021	78 972	81 791	80 420
Total	65 418	68 175	69 576	68 971	75 891	86 415	88 105	78 756	85 239	95 206	97 675	97 420

TABLE 6: Sales value of production 2002 - 2013

Rock/mineral	2002 M.NOK	2003 M.NOK	2004 M.NOK	2005 M.NOK	2006 M.NOK	2007 M.NOK	2008 M.NOK	2009 M.NOK	2010 M.NOK	2011 M.NOK	2012 M.NOK	2013 M.NOK
Olivine	278	297	377	398	391	301	361	259	435	343	296	313
Nepheline syenite	219	221	211	235	247	229	231	230	239	278	240	240
Quars/quartzite	140	135	158	143	137	170	184	204	271	393	185	183
Talc- soapstone	48	54	53	50	88	72	23	14	6	6	7	
Feltspar (anorthosite)	52	73	79	51	35	35	35	33	36	17		
Graphite	19	-	13	19	17	6	8	13	16	34	34	26
Carbonate	1 488	1 731	1 925	1 877	1 995	1 873	1 959	1 648	1 539	1796	1 894	1 587
Dolomite	57	51	60	61	115	133	74	65	55	64	140	74
Total industrial minerals	2 301	2 562	2 876	2 834	3 025	2 819	2 876	2 466	2 597	2 931	2 796	2 423
Ilmenite	470	472	473	508	533	523	563	471	571	621	945	843
Molybdenum							3	2	2			1
Nickel concentrate	93	8	17	15	25	28	39	16	23	23	20	16
Iron	91	74	131	185	562	232	329	281	1 225	1 819	2 019	1 880
Total metallic ores	654	554	621	708	1 120	783	934	770	1 821	2 463	2 984	2 740
Coal	654	938	1 021	615	1 095	1 936	2 645	2 007	1 464	1 406	826	1 273
Peat	-	-	-	-	60	67	77	73	72	53	68	52
Total energy minerals	654	938	1 021	615	1 155	2 003	2 722	2 080	1 536	1 459	894	1 325
Dimension stone	836	722	842	788	641	644	557	460	501	534	487	823
Slate/flagstone	234	219	233	275	281	266	297	269	238	256	247	184
Masonry stone	-	-	-	-	76	69	85	82	105	133	153	153
Total natural stone	1 070	941	1 075	1 063	998	979	939	811	844	923	887	1 160
Hard-rock aggregate	1 950	1 960	2 040	2 300	2 382	3 054	3 234	3 157	3 307	3 849	4 241	4 449
Sand/gravel	590	590	600	720	632	873	800	756	773	919	892	925
Clay	10	9	8	7	9	9	8	6	6	8	4	4
Total construction materials	2 550	2 559	2 648	3 027	3 023	3 936	4 042	3 919	4 086	4 776	5 137	5 378
Total	7 229	7 554	8 241	8 247	9 321	10 520	11 512	10 046	10 884	12 552	12 698	13 026

