



2007 Minerals Yearbook

**DENMARK, THE FAROE ISLANDS, AND GREENLAND
[ADVANCE RELEASE]**

THE MINERAL INDUSTRIES OF DENMARK, THE FAROE ISLANDS, AND GREENLAND

By Harold R. Newman

DENMARK

Denmark has an industrialized market economy, and the country's economic growth depended on imported raw materials and foreign trade. About two-thirds of foreign trade was with European Union (EU) member countries. Private ownership and exploitation of minerals were allowed under Danish law. The permitting procedures for mineral production were executed by individual counties, and regulations concerning the mineral industry were comparable with those of the other EU member countries (Ministry of Foreign Affairs, 2007).

Production

Denmark has no reserves of metallic ores, but it does have reserves of industrial minerals. Denmark's industrial minerals sector was based on easily accessible materials, such as chalk, clays, limestone, and sand and gravel, and was well developed. Denmark was the only commercial producer of moler, which consists of a natural mixture of diatomite and from 20% to 25% smectite clay and is an important ingredient of insulation bricks. The production of natural gas and petroleum from the Danish area of the North Sea was continuing (table 1).

Structure of the Mineral Industry

The Danish mineral industry was mostly privately owned. Table 2 is a list of the country's major mineral industry facilities and their capacities.

Commodity Review

Metals

Iron and Steel.—Uniscrap A/S, which was a joint venture of Alco-Metal A/S of Denmark and Scholz AG of Germany, was a major scrap merchant in Denmark with 20 sites across the country. Scholz was one of Europe's leading scrap merchants with 12 sites in Germany. Alco-Metal was a Danish merchant with mainly nonferrous and stainless steel scrap operations.

Uniscrap planned to become a deep-sea scrap exporter with the development of its 35,000-square-meter port facility at Grenaa. The new port facility would allow access to deep-sea markets, such as Egypt and Turkey. The existing port was only 6 to 7 meters (m) deep and was too shallow to allow deep-draft ships to enter. Uniscrap also planned to install a new 4,000-horsepower shredder at Grenaa to replace a smaller one (Metal Bulletin, 2007).

Industrial Minerals

Stone, Crushed.—A/S Faxe Kalkbrud, which was owned by the Lhoist Group of Belgium, was a major producer of calcium carbonate from its deposits on the island of Zealand. Faxe was the only company in Denmark to use oyster shells as a source material for calcium carbonate (Industrial Minerals, 2007).

Cement.—Aalborg Portland A/S was the sole producer of grey and white cement in Denmark. Aalborg operated seven kilns at its plant in Rordal, which had a capacity of 2.7 million metric tons (Mt) of grey cement and 850,000 metric tons of white cement. Aalborg produces cement with a low alumina content, which has a high resistance to sea water (Global Cement Magazine, 2007).

Mineral Fuels

Petroleum.—North Sea production of petroleum declined by 9.8% to an average of 4.7 million barrels per day. Denmark cut its petroleum production forecast by 9% until 2010. After producing 125.8 million barrels in 2006, Denmark produced 113.5 million barrels in 2007 owing to lower output from three fields and startup delays at a fourth. Petroleum reserves were reported to be 1.5 billion barrels as of January 1, 2007 (Upstreamonline, 2007).

References Cited

- Global Cement Magazine, 2007, Scandinavian cement industry review: Global Cement Magazine, September, p. 38.
- Industrial Minerals, 2007, A bright carbonate future: Industrial Minerals, January, p. 26.
- Metal Bulletin, 2007, Uniscrap plans deep-sea export capability: Metal Bulletin, January 15, no. 8978, p. 17.
- Ministry of Foreign Affairs, 2007, Denmark in brief: Copenhagen, Denmark, Ministry of Foreign Affairs. (Accessed September 16, 2008, at <http://www.denmark.dk/en/menu/About-Denmark/Denmark-In-Brief>.)
- Upstreamonline, 2007, Denmark trims oil output forecast. (Accessed July 23, 2007, at <http://www.gasandoil.com/goc/news/nte72839.htm>.)

FAROE ISLANDS

The Faroe Islands have no significant identified mineral resources. The Faroese economy depended on fishing and salmon farming and was aided by a substantial annual subsidy from Denmark. Possible potential discoveries of oil in the future in the Faroese area gave hope for eventual oil production and diversification of its economy. The principal involvement of the Faroe Islands in the international mineral industry has been as a market for imported materials, principally cement, fertilizer materials, and fuels.

GREENLAND

Greenland is a self-governing overseas administrative division of Denmark. About one-half of Greenland's revenues came from grants from the Danish Government. The private and public sectors contributed to Greenland's economy. Hydrocarbon and mineral exploration activities were the focuses of foreign investment. Exploration was most active for base metals, diamond, gemstones, gold, nickel, and platinum-group metals (PGM).

