

NORWAY

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During 2002, the major issues facing the Norwegian mining and smelting industry (mainly export-oriented), were the depreciation of the US dollar, from above NK9 to less than NK7, and, later in the year, a shortage of hydroelectric power which increased spot prices to levels never before seen in Norway. (Norwegians tended to use electrical power as inefficiently as US citizens use gasoline.) Both issues contributed to a poor financial performance for most plants, although hedging of dollar accounts and long-term power contracts softened the blow.

In mining and quarrying, a total of 65 Mt of material was extracted in 2002, worth NK7.2 billion. The Norwegian Geological Survey publishes an extensive overview each year (www.ngu.no).

Exploration

The eclogite deposits containing rutile in the Sunnfjord area have yet to attract investors for their development. As of now, the deposits probably constitute the most promising mineral property in Norway. Tailings disposal in a tourist area remains the largest unresolved problem.

Along the western coast, a little further south, the scenically spectacular area around Nærøyfjorden, a branch of the Sognefjord, has been made a protected landscape area after protracted debate. It extends from sea-level to an altitude of 1,700 m and covers some 570 km². A fruitful collaboration between the Inspector of Mines and the environmental authorities has ensured that the anorthosite deposits comprising most of the area, probably billions of tonnes, will remain available for underground mining. Access has to be from outside the protected area. The anorthosites are a potential source of aluminium oxide.

Many projects investigating high-purity quartz deposits are continuing, not least because Norway is a major producer of silicone. Scanwafer, the company producing silicone for solar-cell wafers, is expanding rapidly, maintaining its share of about 25% of world production.

Iron ore and base metals

The Nikkel & Olivin operation in Ballangen, the last sulphide mine in the country, was closed in September 2002. The operation had yielded 8.5 Mt of ore containing 32,500 t of nickel, 9,000 t of copper and 1,500 t of cobalt, and Outokumpu had operated the mine since 1992. Rana Gruber is the only iron-ore mine remaining in Norway. The ore is predominantly haematite but the relatively small amount of magnetite contained in the ore is very pure and can be upgraded into products such as pigments. Hence, in a way, this mine is being transformed into an industrial-mineral producer.

Industrial minerals

The growth in industrial minerals production, together with the demise of metal mining, has made this sector the most important part of the Norwegian mining industry.

Titania A/S celebrated its centenary during 2002. Regular mining started in 1919 to supply the forerunner of Kronos Titan A/S, utilising a process to produce titanium dioxide pigments developed by professor Farup in Trondheim. The deposit being mined at present, Tellnes, was discovered in 1954 and reserves may be sufficient for some centuries to come. The ilmenite concentrate is processed via the sulphate route to produce pigment, and for reduction to pig iron and titanium slag at the Tyssedal ilmenite smelter. Titania also uses the ilmenite as a heavy mineral for drilling mud.

Skaland Grafitverk was a victim of the strong Norwegian krone and low international prices for its products, and went into receivership in November 2002. The company produced graphite flake and powder. Reserves at the existing operation are nearly exhausted and a new deposit, about 2 km away, would have to be developed within a few years. The financing required for this project has made it difficult to attract investors. The mine has been operating more or less continuously since 1917 under various ownership and profitability has also varied considerably over the years. In recent years, annual production has been somewhat below 10,000 t. The present concentrator was started up in 1989 after the old one burnt down in 1984.

Aggregates and gravel

There are about 20 aggregate quarries along the southern and western coasts and the product is shipped to Europe. Some 11.2 Mt/y are exported; in addition, 1.2 Mt are used offshore. The total value of exports last year was NK454 million. The domestic market is still the most important, however, with an annual turnover of some NK2.6 billion, although in 2002 domestic sales were down slightly whereas there was a modest increase in exports.

The Devonian conglomerate in Bremanger is evidently popular among asphalt producers, and Bremanger Quarry, owned by Bontrup Beheer of the Netherlands, is making good progress with its underground project. An adit and a spiral ramp totalling 3,000 m have been constructed to the top of Sæbufjellet where the open pit is situated. In addition, the French company, Eurovia plans to start a quarry at Gulestø in the same area. Start-up is scheduled for early 2004, provided the necessary permits are granted. An investment of NK135 million is planned for a 1.0 Mt/y capacity plant. The concession area contains about 100 Mt and the product will be marketed in Germany, England and France.

Dimension stone and slate/flagstone

Total production was around 400,000 t last year at a value approaching NK1 billion. The Norwegian cost level ensures that only highly-priced stone is quarried, and further treatment is usually performed in Italy. The most valuable stone is larvikite, known for its special lustre and named after the town of Larvik.

Metallurgy

Norway's metallurgical sector is undergoing transition. During 2002, a shortage of electrical power, mainly as a result of increased consumption by domestic users, combined with a dry autumn and winter, resulted in electricity prices quadrupling for a short period. This, together with the stronger Norwegian krone against the US dollar, is forcing industry to make its use of power more efficient. Approximately 25% of Norway's hydroelectric power, or 30,000 GWh goes to the process industries.

