



2006 Minerals Yearbook

DENMARK, THE FAROE ISLANDS, AND GREENLAND

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

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DENMARK

Denmark has an industrialized market economy and the country's economic growth depended on imported raw materials and foreign trade. Denmark exported energy, food products, instruments, and machinery. The production of natural gas and petroleum from the Denmark area of the North Sea was continuing.

Production

The country has no metallic mineral resources but does have reserves of industrial minerals, such as chalk, clays, limestone and sand and gravel, that were produced in 2006 (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.

Commodity Review

Industrial Minerals

Calcium Carbonate.—Faxe Kalk A/S, which was owned by the Loist 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 calcium carbonate sources (oyster shells) other than chalk. Faxe was also the leading producer of lime in Denmark (Industrial Minerals, 2007).

Reference Cited

Industrial Minerals, 2007, Denmark: Industrial Minerals, January, p. 26.

FAROE ISLANDS

The Faroese economy depended on fishing and salmon farming and was aided by a substantial annual subsidy from Denmark. Potential discoveries of oil in the Faroese area gave hope for eventual oil production and diversification of the economy. Foreign oil companies were engaged in geophysical exploration and well drilling offshore. The Faroe Islands have no known significant mineral resources.

The Faroese Petroleum Administration of the Ministry of Trade and Industry agreed to move drilling commitments in the 001 and 003 licenses to license 006. As a result, a well was to be drilled offshore on the Brugdan prospect in the summer of 2006. The investors were Statoil A/S (27.15%) as operator, DONG Energy A/S of Denmark (21.91%), Anadarko Petroleum Corp. of the United States (13%), Enterprise Oil plc of the

United Kingdom (12.47%), Hess Corp. of the United States (formerly Amerada Hess Corp.) (11.09%), BG Group plc of the United Kingdom (10.31%), Faroe Petroleum plc (4.04%), and Atlantic Petroleum (0.025%). Statoil stated that Brugdan would be challenging to interpret because it lies under thick sections of volcanic rock. The well would be drilled by the Stena Don semisubmersible rig to a depth of 450 meters (Petroleum Economist, 2006).

Reference Cited

Petroleum Economist, 2006, Faroe Islands: Petroleum Economist, v. 73, no. 1, January, p. 41.

GREENLAND

Greenland is a self-governing overseas administrative division of Denmark. About one-half of the Government 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.

The European Union (EU) was to expand its existing partnership agreement with Greenland to include the exploitation of the island's mineral resources. The agreement would expand the amount of EU grants and loans available for Greenland exploitation starting in 2007 (Mining Journal Online, 2006b).

Commodity Review

Metals

Aluminum.—The Government of Greenland and Alcoa Inc. of the United States began a joint study of the possibility of constructing an aluminum smelter and associated hydropower plant. If the study results were positive, and the project was approved for development, then construction could take between 5 and 10 years to complete (Mining Journal Online, 2006a).

Nickel.—The Ammassalik nickel project in eastern Greenland, which was owned by Diamond Fields International Ltd. of South Africa, consisted of two adjacent properties that had a combined area of 63,737 hectares (ha); it had been found to have associated copper, nickel, and platinum-group metal mineralization. Diamond Fields assessed its data and data from a report by Inco Ltd. of Canada (which was based on previous drilling by Inco) to determine if further exploration was warranted. Diamond Fields subsequently concluded an agreement with Inco regarding the Ammassalik Block. The

agreement granted Inco the option to earn a 65% interest in the block by spending up to \$3 million by the end of 2008 (Diamond Fields International Ltd., 2006).

Lead and Zinc.—According to a resource report by Wardell Armstrong International, Angus & Ross plc of the United Kingdom indicated that reopening of its Black Angel Mine in western Greenland was viable and that a number of options for reopening the mine were being considered. The mine had been closed in 1990 and was last inspected in 1997. Angus & Ross completed an extensive drilling program in 2006. The program established the existence of about 2 million metric tons (Mt) of mineral resources around the Black Angel Mine. This amount does not include the 1.6 Mt of proven and probable reserves with an average combined lead/zinc grade of 21.6% that remained in the Black Angel Mine (Minex Online, 2006).

Industrial Minerals

Diamond.—Hudson Resources Inc. reported that it had completed more than 3,000 meters (m) of drilling on 12 holes in the Garnet Lake area where a diamondiferous kimberlite was discovered, and in the Spider Lake area, where diamondiferous kimberlite dikes radiated from a deep-seated circular anomaly. Significant diamond recoveries were known at four locations in the Garnet Lake area. Hudson reported that it had recovered the largest diamond ever recovered in Greenland from this exploration effort. The stone, which weighed 0.122 carat, was recovered from a sample from a kimberlite dyke that measured 4.5 m in thickness. Hudson stated that the find confirmed the highly diamondiferous nature of the dyke (Mining Journal Online, 2006c).

Mineral Fuels

Petroleum.—Twelve companies advanced to the prequalification stage under the first phase of Greenland's round of licensing for petroleum blocks. The prequalification stage closed on December 15, 2006. Greenland was offering eight blocks that covered about 92,000 square kilometers for exploration off Disko-Nuussuag in west-central Greenland. There have been numerous oil seeps in Cretaceous sandstones and Paleocene volcanics in western Greenland. Licenses would be offered for a maximum exploration period of 10 years, with a right to a 30-year extension for production (Oil and Gas Journal, 2006).

