

DENMARK AND GREENLAND

By Staff¹

DENMARK

The mining and quarrying and the minerals processing sectors traditionally have not been a driving factor in Denmark's economy. Employment in all aspects of the minerals industry (mining and quarrying, basic metal industry, etc.) accounts for about 2% of total employment in Denmark.

During 1994, the Danish Government continued its efforts to fight unemployment and inflation in an attempt to stabilize the economy, which would, in turn, stimulate mineral related activities, such as home construction. According to the Danish Statistical Office, Denmark's real gross domestic product (GDP) increased in 1994 by 4.5%, the largest increase in several years, and private consumption increased by 7.1%, the largest annual increase since 1976. Unemployment increased by only 0.3% in 1994, while productivity per employee increased by 3% for the total economy and by 7.5% in manufacturing.

Continued close cooperation with the other members of the European Union (EU) was very important for Denmark because the other member countries of the EU remain the major market for the country's extremely important export activities. For example, in 1993, 84% of the steel produced in Denmark was exported. Of that total, 53% was to other EU member countries and 31% was to non-EU member countries. The same was true for other minerals and mineral products such as cement, of which almost three-quarters of Danish production was exported in 1993.

The Danes traditionally have been very environmentally conscious. The mining and metals industry, as with other elements of the country, worked closely with the Ministry of Environment in Copenhagen. For example, the Danish Steel Works continued its efforts to improve the environment, both within the plant and in the surrounding area. A common goal of the steelworks and other industrial concerns was to make use of as much of the raw material taken into the plant as possible and to maximize the use of any byproducts, such as flue dusts. Industry worked closely with not only the Federal Ministry of Environment, but also with local and community governments and citizen groups to minimize any adverse effects to the environment.

Late in 1994, the Danish Government started preparing "green" national accounts, which will provide indicators of the degree to which production and consumption contribute to global pollution. Only industrial companies that must

have a certificate of approval for their potentially polluting operations would be affected, but already questions and objections from some sectors were being raised. The suggestion that special environmental standards should be written into tender requirements for public sector contracts, such as for the steel and cement contracts for the proposed 17 kilometer (km) bridge linking Copenhagen and Malmö, Sweden, have raised the question of whether the European Commission (EC) would consider the law to favor local suppliers and thus stifle international competition.

Crude steel production in Denmark increased by 20% in 1994 compared with that of 1993. This increase was a result of the continuing easing of the global recession during 1994 and the resultant increase in the export of Denmark's steels for the consumer market. Denmark's steel industry was small compared to the majority of other EU countries, and, as a result of its size, was not affected by the proposed cuts being studied by the EC in its effort to make the EU steel industry more competitive with those of other countries. (*See Table 1.*)

Cement production in Denmark in 1994 increased somewhat from that of 1993. A slowdown in the domestic construction industry was offset by continued demand in the eastern states of Germany, where construction projects continued to proliferate.

Crude petroleum production in Denmark in 1994 increased by 8.4% compared to that of 1993, and natural gas production increased by 8%. The rise in crude petroleum production allowed Denmark to remain self-sufficient in petroleum, with production exceeding consumption for the second year in a row, and the 1994 level of petroleum production was expected to continue. At the beginning of 1994, Denmark had 148 producing petroleum wells, all offshore. The increase in natural gas production in 1994 enabled Denmark to continue exports of about 20% of production.

Denmark has no known economically exploitable reserves of metal ores but has large reserves of nonmetallic materials such as chalk, diatomaceous earths, limestone, and sand and gravel. No reserve figures are available for these materials because of the varied uses for them and the changing technologies that produce marketable products from the raw materials. Reserve figures for materials such as sand and gravel would cover an extremely wide range, depending on the prospective use of the sand and gravel, whether for landfill, industrial use, building material, etc. At the

beginning of 1994, reserves of crude petroleum were given at 780 million barrels (Mbbbl) and reserves of natural gas were given at 121 million cubic meters, all offshore, as listed by the Oil and Gas Journal of December 26, 1994.