TABLE 7: Number of employees 2002 -2013

Rock/mineral	2002 No.of empl.	2003 No.of empl.	2004 No.of empl.	2005 No.of empl.	2006 No.of empl.	2007 No.of empl.	2008 No.of empl.	2009 No.of empl.	2010 No.of empl.	2011 No.of empl.	2012 No.of empl.	2013 No.of empl.
Olivine	205	199	225	210	184	199	175	141	121	176	135	116
Nepheline syenite	107	105	97	100	91	91	92	95	95	92	98	97
Quars/quartzite	94	92	94	84	87	100	113	108	114	148	138	136
Talc- soapstone	102	75	67	67	31	29	18	18	4	4	3	
Feltspar (anorthosite)	34	43	45	42	22	23	21	23	22	22		
Graphite	-	-	26	26	25	25	27	27	27	29	32	33
Carbonate	401	417	421	479	513	475	478	443	474	437	392	383
Dolomite	51	63	68	70	78	87	53	49	51	52	54	53
Total industrial minerals	994	994	1 043	1 078	1 031	1 029	977	904	908	960	852	818
Ilmenite	236	247	246	245	277	245	248	247	250	257	290	273
Molybdenum							3	2	3		1	1
Nickel concentrate	2	-	-	-	3	2	2	3	2	2	3	3
Iron	160	160	160	178	188	197	213	352	759	804	724	968
Total metallic ores	398	407	406	423	468	444	466	604	1 014	1 063	1 018	1245
Coal	225	233	362	430	411	396	464	426	414	475	529	476
Peat	-	-	-	-	48	45	83	43	42	46	37	37
Total energy minerals	225	233	362	430	459	441	547	469	456	521	566	513
Dimension stone	465	474	470	465	404	358	327	260	238	268	214	253
Slate/flagstone	357	378	325	347	373	279	313	304	240	264	260	259
Masonry stone	-	-	-	-	74	59	75	77	123	116	175	163
Total natural stone	822	852	795	812	851	696	715	641	601	648	649	675
Hard-rock aggregate	1 242	1 340	1 205	1 312	1 288	1 561	1 624	1 667	1 852	2 068	2 105	2172
Sand/gravel	1 353	1 178	1 333	1 355	571	535	510	623	674	764	724	730
Clay	-	-	78	59	40	92	38	72	70	74	76	74
Total construction materials	2 595	2 518	2 616	2 726	1 899	2 188	2 172	2 362	2 596	2 906	2 905	2976
Total	5 034	5 004	5 222	5 469	4 708	4 798	4 877	4 980	5 575	6 098	5 990	6 227

TABLE 8: Production of gravel and sand by county 2013

COUNTY/REGION	No. of producers	EXTRACTION (metric tonnes)			SALE/DELIVERED (metric tonnes)			SALES VALUE (FOB NOK)			No. of employees
	Total	Production	Wasterock	Total	Domestic	Export	Total	Domestic	Export	Total	Total
Østfold	10	493 649	7 812	501 461	489 649		489 649	28 285 400		28 285 400	15,8
Akershus	7	1 159 928		1 159 928	1 159 730		1 159 730	62 307 650		62 307 650	33,5
Oslo	0										
Hedmark	52	930 358	7 828	938 186	870 845	1 850	872 695	59 536 189	155 000	59 691 189	56,1
Oppland	56	1 356 899	800	1 357 699	1 273 175		1 273 175	87 660 123		87 660 123	53,4
Buskerud	37	1 684 031	734	1 684 765	1 658 891	2 500	1 661 391	132 222 659	700 000	132 922 659	77,7
Vestfold	1	49 016		49 016	49 016		49 016	3 791 121		3 791 121	2,2
Telemark	23	639 501	288	639 789	650 577		650 577	41 268 768		41 268 768	40,9
Aust-Agder	19	477 037		477 037	480 237		480 237	24 464 734		24 464 734	12
Vest-Agder	5	24 401		24 401	31 578		31 578	1 704 500		1 704 500	1,2
Rogaland	33	2 342 292		2 342 292	2 288 781	40 537	2 329 318	157 825 801	2 215 996	160 041 797	117,1
Hordaland	8	581 600		581 600	532 789		532 789	41 260 912		41 260 912	24,4
Sogn og Fjordane	20	303 712	209	303 921	367 930		367 930	27 751 840		27 751 840	27,4
Møre og Romsdal	26	1 164 069	10 625	1 174 694	1 178 467	10 585	1 189 052	78 090 533	775 933	78 866 466	45
Sør-Trøndelag	33	815 987	15 243	831 230	804 318		804 318	48 975 184		48 975 184	64,7
Nord-Trøndelag	45	725 908		725 908	707 612	9 993	717 605	41 747 795	700 000	42 447 795	51,5
Nordland	29	307 653	7 290	314 943	318 522		318 522	21 880 752		21 880 752	32,7
Troms	31	543 916	400	544 316	561 863		561 863	33 555 341		33 555 341	39,2
Finnmark	26	479 758	17 520	497 278	494 778		494 778	28 184 071		28 184 071	35,4
TOTAL	461	14 079 715	68 749	14 148 464	13 918 758	65 465	13 984 223	920 513 373	4 546 929	925 060 302	730,2

