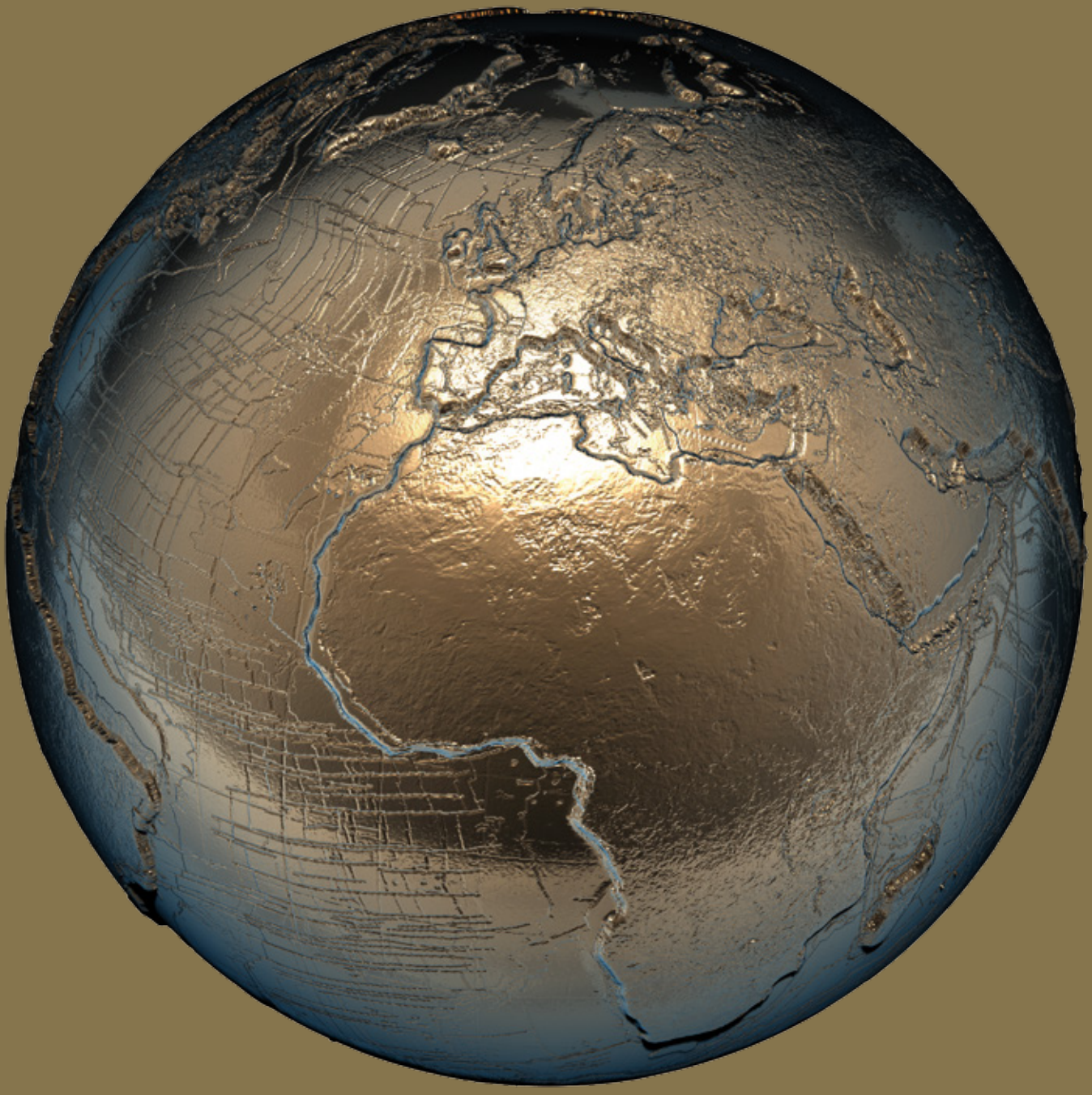
# World Mineral Production

## 2008–2012



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Centenary edition

BRITISH GEOLOGICAL SURVEY

# WORLD MINERAL PRODUCTION 2008–12

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*The British Geological Survey is a component body of the Natural Environment Research Council.*

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**PREFACE**

This volume is the latest in the series *World Mineral Production*, published by the British Geological Survey. It includes global mineral production data for 2012, which represents the 100th year of a continuous dataset that started in 1913. This is an important milestone and consequently for this special 'Centenary Edition' we have selected a range of important mineral commodities and provided infographic pages to illustrate particular aspects of the data, past and present. We have also provided a brief history of the mineral statistics process over the years describing how it has evolved from a UK- and British Empire-focussed book a hundred years ago to a web-delivered global service providing data on 73 commodities for 177 countries today.

This publication and its predecessors have together provided valuable information to a wide range of users around the world for a century. The format and style may have changed but the objective has remained the same: namely, to provide a reliable, objective, comprehensive and continuous set of data covering most of the minerals that enter international trade.

The data for this publication is held in a comprehensive database maintained by the British Geological Survey and we continue to present the latest production information obtained from official bodies in individual countries, although other sources are also used to ensure completeness and accuracy. The cooperation afforded to the British Geological Survey by numerous national and international organisations is gratefully acknowledged.

We believe this information is as important today as it has ever been. The issue of ensuring the security of supply of minerals has existed throughout the last century, although the underlying reasons for concern may have changed. Interest in this subject remains high and with a growing global population it is likely to remain so in future. BGS is playing a leading role in an EU project aimed at developing a European Mineral Intelligence Network, in collaboration with most other European National Geological Surveys. We hope that this Network will become firmly established, complementing BGS' mineral statistics work, as we move into the next century.

John N Ludden
Executive Director

British Geological Survey
Keyworth
Nottingham

February 2014

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*Commodity Index*



**EXPLANATORY NOTES**

*Coverage*

*World Mineral Production* covers the majority of economically important mineral commodities. For each commodity constant efforts are made to ensure that as many producing countries as possible are reported. For some commodities, where statistics on production are not publicly available, estimates are made. Users of this compilation are advised that more statistical information than can be included in a publication of this nature is held in the British Geological Survey files and is available for consultation. Historical data (from 1913 for many commodities) can be obtained from the predecessors to this series entitled *World Mineral Statistics* and the *Statistical Summary of the Mineral Industry*. Copies of these publications are available in the World Archive section of the website: www.mineralsUK.com.

*Arrangement of countries*

Countries are ordered alphabetically in geographical groupings as follows:

Europe
Africa
North and Central America, including the Caribbean
South America
Asia
Australasia, including the Pacific Islands

*Metals*

Mine production of many metals is expressed in terms of metal content. This is clearly indicated at the head of the table, adjacent to the unit used. For aluminium, cobalt, copper, iron, lead, nickel, tin and zinc, mine production and metal production are shown in separate tables. Unless otherwise specified, metal production statistics relate to metal recovered from both domestic and imported materials, whether primary or secondary, but exclude remelted material wherever possible.

*World totals*

For certain minerals and metals no world total is shown due to the non-availability of certain individual country totals.

*Exclusion of Warranty*

Use by recipients of information provided by the BGS, is at the recipients' own risk. BGS has taken care to ensure that information provided is as free from error as is reasonably practical. In view of the disparate sources of information at BGS's disposal, including such material donated to BGS, that BGS accepts in good faith as being accurate, the Natural Environment Research Council (NERC) gives no warranty, expressed or implied, as to the quality, accuracy, performance, and merchantability of the information supplied, or to the information's suitability for any use whether made known to BGS or otherwise. NERC/BGS accepts no liability whatever in respect of loss, damage, injury or other occurrence however caused.

*Acknowledgements*


Compilation of this volume of mineral statistics has been possible only by obtaining information from a very large number of organisations throughout the world, chiefly home and overseas government departments and specialist national or international authorities concerned with particular sectors of the minerals or metals industries. To all these bodies the British Geological Survey expresses its grateful acknowledgement for the information made available, whether

in published form or provided by direct correspondence. Particular acknowledgement is made to the Mines Departments and other government agencies of many countries whose regular statements, yearbooks and other reports are worthy of direct consultations by readers in search of detail.

Specialist commodity organisations which have kindly allowed information to be reproduced include the International Copper Study Group, the International Lead and Zinc Study Group, the International Nickel Study Group, the Barytes Association and the International Fertilizer Industry Association Ltd. In a few instances, information on specific commodities has been obtained directly from company sources. The co-operation of other members of the International Consultative Group on Non-Ferrous Metal Statistics is also gratefully acknowledged.

Supplementary information is also obtained from publications dealing with a wider range of commodities such as Société de l'Industrie Minérale, *Annuaire Statistique Mondial des Minerais et Métaux;* World Bureau of Metal Statistics, *World Metal Statistics* and*, Metallstatistik;* publications of the Interstate Statistical Committee of the CIS, the United States Geological Survey, and UN agencies.

In addition, information has been obtained from the websites of the following organisations, companies, statistical offices and government departments: United Nations; BP Plc; Eurofer; Eurostat; Instituto Latinoamericano del Fierro y el Acero; International Iron and Steel Institute; Kaolin & Plastic Clays Europe; Kimberley Process; World Nuclear Association; Agnico Eagle Mines; Aluminium de Greece; Anglo American; Aura Minerals Inc; BHP Biliton; Breakwater Resources; Dragon Mining; Dundee Precious Metals; Endomines; Eramet; Exxaro; Eurozinc Mining Corporation; Glamis Gold; Glencairn Gold; Goldcorp Inc; Iamgold Corporation; Inmet Mining; Lappland Goldminers; Lundin Mining; New Boliden; Norilsk Nickel; Nyrstar; Orosur Mining Inc; Outokumpu; Paladin Energy Ltd; Phosphate Resources Ltd; Qatar Steel Company; Rio Narcea; Rio Tinto; RNC Gold; Rusal; Stillwater Mining; Talvivaara; Vitmetco; Weatherly International Plc; Xstrata; Institute of Argentinean Petroleum and Gas, Argentina; Institute of Argentinean Steel, Argentina; Acero Argentinos; Northern Territory Government, Australia; Department of Primary Industries Victoria, Australia; Mineral Resources Tasmania, Australia; Australian Bureau of Agricultural & Resource Economics; Vereinigung der Osterreichishen Zementindustrie, Austria; Energy Bangla, Bangladesh; Petrobangla, Bangladesh; Central Bank of Barbados; Federation de l'Industrie Cimentiere Belge, Belgium; Belgian Steel Federation; Statistics Belgium; Instituto Nacional de Estatistica Boliva; Cámara Boliviana de Hidrocarburos, Bolivia; Ministry of Mining and Metallurgy, Bolivia; Republika Srpska Institute of Statistics, Bosnia & Herzegovina; Departamento Nacional De Producao Mineral, Brazil; Grupo Paranapanema, Brazil; Agencia Nacional do Petroleo, Brazil; Associação Brasileira do Alumínio, Brazil; Ministerio de Minas y Energia, Brazil; Sindicato da Indústria Carbonífera de Santa Catarina, Brazil; Natural Resources Canada; Statistics Canada; Canadian Association of Petroleum Producers; Mineral Resources of Quebec, Canada; Chilean Copper Commission; National Service for Geology and Mining, Chile; China Mining Association; National Bureau of Statistics, China; Ministerio De Minas Y Energia, Columbia; Unidad de Planeación Minero Energética, Columbia; Central National de la Statistique et des Etudes, Economiques, Republic of Congo; Oficina Nacional de Estadisticas, Cuba; Czech Republic Statistical Office; Statistics Denmark; Danish Energy Agency, Denmark; Banco Central de la Republica Dominicana, Dominican Republic, Banco Central del Ecuador; Geological Survey of Finland; Federation des Minerais, Mineraux Industrielles et Metaux non Ferreux, France; Comite Professionel de Petrole, France; Ministere de l'Economie, des Finances et de l'Industrie, France; Unicem, France; Infociments, France; Statistisches Bundesamt Deutschland, Germany; National Statistical Service of Greece; National Bank of Guyana; Ministerio de Energia y Minas, Guatemala; Federacciai, Italy; Unione Petrolifera, Italy; Istituto Nazionale di Statistica, Italy; Salt Industry Centre, Japan; Metal Economics Research Institute, Japan; Statistics Agency of Kazkhstan; Korea Institute of Geoscience and Mineral Resources, Republic of Korea; Statistical Office of Kosovo; Statec, Luxembourg; Bank Negara Malaysia; Pemex, Mexico; Secteria de Economia, Mexico; Servicio Geologico de Mexico; Mineral Resources & Petroleum Authority of Mongolia; Statistics Office of Montenegro; Bank al Maghrib, Morocco; Ministry of Mines, Morocco; Ministry of Mines and Energy, Namibia; Centraal Bureau voor de Statistiek, Netherlands; Staatstoezicht op de Mijnen, Netherlands; Ministry of Economic Development, New Zealand; Central Bank, Nicaragua; National Bureau of Statistics, Nigeria; Statistisk Sentralbyra, Norway; Geological Survey of Norway; Norwegian Petroleum Directorate; Central Bank of Oman; Ministry of National Economy, Oman; Direccion de Estadistica y Censo, Panama; Chamber of Mines and Petroleum, Papua New Guinea; PeruPetro; Ministerio de Energia y Minas, Peru; Sociedad Nacional de Mineria Petroleo y Energia, Peru; Mines and Geosciences Bureau, Philippines; Instituto Nacional de Estatistica, Portugal; Ministry of Agriculture, Portugal; Federal State Statistics Service, Russia; National Bank of Rwanda; Agence Nationale de la Statistique et de la Démographie, Senegal; Statistical Office of the Republic of Serbia; Central Bank of Sierra Leone; Statistical Office of the Republic of Slovenia; Central Bank of Solomon Islands; Unesid, Spain; Staatsolie Maatschappij, Suriname; Sveriges Geologiska Undersokning, Sweden; Jernkontoret, Sweden; Statistiska Centralbyran, Sweden; Bureau of Mines, Taiwan; National Statistics, Taiwan; Bank of Thailand; Central Bank of Trinidad and Tobago; Department of Business, Innovation and Skills, United Kingdom; Department of Energy and Climate Change, United Kingdom; Office for National Statistics, United Kingdom; Energy Information Administration, United States of America; Direccion Nacional de Minería y Geología, Uruguay; General Statistics Office, Vietnam; Central Statistical Organisation, Republic of Yemen.