Commodity Review

Metals

Gold.—The joint venture of Crew Gold Corp. and NunaMinerals A/S discovered the high-grade Nalunaq gold deposit in southern Greenland in 2004. NunaMinerals sold its shares in Nalunaq to its partner, Crew Gold, in 2007. The mine started operation during 2005 and the first gold was poured in March 2007. The mine had a total production of 1,639 kilograms at yearend 2007. The opening of Nalunaq was a milestone for Greenland, being its first gold mine and the first new mine to be developed in Greenland for more than 30 years. The mine is located about 40 kilometers (km) northeast of the town of Nanortalik on the southernmost tip of Greenland and is a Proterozoic narrow-vein high-grade gold-only deposit (Crew Gold Corp., 2007).

Molybdenum.—Quadra Mining Ltd. announced that its subsidiary International Molybdenum plc had commenced a feasibility study that was required for the company to make a development decision on the Malmbjerg molybdenum project. Work included infill and geotechnical drilling, pilot plant testing of a bulk sample, environmental permitting applications, basic engineering, and cost studies. The Malmbjerg project is located on the east coast of Greenland and was one of the country's highest grade molybdenum projects that was amenable to open pit mining (Quadra Mining Ltd., 2007).

Nickel.—NunaMinerals A/S's Ammassalik nickel project, which was located in southeastern Greenland and was formerly owned by Diamond Fields International Ltd. of South Africa, consisted of two adjacent properties that had a combined area of 63,737 hectares; it also had associated copper and PGM mineralization. NunaMinerals reported that exploration had led to the discovery of several nickel-bearing structures on the southern side of Ammassalik Island and the southern coast of the Johan Petersen Fjord. The largest discovery was a nickel-and-copper-bearing sulfide lens that is 90 to 100 m long and 1 m to 8 m wide. Bulk samples collected showed an average content of about 1.45% nickel and 0.5% copper. In terms of the estimated grade of the ore, the nickel content was 4.7% and the copper content was 1.6% (NunaMinerals A/S, 2007).

Zinc.—Angus & Ross plc was continuing with its exploration program at the Black Angel Mine area in 2007. Angus & Ross had completed an extensive drilling program in 2006 and was continuing with a drilling program that was concentrated on the

South Lakes Glacier prospect. The previous reserves within the Black Angel Mine itself were estimated to be 1.7 Mt at grades of 9.7% zinc and 3.1% lead (Angus & Ross plc, 2007).

Industrial Minerals

Diamond.—Hudson Resources Inc. announced that it was recovering larger stones as exploration continued and targets were narrowed. The initial phase of processing the 47-t sample from the Garnet Lake kimberlite resulted in recovery of 236 diamonds, including 12 diamonds that weighed more than 0.10 carat. The largest diamond weighed 2.39 carats (Greenland Mineral Exploration Newsletter, 2007).

Gemstones.—True North Gems Inc. announced a \$3 million exploration program for rubies on the 110-square-kilometer (km²) property located near the village of Fiskenaeset on the southwest coast of Greenland. The exploration program included a 5,000-m diamond drilling program, bulk sampling, and geologic mapping. In addition, True North planned to upgrade the Fiskenaeset processing plant for the preparation of sized gravity concentrates (True North Gems Inc., 2007).

Mineral Fuels

Petroleum.—Husky Energy Inc. of Canada announced that, as a result of the West Disco 2006 Licensing Round, it had been awarded exploration licenses on Block 5 (for the period 2007-22) and Block 7 (for the period 2007-24). The two blocks, which cover an area of 21,067 km², are located about 120 kilometers offshore the west coast of Disko Island in water depths of less than 500 m. The second phase of the licensing round was initiated on August 1, 2007, and applications for the remaining Blocks, 1, 2, 3, and 8, could be submitted until February 1, 2008 (Rigzone, 2007).

References Cited

- Angus & Ross plc, 2007, Black Angel 2007 resource statement: Angus & Ross plc. (Accessed September 16, 2008, at <http://www.infomine.com/index/pr/PA569697.pdf>.)
- Crew Gold Corp., 2007, Nalunaq gold mine—Greenland, Crew Gold Corp. (Accessed September 19, 2008, at http://www.crewgold.com/om_nalunaq_gold_mine.php.)
- Greenland Mineral Exploration Newsletter, 2007, Hudson Resources 'Garnet Lake' dyke delivered a 2.4 carat diamond: Geological Survey of Denmark (Accessed July 10, 2008, at <http://www.geus.dk/minex/minex-30-uk.htm>.)
- NunaMinerals A/S, 2007, Nickel projects—Giesecke & Ammassalik/Kitak: NunaMinerals A/S. (Accessed September 19, 2008, at <http://www.nunaminerals.com/index.dsp?page=105>.)
- Quadra Mining Ltd., 2007, Quadra announces development plans for the Malmbjerg molybdenum project: Quadra Mining Ltd. (Accessed September 19, 2008, at <http://www.marketwire.com/press-release/Quadra-Mining-Ltd-TSX-QUA-749692.html>.)
- Rigzone, 2007, Husky to begin offshore Greenland survey this summer: Rigzone, June 21. (Accessed June 25, 2007, at http://www.rigzone.com/news/article.asp?a_id=46782.)
- True North Gems Inc., 2007, True North Gems announces \$3 million exploration program for Greenland rubies: True North Gems Inc. (Accessed September 19, 2008, at http://www.truenorthgems.com/s/NewsReleases.asp?ReportID=180511&_Type=News-Release.)