TABLE 9: Production of hard-rock aggregate by county, 2013

COUNTY/REGION	No. of producers	EXTRACTION (metric tonnes)			SALE/DELIVERED (metric tonnes)			SALES VALUE (FOB NOK)			No. of employees
	Total	Production	Wasterock	Total	Domestic	Export	Total	Domestic	Export	Total	Total
Østfold	22	2 652 495		2 652 495	2 181 326	342 000	2 523 326	183 457 495	17 442 000	200 899 495	92,5
Akershus	20	4 815 994	168 000	4 983 994	4 677 318		4 677 318	407 673 004		407 673 004	165,7
Oslo	2	525 273		525 273	490 273		490 273	58 374 000		58 374 000	22
Hedmark	29	3 556 274	10 451	3 566 725	3 467 894		3 467 894	245 316 275		245 316 275	91,7
Oppland	41	1 572 104	79 423	1 651 527	1 647 000		1 647 000	130 208 019		130 208 019	71,8
Buskerud	36	2 879 198	20 000	2 899 198	2 794 288		2 794 288	217 680 526		217 680 526	122,5
Vestfold	19	2 625 490	330 001	2 955 491	2 676 909	321 158	2 998 067	206 793 139	28 954 220	235 747 359	108,2
Telemark	31	1 964 700	34 974	1 999 674	1 304 715	507 750	1 812 465	99 552 551	31 136 006	130 688 557	59
Aust-Agder	17	662 475	6 164	668 639	660 574		660 574	51 701 984		51 701 984	31,9
Vest-Agder	17	852 070	32 220	884 290	895 434	50 000	945 434	69 076 135	3 000 000	72 076 135	35,8
Rogaland	38	18 456 772	57 551	18 514 323	7 253 970	12 258 549	19 512 519	438 502 470	634 777 433	1 073 279 903	431,8
Hordaland	21	3 640 028	117 051	3 757 079	2 121 195	1 455 431	3 576 626	155 657 878	65 152 062	220 809 940	117,5
Sogn og Fjordane	35	6 732 994	116 193	6 849 187	1 180 508	5 576 566	6 757 074	76 145 902	316 189 000	392 334 902	216,6
Møre og Romsdal	45	3 580 524	159 894	3 740 418	3 204 792	187 706	3 392 498	215 215 514	13 167 000	228 382 514	147,1
Sør-Trøndelag	39	3 500 465	85 032	3 585 497	3 987 253	4 000	3 991 253	278 170 832	250 000	278 420 832	131,1
Nord-Trøndelag	48	2 459 082	16 365	2 475 447	2 361 397		2 361 397	135 231 633		135 231 633	76,1
Nordland	48	2 835 163	117 573	2 952 736	2 805 499	5 000	2 810 499	235 739 983	151 600	235 891 583	178,5
Troms	12	873 800	17 800	891 600	874 339		874 339	69 562 000		69 562 000	37,8
Finnmark	11	990 598	210 477	1 201 075	655 568	310 157	965 725	35 863 130	28 564 690	64 427 820	34,8
TOTAL	531	65 175 499	1 579 169	66 754 668	45 240 252	21 018 317	66 258 569	3 309 922 470	1 138 784 011	4 448 706 481	2172,4

TABLE 10: Size and royalty distribution for gravel producers based on tonnage sold in 2013

					TONNES				ROYALITY (NOK/TONNES)			
	Prod.		CE-marking					Prod.				
Size (metric tonnes)	Producers	%	Total	%	Total tonnes	%	Average	Producers	Min	Max	Average	Median
1 - 10000	265	57,5	40	8,7	820 626	5,9	3 097	141	0,0	21,5	8,2	7,5
10001 - 50000	131	28,4	69	15,0	2 977 278	21,3	22 727	115	1,0	26,7	7,7	6,5
50001 - 100000	27	5,9	20	4,3	2 053 564	14,7	76 058	25	1,0	17,0	7,9	6,8
100001 - 250000	28	6,1	18	3,9	4 507 448	32,2	160 980	26	2,2	25,0	8,0	6,6
250001 - 500000	9	2,0	4	0,9	3 043 835	21,8	338 204	9	4,4	11,0	8,3	8,1
500001 -1000000	1	0,2	1	0,2	581 472	4,2	581 472	1	3,0	3,0	3,0	3,0
1000001 -	0	0,0	0	0,0	0	0,0	0	0				
Total	461		152	33	13 984 223		30 335	317	0,01	26,7	7,99	7

