THE MINERAL INDUSTRY OF THE NETHERLANDS

By Harold R. Newman

The Netherlands was an important regional producer of natural gas and petroleum for the European market and played a major role as a transshipment center for mineral materials that entered and left continental Europe. In terms of world production, however, it was a modest producer of metallic and nonmetallic minerals and mineral products.

The Netherlands has a land area of 33,883 square kilometers and borders the North Sea to the north and west, Belgium to the south, and Germany to the east. The country was one of the most densely populated and topographically low-lying countries in the world. In 2004, the gross domestic product (GDP) at purchasing power parity was \$477 billion, and per capita income was \$29,253. The growth rate was 1.25% (International Monetary Fund, 2005§¹).

In 2004, the Dutch economy appeared to be coming out of recession although the recovery was fragile and unsteady. Production remained about the same; output was lower in construction and practically every branch of industry and commercial services. Unemployment rose to 4.6% in 2004 from 4.2% in 2003, and the number of jobs declined for the first time since 1994. The growth in the GDP increased slightly because of the increase in domestic demand and a 7.2% increase in exports. Imports rose by 6.7%. The Dutch economy was heavily dependent on international developments and could benefit from a strong revival of the world economy. The export, reexport, and import of goods and services together account for more than 60% of the GDP (Holland Trade, 2004b§).

The raw materials sector was dominated by natural gas and petroleum production, of which about 40% was from offshore. Mining was confined to the extraction of limestone, peat, and sand and gravel by quarrying and salt by solution mining. In 2004, production of mineral commodities generally remained the same or decreased. Downstream activities included metallurgical and chemical industries, which were largely based on imported ores and industrial minerals (table 1).

Staatstoezicht op de Minjnen (State Supervision of Mines) [SodM] ensured that the production of minerals in the Netherlands and the Netherlands portion of the continental shelf was carried out in a responsible and socially acceptable manner. SodM is an agency in the Ministerie van Economische Zaken (Ministry of Economic Affairs). On January 1, 2004, the mining legislation (Mijnbouwwetgeving) which consisted of the Mining Act, the Mining Decree, and the Mining Regulation and replaced previous directives and special rules, was put into force (Staatstoezicht op de Minjnen, 2004§).

Since the 1980s, the Government has reduced its role in the economy, and privatization has continued with little debate or opposition. Nevertheless, the Government continued to

dominate the energy sector and played a large role in the aviation, chemicals, telecommunications, and transportation sectors. The structure of the mineral industry is listed in table 2.

Ispat International N.V. announced it was merging with LNM Holdings N.V. and International Steel Group to create a new steelmaking company Mittal Steel Company N.V. Mittal Steel would be the leading steel producer in the world with a global capacity of 70 million metric tons per year (Mt/yr) and annual sales of \$30 billion. Mittal would be based in the Netherlands. LNM Holdings was one of the world's leading and most profitable steel companies and had substantial mining assets (Indo-Asian News Service, 2004§).

Ziniflex Ltd.'s zinc smelter at Budel produced 228,100 metric tons (t) in 2004 compared with 222,700 t in 2003. A feasibility study was underway to expand capacity to 260,000 metric tons per year (t/yr). If the work is approved, then the smelter could reach that capacity by March 2006 (Mining Journal 2005).

Omya Beheer BV (a subsidiary of Omya AG of the Netherlands) was building a ground calcium carbonate (GCC) plant in Moerdijk, which is located near Rotterdam. The company planned to start production by yearend 2005 with an initial capacity of 500,000 t/yr of GCC. The new facility would process white high-purity marble from Omya's Turkish mining operations (Industrial Minerals, 2004b).

Nedmag Industries Mining & Manufacturing BV produced magnesia by a somewhat unusual operation. Nedmag sourced its magnesia by solution mining magnesium chloride deposits of bischofite and carnallite 2 kilometers below the surface in the Zechstein basin. This deposit yields about 500,000 t/yr of raw magnesium-rich salts. The deposit was discovered by the Royal Dutch/Shell Group in 1997 while they were doing exploratory drilling for natural gas. Nedmag produced a suite of products that included calcium chloride, caustic calcined magnesia, dead burned magnesia, magnesium chloride, and magnesium hydroxide (Industrial Minerals, 2004a).