The structure of the Danish mineral industry, showing its major components, is shown in table 2.

Denmark has a well-developed, modern transportation system. Rail lines total 2,770 km, of which 2,120 km was operated by the Danish State Railways and 650 km was privately owned and operated. The rails were 1.435-meter standard gauge and 121 km of the Danish State Railways was rail ferry service. Highways consisted of 66,482 km, of which 64,551 km was concrete, bitumen, or stone block and 1,931 km was gravel, crushed stone, or improved earth. Inland waterways totaled 417 km. Pipelines totaled 1,388 km, of which 110 km was for crude petroleum, 578 km was for petroleum refinery products, and 700 km was for natural gas. The Danish merchant marine totaled 347 vessels of 1,000 gross weight tons or over, totaling 4,974,494 gross weight tons (6,820,067 deadweight tons [dwt]). Of the total vessels, 12 were short-sea passenger vessels, 110 cargo, 21 refrigerated cargo, 51 container, 39 roll-on/roll-off, 1 railcar carrier, 33 petroleum tankers, 24 chemical tankers, 36 liquified gas tankers, 4 livestock carriers, 15 bulk carriers, and 1 combination bulk carrier. Denmark's principal ports were Ålborg, Århus, Copenhagen, Esbjerg, and Fredericia and there were numerous secondary and minor ports.

The Government that was elected in 1993 continued its policies of tempering the economy to reduce unemployment and keep inflation in check. These policies were successful during 1994 and were expected to continue. Growth in 1995 was expected to be lower than in 1994 at about 3%, mainly a result of lower domestic consumption. Mortgage rates, which greatly influence new home construction, increased in 1994 by about 40%, but many homeowners had already refinanced their mortgages during the period of lower rates and, it was assumed, they had spent the extra money on durable consumer goods, such as automobiles and appliances, and therefore private consumption would return to the level of pre-1994.

FAROE ISLANDS

The Faroe Islands, a self-governing overseas administrative division of Denmark, has no known mineral reserves. The economy remains entirely dependent on fisheries, which collapsed at the beginning of the 1990's, causing an economic crisis. However, this could change if a dispute with the United Kingdom over a wide strip of sea between the Faroe Islands and the Shetland Islands that has continued for the past few years is eventually settled in favor of the Faroes. The dispute concerned the boundary of the economic zones of the Faroe Islands and the Shetland Islands and intensified during 1994 as a result of oil having been discovered in the Shetland zone less than 20 km from the present boundary and in the disputed zone. Companies that have explored in the area suggest that there might be as much

as 3,500 Mbbbl in place.

The principal involvement to date of the Faroe Islands in the international minerals industry has been as a market for imported materials to support the local, fishing-based economy. These imports are principally fuels, fertilizer materials, and building products such as cement.

GREENLAND

Since the cessation of mining activities in 1990, Greenland, a self-governing overseas administrative division of Denmark, has been looking for a means of diversifying its economy, based almost entirely on fishing and hunting. Recent legislation has created favorable licensing terms and investment rules, and this together with a very varied geology has attracted mineral exploration to Greenland. Exploration activity has revealed the potential for economic exploitation of antimony, barite, beryllium, chromite, coal, columbium, copper, cryolite, diamond, gold, graphite, ilmenite, iron, lead, molybdenum, nickel, platinum-group metals, rare earths, tantalum, thorium, tungsten, uranium, zinc, and zirconium. Drilling and exploration so far have shown economically exploitable deposits mainly of gold and zinc. There have also been indications of petroleum deposits on the southwest coast of the Nuuuaq Peninsula off the central western coast of the island and of gas reserves offshore in water depths ranging from 200 to 1,500 meters (m). The Greenland Home Rule Government and the Danish Governments announced financing for a new aeromagnetic survey over southern Greenland during the summer of 1995.