TABLE 11: Size and royalty distribution for hard-rock aggregate producers based on tonnage sold in 2013

					TONNES				ROYALITY (NOK/TONNES)			
	Prod.		CE-marking					Prod.				
Size (metric tonnes)	Producers	%	Total	%	Total tonnes	%	Average	Producers	Min	Max	Average	Median
1 - 10000	160	30,1	26	4,9	684 480	1,0	4 278	67	0,0	15,0	4,69	3,5
10001 - 50000	170	32,0	56	10,5	4 734 636	7,1	27 851	114	0,0	15,0	3,57	3,0
50001 - 100000	74	13,9	35	6,6	5 359 373	8,1	72 424	58	0,3	18,0	3,29	3,0
100001 - 250000	65	12,2	40	7,5	11 042 656	16,7	169 887	49	0,1	16,0	3,29	3,0
250001 - 500000	43	8,1	24	4,5	14 821 214	22,4	344 679	35	0,3	9,0	2,64	2,5
500001 -1000000	10	1,9	6	1,1	5 975 241	9,0	597 524	8	0,3	3,4	1,92	2,0
1000001 -	9	1,7	7	1,3	23 640 969	35,7	2 626 774	6	0,3	2,2	1,11	1,1
Total	531		194	36,5	66 258 569		124 781	337	0,01	18,0	3,52	3,0

TABLE 12: Consumption/sector for gravel in 2013

	Sale (metric tonnes)	ROAD MAKING		ASPHALT		CONCRETE		OTHER USES		UNKNOWN	
COUNTY/REGION		%	metric tonnes	%	metric tonnes	%	metric tonnes	%	metric tonnes	%	metric tonnes
01 Østfold	489 649	34,5	169 000			54,2	265 561	11,3	55 088		
02 Akershus	1 159 730	16,2	187 917	37,5	434 913	32,7	379 104	13,6	157 796		
03 Oslo											
04 Hedmark	872 695	39,9	347 910	12,8	111 598	24,0	209 382	23,4	203 805		
05 Oppland	1 273 175	44,9	571 264	8,9	112 761	7,0	88 947	39,3	500 203		
06 Buskerud	1 661 391	5,7	93 935	4,6	76 991	67,2	1 116 480	22,5	373 985		
07 Vestfold	49 016	34,0	16 665			46,0	22 547	20,0	9 803		
08 Telemark	650 577	17,2	111 994	10,2	66 650	56,9	370 173	15,6	101 760		
09 Aust-Agder	480 237	13,0	62 367	16,0	76 860	54,5	261 571	16,5	79 438		
10 Vest-Agder	31 578	3,1	975			42,4	13 400	54,5	17 203		
11 Rogaland	2 329 318	5,0	117 214	1,3	31 020	87,3	2 033 481	6,3	147 601		2
12 Hordaland	532 789	16,6	88 332	24,6	131 027	37,4	199 431	21,4	113 999		
14 Sogn og Fjordane	367 930	31,5	115 629	11,2	41 269	36,2	133 062	21,2	77 970		
15 Møre og Romsdal	1 189 052	9,3	110 970	24,7	293 682	51,5	612 767	9,8	116 632	4,6	55 000
16 Sør-Trøndelag	804 318	19,8	159 394	9,1	73 575	43,5	349 500	27,6	221 850		
17 Nord-Trøndelag	717 605	15,6	112 138	16,3	116 833	44,9	322 346	23,2	166 288		
18 Nordland	318 522	24,1	76 708	6,5	20 546	41,8	133 009	25,5	81 213	2,2	7 045
19 Troms	561 863	11,8	66 205	36,3	204 200	33,5	188 136	18,4	103 322		
20 Finnmark	494 778	35,3	174 338	22,7	112 546	13,7	67 578	28,4	140 316		
Total	13 984 223	18,5	2 582 954	13,6	1 904 472	48,4	6 766 476	19,1	2 668 275	0,4	62 047