When it came to the supply of energy, the Netherlands was active on the international scene in more than one respect. The country supplied energy to Europe, served as the entrepôt for oil products for the whole of northwestern Europe, and was an advocate for sustainable energy. Onshore natural gas reserves and offshore petroleum and gas reserves in the North Sea have allowed the Netherlands to make a significant contribution to the European energy supply. Its main customers were Belgium, France, Germany, Italy, and Switzerland (Holland Trade, 2004a§).

As of 2003, proven natural gas reserves were more than 1.9 trillion cubic meters, or about 1% of the world total. The Netherlands was the third leading natural gas producer in the European Union (EU) and the ninth leading in the world; the country accounted for more than 30% of total EU annual natural gas production and about 2.8% of the annual world total. It was also the world's fifth leading natural gas exporter (Carbon Sequestration Leadership Forum, 2004§).

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¹References that include a section mark (§) are found in the Internet References Cited section.

BP plc announced that it had begun construction of a 9-megawatt (MW) wind farm at its oil terminal in the Port of Amsterdam. The project, which was expected to be completed in mid-2005, will have the capacity to provide electricity for about 5,000 Dutch homes and to displace 5,000 t of carbon dioxide. The project will consist of three wind turbines, each of which will be capable of producing 3 MW of electricity, and was the largest to be ordered for the Dutch market. The electricity will be sold into the Dutch electricity grid (BP Global, 2005§).

Rotterdam, which was the world's leading container port and a major European transportation hub, remained extremely important as a shipping and storage center. In 2004, 352 million metric tons (Mt) of cargo was handled in the Port of Rotterdam; this was an increase of 7% compared with that of 2003. The increase was attributed to petroleum products (21%), handling of ores and scrap (6%), and handling of coal (3%) and crude oil (2%). More than two-thirds of the 29-Mt increase came from crude oil and petroleum products (Port of Rotterdam, 2004§).

Outlook

The Port of Rotterdam will continue to be the leading European port and to play a very important role in the European import and export market. Almost as much cargo will pass through Rotterdam as the numbers two, three, and four ports in Europe—Antwerp, Hamburg, and Marseille—combined. A significant percentage of the cargo coming into the port was processed in the port. The Netherlands is an important exporter of natural gas in the region and is expected to remain so.

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Major Sources of Information

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National Geological Survey of the Netherlands

Princetonlaan 6 3508 TA Utrecht Netherlands

State Supervision of Mines Prinses Beatrixiaan 428 2273 XZ Voorburg Netherlands

$\label{eq:table 1} \textbf{TABLE 1} \\ \textbf{NETHERLANDS: PRODUCTION OF MINERAL COMMODITIES}^1$

(Metric tons unless otherwise specified)