Feasibility studies continued in 1994 on the possibility of a 170,000 metric-ton-per-year zinc refinery near Nuuk that would treat Canadian and possibly Irish concentrates that are currently being treated in Europe. The refinery would use locally available hydroelectricity, and the use of pressure-leach technology and underground waste storage would minimize environmental pollution. The refinery would be Greenland's largest-ever industrial project, and the Government reportedly views the project very favorably and would be a 3% shareholder in the project.

The population of Greenland is concentrated on the southern half of the west coast of the island. The cities are served by a system of air and sea links. All major cities and towns have modern harbor facilities. The 80 km of highways on the island is within cities but do not connect cities. The only vessel in Greenland's merchant marine, a 1,778 dwt refrigerated cargo ship, operates under the registry of Denmark.

¹Text prepared May 1995.

Major Sources of Information

Danmarks Geologiske Undersogelse
(Geological Survey of Denmark)
Entemestervej 8

DK-2400 Copenhagen NV, Denmark
Telephone: 35 87 50 50
Fax: 35 87 50 51
Danmarks Statistik
Sejrogade 11
Copenhagen, Denmark
Telephone: 39 17 39 17
Ministry of Economic Affairs
Copenhagen, Denmark
Ministry of Environment
Copenhagen, Denmark
Ministry of Energy
Copenhagen, Denmark
Mineral Resources Administration of Greenland
Slotsholmsgade 1, 4th Floor
DK-1216 Copenhagen K, Denmark
Telephone: 33 95 75 00
Fax: 33 13 30 17
Geological Survey of Greenland
Oster Voldgade 10
DK-1350 Copenhagen K, Denmark

Telephone: 33 11 88 66
Fax: 33 93 53 52
Minerals Office
The Secretariat
Greenland Home Rule Government
P.O. Box 1015
DK-3900 Nuuk, Greenland

Major Publications

Varestatistik for industri, Series A, B, C, D
Danmarks Statistik
The Northern Miner
Toronto, Canada
Mining Journal
London, United Kingdom
American Metal Market
New York, New York
Oil and Gas Journal
Tulsa, Oklahoma