*Units*

The Statistics shown in this volume are expressed in metric units. The following factors are given for converting to non-metric units:

tonnes × 0.9842 = long tons
tonnes × 1.1023 = short tons
kilograms × 2.2046 = pounds
kilograms × 32.1507 = troy ounces
cubic metres × 35.3147 = cubic feet
1 tonne of crude petroleum equals on average 7 barrels of crude petroleum.
1 flask mercury = 34.5 kilograms

*Symbols*

| | |
|---|---|
| ... | figures not available |
| 0 | quantity less than half unit shown |
| — | nil |
| * | estimated |
| BGS | British Geological Survey |

# The World Mineral Statistics dataset: 100 years and counting

Welcome to the latest edition of *World Mineral Production*, an annual publication from the British Geological Survey (BGS). This volume is the 'Centenary Edition' because the dataset that underpins this publication is continuous from 1913 to the present day, containing mineral production data by commodity, by country, in each of those 100 years. The dataset also contains import and export data for a large number of the commodities for the majority of the last century.

To be the custodians of such a long-running dataset is a privilege. To maintain that dataset, and continually add to it, is a considerable responsibility. We are proud of this dataset because of the significant value it provides to many people in government, industry and academia worldwide.

Although there have been many changes over the past century, some of which are described below, the rationale for collating, analysing and publishing these statistics has remained similar throughout. The objective that led to the publication of the early editions was to provide data and information in support of industry, firstly of the United Kingdom and 'British Empire' but also of the world. The term 'industry' is used here in its widest sense; to include most activities of mankind that bring economic benefits including construction, chemicals, energy, environmental protection, etc. All these activities require secure and sustainable supplies of minerals.

The preface of the 1977 edition of *World Mineral Statistics* described it as follows: "The primary object of this work remains what it always has been: to present as comprehensively and accurately as possible factual data about the world mineral industry's activities, which are essentially the end-product of geology and a measure of the unceasing contribution of the geological sciences to man's material welfare and progress."

The 1995 edition's preface added that "it appears that the second half of the decade may see real growth in world economic activity and hence in the demand for raw materials. Resources of most minerals are sufficient to meet demand for the foreseeable future but the uncertainties that surround the geographic patterns of production and trade make the availability of reliable statistics an essential tool for the analysis of activity in this sector."

The process of collection, management and delivery of data has evolved and been refined in response to the changing global political, economic, technological and social conditions but these statements remain true today. As the global economy recovers, mankind will need minerals in increasing quantities and, consequently, these statistics are as essential now as they have always been.

**The origin of 'mineral statistics'**

It may be uncomfortable to acknowledge, but wars have been the drivers for many of mankind's technological developments. Such technologies depend on secure supplies of numerous mineral commodities for which demand inevitably escalates in times of war. However conflict also inevitably restricts supply of mineral commodities, either because they are sourced from opposing countries, or because transport infrastructure is disrupted. As a consequence, the risks associated with demand exceeding supply receive more attention during periods of conflict.

Although the need to collect mineral statistics data had been identified before the First World War (1914–1918), this requirement was accentuated by the conflict. Supplies of certain key minerals from overseas, such as manganese, tungsten, phosphates and petroleum, were interrupted during the war and this necessitated the urgent search for, and development of, resources in the United Kingdom and those parts of the world that formed the 'British Empire'.

**Minerals for the Empire**

In October 1918 the Geological Magazine reported that "… as a result of the deliberations of the Imperial War Conference last year a Special Committee … was appointed … to prepare a scheme for the establishment, in London, of an Imperial Mineral Resources Bureau." The Committee recommended that the Bureau should "… collect, co-ordinate, and disseminate information in regard to the resources, production, treatment, consumption, and requirements of every mineral and metal of economic value …" and "… advise on the development of the mineral resources … in order that such resources may be made available for the purposes of Imperial defence or industry …". Thereafter the Imperial Mineral Resources Bureau was formed and received a Royal Charter in 1919.

This Bureau released many reports, 'pamphlets' and other publications on these subjects, but a series containing statistics of mineral production and trade are most pertinent to this volume.

The first issue, published in 1921, was entitled *The Mineral Industry of the British Empire and Foreign Countries, Statistical Summary (Production, Imports and Exports)* and covers the years 1913–1920. The starting year of 1913 was deliberately chosen to enable direct comparison between the last pre-War year with those during the period of conflict. The book included data on 40 mineral commodities, from aluminium to zinc, most of which are still found in this volume. However some readers may not immediately recognise 'quicksilver' as mercury or 'monazite' as an important rare earth element-bearing mineral.

As would be expected, statistical data for the war years was difficult to compile but the first edition concluded that "… the figures are, generally speaking, as complete as possible in the circumstances of war …" and to the modern eye they appear remarkably complete. Although some attempts at collecting mineral production data from outside the United Kingdom had been conducted prior to this first volume, it is from 1913 that the dataset became comprehensive, both in the countries and commodities covered.

The preface to the first edition included several references to intended future improvements: for example the inclusion of both ore and smelter production of certain metals; the addition of substances such as oil shale, salt and china clay; and the publication of trade data for petroleum. All of these, and more besides, were implemented for the second edition published in 1924 and covering the years 1920–1922. Thereafter the publication was released annually, with the exception of the years during and immediately after the Second World War.

**A constantly changing world**

Various political changes are reflected by the publications, in particular through the country names, but also in the prefaces or introductory notes for each volume. For example the edition published in 1925 (covering the years 1921–1923) notes that "Trade statistics given for the United Kingdom, include, as from 1st April, 1923, the trade of Great Britain and Northern Ireland with the Irish Free State and exclude, from that date, the direct foreign trade of the Irish Free State" thus reflecting the formation of the separate Irish nation created by the Anglo-Irish Treaty which was signed in December 1921. The Irish Free State became known as Eire in 1937 to reflect the nation's new constitution, before later changing to its current name of the Republic of Ireland.

The edition published in 1949 reflected the separation of India and Pakistan with comments relating to the availability of trade data from particular parts of these countries. The 'British Indian Empire' was separated in August 1947 into the 'Dominion of Pakistan' and the 'Union of India'. The former originally included Bangladesh, which achieved secession from Pakistan in 1971.

In 1953 there are references to the formation of the 'Federation of Rhodesia and Nyasaland' from the previously listed countries of Northern Rhodesia, Nyasaland and Southern Rhodesia. This federation only lasted until the end of 1963 when Northern Rhodesia became independent as Zambia and Nyasaland gained

independence as Malawi. Southern Rhodesia became known as Rhodesia and was renamed as Zimbabwe in 1980.

The term 'Congo' is today liable to misinterpretation because of the existence of two countries in Africa: Republic of Congo with a capital city of Brazzaville and the Democratic Republic of Congo (sometimes shortened to DRC) with its capital at Kinshasa. However, this situation has existed throughout the last century because the former was known as 'French Congo' until 1960 and 'People's republic of the Congo' from 1970–1991. The DRC was known as 'Belgian Congo' until 1960, then 'Republic of Congo' (1960–1964) and 'Zaire' (1965–1997). This issue was particularly highlighted in the edition published in 1962, which stated "In this issue the designation 'Congo Republic' has been used for the former Belgian Congo and the designation 'Congo (Republic of)' for the former French Territory of Middle Congo." This illustrates the complexity of using long time series data. Users should ensure they are comparing like with like, which can become challenging when borders change or countries are renamed.

More recently, the dissolution of the Soviet Union in December 1991 created, in total, 15 'new' countries. Also around this time Yugoslavia broke up creating yet more independent states although periods of conflict followed. The practicalities of separating the mineral production statistics into these individual countries should not be under-estimated and not surprisingly it is the edition published in 1995 when the new countries begin to be shown.

Examples of other changes in country names are given in the table below, although this list is not exhaustive. The first edition, published in 1921, contained statistics from 98 'countries' or separately named territories, this centenary volume includes data from a total of 177.

| Name used in one or more editions prior to 1939 | Name(s) used in the intervening period | Name(s) used in 2014 | Continent |
|---|---|---|---|
| Anglo-Egyptian Sudan | Sudan | Sudan, South Sudan | Africa |
| Bechuanaland | | Botswana | Africa |
| Belgian Congo | Republic of Congo, Zaire | Democratic Repulic of Congo | Africa |
| Bosnia and Herzegovina | Yugoslavia | Bosnia and Herzegovina | Europe |
| British Guiana | | Guyana | South America |
| British India | | India, Pakistan, Bangladesh, Burma | Asia |
| Ceylon | | Sri Lanka | Asia |
| Czechoslovakia | | Czech Republic, Slovakia | Europe |
| Dutch East Indies | | Indonesia | Asia |
| Dutch Guiana | Surinam | Suriname | South America |
| Formosa | | Taiwan | Asia |
| French Congo | People's Republic of Congo | Republic of Congo | Africa |
| French Indo-China | | Vietnam, Cambodia, Laos | Asia |
| French West Africa | Parts known as: French Sudan, Upper Volta, Dahomey | Mauritania, Senegal, Mali, French Guinea, Ivory Coast, Burkina Faso, Benin, Niger | Africa |
| Gold Coast | | Ghana | Africa |
| Irish Free State | Eire | Republic of Ireland | Europe |
| Northern Rhodesia | Federation of Rhodesia and Nyasaland | Zambia | Africa |
| Nyasaland | Federation of Rhodesia and Nyasaland | Malawi | Africa |
| Persia | | Iran | Asia |
| Portuguese East Africa | | Mozambique | Africa |
| Siam | | Thailand | Asia |
| South West Africa | | Namibia | Africa |
| Southern Rhodesia | Federation of Rhodesia and Nyasaland, Rhodesia | Zimbabwe | Africa |
| Straits Settlements | | Malaysia, Singapore | Asia |
| Tanganyika | | part of Tanzania | Africa |
| Zanzibar | | part of Tanzania | Africa |

**The Second World War and aftermath**

The Second World War created significant problems for the collection of statistical data on mineral production and trade, and also made its publication more sensitive, with no statistical volumes published in the years 1939 to 1947. However, after the war the Imperial Institute clearly recognised the importance of the data and endeavoured to include as complete a set of data as possible for all the war years in the edition released in 1948 (covering the years 1938–1944).

The Introductory Note to that edition highlighted some of the difficulties in acquiring meaningful data. It indicated that "some of the trade statistics for European countries are, however, not strictly comparable owing to the 'annexation' of certain territories by Germany, e.g. the Customs barriers of Germany were extended between 1938 and 1940 to include Sudetenland, Danzig and other parts of Poland, Alsace-Lorraine, Luxemburg, Bohemia and Moravia" (these are parts of modern day Czech Republic, Poland, France and Luxemburg). It also states that "Trade statistics for Japan as published in the official returns do not include trade between that country and the rest of the Japanese Empire …" which at that time included most countries of South East Asia.

The aftermath of the Second World War also necessitated a change in title for the annual publication. It was no longer appropriate to refer to the 'British Empire' and therefore from 1950 the volumes were titled *Statistical Summary of the Mineral Industry, Production Imports and Exports* although the tables were still divided into 'British Countries' and 'Foreign Countries'. In April 1949 the Mineral Resources Department of the Imperial Institute was transferred to the Colonial Geological Surveys and, therefore, from 1950 onwards it was the latter name that appeared on the cover of the publication.

The collection of accurate statistical data remained problematic for several years after the war. The Introductory Note for the 1949 edition stated, "It has not been possible to give complete information for some countries, including those of eastern Europe, but in order that world totals may be arrived at, estimates for such countries have been attempted." This clearly reflects the impact of the so-called 'Iron Curtain' spoken about by Winston Churchill in his famous speech of 1946. Today, where data cannot be found estimates are still made if it is possible to do so.

Further changes from the old 'Empire' to the new 'Commonwealth' can be seen in the publications in the late 1950s. From the edition published in 1958 the 'Colonial Geological Surveys' was renamed the 'Overseas Geological Surveys' although the Mineral Resources Division remained responsible for the mineral statistics. From 1960 the countries were no longer divided between 'British' and 'Foreign' but were listed as 'Commonwealth countries' and 'Other countries'.

The organisation responsible for compiling the statistics changed again in 1965 with the formation of the Institute of Geological Sciences (IGS) by the amalgamation of the Overseas Geological Surveys with the Geological Survey of Great Britain and the Museum of Practical Geology. At this point the organisation became a constituent body of the Natural Environment Research Council (NERC).

**The commodities covered**

The evolution of the series is also reflected in the commodities covered. The contents page of the first edition listed 39 commodities, compared to 73 in this centenary volume. Of original 39, only aluminium had separate tables for its ore (bauxite) and refined metal. In the 1920s eleven further commodities were added including cadmium, china clay (kaolin), diamonds, platinum and salt, together with more detail on coal, iron and steel and petroleum.

Also in the 1920s the statistics for copper, lead, tin and zinc were expanded to include both the production of ore and refined metal. The rationale was that the ore is not always smelted in the country of origin and therefore the compilers noted that the metal tables included metal derived from both domestic and

imported ore. Since the 1970s, this distinction was also made for cobalt and nickel, and continues to be very informative as the global distribution of production from mining and smelting has continued to evolve.

In the edition published in 1960 statistics were first published for bentonite, cement, indium, perlite and natural sodium carbonate. Figures for cement were included until 1973 but then ceased. Data for indium were discontinued in the 1970 edition but were reinstated in 2012.