TABLE 13: Consumption/sector for hard-rock aggregate in 2013

	Sale (metric tonnes)	ROAD MAKING		ASPHALT		CONCRETE		OTHER USES		UNKNOWN	
COUNTY/REGION		%	metric tonnes	%	metric tonnes	%	metric tonnes	%	metric tonnes	%	metric tonnes
01 Østfold	2 523 326	40,6	1 023 202	8,2	206 592	16,1	407 511	35,1	886 021		
02 Akershus	4 677 318	46,5	2 171 931	10,2	475 250	9,6	450 700	31,7	1 484 281	2,0	95 156
03 Oslo	490 273	41,9	205 273	23,3	114 000	27,1	133 000	7,8	38 000		
04 Hedmark	3 467 894	57,1	1 976 868	8,1	280 319	3,4	119 325	31,5	1 091 381		
05 Oppland	1 647 000	47,5	781 230	9,8	161 044	2,3	38 458	40,5	666 268		
06 Buskerud	2 794 288	50,4	1 407 106	18,8	526 645	9,4	261 599	21,4	598 938		
07 Vestfold	2 998 067	20,6	617 834	17,5	525 034	4,3	129 553	57,6	1 725 647		
08 Telemark	1 812 465	38,4	696 194	32,3	584 556	2,7	48 320	26,6	481 895	0,1	1 500
09 Aust-Agder	660 574	46,9	309 370	16,0	105 795	5,2	34 650	31,9	210 759		
10 Vest-Agder	945 434	31,5	297 670	1,7	16 429	2,5	23 287	64,3	608 047		
11 Rogaland	19 512 519	47,0	9 160 787	13,4	2 620 388	12,6	2 458 840	27,0	5 272 503		1
12 Hordaland	3 576 626	54,6	1 951 898	3,8	134 600	15,2	544 137	26,4	945 991		
14 Sogn og Fjordane	6 757 074	42,9	2 893 879	8,2	555 614	8,0	540 632	40,9	2 766 949		
15 Møre og Romsdal	3 392 498	35,7	1 210 302	1,6	55 428	0,3	10 400	62,4	2 116 368		
16 Sør-Trøndelag	3 991 253	45,5	1 815 145	12,9	513 180	4,4	175 056	37,0	1 475 872	0,3	12 000
17 Nord-Trøndelag	2 361 397	50,5	1 191 734	5,8	138 026	3,3	76 961	38,4	905 677	2,1	48 999
18 Nordland	2 810 499	48,8	1 369 452	14,8	415 808	8,7	243 888	27,6	776 851	0,2	4 500
19 Troms	874 339	28,7	250 916	4,1	35 550	9,2	80 600	58,0	507 273		
20 Finnmark	965 725	25,0	241 139				157	75,0	724 429		
Total	66 258 569	44,6	29 571 930	11,3	7 464 258	8,7	5 777 074	35,1	23 283 151	0,2	162 156

TABLE 14: Transport of sand and gravel for each county 2013

			DOMISTIC						EXPORT					
	No. of producers		Transport %			Average transport in km			Transport %			Average transport in km		
COUNTY/REGION	Total	With export	Car	Train	Boat	Car	Train	Boat	Car	Train	Boat	Car	Train	Boat
01 Østfold	10	0	100			25								
02 Akershus	7	0	100			27								
03 Oslo	0	0												
04 Hedmark	52	2	100			18			100			50		
05 Oppland	56	0	100			19		0						
06 Buskerud	37	1	70		30	28		40	100			350		
07 Vestfold	1	0	100			15								
08 Telemark	23	0	100			21								
09 Aust-Agder	19	0	100			32								
10 Vest-Agder	5	0	100			15								
11 Rogaland	30	4	28		72	15		239			100			409
12 Hordaland	8	0	69		31	13		62						
14 Sogn og Fjordane	20	0	100			13								
15 Møre og Romsdal	25	1	30		70	12		72						
16 Sør-Trøndelag	33	0	100			22								
17 Nord-Trøndelag	45	2	93		7	18		280	100			30		
18 Nordland	29	0	78		22	17		70						
19 Troms	31	0	42		58	16		96						
20 Finnmark	26	0	92		8	14		96						
21 Svalbard	0	0												
Total	457	10	74		26	21		147	28		72	88		409