TABLE 1
DENMARK: APPARENT PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1990	1991	1992	1993	1994
Aluminum metal, secondary	10,600	12,000	15,200	20,700	21,200
Cement, hydraulic	1,660,000	2,020,000 r/	2,070,000	2,270,000 r/	2,430,000
Chalk	341,000 r/	363,000 r/	355,000	386,000 r/	414,000
Clays:					
Fire clay	1,710 r/	2,060 r/	2,040	13,400 r/	1,530
Kaolin	17,400	17,100	3,500	3,500 e/	3,500 e/
Other	1,810 r/	1,790 r/	1,470	267 r/	224
Cryolite	16,500 e/ r/	15,000 e/	--	--	--
Diatomaceous materials:					
Diatomite	1,000 e/	1,000 e/	1,000 e/	1,000 e/	1,000 e/
Moler	97,000 e/	95,000 e/	95,000 e/	95,000 e/	95,000 e/
Extracted moler 3/	194	190 e/	190 e/	190 e/	190 e/
thousand cubic meters					
Gas:					
Manufactured	1,780	1,670 r/	1,700 e/	1,700 e/	1,700 e/
terajoules					
Natural:					
Gross3/	5,140	5,760	6,200	6,350	6,900 e/
million cubic meters					
Marketable	2,910	3,720	3,850	4,270 r/	4,630
do					
Iron and steel metal: Steel 3/					
Crude	610,000	633,000	591,000	603,000 r/	722,000
Semimanufactures	539,000	518,000	525,000	527,000 r/	638,000
Lime, hydrated and quicklime	156,000 r/	114,000 r/	128,000 r/	124,000 r/	126,000
Natural gas plant liquids 3/	37,500 e/	42,000 e/	43,500 e/	48,000 e/	48,000 e/
thousand 42-gallon barrels					
Nitrogen, N content of ammonia	1,500 e/	1,500 e/	1,500 e/	1,770	1,700
Peat	225,000 3/	184,000 r/	195,000	189,000 r/	199,000
Petroleum:					
Crude3/	45,400	51,900	58,200	63,500 r/	68,800
thousand 42-gallon barrels					
Refinery products:					
Liquefied petroleum gas	1,660	1,670	1,450 r/	1,700 r/	1,600
thousand 42-gallon barrels					
Gasoline	11,200	13,200	16,200 r/	12,800 r/	11,700
do					
Naphtha	2,130	1,290	1,910 r/	1,210 r/	1,200
do					
Mineral jelly and wax	12 r/	8 r/	4	4	4
do					
Jet fuel	1,980	1,500	1,180	1,630 r/	1,930
do					
Kerosine	605	209	171	109 r/	110 e/
do					
Distillate fuel oil	24,500	27,900	28,700 r/	31,400 r/	28,400
do					
Refinery gas	1,940	1,700 e/	1,700 e/	1,700 e/	1,700 e/
do					
Lubricants	310	318	324	300 e/	260
do					
Residual fuel oil	14,800	13,800 r/	13,300 r/	15,600 r/	13,700
do					
Bitumen and bituminous mixtures	164	61	63	60 e/	52
do					
Petroleum coke	3 e/	3 e/	3	3 e/	3
do					
Total	59,300 e/	61,600 e/	65,000 e/	66,516 e/	60,569 e/
Phosphates, crude, gross weight	528	329	--	1,480 r/	1,270
Salt, all forms	522,000	550,000	528,000	591,000 r/	634,000
Sand and gravel: 3/					
Onshore	22,400	22,000 e/	20,000 e/	20,000 e/	20,000 e/
thousand cubic meters					
Offshore	6,220	6,000 e/	5,000 e/	5,000 e/	5,000 e/
do					
Total	28,700	28,000 e/	25,000 e/	25,000 e/	25,000 e/
do					
Of which: Sand, industrial (sales)	133	130 e/	125 e/	125 e/	25 e/
do					
Stone:					
Dimension (mostly granite) 2/	810	500 e/	385 e/	385 e/	385 e/
cubic meters					
Limestone:					
Agricultural	1,480,000	1,130,000 r/	806,000	584,000 r/	703,000
Industrial	205,000	220,000 r/	217,000	220,000 r/	252,000
Sulfur, byproduct	12,100	6,260	6,980 r/	10,400 r/	10,100

e/Estimated. r/ Revised.

1/ Table includes data available through May 1, 1995, which was based on reported sales of domestically produced mineral commodities.

2/ Previously published and 1994 data have been rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

3/ Production.

TABLE 2
DENMARK: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(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)		Skamol-Skarrehage Molervaerk A/S	Quarries on Mors and Fur (Fry) Islands	85
Do.		Dansk Moler Industri A/S	Quarries on Fur Island	50
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	190
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 Undergrunds Consortium	Dan, Gorm, Rolf, and Tyra oilfields, Danish North Sea	127,000
Refined	do	A/S Dansk Shell	Fredericia	55,000
Do.	do	Kuwait Petroleum Refinig A/S	Gulfhavn	56,500
Do.	do	Statoil A/S	Kalundborg	65,000
Salt		Dansk Salt I/S	Mine (brine) at Hvornum, processing plant at Mariager	600
Steel		Danish Steel Works Ltd. (Det Danske Stalvalsevaerk A/S) (30% Government owned)	Plant at Frederilsvaerk	750

TABLE 3
GREENLAND: PRODUCTION OF MINERAL COMMODITIES^{1/ 2/}

(Metric tons unless otherwise specified)

Commodity	1990	1991	1992	1993	1994
Lead: Concentrate, Pb content	16,000	--	--	--	--
Silver: In lead concentrates kilograms	9,180	--	--	--	--
Zinc: Concentrate, Zn content	47,900	--	--	--	--

1/ Table includes data available through May 1, 1995.

2/ Previously published data have been rounded by the U.S. Bureau of Mines to three significant digits.