Very few commodities have been removed from the publication; amongst these are abrasives and nitrates; the first because they are "now nearly all synthesised" and the latter because they are "now predominantly derived from the atmosphere", as noted in the 70th edition published in 1985. The early editions contained substantial information on coal by-products but the level of detail was reduced from the 1960 edition onwards.

Many of the commodities added might be termed 'technology metals' because they are required for new technologies, such as those needed to produce clean energy and for modern communication and computing. However, what is probably not appreciated is just how early in the compilations some of these commodities first appeared. For example, lithium production was first recorded in 1925, while selenium, tantalum and tellurium were introduced in 1937. It is evident that mankind has developed new uses for many of these commodities, leading to recent major increases in consumption, but it is incorrect to regard these commodities as 'new'.

**Metrication and modernisation**

A significant change occurred in the edition published in 1972, in the preface to which the Director of IGS was "pleased to announce that, in line with the development of metrication in industry and elsewhere, the latest statistical information in this edition is presented to the reader on a fully metric basis as well as in the units employed hitherto." As indicated, this volume includes two columns for 1970 the first using 'long tons' while the second contains 'metric tonnes'.

The last *Statistical Summary of the Mineral Industry* was published in 1973 (covering years 1967–1971) but it was succeeded by a new series titled *World Mineral Statistics* in 1977. This book looked completely different to its predecessor; it differed in page size and font, had a brightly coloured cover, in contrast to the previous grey or brown and the countries were no longer separated into 'Commonwealth' and 'Other'. The preface to the 1977 edition noted, "Its coverage is broadly similar to, and indeed deliberately overlaps, that of the previous series in order to maintain the comparability and continuity of information."

The order in which the country data were presented changed again in 1999. Prior to that UK data were provided first, but subsequently this was changed to the format which remains today: alphabetical by continent with Europe first, followed by Africa, North and Central America, South America, Asia and Australasia.

On 1 January 1984 the Institute of Geological Sciences was renamed the British Geological Survey (BGS) and this was first reflected in the edition that covers the years 1978-1982.

**Trade statistics**

An issue that has always existed with trade statistics was mentioned in the volume published in 1948 and is described thus "… the trade figures are intended to represent imports for home consumption and exports of domestic produce. … however, many countries include a certain amount of 'nationalised' goods, i.e. goods originally imported, … and subsequently re-exported." Although separation of 're-exports' was attempted for several decades, this was discontinued because it was a difficult and complex task and the results were not always complete.

The preface to the edition published in 1986 refers to the inclusion of an appendix to include 'reconstructed' trade for a selection of commodities for the Soviet Union. The explanation given is that "Some major trading countries, for example China, Soviet Union and other Eastern bloc countries, publish insufficient data to give a realistic picture of their trade in important mineral commodities. In these cases a reconstruction of either their imports or their exports can be made by searching the official publications of their trading partners that do give details by country." This clearly involved a substantial amount of additional work for the compilers because the appendix included only 29 commodities and covered just trade with the Soviet Union. Subsequent editions provided similar data for China and for other groups of countries but the inclusion of a separate appendix ceased in 1990. Considerable improvements in the reporting of trade data, particularly by the United Nations through its online Commodity Trade database, have largely removed the laborious nature of this work. Trade data for a few countries and/or commodities remains problematic and today BGS undertakes selected reconstructions where necessary for its European Mineral Statistics publication.

**Changing patterns of supply and demand**

In the past 100 years the demand for most minerals and metals has escalated in response to global population growth and the spread of prosperity. In recent years this has led to unprecedented production levels for many minerals and metals, as illustrated in the infographic pages included in this volume. The production of commodities such as antimony, cobalt, platinum-group metals (PGM), lithium and several others which are essential to a range of new and 'green' technologies have grown rapidly in the last three decades. For example, since 1984, global production of the PGM has more than doubled as a result of their use in autocatalysts which were introduced in the late 1970s in Japan and USA and have since been widely adopted elsewhere. Growth in demand for cobalt has been even more marked with mine production increasing fivefold in the past thirty years as its use in rechargeable batteries and a wide range of alloys has grown.

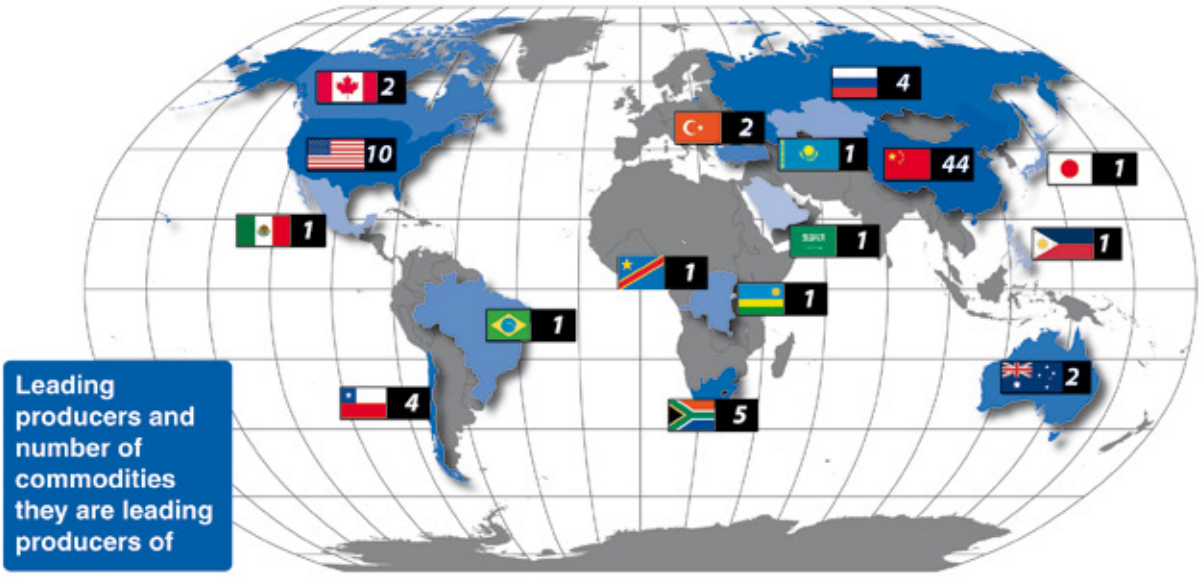
Just as production levels have increased in the past century, so there have been major changes in the patterns of supply and demand for many mineral raw materials. In the 'colonial era', minerals were either sourced locally or were produced in overseas colonies. In the Cold War of the 1960s and 1970s, a comparable situation prevailed with the USA and Soviet Union looking after their own mineral needs from cheap indigenous sources or from their allies. In the following two decades the main consuming nations ceased to be the major producers and the developed economies became increasingly dependent on abundant and cheap mineral supplies from less developed countries.

Following economic stagnation in many developed economies in the 1990s, accelerated growth in the developing and emerging economies led to significant increases in demand and high commodity prices from around 2004 onwards. Many of these countries, such as Brazil, Russia, India and China (collectively referred to as the BRIC countries)but also others, began to demand a greater share of the proceeds of mining. This 'resource nationalism' has taken many forms in the past decade, from the imposition of trade barriers such as taxes and quotas, to increased state ownership and control of the industry. At the same time many mineral-producing nations have also attempted to increase the economic and social benefits derived from the extraction of indigenous resources by the development of value-added activities such as smelting and refining within their own territory. Consequently nations that had previously exported ores and concentrates of metals such as copper and aluminium became major importers of these materials and producers of metals.

China soon became the world's largest and fastest growing market for minerals. In 1995 China was the leading producer of 14 of the commodities in World Mineral Statistics. By 2012 it was the leading producer of 44 commodities listed in this volume (see figure opposite) and a top three producer of a further 12 commodities. Despite this China has been unable to meet all its mineral needs from domestic supplies and has pursued a vigorous policy of sourcing its requirements in the international market. At the same time governments elsewhere have become increasingly worried about the future availability of the mineral raw materials required to maintain growth and competitiveness in their economies.

# Leading Producers

Showing commodities and the leading producers for each




**Leading producers and number of commodities they are leading producers of**

## China

- Alumina
- Aluminium (primary)
- Antimony (mine production)
- White arsenic
- Barytes
- Bismuth (mine production)
- Cadmium
- Coal
- Cobalt (metal production)
- Copper (smelter production)
- Copper (refined production)
- Fluorspar
- Gallium (primary)
- Germanium metal
- Gold (mine production)
- Graphite
- Gypsum
- Indium (refinery production)
- Iron ore
- Pig iron
- Crude steel
- Lead (mine production)
- Lead (refined production)
- Magnesite
- Magnesium metal (primary)
- Manganese ore
- Mercury
- Mica
- Molybdenum (mine production)
- Nickel (smelter/refinery production)
- Perlite
- Phosphate rock
- Rare earth oxides
- Salt
- Strontium minerals
- Pyrites
- Talc
- Tin (mine production)
- Tin (smelter production)
- Tungsten (mine production)
- Vanadium (mine production)
- Wollastonite
- Zinc (mine production)
- Zinc (slab zinc production)

## USA

- Bentonite
- Fuller's earth
- Beryl
- Bromine
- Diatomite
- Kaolin
- Natural gas
- Natural sodium carbonate
- Sulphur (recovered)
- Tellurium metal

## South Africa

- Chromium ores and concentrates
- Platinum (mine production)
- Other platinum group metals (mine production)
- Sillimanite minerals
- Vermiculite

## Russia

- Asbestos
- Diamond
- Nepheline syenite
- Palladium (mine production)

## Chile

- Copper (mine production)
- Iodine
- Lithium (Li content)
- Rhenium

## Australia

- Bauxite
- Zirconium minerals

## Canada

- Potash
- Titanium minerals

## Turkey

- Borates
- Feldspar

## Brazil

- Niobium (Nb content)

## Congo, D.R of

- Cobalt (mine production)

## Japan

- Selenium metal

## Kazakhstan

- Uranium (mine production)

## Mexico

- Silver (mine production)

## Philippines

- Nickel (mine production)

## Rwanda

- Tantalum (Ta content)

## Saudi Arabia

- Petroleum (crude)

The so-called 'critical' raw materials have been, and remain, a particular concern. These minerals and metals have hitherto been used in relatively small amounts but are essential to the function and performance of many new technologies, particularly those used for clean energy. The concentration of production in a few countries, combined with the lack of effective substitutes and low recycling rates, are characteristic of critical raw materials.

The issue of security of supply came to international prominence in 2010 in regard to rare earth elements (REE). China produces more than 90 per cent of global REE production and it also has a near monopoly on the technology for their extraction and refining. Consequently many nations have developed strategies to mitigate the risks to the supply of REE and other critical raw materials. These have involved a range of measures including the opening of new mines, the development alternative materials and technologies, and increased recycling.

Mankind is now using a greater variety of mineral raw materials in greater quantities than ever before. In order to ensure the long-term availability of secure, adequate and sustainable supplies, it is essential to maintain our knowledge of what we are using now and where it is coming from.

**Data storage, presentation and delivery**

For most of the 100-year run the publication was restricted to data tables and related explanatory notes. Simple line graphs of production against price were presented for selected commodities between 1985 and 1992. World production maps were introduced for a few commodities between 1996 and 2004. Short commentaries on certain commodities were also provided between 2008 and 2011.

Since 1992 the World Mineral Statistics database has become firmly established and remains an invaluable tool for the compilers of the annual publications and for answering the multitude of enquiries received every year. In 2012 BGS began to add data for earlier years to this database to facilitate improvements in access to the historical data. This is a complicated process due, in part, to the sheer volume of statistical data that has been accumulated over the past century but also because of the numerous changes mentioned above that have to be accommodated.

With the rapid growth in the use and power of computing technology and the internet, both the method of contacting data providers and delivering the finished tables to data users have dramatically changed. In the 1920s the Imperial Mineral Resources Bureau relied on a large number of 'technical committees' and communicated by letter or 'cable'. The organisations providing data are listed in some early annual reports from the Bureau and amount to less than 100 in number. Today more than 400 organisations are contacted annually, mostly by e-mail or via the internet, although we still use letters or faxes if necessary. In addition, each year we continue to receive several books in paper form and these are invaluable both as sources of data and for detailed reference.

Although *World Mineral Production* is still available in book form, and we send out nearly 400 copies each year, data users can also download a copy from the 'Commodities and Statistics' pages of our MineralsUK website. Previous copies of this publication and all its predecessors, including the first edition covering 1913–1920, can also be downloaded in pdf format from the World Archive section of the website. In addition, data for the more recent years can be extracted from the website into Microsoft Excel format via a new data download tool.

For this special centenary volume we have included some infographics pages for 22 commodities. These include time trend graphs to demonstrate how global production has changed over the 100 years, pie charts to illustrate changes in production concentration between 1962 and 2012 and maps of the leading producing countries in 2012. These pages also provide additional information relating to the end uses of the commodities shown and, where appropriate, their 'risk index' from the BGS 2012 Risk List.

**Sustaining the work**

In the 1995 Preface the BGS Director wrote "Funding constraints continue to make the future of this work uncertain but we shall endeavour to maintain a high standard of service to the international community. Indeed, given all the changes to earth science and mining institutions around the world, I believe it is vital to Britain and to many other nations that we continue to compile these statistics."

The funding of the mineral statistics work at the BGS in the 1990s and early 2000s was provided by the UK's Department for Trade and Industry but this funding ceased on 31 March 2004. As the mineral statistics work was considered to be so important, BGS took the decision to continue funding it. However, a substantial reprioritisation of the work was required and the publication of *World Mineral Statistics* ceased, with the last volume covering the years 1998–2002. It was replaced with two new books: *World Mineral Production* containing mineral production statistics for more than 70 mineral commodities by country worldwide; and *European Mineral Statistics* containing statistics for production, imports and exports for Europe. Thus the legacy of mineral production data remains continuous from 1913 to the present day.