TABLE 15: Transport of hard rock aggregate/county 2013

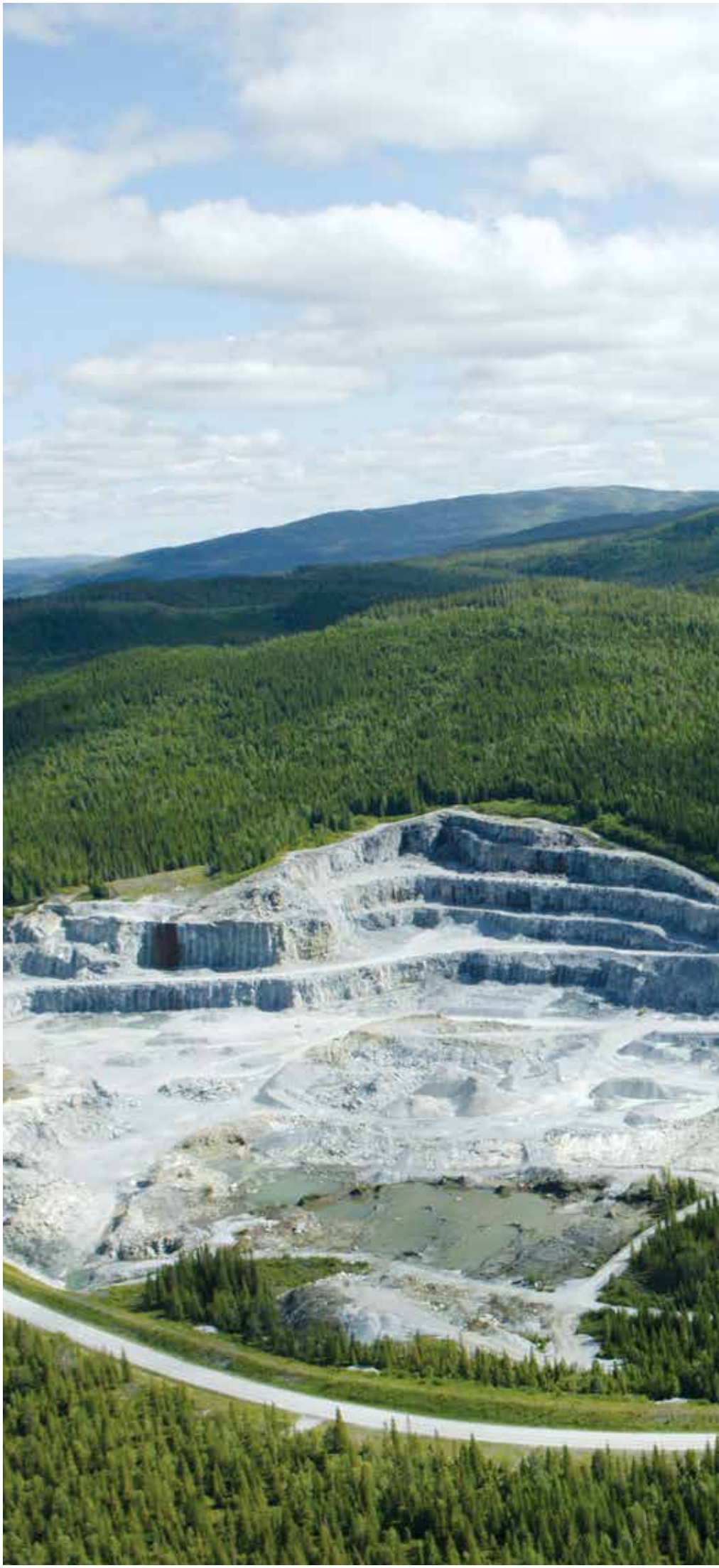
			DOMESTIC						EXPORT					
	No. of producers		Transport %			Average transport in km			Transport %			Average transport in km		
COUNTY/REGION	Total	With export	Car	Train	Boat	Car	Train	Boat	Car	Train	Boat	Car	Train	Boat
01 Østfold	22	1	100			15					100			800
02 Akershus	20	0	100			19								
03 Oslo	2	0	100			27								
04 Hedmark	29	0	98	2		17	100							
05 Oppland	41	0	100			18								
06 Buskerud	36	0	98	2		26	233							
07 Vestfold	19	3	100			13		74			100			800
08 Telemark	29	1	96		4	13		109			100			350
09 Aust-Agder	17	0	100			13		0						
10 Vest-Agder	17	1	100			14								
11 Rogaland	36	9	80		20	18		89			100	900		734
12 Hordaland	21	2	53		46	13	50	72			100			1060
14 Sogn og Fjordane	35	5	48		52	17		158			100			1045
15 Møre og Romsdal	45	1	60		40	13		146			100			500
16 Sør-Trøndelag	39	0	87		13	13		158						
17 Nord-Trøndelag	48	0	98	1	2	15	50	972						
18 Nordland	48	1	40		60	18		184			100			400
19 Troms	12	0	52		48	26		76						
20 Finnmark	11	3	69		31	19		300	7		93	10		660
Total	527	27	84		16	17	150	135			100	20		832