| Commodity ² METALS | 2000 | | 2002 | 2003 | 2004 ^e |
|--|----------------------|---------------------|--|------------------------|------------------------|
| Aluminum, metal: | | | | | |
| Primary | 301,700 | 294,100 | 284,000 ^r | 277,900 | 326,300 ³ |
| Secondary | 119,000 | 120,000 e | 120,000 ^e | 50,000 ° | 50,000 |
| Cadmium, metal, primary | 628 | 455 | 485 | 495 ^r | 572 ³ |
| Iron and steel: | 020 | 433 | 403 | 473 | 372 |
| Ore, sintered, from imported ore ^e | 3,000,000 | 3,000,000 | 3,000,000 | 3,000,000 | 3,000,000 |
| Metal, pig iron, including blast-furnace ferroalloys (if any) | 4,969,000 | 5,305,000 | 5,000,000 e | 5,000,000 | 5,000,000 |
| Steel: | 1,707,000 | 3,303,000 | 3,000,000 | 2,000,000 | 2,000,000 |
| Crude | 5,667,000 | 6,037,000 | 6,117,000 ^r | 6,587,000 ^r | 6,848,000 ³ |
| Semimanufactures | 4,956,000 | 5,335,000 | 5,300,000 e | 5,300,000 ^e | 5,400,000 |
| Lead, metal, refined, secondary | 22,200 | 24,400 | 22,000 ^e | 22,000 ^e | 22,000 |
| Zinc, metal, primary | 216,800 | 204,800 | 203,400 | 222,700 ^r | 228,100 ³ |
| INDUSTRIAL MINERALS | 210,000 | 204,000 | 203,400 | 222,700 | 220,100 |
| Cement, hydraulic ^e thousand metric tons | 3,450 ³ | 3,400 | 3,400 | 3,400 | 3,400 |
| Magnesium compounds: ^c | 3,430 | 3,400 | 3,400 | 3,400 | 3,400 |
| Chloride | 25,000 | 25,000 | 25,000 | 25,000 | 25,000 |
| Oxide | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| Nitrogen, N content of ammonia thousand metric tons | 2,543 | 1,989 | 2,053 | 1,750 ^e | 1,970 |
| | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| | 3,000 | 3,000 | 3,000 | 15 | 3,000 |
| Sand, industrial do. Sodium compounds, n.e.s.: | 13 | 13 | 13 | 13 | 13 |
| | 350.000 | 250,000 | 250,000 | 250,000 | 350,000 |
| Carbonate, synthetic Sulfate: | 350,000 | 350,000 | 350,000 | 350,000 | 330,000 |
| | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| Natural South at a | 20,000 | 20,000 | 20,000 | 20,000 | 15,000 |
| Synthetic Sulfur: | 15,000 | 15,000 | 15,000 | 15,000 | 13,000 |
| Elemental byproduct: | | | | | |
| ** | 122 000 | 126,000 | 124,000 ^r | 131,000 ^r | 137,000 ³ |
| Of metallurgy | 123,000 428,000 | 126,000 384,000 | 373,000 ^r | 408,000 ^r | 410,000 ³ |
| Of petroleum and natural gas Total | 551,000 | 510,000 | 497,000 ^r | 539,000 ^r | 547,000 ³ |
| Sulfuric acid, anhydrous, H ₂ SO ₄ ^e | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| MINERAL FUELS AND RELATED MATERIALS | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Coke, metallurgical ^e | 2 200 000 | 2 200 000 | 2 200 000 | 2 200 000 | 2,200,000 |
| Gas: | 2,300,000 | 2,300,000 | 2,300,000 | 2,300,000 | 2,200,000 |
| | | | | | |
| Natural: | 60 190 | 74 020 | 75 000 e | 75,000 ^e | 75,000 |
| Gross million cubic meters Marketed do. | 69,180 | 74,232 73,296 | 75,000 ^e 74,000 ^e | 73,000 ° | 74,000 |
| | 68,157 | | | | 160,000 |
| Natural gas liquids ^e thousand 42-gallon barrels Petroleum: | 170,000 | 160,000 | 160,000 | 160,000 | 100,000 |
| | 17 (22 | 16 400 F | 16 700 [| 17 000 F | 17,000 |
| Crude do. Refinery products: ^e | 17,633 | 16,490 ^r | 16,790 ^r | 17,000 ^r | 17,000 |
| | 42.711.3 | 42,000 | 42,000 | 42,000 | 12 000 |
| Liquefied petroleum gas do. | 42,711 3 | 42,000 | 42,000 | 42,000 | 42,000 |
| Mineral jelly and wax do. | 896 3 | 900 | 900 | 900 | 900 |
| Gasoline, motor do. | 121,669 3 | 120,000 | 120,000 | 120,000 | 120,000 |
| Naphtha and white spirit do. | 96,076 ³ | 90,000 | 90,000 | 90,000 | 90,000 |
| Kerosene and jet fuel do. | 59,888 ³ | 60,000 | 60,000 | 60,000 | 60,000 |
| Refinery gas do. | 10,486 ³ | 11,000 | 11,000 | 11,000 | 11,000 |
| Diesel oil do. | 164,060 ³ | 160,000 | 160,000 | 160,000 | 160,000 |
| Residual fuel oil do. | 72,900 ³ | 81,000 | 80,000 | 80,000 | 80,000 |
| Bitumen do. | 4,130 ³ | 4,200 | 4,200 | 4,200 | 4,200 |
| Unspecified do. | 41,349 3 | 40,000 | 40,000 | 40,000 | 40,000 |
| Total do. | 614,165 ³ | 609,000 | 608,000 | 608,000 | 608,000 |

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

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¹Table includes data available through May 2005.