Today we remain confident that BGS will continue to play a major role in the collation of world mineral statistics in the long term. There is some uncertainty as to whether the funds will be derived from the UK, Europe or elsewhere, but we are encouraged by current interest and ongoing EU funded programs. The security of supply of minerals has been an important consideration throughout the last century. This remains the same today and will continue to be so in the future. Mineral statistics, such as those contained in this long-running series, remain a vital part of the process.

Teresa Brown
Project Leader - Mineral Information & Analysis
British Geological Survey
February 2014

# STATISTICAL INFORMATION

# AND

# INFOGRAPHIC PAGES

# Bauxite

*The main ore of aluminium (Al)*

**Relative supply risk index for Al 4.8**

## Top 10 producers

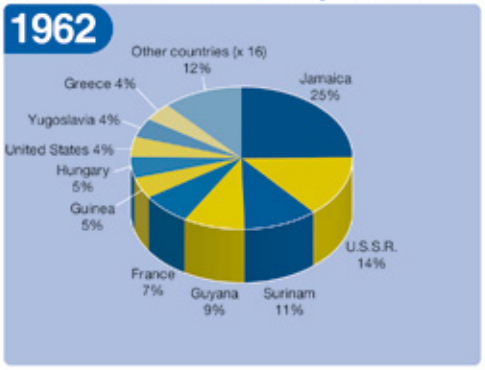
| | % of world total |
|---|---|
| Australia | 31% |
| China | 16% |
| Brazil | 14% |
| Indonesia | 12% |
| Guinea | 7% |
| India | 6% |
| Jamaica | 4% |
| Kazakhstan | 2% |
| Russia | 2% |
| Suriname | 1% |

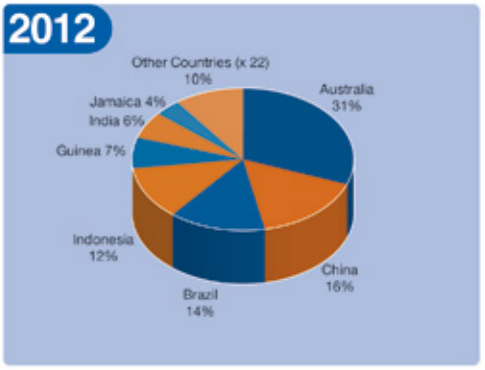
## End uses

**Aluminium:** used in the production of aluminium metal

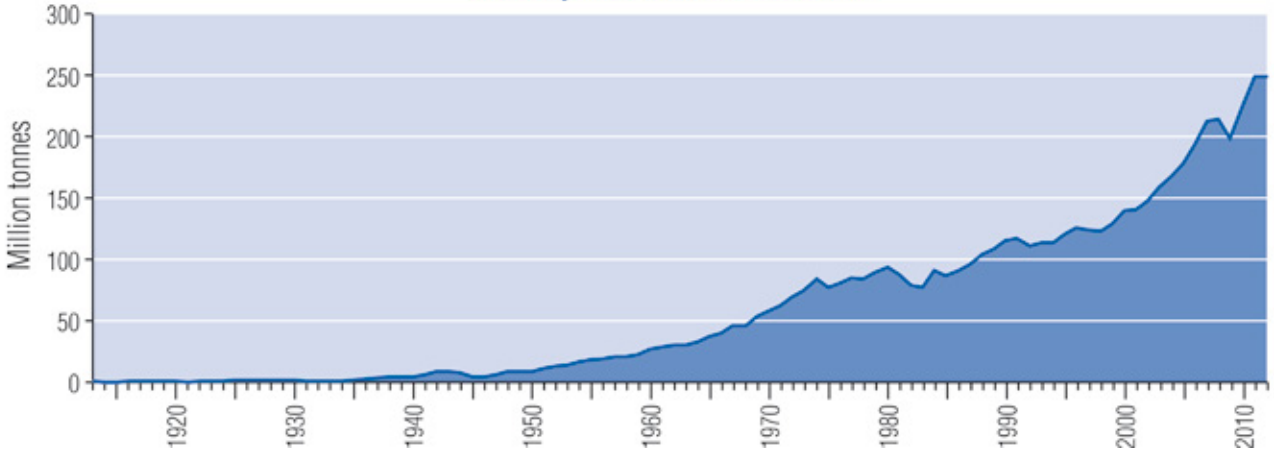
**Various minor non-metallurgical uses:** such as cements, abrasives and refractory applications, paints, etc.

## Distribution of world production




## World production of bauxite



## Production of bauxite

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Bosnia & Herzegovina | 1 018 333 | 555 820 | 827 909 | 707 712 | 800 316 |
| France | 101 700 | 129 700 | 93 100 | 80 800 | 69 500 |
| Greece | 2 174 000 | 1 935 000 | 1 902 000 | 2 324 000 | 1 816 000 |
| Hungary | 511 337 | 317 000 | 365 000 | 277 800 | 255 000 |
| Montenegro | 671 811 | 45 779 | 61 205 | 158 614 | — |
| Russia | 5 675 000 | 5 300 000 | 5 035 000 | 5 380 000 | 5 166 000 |
| Turkey | 818 928 | 406 700 | 855 000 | * 600 000 | * 600 000 |
| Ghana | 796 000 | 440 000 | 512 208 | 400 069 | 752 771 |
| Guinea | 17 682 330 | 14 774 240 | 16 427 300 | 17 593 100 | 17 400 000 |
| Mozambique | 5 443 | 3 600 | 8 600 | 10 400 | 8 600 |
| Sierra Leone | 954 370 | 742 820 | 1 089 131 | 1 457 507 | 734 480 |
| Tanzania | 20 601 | 122 920 | * 31 000 | * 30 000 | * 45 000 |
| Dominican Republic | 67 862 | 53 317 | 8 888 | — | 10 522 |
| Jamaica | 14 636 102 | 8 103 884 | 8 539 853 | 10 188 916 | 9 339 291 |
| Mexico | 20 000 | 20 000 | 21 250 | 14 400 | 96 000 |
| USA (a) | 98 796 | 30 240 | 59 143 | 63 121 | 128 152 |
| Brazil (b) | 28 097 500 | 26 074 400 | 32 028 000 | 33 624 600 | 34 955 800 |
| Guyana | 2 092 237 | 1 484 935 | 1 082 512 | 1 818 399 | 2 213 972 |
| Suriname | 5 333 031 | 3 388 419 | 3 096 650 | 3 236 111 | 2 904 509 |
| Venezuela | 4 192 014 | 3 610 859 | 3 126 242 | 2 454 769 | * 2 500 000 |
| China | 25 176 900 | 29 213 100 | 36 837 200 | 37 173 800 | * 40 000 000 |
| India (c) | 15 460 202 | 14 124 093 | 12 722 820 | 12 877 394 | 15 195 000 |
| Indonesia | * 18 000 000 | * 15 000 000 | * 27 000 000 | * 41 000 000 | * 30 000 000 |
| Iran (d) | 520 000 | 522 018 | 681 235 | 818 224 | * 900 000 |
| Iraq | 4 928 | 250 | 3 350 | — | — |
| Kazakhstan | 5 160 000 | 5 130 000 | 5 310 000 | 5 495 000 | 5 170 000 |
| Malaysia | 295 176 | 274 456 | 124 274 | 188 141 | 121 873 |
| Pakistan (e) | 35 759 | 15 629 | 11 131 | 9 033 | 28 768 |
| Saudi Arabia | — | — | — | 206 000 | 760 000 |
| Vietnam | * 80 000 | * 80 000 | * 80 000 | * 80 000 | * 80 000 |
| Australia | 64 038 000 | 66 168 000 | 68 585 000 | 70 232 000 | 76 282 000 |
| World Total | 214 000 000 | 198 000 000 | 227 000 000 | 248 000 000 | 248 000 000 |

Note(s)
(1) This table includes production of refractory bauxite

(a) Data for Alabama only
(b) Including beneficiated and direct shipping ore
(c) Years ended 31 March following that stated
(d) Years ended 20 March following that stated
(e) Years ended 30 June of that stated

## Production of alumina

tonnes ($Al_2O_3$ content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Azerbaijan | 164 879 | 9 590 | — | 6 188 | * 150 000 |
| Bosnia & Herzegovina | 294 455 | 191 792 | 269 414 | 261 874 | 202 416 |
| France | 630 000 | 348 000 | 481 000 | 470 000 | 430 000 |
| Germany | * 1 000 000 | * 1 000 000 | * 1 000 000 | * 1 000 000 | * 1 000 000 |
| Greece | 524 875 | 517 400 | 510 250 | 526 305 | 509 600 |
| Hungary | * 299 000 | * 185 000 | * 214 000 | * 250 000 | * 170 000 |
| Ireland, Republic of | 1 890 000 | 1 240 000 | 1 864 000 | 1 922 000 | 1 924 000 |
| Italy | 1 045 000 | 92 000 | — | — | — |
| Montenegro | 220 426 | 58 528 | — | — | — |
| Romania | 344 | 44 000 | 414 000 | 484 000 | 414 000 |
| Russia | 3 112 000 | 2 794 000 | 2 857 000 | 2 825 000 | 2 719 000 |
| Spain | 1 300 000 | * 1 300 000 | * 1 300 000 | * 1 300 000 | * 1 100 000 |
| Turkey | * 160 000 | * 100 000 | * 160 000 | * 100 000 | * 100 000 |
| Ukraine | 1 673 000 | 1 524 000 | 1 534 000 | 1 601 000 | 1 429 000 |
| Guinea | 593 000 | 530 000 | 597 000 | 574 000 | 245 000 |
| Canada | 1 491 523 | 1 232 604 | 1 416 594 | 1 473 271 | 1 498 600 |
| Jamaica | 3 995 358 | 1 773 600 | 1 590 658 | 1 959 926 | 1 757 693 |
| USA | 4 298 000 | 3 064 000 | 3 950 000 | 4 360 000 | 4 370 000 |
| Brazil | 7 822 300 | 8 617 900 | 9 523 900 | 10 306 800 | 10 320 600 |
| Suriname | 2 153 968 | 1 536 187 | 1 486 449 | 1 421 464 | 1 202 806 |
| Venezuela | 1 591 000 | 1 376 000 | 1 244 000 | 1 222 162 | 807 300 |
| China | 23 029 200 | 23 805 100 | 29 064 900 | 34 077 600 | 37 715 000 |
| India (a) | 3 620 252 | 3 432 716 | 3 576 917 | * 3 970 000 | * 4 350 000 |
| Iran (b) | 200 042 | 210 385 | 236 476 | 232 000 | * 400 000 |
| Japan | * 600 000 | * 550 000 | * 550 000 | * 500 000 | * 350 000 |
| Kazakhstan | 1 600 000 | 1 608 000 | 1 640 000 | 1 670 000 | 1 510 000 |
| Australia | 19 446 000 | 19 939 000 | 19 806 000 | 18 727 000 | 20 914 000 |
| World Total | 82 800 000 | 77 100 000 | 85 300 000 | 91 200 000 | 95 600 000 |

Note(s)
(1) Where possible figures in this table show the alumina equivalent ($Al_2O_3$) of total hydrate produced, whether or not calcined
(2) The figures in this table represent alumina produced from bauxite. Alumina-rich materials can also be derived from salt slags formed during the production of secondary aluminium

(a) Years ended 31 March following that stated
(b) Years ended 20 March following that stated

## Production of primary aluminium

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Azerbaijan | 61 604 | 10 145 | 379 | 6 817 | * 54 200 |
| Bosnia & Herzegovina | 155 909 | 130 042 | 150 488 | 163 924 | 159 660 |
| France | 389 000 | 345 000 | 356 000 | 334 000 | 349 000 |
| Germany | 605 880 | 291 750 | 402 480 | 432 472 | 410 430 |
| Greece | 162 339 | 134 737 | 137 000 | 165 150 | 165 000 |
| Iceland | 761 204 | 804 605 | 825 803 | 780 853 | 802 827 |
| Italy | 186 400 | 165 800 | 129 500 | 141 900 | 99 600 |
| Montenegro | 111 513 | 63 960 | 82 043 | 92 838 | 74 813 |
| Netherlands | 317 000 | 165 000 | 217 000 | * 200 000 | * 200 000 |
| Norway | 1 368 000 | 1 090 000 | 1 400 000 | 1 982 000 | 1 985 000 |
| Poland | 31 000 | — | — | — | — |
| Romania | 288 156 | 228 630 | 241 000 | 261 000 | 248 000 |
| Russia | 4 190 000 | 3 815 000 | 3 947 000 | 3 992 000 | 4 024 000 |
| Slovakia | 162 995 | 149 604 | 163 000 | 162 840 | 160 662 |
| Slovenia | 83 300 | 35 148 | 40 177 | 75 300 | 74 400 |
| Spain | 405 800 | 334 600 | 335 000 | 365 000 | * 320 000 |
| Sweden | 81 913 | 69 708 | 93 000 | 111 000 | 129 000 |
| Turkey | 61 100 | 30 000 | 54 100 | 56 400 | 43 700 |
| Ukraine | 113 000 | 50 000 | 25 000 | 7 000 | — |
| United Kingdom | 326 900 | 252 000 | 186 000 | 213 000 | 60 000 |
| | | | | | |
| Cameroon | 91 000 | 73 000 | 76 000 | 69 000 | 52 000 |
| Egypt (a) | 392 963 | 400 369 | 352 818 | 353 904 | 393 696 |
| Ghana | 9 300 | — | — | 35 000 | 38 000 |
| Mozambique | 536 000 | 545 000 | 551 000 | 562 000 | 562 000 |
| Nigeria | 9 000 | 11 000 | 18 000 | 15 000 | 14 300 |
| South Africa | 811 000 | 809 000 | 807 000 | 810 000 | 665 000 |
| | | | | | |
| Canada | 3 120 148 | 3 030 269 | 2 963 200 | 2 987 964 | 2 780 556 |
| USA | 2 658 300 | 1 727 200 | 1 727 300 | 1 990 000 | 2 070 000 |
| | | | | | |
| Argentina | 399 714 | 405 779 | 410 947 | 420 299 | 408 338 |
| Brazil | 1 661 000 | 1 535 900 | 1 536 200 | 1 440 400 | 1 436 400 |
| Venezuela | 607 000 | 569 000 | 353 658 | 330 000 | 203 000 |
| | | | | | |
| Bahrain | 871 658 | 847 700 | 850 700 | 881 310 | 890 200 |
| China | 13 178 200 | 12 890 500 | 16 244 100 | 18 134 700 | 20 267 500 |
| India (b) | 1 347 127 | 1 480 568 | 1 621 035 | 1 654 156 | * 1 710 000 |
| Indonesia | 242 500 | 257 600 | 253 300 | 246 300 | 253 000 |
| Iran (c) | 241 300 | 281 300 | 282 000 | 321 900 | * 335 000 |
| Japan | 6 600 | 5 100 | 4 700 | 4 700 | 4 500 |
| Kazakhstan | 106 000 | 127 000 | 227 000 | 249 000 | 249 000 |
| Oman | 49 000 | 351 000 | 367 000 | 373 000 | 360 000 |
| Qatar | — | * 10 000 | 126 000 | 450 000 | 604 000 |
| Tajikistan | 399 500 | 359 400 | 348 900 | 277 600 | 272 500 |
| United Arab Emirates | 891 723 | 1 009 800 | 1 400 000 | 1 750 000 | 1 861 000 |
| | | | | | |
| Australia | 1 974 000 | 1 943 000 | 1 927 000 | 1 945 000 | 1 864 000 |
| New Zealand | 315 500 | 271 000 | 344 000 | 357 000 | 325 000 |
| | | | | | |
| World Total | 39 800 000 | 37 100 000 | 41 600 000 | 45 200 000 | 47 000 000 |