Norsk Hydro is the country's largest aluminium producer. The old Söderberg technology is being phased out and replaced with closed cells using prebaked electrodes. This improves energy efficiency and reduces pollution. The plant at Sunndalsøra is being completely rebuilt. Capacity is being increased to 321,000 t/y, up from 153,000 t. The first new section started at the end of 2002 and the next is planned in April 2003. The high power price prompted Hydro to shut down the old Söderberg cells a little faster than planned. Hydro's plants at Karmøy, Høyanger and part of Årdal still depend upon Söderberg technology. The smaller plant at Høyanger will be closed, but there is speculation that modernisation of the Karmøy plant is not economically feasible owing to expensive power forecasts. A similar modernisation has taken place at Elkem's Mosjøen smelter.

Elkem closed its ferrochrome plant in Mo i Rana in mid-year, partly because of the difficulty in securing an adequate supply of chromite. The plant was utilising some of the electric pig-iron furnaces of Norsk Jernverk, which closed in 1990. The furnaces have, reportedly, been purchased by CVRD of Brazil for NK135 million. It is understood that CVRD will use the furnaces, together with the old briquetting plant, to produce ferromanganese from fines. The other successors to Norsk Jernverk are Fundia, a Finnish-owned scrap steel plant, and Fesil Rana producing ferrosilicon.

Another victim of the adverse factors for the process industry, was the small Ila and Lilleby plant in Trondheim belonging to Fesil. Production was halted, probably permanently. The production of special silicon alloys produced there was transferred to the company's Holla plant in Hemne, where production capacity will be increased.

Other casualties included Arendal Smelteverk a producer of silicone carbide owned by Saint Gobain and Odda Smelteverk which produced calcium carbide and dicyanamide. Both operations were shut down permanently. On the other hand, Outokumpu decided to invest NK700 million in upgrading its zinc smelter at Odda, as a first stage of its plan to double annual capacity from 150,000 t to 300,000 t for zinc and to 42,000 t for aluminium fluoride. Total cost will then be NK2,500 million.

Energy

The rising trend in oil production has halted. Only minor finds are being announced and these are only just replacing the depleting reserves in the mature major oilfields. Gasfields are being developed more actively, however, with increased production as a result. Development of the Snøhvit gasfield

close to the North Cape is being considered, encouraged by a tax concession for onshore production of liquefied gas where the field is too far from the markets to justify transport by pipelines.

Store Norske, which conducts coal mining on the island of Spitsbergen, has finished the preparatory work for its 2.1 Mt/y Svea Nord mine, using large-scale UK and Australian equipment that should give high production rates on a thick coal seam. The total investment was NK150 million. The mining has gone exceedingly well, surpassing planned production by 50%. Truck transport over a glacier to the harbour, which can accommodate 70,000 t vessels, costs NK48 million annually. Because coal dust must be minimised in the arctic environment, plans are being drawn up for a 15 km tunnel with a coal conveyor. The estimated cost is NK 260 million. Proven reserves are 41 Mt. The company, run partly for political reasons during the final years of the Cold War, has showed a profit (of NK60 million) for the first time in 30 years due to the development of the best coal seam ever mined on Spitsbergen.

Elsewhere on the island, Mine No.7 at Longyearbyen is still operating a 1.4 m seam on a small scale, producing coal for the power plant at the administrative and tourist centre of the region. A Russian coal company is planning to re-open the Grumant mine, 20 km from Longyearbyen, which was closed around 1960. Permits will likely be given for political reasons although some environmentalists argue that conditions should be set so no mining will be possible on the island at all.

Mineral and Smelter Production (t)

| | 2000 | 2001 | 2002 |
|---------------------------------------|-----------|-----------|-----------|
| Iron and metal mines | | | |
| Nickel conc. 12% Ni | 17,000 | 22,700 | 14,000 |
| Iron ore conc. | 470,000 | 384,000 | 480,000 |
| Industrial minerals | | | |
| Nepheline syenite | 330,000 | 340,000 | na |
| Olivine | 3,600,000 | 3,200,000 | 3,100,000 |
| Graphite | 9,000 | 9,000 | 6,000 |
| Limestone | 6,100,000 | 4,300,000 | 5,500,000 |
| Dolomite | 950,000 | 810,000 | na |
| Quartz | 1,530,000 | 1,300,000 | 1,100,000 |
| Energy | | | |
| Coal (Store Norske) | 630,000 | 1,890,000 | 2,200,000 |
| Oil ('000 t) | 158,625 | 163,100 | 159,200 |
| Natural gas (million m ³) | 53,100 | 57,465 | 121,000 |
| Electricity (GWh) | 143,000 | 122,000 | na |

Na : not available