TABLE 16: Recirculated aggregate and gravel/county 2013 (for crushing and resale as building material)

COUNTY/REGION	No. of producers recycling	Total sale metric tonnes	PRODUCT					
			ASPHALT		CONCRETE		OTHER USES	
			Tonnes	%	Tonnes	%	Tonnes	%
01 Østfold	3	11 955	11 840	99,0	115	1,0		
02 Akershus	2	26 000	11 000	42,3	15 000	57,7		
03 Oslo	2	109 108	104 108	95,4	5 000	4,6		
04 Hedmark	3	3 448	3 000	87,0	250	7,3	198	5,7
05 Oppland	6	50 232	36 217	72,1	240	0,5	13 775	27,4
06 Buskerud	8	124 856	8 275	6,6	57 172	45,8	59 409	47,6
07 Vestfold	3	329 529					329 529	100,0
08 Telemark	6	31 596	15 630	49,5	300	0,9	15 666	49,6
09 Aust-Agder	4	11 940	11 840	99,2			100	0,8
10 Vest-Agder	5	38 409	32 902	85,7	5 507	14,3		
11 Rogaland	8	128 769	82 413	64,0	25 000	19,4	21 356	16,6
12 Hordaland	5	33 720	17 080	50,7	640	1,9	16 000	47,4
14 Sogn og Fjordane	8	89 300	4 100	4,6	40 000	44,8	45 200	50,6
15 Møre og Romsdal	9	99 164	64 700	65,2	9 114	9,2	25 350	25,6
16 Sør-Trøndelag	13	313 651	89 377	28,5	12 700	4,0	211 574	67,5
17 Nord-Trøndelag	12	290 856	77 870	26,8	77 145	26,5	135 841	46,7
18 Nordland	8	47 001	8 100	17,2	20 851	44,4	18 050	38,4
19 Troms	4	13 746	2 750	20,0	500	3,6	10 496	76,4
20 Finnmark	2	1 510	10	0,7			1 500	99,3
Total	111	1 754 790	581 212	33,1	269 534	15,4	904 044	51,5

TABLE 17: Land use and mapping costs according to the companies

	Area of quarries/mines and buildings in decares		Area of operating concessions in decares		Remaining reserves estimated by the companies		Exploration/mapping costs, companies in production	
Mineral products	Quarries/mines	Sum(1000m2)	Quarries/mines	Sum(1000m2)	Quarries/mines	Sum(mill. tonn)	Quarries/mines	Sum(mill. kr.)
Sand/gravel	202	17 226	133	13 722	138	1 289	143	8
Hard-rock aggregate	284	31 437	218	24 830	233	3 442	218	27
Clay	3	503	3	838	3	6	3	-
Natural stone	66	7 164	46	17 811	43	888	49	6
Industrial minerals	17	9 343	14	18 293	19	894	20	12
Metallic ores	3	18 754	4	187 811	3	675	4	19
Energy minerals	6	3 722	5	5 061	4	302	6	20
Total	581	88 149	423	268 365	443	7 496	443	91



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