References Cited

- Diamond Fields International Ltd., 2006, Annual report—Greenland: Vancouver, British Columbia, Canada, Diamond Fields International Ltd. 2006, p. 7.
- Minex Online, 2006, Significant new resource added to Black Angel property: Greenland Mineral Exploration Newsletter, no. 29. (Accessed October 11, 2007, at <http://www.geus.dk/minex/minex-29-uk.htm>.)
- Mining Journal Online, 2006a, Alcoa in Greenland: Mining Journal. (Accessed February 11, 2007, at http://www.mining-journal.com/Subscribers/journal_Article.aspx?articleid=8929.)
- Mining Journal Online, 2006b, EU Greenland support: Mining Journal. (Accessed February 11, 2007, at http://www.mining-journal.com/Subscribers/journal_Article.aspx?articleid=8880.)
- Mining Journal Online, 2006c, Greenland record: Mining Journal. (Accessed February 4, 2007, at http://www.mining-journal.com/Subscribers?Journal_Article.aspx?articleid=12467.)
- Oil and Gas Journal, 2006, Twelve firms advance in Greenland licensing: Oil and Gas Journal. (Accessed November 24, 2006, at http://www.ogj.com/articles/article_display.cfm?article_id=277939.)

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

(Metric tons unless otherwise specified)

Commodity	2002	2003	2004	2005	2006
Aluminum, metal, secondary	18,000	18,000	20,000	20,000	25,000
Cement, hydraulic	2,010,000	2,020,000	2,050,000	2,070,000	2,060,000
Chalk	1,900,000	1,900,000	1,950,000	1,950,000	1,900,000
Clays:					
Bentonite	14,539 ^r	16,303 ^r	18,352 ^r	18,515 ^r	18,500
Fire clay	25	25	25	25	25
Kaolin	2,500	2,500	2,500	2,500	2,500
Moler, extracted	thousand cubic meters	230	232	233	234
Other	6,000	6,000	6,000	5,500	5,000
Gas:					
Manufactured	million cubic meters	1,500	1,500	1,500	1,500
Natural:					
Gross	do.	8,100	8,300	9,000	9,500
Marketable	do.	7,300	7,300	8,200	9,200
Iron and steel, metal, steel:					
Crude ⁴	thousand metric tons	392 ⁴	-- ⁴	-- ⁴	-- ⁴
Semimanufactures	do.	379 ^r	429 ^r	516 ^r	--
Lime, hydrated and quicklime		114,000	115,000	116,000	120,000
Natural gas plant liquids	thousand 42-gallon barrels	46,700 ⁴	46,000	47,000	48,000
Nitrogen, N content of ammonia		1,600	1,600	1,600	1,600
Peat		290,000	295,000	296,000	298,000
Petroleum:					
Crude ³	thousand 42-gallon barrels	132,900 ⁴	133,000 ⁴	144,465 ^{r,4}	142,000 ^r
Refinery products:					
Liquefied petroleum gas	do.	1,195 ⁴	1,232 ⁴	1,902 ^{r,4}	1,800 ^r
Gasoline	do.	15,205 ⁴	15,264 ⁴	16,881 ^{r,4}	15,400
Naphtha	do.	-- ⁴	--	51 ^{r,4}	50 ^r
Jet fuel	do.	3,878 ⁴	4,479 ⁴	4,848 ^{r,4}	4,800
Distillate fuel oil	do.	23,886 ⁴	25,300 ⁴	24,834 ^{r,4}	26,000
Refinery gas	do.	2,141 ⁴	2,331 ⁴	2,100 ^{r,4}	2,200
Residual fuel oil	do.	11,540 ⁴	11,136 ⁴	10,370 ^{r,4}	11,300
Total	do.	57,845 ⁴	59,742 ^{r,4}	60,986 ^{r,4}	61,600 ^r
Phosphates, crude, gross weight		1,300	1,400	1,400	1,400
Salt, all forms		600,000	560,000 ^r	610,000	610,000
Sand and gravel:					
Onshore	thousand cubic meters	27,000	27,000	28,000	28,000
Offshore	do.	700	600	600	600
Total	do.	27,700	27,600	28,600	28,600
Of which sand, industrial (sales)	do.	490	500	500	500
Stone:					
Dimension (mostly granite)		25,000	26,000	26,000	27,000
Limestone:					
Agricultural		700,000	700,000	700,000	700,000
Industrial		250,000	250,000	250,000	250,000
Sulfur, recovered		4,386 ^r	4,751 ^r	4,660 ^r	4,223 ^r

^rRevised. -- Zero.

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

²Table includes data available through October 1, 2007

³Danish Steel Works Ltd. Ceased production in 2002.

⁴Reported figure.

TABLE 2
DENMARK: STRUCTURE OF THE MINERAL INDUSTRY IN 2006

(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	3,000
Chalk		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	Guldhavn	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 Frederilsvaerk (closed)	750