Note(s)
(1) The figures in this table are for primary aluminium only. Aluminium can also be produced from secondary sources and may be recovered from salt slags

(a) Years ended 30 June of that stated
(b) Years ended 31 March following that stated
(c) Years ended 20 March following that stated

# Antimony

*Symbol Sb*

**Relative supply risk index**
**9.0**

## Top 10 producers

| | % of world total |
|---|---|
| China | 82% |
| Tajikistan | 4% |
| Russia | 4% |
| Bolivia | 3% |
| South Africa | 2% |
| Australia | 1% |
| Turkey | 1% |
| Laos | 1% |
| Kyrgyzstan | 1% |
| Kazakhstan | 0.5% |

## End uses

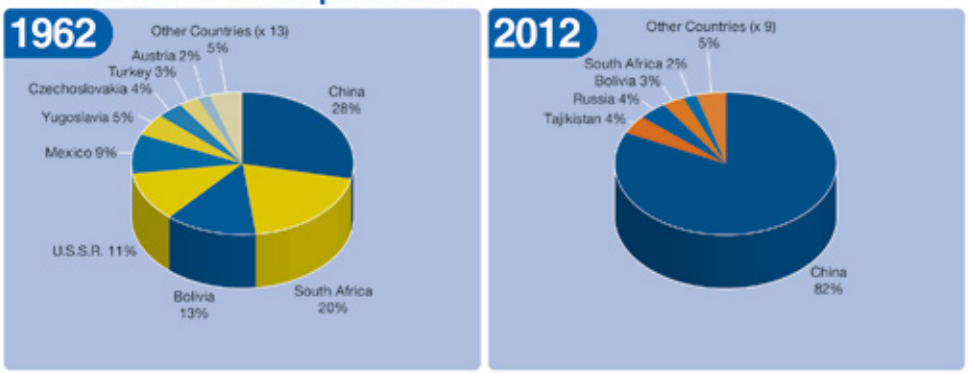
**Flame retardants:** for plastics and other products

**Lead-acid batteries:** in transportation, back-up power systems, etc.

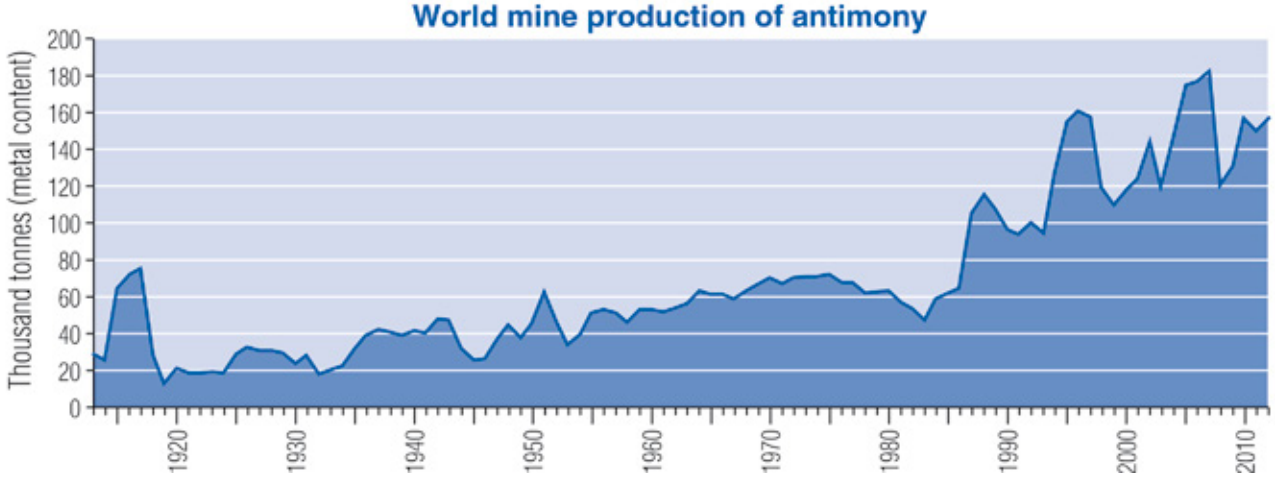
**Lead alloys:** used in the manufacture of batteries and ammunition

**Catalysts:** for the manufacture of synthetic textiles and plastic containers

## Distribution of world production




## World mine production of antimony



## Mine production of antimony

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia | * 3 000 | * 3 000 | 6 039 | 6 348 | * 6 400 |
| Turkey | * 1 300 | * 1 300 | * 1 300 | * 1 300 | * 1 300 |
| South Africa | 3 674 | 2 090 | 2 257 | 2 391 | 3 044 |
| Canada | 132 | 64 | 69 | 68 | * 65 |
| Guatemala | — | — | — | — | 62 |
| Mexico | 380 | 74 | 71 | 5 | — |
| Bolivia | 3 905 | 2 990 | 4 980 | 3 947 | 5 081 |
| Peru (a) | 531 | 145 | — | — | — |
| China | 100 230 | 112 000 | 129 831 | 123 900 | 128 600 |
| Kazakhstan | 890 | 597 | 785 | * 800 | * 750 |
| Kyrgyzstan | * 250 | 918 | * 900 | * 900 | * 900 |
| Laos | ... | 887 | 530 | 1 456 | 1 042 |
| Pakistan (b) | 245 | 75 | 25 | — | 12 |
| Tajikistan | 3 700 | 4 200 | 8 500 | 6 600 | 6 600 |
| Thailand | 422 | 555 | 705 | 442 | 672 |
| Australia (b) | 1 688 | 1 794 | 707 | 1 751 | 1 950 |
| World Total | 120 000 | 131 000 | 157 000 | 150 000 | 156 000 |

Note(s)
(1) This table includes antimony content of antimonial lead alloys
(2) In addition, Hungary is believed to produce antimony

(a) Including Sb content of antimonial lead plus Sb content of ores for export
(b) Years ended 30 June of that stated

## Production of white arsenic

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Belgium | * 1 000 | * 1 000 | * 1 000 | * 1 000 | * 1 000 |
| Portugal | * 15 | * 15 | * 15 | * 15 | * 15 |
| Russia | * 1 500 | * 1 500 | * 1 500 | * 1 500 | * 1 500 |
| Namibia | 574 | — | — | — | — |
| Bolivia | 74 | 115 | 155 | 99 | * 100 |
| Chile (a) | * 10 000 | * 11 000 | * 11 000 | * 10 000 | * 10 000 |
| Peru | 4 822 | 300 | — | — | — |
| China | * 25 000 | * 25 000 | * 25 000 | * 25 000 | * 26 000 |
| Iran (b) | * 100 | — | * — | * — | * — |
| Japan | * 40 | * 40 | * 40 | * 40 | * 40 |

Note(s)
(1) This table includes calculated trioxide equivalent of arsenic metal produced except where this would involve double counting
(2) In addition to the countries listed, Austria, Finland, Hungary, Spain and the United Kingdom are believed to produce arsenic

(a) Exports
(b) Orpiment and realgar concentrates

# Barytes

*Symbol of barium Ba*

**Relative supply risk index of barium 8.1**

## Top 10 producers

| | % of world total |
|---|---|
| China | 45% |
| India | 18% |
| Morocco | 10% |
| USA | 7% |
| Kazakhstan | 6% |
| Turkey | 3% |
| Iran | 3% |
| Mexico | 1% |
| Vietnam | 1% |
| Peru | 1% |

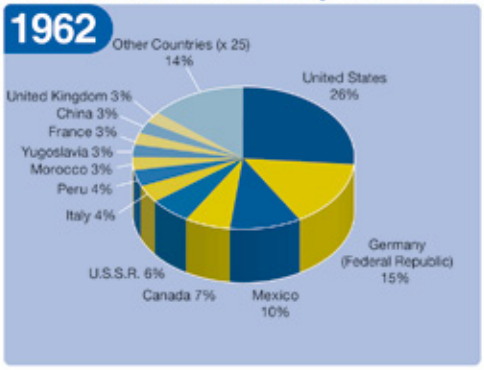
## End uses

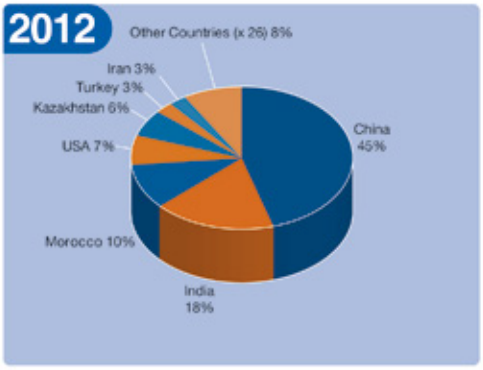
**Drilling muds:** for oil and gas extraction

**Minor industrial uses:** e.g. in ceramics, glass, rubber and paint

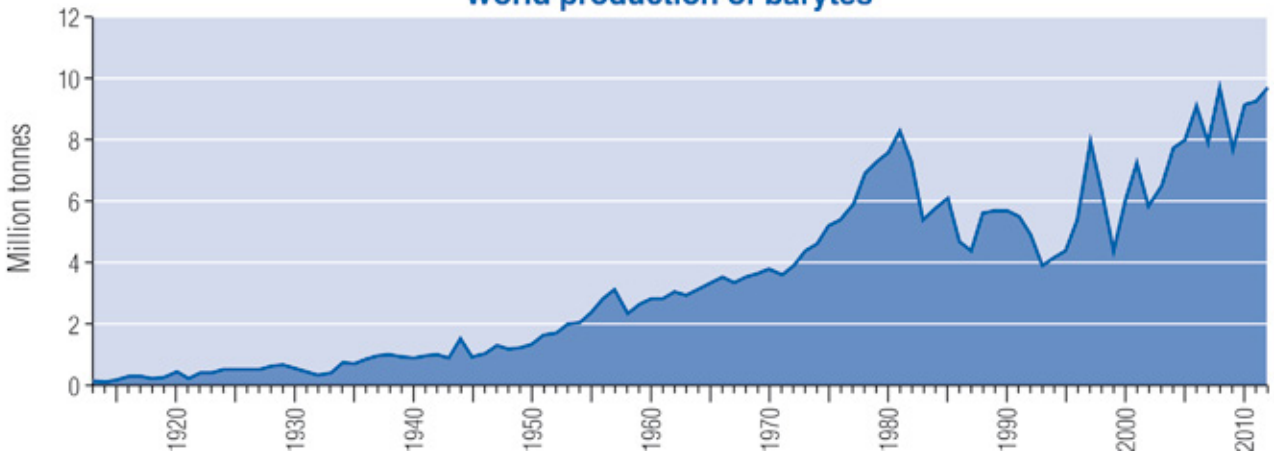
**Medical applications:** ingested and used in x-ray examinations