TABLE 1
DENMARK: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	2003	2004	2005	2006	2007
Aluminum metal, secondary	18,000	20,000	20,000	25,000	30,000
Cement, hydraulic	2,020,000	2,050,000	2,120,000 ^r	2,115,000 ^{r,3}	2,100,000
Chalk, calcium carbonate	1,900,000	1,950,000	1,950,000	1,900,000	1,950,000
Clays:					
Bentonite	16,303 ⁴	18,352 ⁴	18,515 ⁴	18,500	18,500
Fire clay	25	25	25	25	25
Kaolin	2,500	2,500	2,500	2,500	2,500
Other	6,000	6,000	5,500	5,000	5,000
Moler, extracted	thousand cubic meters	232	233	234	240
235					
Gas:					
Manufactured	million cubic meters	1,500	1,500	1,500	1,500
Natural:					
Gross	do.	8,300	9,000	10,540 ^{r,4}	10,510 ^{r,4}
Marketable	do.	7,300	8,200	9,500	9,500
Gold ³ :	kilograms	--	--	1,000	1,500
1,639 ⁴					
Iron and steel:					
Semimanufactures	thousand metric tons	429	516	--	--
Lime, hydrated and quicklime		115,000	116,000	120,000	115,000
Natural gas plant liquids	thousand 42-gallon barrels	46,000	47,000	48,000	48,000
Nitrogen, N content of ammonia		1,600	1,600	1,600	1,600
Peat		295,000	296,000	298,000	295,000
Petroleum:					
Crude	thousand 42-gallon barrels	133,000 ⁴	144,465 ⁴	137,605 ^{r,4}	125,830 ^{r,4}
Refinery products:					
Liquefied petroleum gas	do.	1,232 ⁴	1,902 ⁴	1,800 ^r	1,800
Gasoline	do.	15,264 ⁴	16,881 ⁴	15,400	16,000
Naphtha	do.	-- ⁴	51 ⁴	50 ^r	50
Jet fuel	do.	4,479 ⁴	4,848 ⁴	4,800	4,800
Distillate fuel oil	do.	25,300 ⁴	24,834 ⁴	26,000	26,000
Refinery gas	do.	2,331 ⁴	2,100 ⁴	2,200	2,200
Residual fuel oil	do.	11,136 ⁴	10,370 ⁴	11,300	11,300
Total	do.	59,742 ⁴	60,986 ⁴	61,600	62,200 ¹
59,700					
Phosphates, crude, gross weight		1,400	1,400	1,400	1,400
Salt, all forms		560,000	610,000	610,000	600,000
Sand and gravel:					
From onshore deposits	thousand cubic meters	27,000	28,000	28,400	28,000
From offshore deposits	do.	600	600	600	600
Total	do.	27,600	28,600	29,000	28,600
Of which sand, industrial (sales)	do.	500	500	500	500
Stone:					
Dimension (mostly granite)		26,000	26,000	27,000	26,000
Limestone:					
Agricultural		700,000	700,000	700,000	700,000
Industrial		250,000	250,000	250,000	250,000
Sulfur, recovered		4,751 ⁴	4,660	4,223 ⁴	4,500

^rRevised. do. Ditto. -- Zero.

¹Estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Table includes data available through September 2008.

³Production from Greenland Island.

⁴Reported figure.

TABLE 2
DENMARK: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement	Aalborg Portland A/S	Plant at Rordal	2,700
Chalk, calcium carbonate	A/S Faxe Kalkbrud	Quarries at Stevns and Sigerslev	250
Diatomite, moler thousand cubic meters	Dansk Moler Industri A/S (Damolin)	Quarries on Mors and Fur Islands	145
Kaolin	Aalborg Portland A/S	Mine and plant on Bornholm Island	25
Lime	A/S Faxe Kalkbrud (Aalborg Portland Holding A/S)	Plant at Stubberup, near Fakse, on Zealand Island	200
Natural gas million cubic meters	Maersk Olie og Gas A/S	Roar and Tyra Gasfields, Danish North Sea	2,550
Petroleum:			
Crude barrels per day	Dansk Undergrounds Consortium	Dan, Gorm, Rolf, and Tyra, Danish North Sea	127,000
Refined do.	A/S Dansk Shell	Fredericia	55,000
Do. do.	Kuwait Petroleum Refining A/S	Gulfhavn and Skaelskor	56,500
Do. do.	Statoil A/S	Kalundborg	65,000
Salt	Dansk Salt I/S	Mine (brine) at Hvornum, plant at Mariager	600
Steel	Danish Steel Works Ltd. (Det Danske Stalvalsevaerk A/S) (30% Government owned)	Plant at Frederiksvaerk (closed in 2002)	750
do. Ditto.			