²In addition to the commodities listed, the Netherlands produced limestone, peat, and construction materials, such as sand and gravel, but output was not reported and no basis exists to make reliable estimates of production.

³Reported figure.

${\bf TABLE~2}$ NETHERLANDS: STRUCTURE OF THE MINERAL INDUSTRY IN 2004

(Thousand metric tons unless otherwise specified)

| Comme | odity | Major operating companies | Location of main facility | Annual capacity |
|---------------------|---------------------------------|--|--|-----------------|
| Aluminum: | | | | - |
| Primary | | Pechiney Nederland NV | Smelter at Vlissingen | 175 |
| Do. | | Corus Group | Smelter at Delfzijl | 100 |
| Secondary | | Alumax Recycling BV | Smelter at Kerkade | 50 |
| Cadmium | metric tons | Budelco BV (Australian Overseas Smelting Pty. | Plant at Budel-Dorplein | 650 |
| | | Ltd, 50%, and Kempensche Zinkmaatschappij | | |
| | | Zincs de la Campine BV, 50%) | | |
| Cement | | Eerste Nederlandse Cement Industrie NV | Ten plants at Maastrict | 2,700 |
| Do. | | Cementfabriek IJmuiden BV | Three plants at Ijmuiden | 1,600 |
| Do. | | Cementfabriek Rozenburg BV | Two plants at Rozenburg | 920 |
| Lead | | Hollandse Metallurgische Industrie Billiton BV | Electrolytic plant at Arnhem | 35 |
| Do. | | Billiton Witmetaal BV | Electrolytic plant at Naarden | 6 |
| Limestone | | Ankerpoort NV (Lhoist SA, 100%) | Mines at Maastricht and Winterswijk | 600 |
| Magnesia | | Nedmag Industries Mining & Manufacturing BV | Plant at Veendam | 130 |
| Do. | | MAF Magnesite BV | Plant at Schiedam | 40 |
| Natural gas | million cubic | Nederlandse Aardolie Maatschappij BV (NAM) | Groningen, Leeuwarden, Assen, and other onshore | |
| | meters per day | (Shell BV, 50%, and Exxon Mobile BV, 50%) | gasfields and several offshore wells in the North Sea | 225 |
| Petroleum: | | | | |
| Crude | 42-gallon barrels | Amoco Inc., Conoco Inc., and Unocal Inc. | 766 wells (204 producing) including North Sea fields: | 83,500 |
| | per day | | Haven, Helder, Helm, Hoorn, Kotter, Logger, and Rijn | |
| Do. | do. | Nederlandse Aardolie Maatschappij BV (NAM) | Onshore fields: Berkel, DeLier, Ijselmonde, Meerkapelle, | 20,500 |
| | | (Shell BV, 50%, and Exxon Mobile BV, 50%) | Pernis, West, Pinacke, Rotterdam, Schoonebeck, | |
| | | | Werkendam, and Zoetemeer | |
| Do. | do. | Veba Oil and Gas Netherlands | Hanze field, North Sea | 31,500 |
| Refined | | Six companies, of which the major ones are: | Refineries | 1,230,500 |
| | | | Of which: | |
| | | Netherlands Refining Co. | Rotterdam | (446,000) |
| | Shell Nederland Raffinaderij BV | Pernis | (374,000) | |
| | Esso Nederland BV | Rotterdam | (175,000) | |
| | | Total Raffinaderij Nederland NV | Vlissingen | (150,000) |
| Salt | | Akzo Nobel Salt BV (Akzo Nobel BV, 100%) | Mines | 4,100 |
| | | | Of which: | |
| | | | Hengelo | (2,100) |
| | | | Delfzijl | (2,000) |
| Sand, silica | | Lieben Minërals BV | Mines at South Limburg | 150 |
| Sodium: | | | | |
| Carbonate, syntheti | ic | Brunner Mond Group | Plant at Delfzijl | 380 |
| Sulfate, synthetic | | do. | do. | 600 |
| Steel | | Corus Group | Plant at IJmuiden | 6,100 |
| Zinc | | Budel Zinc BV (Ziniflex Ltd.) | Plant at Budel-Dorplein | 250 |