## Distribution of world production




## World production of barytes



## Production of barytes

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Bosnia & Herzegovina | 54 | 30 | 57 | 13 | 28 |
| Bulgaria | 40 100 | 14 300 | 500 | 200 | — |
| Germany | 78 941 | 45 606 | 55 887 | 55 342 | 52 030 |
| Italy | * 5 000 | * 3 500 | * 3 500 | * 3 500 | * 3 500 |
| Poland | 308 | — | — | — | — |
| Portugal | 171 | 1 078 | 15 | — | — |
| Russia | * 64 000 | * 64 000 | * 64 000 | * 64 000 | * 64 000 |
| Slovakia | 20 000 | 30 000 | 17 000 | 13 000 | 21 000 |
| Spain | 11 100 | 5 212 | 2 050 | — | — |
| Turkey | 150 000 | 213 187 | 225 000 | 225 000 | 250 000 |
| United Kingdom | 43 000 | 36 000 | 34 099 | 31 000 | 30 000 |
| | | | | | |
| Algeria | 60 088 | 37 981 | 42 254 | 36 500 | 36 000 |
| Egypt | 1 556 | 1 587 | 1 170 | 1 168 | 8 053 |
| Morocco | 725 060 | 586 937 | 572 429 | 769 504 | * 1 000 000 |
| Nigeria | * 16 000 | 14 314 | 10 749 | * 11 000 | 6 000 |
| Tunisia | — | — | — | 5 700 | * 5 700 |
| | | | | | |
| Canada | 12 300 | 15 000 | 22 000 | 22 000 | 22 000 |
| Guatemala | — | 13 | 11 | 334 | 91 |
| Mexico | 140 066 | 152 791 | 143 225 | 134 727 | 139 997 |
| USA (a) | 648 000 | 383 000 | 662 000 | 710 000 | * 654 000 |
| | | | | | |
| Argentina | 3 170 | 3 416 | 2 900 | 3 000 | 3 000 |
| Bolivia | 10 900 | 1 900 | 7 845 | 21 297 | 20 400 |
| Brazil (b) | 23 276 | 49 847 | * 41 385 | * 19 081 | * 40 000 |
| Colombia | * 2 000 | * 2 000 | * 2 000 | * 2 000 | * 2 000 |
| Peru | 45 199 | 27 881 | 52 275 | 86 790 | 79 451 |
| | | | | | |
| Afghanistan | * 1 500 | * 1 000 | * 1 000 | * 1 000 | * 1 000 |
| Burma (c) | 6 889 | 7 008 | 14 119 | 31 791 | * 32 000 |
| China | 5 000 000 | 2 900 000 | 3 900 000 | 4 300 000 | 4 400 000 |
| India (c) | 1 686 148 | 2 152 552 | 2 338 806 | 1 722 804 | 1 723 508 |
| Iran (d) | 226 590 | 361 217 | 326 275 | 271 454 | 250 000 |
| Kazakhstan | 492 000 | 306 000 | 358 000 | 466 000 | 590 000 |
| Laos | 1 000 | 12 460 | 17 500 | 12 400 | 15 000 |
| Malaysia | 4 372 | 22 390 | 1 000 | — | — |
| Pakistan (e) | 49 933 | 62 997 | 57 166 | 31 836 | 48 510 |
| Saudi Arabia | 30 000 | 30 000 | 30 000 | 30 000 | * 32 000 |
| Thailand | 9 180 | 51 895 | 33 465 | 67 703 | 64 499 |
| Vietnam | 80 000 | 70 000 | 90 000 | 90 000 | 90 000 |
| | | | | | |
| Australia | 22 189 | 16 634 | 16 529 | 10 569 | 10 273 |
| | | | | | |
| World Total | 9 700 000 | 7 700 000 | 9 100 000 | 9 300 000 | 9 700 000 |

Note(s)
(1) This table may include small quantities of witherite
(2) In addition to the countries listed, Cuba is believed to produce barytes

(a) Sold or used by producers
(b) Including beneficiated and directly shipped material
(c) Years ended 31 March following that stated
(d) Years ended 20 March following that stated
(e) Years ended 30 June of that stated

## Production of asbestos

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia | 1 020 000 | * 1 000 000 | * 1 000 000 | * 1 000 000 | * 1 000 000 |
| Slovakia | 200 | — | — | — | — |
| Zimbabwe | | | | | |
| Chrysotile | 11 489 | 4 971 | 2 031 | — | 614 |
| Canada | | | | | |
| Chrysotile | * 160 000 | * 150 000 | * 100 000 | * 50 000 | * — |
| Argentina | 298 | 322 | 341 | 105 | * 100 |
| Brazil | 305 000 | 288 452 | 302 257 | 306 320 | 305 000 |
| China | * 380 000 | * 440 000 | * 400 000 | * 440 000 | * 420 000 |
| India | | | | | |
| Amphibole (a) | 315 | 243 | 268 | 280 | 387 |
| Kazakhstan | 230 100 | 230 000 | 214 100 | 223 200 | 241 000 |
| World Total | 2 100 000 | 2 100 000 | 2 000 000 | 2 000 000 | 2 000 000 |

Note(s)
(1) In addition to the countries listed, Romania is believed to produce asbestos

(a) Years ended 31 March following that stated

## Production of bentonite and fuller's earth

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Armenia | | | | | |
| Bentonite | 50 | 238 | 1 397 | 835 | 4 987 |
| Azerbaijan | | | | | |
| Bentonite | 40 683 | 10 581 | 18 100 | 20 679 | * 22 000 |
| Bosnia & Herzegovina | | | | | |
| Bentonite (a) | 30 504 | 16 042 | 314 | — | — |
| Bulgaria | | | | | |
| Bentonite | 178 700 | 108 400 | 99 700 | 53 900 | 77 900 |
| Croatia | | | | | |
| Bentonite | 19 759 | — | — | — | — |
| Cyprus | | | | | |
| Bentonite | 155 125 | 152 722 | 162 969 | 160 625 | 160 180 |
| Czech Republic | | | | | |
| Bentonite | 235 000 | 177 000 | 183 000 | 160 000 | 221 000 |
| Denmark | | | | | |
| Bentonite | 22 458 | 24 040 | 23 832 | 38 300 | 30 330 |
| France | | | | | |
| Bentonite | ... | 25 000 | 25 000 | 20 000 | 28 000 |
| Germany | | | | | |
| Bentonite | 414 336 | 326 461 | 362 623 | 375 332 | 366 220 |
| Greece | | | | | |
| Bentonite | 1 580 000 | 1 500 000 | 844 804 | 1 250 000 | 1 300 000 |
| Hungary | | | | | |
| Bentonite | 6 220 | 5 298 | 17 200 | 22 931 | * 22 000 |
| Italy | | | | | |
| Bentonite | 124 419 | 114 212 | 104 279 | 105 952 | 144 710 |
| Macedonia | | | | | |
| Bentonite | 13 689 | 9 033 | 7 084 | 8 918 | 2 355 |
| Poland | | | | | |
| Bentonite | 3 000 | 2 800 | 2 000 | 900 | 800 |
| Romania | | | | | |
| Bentonite | 16 638 | 13 756 | 21 637 | 19 864 | 19 241 |
| Russia | | | | | |
| Bentonite | * 460 000 | * 460 000 | * 460 000 | * 460 000 | * 460 000 |
| Slovakia | | | | | |
| Bentonite | 145 000 | 109 000 | 153 000 | 213 000 | 177 000 |
| Slovenia | | | | | |
| Bentonite | 160 | 104 | 135 | 168 | 98 |
| Spain | | | | | |
| Bentonite | 154 534 | 147 090 | 157 001 | 110 371 | 135 445 |
| Attapulgite | 27 348 | 21 110 | 27 841 | 26 021 | 23 537 |
| Sepiolite | 737 659 | 573 937 | 557 862 | 566 270 | 748 863 |
| Turkey | | | | | |
| Bentonite | 683 253 | 753 155 | 718 260 | 379 917 | * 370 000 |
| Sepiolite | * 10 000 | * 10 000 | * 10 000 | * 10 000 | * 10 000 |
| Ukraine | | | | | |
| Bentonite | 200 000 | 195 000 | 185 000 | 211 000 | 219 000 |
| | | | | | |
| Algeria | | | | | |
| Bentonite | 30 595 | 31 612 | 34 126 | 29 000 | 26 000 |
| Egypt | | | | | |
| Bentonite (b) | 28 320 | 35 384 | 28 865 | 33 132 | 17 709 |
| Malawi | | | | | |
| Bentonite | 7 023 | 8 050 | 1 020 | * 1 000 | * 1 000 |
| Morocco | | | | | |
| Bentonite | 50 125 | 84 097 | 110 703 | 97 071 | * 100 000 |
| Fuller's earth (c) | 140 875 | 132 110 | 82 570 | 103 682 | * 100 000 |
| Mozambique | | | | | |
| Bentonite | 614 | 577 | 459 | 493 | * 500 |
| Senegal | | | | | |
| Attapulgite | 166 900 | 180 900 | 204 300 | 179 900 | 180 500 |
| South Africa | | | | | |
| Bentonite | 44 067 | 40 340 | 82 341 | 120 417 | 120 566 |
| Attapulgite | 69 876 | 52 103 | 57 606 | 14 448 | 15 850 |

## Production of bentonite and fuller's earth

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Canada | | | | | |
| Bentonite (d) | 3 906 | 3 947 | 4 542 | 2 266 | 2 015 |
| Cuba | | | | | |
| Bentonite | 382 | 670 | 228 | 1 244 | * 1 200 |
| Guatemala | | | | | |
| Bentonite | 62 749 | 14 287 | 22 423 | 12 270 | 131 843 |
| Mexico | | | | | |
| Bentonite | 374 933 | 511 430 | 590 998 | 563 795 | 956 224 |
| Fuller's earth | 66 123 | 108 139 | 170 350 | 107 436 | 227 496 |
| USA | | | | | |
| Bentonite (e) | 4 900 000 | 3 650 000 | 4 630 000 | 4 950 000 | * 4 800 000 |
| Fuller's earth (e) | 2 510 000 | 2 010 000 | 2 050 000 | 1 950 000 | * 2 000 000 |
| Argentina | | | | | |
| Bentonite | 265 782 | 148 099 | 229 301 | 228 357 | * 200 000 |
| Brazil | | | | | |
| Bentonite | 340 141 | 217 926 | 326 428 | 363 555 | * 360 000 |
| Chile | | | | | |
| Bentonite | — | — | — | 1 255 | 893 |
| Peru | | | | | |
| Bentonite | 31 557 | 119 452 | 44 266 | 27 534 | 22 977 |
| Uruguay | | | | | |
| Bentonite | 310 | 210 | 430 | 1 210 | * 1 200 |
| Burma | | | | | |
| Bentonite (f) | * 1 000 | * 1 000 | * 1 000 | * 1 000 | * 1 000 |
| China | | | | | |
| Bentonite | * 3 300 000 | * 3 400 000 | * 3 400 000 | * 3 500 000 | * 3 500 000 |
| India | | | | | |
| Bentonite (f) | * 671 000 | * 561 000 | * 739 000 | * 996 000 | * 1 081 000 |
| Fuller's earth (f) | * 29 000 | * 5 600 | * 5 600 | * 5 600 | * 5 600 |
| Indonesia | | | | | |
| Bentonite | * 6 000 | * 6 000 | * 6 500 | * 6 500 | * 6 500 |
| Iran | | | | | |
| Bentonite (g) | 375 898 | 387 437 | 350 208 | 377 398 | * 380 000 |
| Iraq | | | | | |
| Bentonite | 1 605 | 3 959 | 6 127 | 6 452 | 1 004 |
| Japan | | | | | |
| Bentonite | * 435 000 | * 432 000 | * 430 000 | * 425 000 | * 425 000 |
| Fuller's earth | * 110 000 | * 110 000 | * 110 000 | * 110 000 | * 110 000 |
| Korea (Rep. of) | | | | | |
| Bentonite | 71 052 | 84 963 | 88 255 | 94 987 | 88 543 |
| Fuller's earth | 70 711 | 99 802 | 83 476 | 46 623 | 57 787 |
| Pakistan | | | | | |
| Bentonite (b) | 31 247 | 32 032 | 34 596 | 30 840 | 16 520 |
| Fuller's earth (b) | 10 998 | 10 213 | 11 219 | 6 774 | 9 942 |
| Philippines | | | | | |
| Bentonite | 1 422 | 1 413 | 1 475 | 2 087 | * 2 100 |
| Thailand | | | | | |
| Bentonite | 210 | 110 | 130 | 55 220 | 81 000 |
| Uzbekistan | | | | | |
| Bentonite | * 40 000 | * 40 000 | * 40 000 | 40 000 | * 40 000 |
| Vietnam | | | | | |
| Bentonite | * 20 000 | * 20 000 | * 20 000 | * 20 000 | * 20 000 |

## Production of bentonite and fuller's earth

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Australia | | | | | |
| Bentonite (b) | * 85 800 | * 124 400 | * 126 600 | * 72 000 | * 60 100 |
| Fuller's earth | * 10 000 | * 10 000 | * 10 000 | * 14 300 | * 16 900 |
| New Zealand | | | | | |
| Bentonite | 753 | 880 | 1 216 | — | 2 263 |
| World Total Bentonite | 15 700 000 | 14 100 000 | 14 900 000 | 15 700 000 | 16 200 000 |
| World Total Fuller's Earth (a) | 4 000 000 | 3 300 000 | 3 400 000 | 3 100 000 | 3 500 000 |

Note(s)
(1) Bentonites consist of montmorillonite (one of the smectite group of clay minerals) and occur in two main varieties, calcium bentonite, the most commonly occurring, and sodium bentonite, industrially the more important
(2) Calcium bentonite can be converted to sodium bentonite by a sodium-exchange process
(3) In some countries, such as the United Kingdom, calcium bentonite is known as fuller's earth, a term which is also used to refer attapulgite, a mineralogically distinct clay mineral but exhibiting similar properties
(4) In addition to the countries listed, Austria is believed to produce bentonite and France may produce fuller's earth

(a) Including attapulgite and sepiolite
(b) Years ended 30 June of that stated
(c) Smectite
(d) Sales
(e) Sold or used by producers
(f) Years ended 31 March following that stated
(g) Years ended 20 March following that stated

## Production of beryl

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Madagascar (a) | * 12 | * 12 | * 12 | * 12 | * 12 |
| Mozambique | 8 | 45 | 57 | 58 | * 60 |
| Zambia | * 4 | * 6 | * 6 | * 6 | * 6 |
| USA (b) | 4 410 | 3 030 | * 4 460 | * 4 500 | * 4 500 |
| China | * 500 | * 500 | * 550 | * 550 | * 550 |

Note(s)
(a) Includes ornamental and industrial products
(b) Includes bertrandite ore, calculated as equivalent to beryl containing 11% beryllium oxide

## Mine production of bismuth

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Bulgaria | * 45 | * 45 | * 45 | * 45 | * 45 |
| Russia | * 70 | * 65 | * 50 | * 45 | * 45 |
| Canada | 71 | 86 | 92 | 92 | 121 |
| Mexico | 1 132 | 854 | 982 | 935 | 800 |
| Bolivia | 28 | 54 | 87 | 41 | * 45 |
| Peru (a) | 1 061 | 423 | — | — | — |
| China | 1 453 | 1 688 | 1 589 | 1 544 | * 1 500 |
| Japan (a) | 480 | 423 | 448 | 476 | 446 |
| Kazakhstan | * 150 | * — | * — | * — | * — |
| World Total | 4 500 | 3 600 | 3 300 | 3 200 | 3 000 |

Note(s)
(1) The figures in this table are in some instances derived from reported bismuth content of refined and impure metal plus recoverable in ores and concentrates exported
(2) Production for some countries may include bismuth produced from imported ores but it is thought that any resulting duplication is insignificant in the countries shown
(3) In addition to the countries listed, Brazil is believed to produce bismuth

(a) Metal production

## Production of borates

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia | * 400 000 | * 400 000 | * 400 000 | * 400 000 | * 400 000 |
| Turkey | 2 139 224 | 1 687 102 | 1 910 000 | 2 711 831 | * 2 700 000 |
| USA (a) | * 1 150 000 | * 1 200 000 | * 1 200 000 | * 1 250 000 | * 1 300 000 |
| Argentina | 789 954 | 505 983 | 622 968 | 648 806 | * 600 000 |
| Bolivia | 66 249 | 93 829 | 109 922 | 138 767 | * 150 000 |
| Chile | 590 999 | 613 135 | 503 609 | 491 421 | 449 572 |
| Peru | 349 891 | 187 221 | 292 855 | — | 104 072 |
| China | * 280 000 | * 190 000 | * 200 000 | * 200 000 | * 200 000 |
| Iran (b) | 1 020 | 388 | * 500 | * 1 044 | * 1 000 |
| Kazakhstan | * 30 000 | * 30 000 | * 30 000 | * 30 000 | * 30 000 |

Note(s)
(a) Sold or used by producers
(b) Years ended 20 March following that stated

## Production of bromine

kilograms

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia | * 60 000 | * 60 000 | * 60 000 | * 60 000 | * 60 000 |
| Ukraine | * 400 000 | * 400 000 | * 400 000 | * 400 000 | * 400 000 |
| USA (a) | * 230 000 000 | * 230 000 000 | * 230 000 000 | * 225 000 000 | * 225 000 000 |
| China | * 135 000 000 | * 140 000 000 | * 150 000 000 | * 150 000 000 | * 150 000 000 |
| India (b) | 2 118 740 | 1 862 480 | 1 587 000 | 1 572 160 | * 1 600 000 |
| Israel | 164 042 000 | 127 689 000 | 184 696 000 | 202 313 000 | 173 940 000 |
| Japan | * 20 000 000 | * 20 000 000 | * 20 000 000 | * 20 000 000 | * 20 000 000 |
| Jordan | 105 600 000 | 69 000 000 | 329 200 000 | 147 988 000 | * 200 000 000 |
| World Total | 657 000 000 | 589 000 000 | 916 000 000 | 747 000 000 | 771 000 000 |

Note(s)
(a) Elemental bromine sold as such or used in the preparation of bromine compounds by primary producers
(b) Years ended 31 March following that stated

## Production of cadmium

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Bulgaria | 376 | 413 | 389 | 427 | 363 |
| Germany | 420 | * 400 | * 400 | * 400 | * 400 |
| Netherlands | 530 | * 490 | * 560 | * 570 | * 560 |
| Norway | 178 | 249 | 300 | 309 | * 310 |
| Poland | 603 | 534 | 451 | 526 | 370 |
| Russia | * 800 | * 700 | * 700 | * 700 | * 700 |
| Canada (a) | 1 409 | 1 299 | 1 357 | 1 203 | 1 286 |
| Mexico | 1 550 | 1 510 | 1 464 | 1 485 | 1 482 |
| USA (a) | 777 | 633 | 637 | 600 | * 600 |
| Argentina | 38 | 36 | 32 | * 31 | * 30 |
| Brazil | * 200 | * 200 | * 200 | * 200 | * 200 |
| Peru | 371 | 289 | 357 | 572 | 684 |
| China | 6 964 | 7 053 | 7 363 | 6 672 | * 7 000 |
| India (b) | 507 | 553 | 550 | 449 | * 370 |
| Japan | 2 126 | 1 824 | 2 053 | 1 755 | 1 856 |
| Kazakhstan | 1 118 | 1 270 | 1 407 | 1 278 | 1 166 |
| Korea (Rep. of) | 3 090 | 2 500 | 4 166 | 3 005 | 3 904 |
| Korea, Dem. P.R. of | * 200 | * 200 | * 200 | * 200 | * 200 |
| Australia | * 350 | * 370 | * 350 | * 390 | * 380 |
| World Total | 21 600 | 20 500 | 22 900 | 20 800 | 21 900 |

Note(s)
(1) Data in this table excludes secondary metal unless otherwise stated

(a) Including cadmium sponge and/or secondary metal
(b) Years ended 31 March following that stated

# Chromium

*Symbol Cr*

**Relative supply risk index**
**6.2**

## Top 10 producers

| | % of world total |
|---|---|
| South Africa | 44% |
| Kazakhstan | 20% |
| India | 12% |
| Turkey | 9% |
| Oman | 2% |
| Pakistan | 2% |
| Australia | 2% |
| Finland | 2% |
| Brazil | 2% |
| Iran | 2% |

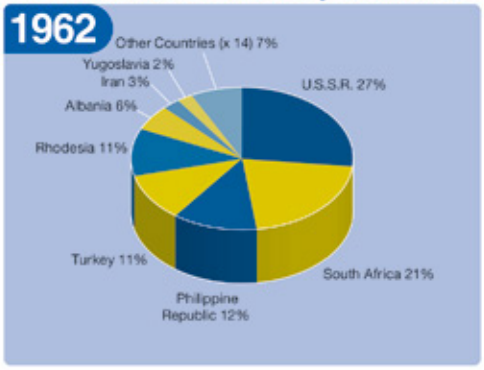
## End uses

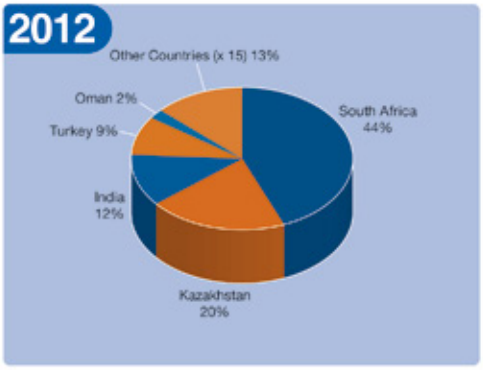
**Stainless steel and other alloys:** e.g. food preparation and medical equipment

**Chemicals:** e.g. for leather tanning and plating metal

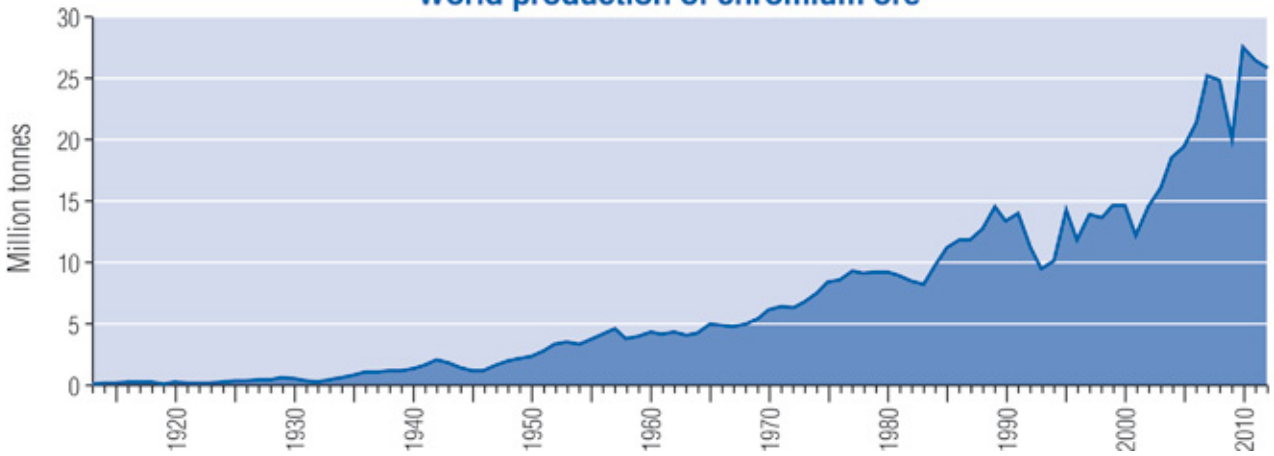
**Refractory applications:** for steel production, metal refining and metal casting

## Distribution of world production




## World production of chromium ore



## Production of chromium ores and concentrates

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Albania | 220 536 | 288 759 | 334 467 | 187 788 | * 190 000 |
| Finland | 614 000 | 247 000 | 598 000 | 693 000 | 452 000 |
| Kosovo | — | — | — | — | 2 000 |
| Russia | 913 000 | 416 194 | * 400 000 | * 400 000 | * 400 000 |
| Turkey | 1 885 712 | 1 770 029 | 2 461 314 | 2 281 981 | * 2 280 000 |
| Madagascar | 112 600 | 131 800 | 134 500 | 66 700 | 100 500 |
| South Africa | 9 682 640 | 6 864 938 | 10 871 095 | 10 721 360 | 11 310 223 |
| Sudan | 27 094 | 14 087 | 56 823 | 64 130 | * 65 000 |
| Zimbabwe | 442 584 | 193 674 | 516 776 | 599 079 | 119 409 |
| Brazil | 664 000 | 365 210 | 520 129 | 542 512 | 423 982 |
| Afghanistan | 6 491 | 6 000 | * 6 000 | * 6 000 | * 6 000 |
| China | * 220 000 | * 220 000 | * 220 000 | * 220 000 | * 220 000 |
| India (a) | 4 073 479 | 3 425 580 | 4 325 699 | 3 764 120 | 3 040 000 |
| Iran (b)(c) | 268 586 | 274 511 | 350 000 | 417 554 | * 420 000 |
| Kazakhstan | 4 207 000 | 4 678 000 | 5 092 000 | 5 059 000 | 5 233 000 |
| Oman | 859 748 | 636 482 | 865 400 | 616 700 | 554 800 |
| Pakistan | * 390 000 | * 300 000 | * 540 000 | * 450 000 | * 500 000 |
| Philippines (b) | 15 268 | 14 322 | 14 807 | 25 483 | 36 628 |
| United Arab Emirates | 31 000 | — | — | — | — |
| Vietnam | * 55 100 | * 37 100 | * 58 600 | * 24 900 | * 1 800 |
| Australia | 142 000 | 182 000 | 181 200 | 323 800 | 452 300 |
| World Total | 24 800 000 | 20 100 000 | 27 500 000 | 26 500 000 | 25 800 000 |

Note(s)
(1) In addition to the countries listed, Bulgaria is believed to produce chromite

(a) Years ended 31 March following that stated
(b) Including foundry sand and/or lumpy ore
(c) Years ended 20 March following that stated

# Coal

## Top 10 producers

| | % of world total |
|---|---|
| China | 46% |
| USA | 12% |
| India | 8% |
| Australia | 6% |
| Indonesia | 5% |
| Russia | 4% |
| South Africa | 3% |
| Germany | 2% |
| Poland | 2% |
| Kazakhstan | 2% |

## End uses

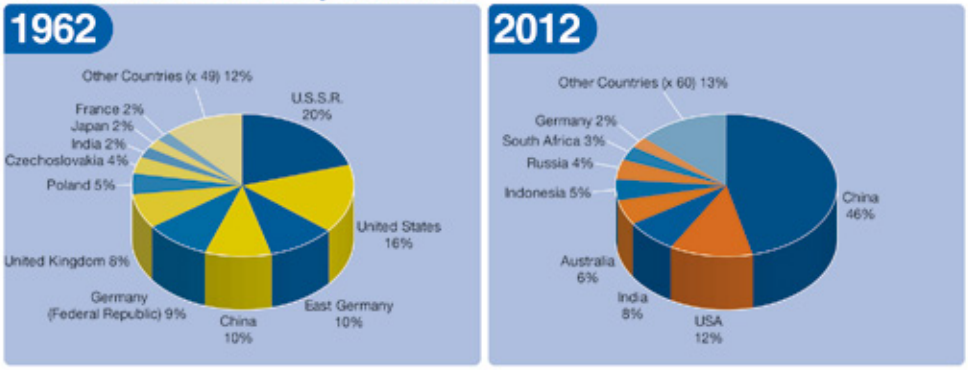
**Electricity generation:** used as fuel in power stations

**Steel production:** used in blast furnaces to smelt iron ore

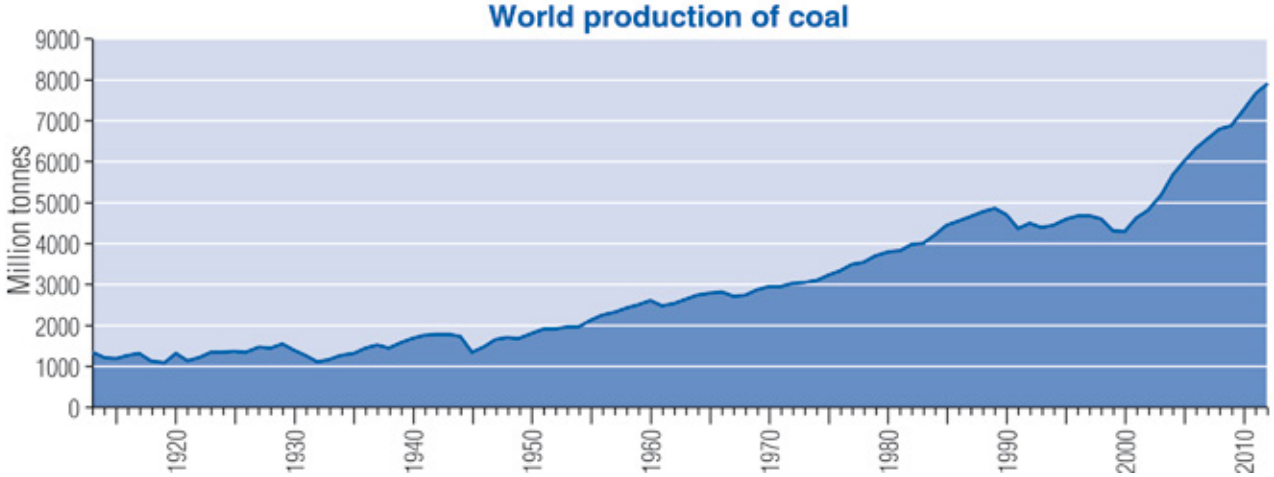
**Liquid fuel:** used for transport fuel and other oil products

**Many minor uses:** e.g. cement production, industrial heating and manufacture of chemicals

## Distribution of world production




## World production of coal



## Production of coal

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Albania | | | | | |
| Lignite | 1 500 | 2 000 | 3 000 | 100 | * 100 |
| Bosnia & Herzegovina | | | | | |
| Brown coal & lignite | 11 221 305 | 11 515 138 | 10 976 163 | 12 738 225 | 12 311 623 |
| Bulgaria | | | | | |
| Lignite | 26 007 800 | 25 014 800 | 27 148 300 | 34 496 200 | 31 040 700 |
| Brown coal | 2 643 200 | 2 243 800 | 2 321 200 | 2 743 500 | * 2 700 000 |
| Czech Republic | | | | | |
| Bituminous | 12 197 000 | 10 621 000 | 11 193 000 | 10 967 000 | 10 796 000 |
| Lignite | 416 000 | 262 000 | — | — | — |
| Brown coal | 47 456 000 | 45 354 000 | 43 931 000 | 46 848 000 | 43 710 000 |
| Georgia | 12 000 | 213 188 | 267 664 | 352 872 | 424 998 |
| Germany | | | | | |
| Anthracite & Bituminous | 19 143 000 | 14 971 000 | 14 110 000 | 12 960 000 | 11 560 000 |
| Brown coal | 175 313 020 | 169 857 142 | 169 402 544 | 176 502 048 | 185 432 000 |
| Greece | | | | | |
| Lignite | 64 521 000 | 61 800 000 | 53 600 000 | 58 400 000 | 62 368 000 |
| Hungary | | | | | |
| Lignite | 8 041 168 | 8 026 587 | 8 202 859 | 8 800 783 | 8 438 000 |
| Brown coal | 1 386 140 | 944 139 | 813 403 | 699 129 | 875 944 |
| Kosovo | | | | | |
| Lignite | 7 842 000 | 7 839 173 | 7 958 090 | 8 212 103 | 8 028 397 |
| Macedonia | | | | | |
| Lignite | 7 669 103 | 7 395 915 | 6 583 074 | 7 902 084 | 7 309 546 |
| Montenegro | | | | | |
| Lignite | 1 740 076 | 957 164 | 1 937 847 | 1 972 671 | 1 706 302 |
| Norway | | | | | |
| Bituminous (a) | 3 429 000 | 2 437 000 | 1 685 000 | 1 640 000 | 1 583 000 |
| Poland | | | | | |
| Bituminous | 84 345 443 | 78 064 462 | 76 727 802 | 76 447 604 | 79 854 904 |
| Lignite | 59 668 166 | 57 108 304 | 56 510 125 | 62 841 269 | 64 279 772 |
| Romania | | | | | |
| Anthracite & Bituminous | — | — | — | 2 121 574 | 1 876 062 |
| Lignite | 34 529 000 | 28 460 152 | 28 774 244 | 33 779 130 | 31 529 377 |
| Brown coal | 205 000 | 63 458 | 62 448 | 46 071 | 17 700 |
| Russia | 326 000 000 | 298 000 000 | 317 000 000 | 334 000 000 | 354 000 000 |
| Serbia | | | | | |
| Bituminous | 66 000 | 69 000 | 108 000 | 134 000 | 141 000 |
| Lignite (b) | (c) 31 332 000 | 38 070 579 | 37 562 840 | 40 467 132 | 37 707 017 |
| Brown coal | ... | 209 660 | 193 492 | 349 861 | 316 507 |
| Slovakia | | | | | |
| Lignite | 87 000 | 155 000 | 176 000 | 124 000 | 136 000 |
| Brown coal | 2 075 000 | 2 221 000 | 2 026 000 | 1 989 000 | 1 964 000 |
| Slovenia | | | | | |
| Lignite | 4 008 440 | 3 921 746 | 4 010 930 | 4 066 278 | 3 967 064 |
| Brown coal | 488 828 | 510 769 | 419 466 | 435 800 | 354 262 |
| Spain | | | | | |
| Anthracite | 3 152 550 | 4 306 033 | 3 212 603 | 2 489 797 | 2 259 236 |
| Bituminous | 4 085 652 | 2 898 340 | 2 776 918 | 1 774 992 | 1 651 496 |
| Sub-bituminous | 2 890 230 | 2 493 577 | 2 428 877 | 2 358 930 | 2 275 409 |
| Turkey | | | | | |
| Anthracite | 3 343 409 | 3 773 603 | 6 312 137 | 5 619 316 | * 5 600 000 |
| Bituminous | * 1 000 000 | * 1 000 000 | * 1 000 000 | 3 542 223 | * 3 550 000 |
| Lignite | 86 074 626 | 82 263 104 | 86 943 392 | 79 968 510 | * 80 000 000 |
| Ukraine | | | | | |
| Bituminous | 77 802 200 | 54 977 000 | 54 952 000 | 62 661 000 | 65 523 000 |
| Lignite | 163 000 | 175 000 | * 175 000 | * 175 000 | * 175 000 |
| United Kingdom | | | | | |
| Bituminous (d) | 18 053 000 | 17 874 000 | 18 417 000 | 18 627 000 | 17 047 000 |
| | | | | | |
| Botswana | 909 511 | 737 798 | 988 240 | 787 729 | 1 454 724 |
| Congo, Democratic Republic | | | | | |
| Bituminous | 128 800 | 133 400 | 133 400 | 132 000 | * 132 000 |
| Egypt (e) | — | — | 109 884 | 233 283 | * 250 000 |
| Ethiopia | | | | | |
| Lignite | — | 15 000 | 20 000 | 20 000 | * 20 000 |
| Malawi | 57 477 | 59 201 | 79 186 | 83 146 | 70 552 |

## Production of coal

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Mozambique | | | | | |
| Bituminous | 37 700 | 25 924 | 35 737 | 82 920 | 54 432 |
| Niger | 182 912 | 225 072 | 246 558 | 225 000 | 225 000 |
| Nigeria | | | | | |
| Sub-bituminous | * 30 000 | * 40 000 | 44 148 | * 44 000 | * 44 000 |
| South Africa | | | | | |
| Anthracite | 2 207 304 | 1 657 860 | 2 073 889 | 2 553 635 | 3 005 136 |
| Bituminous | 250 006 054 | 248 923 814 | 255 131 918 | 250 203 209 | 255 570 657 |
| Swaziland | | | | | |
| Anthracite | 174 807 | 129 647 | 145 903 | 121 050 | 152 284 |
| Tanzania | | | | | |
| Bituminous | 15 242 | 16 500 | 179 500 | 82 856 | 78 672 |
| Zambia | | | | | |
| Bituminous | * 14 000 | * 14 000 | — | — | — |
| Zimbabwe | | | | | |
| Bituminous | 1 509 080 | 1 667 346 | 2 668 183 | 2 562 054 | 1 593 600 |
| | | | | | |
| Canada | | | | | |
| Bituminous | 32 839 000 | 27 959 000 | 33 704 000 | 34 621 000 | 35 375 000 |
| Sub-bituminous | 24 988 000 | 24 425 000 | 23 927 000 | 22 762 000 | 21 694 000 |
| Lignite | 9 921 000 | 10 550 000 | 10 264 000 | 9 731 000 | 9 496 000 |
| Mexico | | | | | |
| Bituminous | 15 038 557 | 13 555 680 | 16 318 120 | 20 967 630 | 16 276 556 |
| USA | | | | | |
| Anthracite (f) | 1 542 000 | 1 724 000 | 1 633 000 | 2 082 940 | * 2 000 000 |
| Bituminous (f) | 503 768 000 | 457 320 000 | 444 074 000 | 454 054 000 | * 454 000 000 |
| Sub-bituminous | 489 072 000 | 450 334 000 | 467 027 000 | 441 167 731 | * 435 000 000 |
| Lignite | 68 675 000 | 65 772 000 | 70 943 000 | 73 440 875 | * 73 500 000 |
| | | | | | |
| Argentina | | | | | |
| Bituminous | 207 983 | 181 474 | 140 000 | 178 000 | * 180 000 |
| Brazil | | | | | |
| Bituminous & lignite (g) | 6 518 733 | 5 947 364 | 5 611 467 | 5 985 489 | 6 440 998 |
| Chile | | | | | |
| Bituminous | 212 375 | 118 305 | 106 018 | 131 430 | 141 120 |
| Lignite | 321 417 | 517 769 | 512 775 | 522 672 | 570 594 |
| Colombia | | | | | |
| Bituminous | 73 502 075 | 72 807 412 | 74 350 133 | 85 803 229 | 89 024 321 |
| Peru | | | | | |
| Anthracite & Bituminous | 136 435 | 156 372 | 91 960 | 164 392 | 226 908 |
| Venezuela | | | | | |
| Bituminous | 5 053 700 | 3 258 146 | 2 630 820 | * 2 600 000 | * 2 600 000 |
| | | | | | |
| Afghanistan | | | | | |
| Bituminous | 314 702 | 453 592 | 657 618 | * 658 000 | * 658 000 |
| Bangladesh (e) | 677 098 | 857 648 | 730 866 | 666 635 | 861 072 |
| Bhutan | 123 704 | 48 545 | 87 814 | 148 244 | 98 731 |
| Burma (h) | 241 299 | 231 271 | 235 743 | 351 770 | * 350 000 |
| China | 2 802 000 000 | 2 973 000 000 | 3 235 000 000 | 3 520 000 000 | 3 660 000 000 |
| India | | | | | |
| Bituminous (h) | 492 757 000 | 532 042 000 | 532 694 000 | 539 852 000 | 557 020 000 |
| Lignite (h) | 32 421 000 | 34 071 000 | 37 733 000 | 42 897 000 | 46 520 000 |
| Indonesia | | | | | |
| Anthracite & Bituminous | 240 249 968 | 256 181 000 | 275 164 196 | 353 270 937 | * 380 000 000 |
| Iran | | | | | |
| Bituminous (g) | 2 520 000 | 2 180 810 | * 2 500 000 | 2 499 495 | * 2 500 000 |
| Japan | | | | | |
| Bituminous | * 1 300 000 | * 1 100 000 | * 1 000 000 | * 900 000 | * 900 000 |
| Kazakhstan | | | | | |
| Bituminous | 106 295 600 | 95 770 000 | 103 646 000 | 108 081 000 | 112 780 000 |
| Lignite | 4 776 700 | 5 084 000 | 7 283 000 | 8 368 000 | 7 748 000 |
| Korea (Rep. of) | | | | | |
| Anthracite | 2 772 544 | 2 518 940 | 2 083 972 | 2 084 474 | 2 094 000 |
| Korea, Dem. P.R. of (h) | * 25 060 000 | * 36 000 000 | * 41 000 000 | * 41 000 000 | * 41 000 000 |
| Kyrgyzstan | 491 800 | 606 900 | 575 000 | 830 700 | 1 106 700 |
| Laos | 379 273 | 466 082 | 501 600 | 511 700 | 510 100 |
| Malaysia | 1 166 525 | 2 138 390 | 2 397 340 | 2 915 788 | 2 951 124 |

## Production of coal

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Mongolia | | | | | |
| Anthracite & semi-bituminous | 5 228 000 | ... | ... | ... | ... |
| Brown coal & lignite | 4 843 900 | (j) 14 365 500 | (j) 25 161 900 | (j) 32 029 700 | (j) 28 561 000 |
| Nepal | | | | | |
| Sub-bituminous (k) | 13 845 | 14 819 | 11 799 | 13 165 | 9 406 |
| Pakistan (e) (l) | 4 066 409 | 3 679 185 | 3 535 828 | 3 291 617 | 3 178 986 |
| Philippines | | | | | |
| Bituminous | 3 609 316 | 4 687 277 | 6 650 357 | 6 881 474 | 7 348 647 |
| Tajikistan | 198 500 | 178 300 | 199 700 | 236 400 | 412 000 |
| Thailand | | | | | |
| Lignite | 18 095 335 | 16 360 261 | 18 399 399 | 21 324 406 | 18 652 557 |
| Uzbekistan | | | | | |
| Bituminous | 197 766 | 100 698 | 197 766 | * 198 000 | * 198 000 |
| Lignite | 3 091 685 | 3 553 443 | 3 101 665 | * 3 100 000 | * 3 100 000 |
| Vietnam | | | | | |
| Anthracite | 39 777 000 | 44 078 000 | 44 835 000 | 46 611 000 | 42 383 000 |
| | | | | | |
| Australia | | | | | |
| Bituminous (m) | 333 000 000 | 350 000 000 | 357 000 000 | 350 000 000 | 380 000 000 |
| Brown coal (e) | 66 033 000 | 68 252 000 | 68 751 000 | 66 733 000 | * 67 000 000 |
| New Zealand | | | | | |
| Bituminous | 2 476 848 | 2 085 486 | 2 597 400 | 2 330 400 | 2 276 300 |
| Sub-bituminous | 2 179 081 | 2 218 143 | 2 438 200 | 2 294 200 | 2 324 000 |
| Lignite | 253 492 | 259 704 | 294 900 | 320 100 | 325 900 |
| | | | | | |
| World Total | 6 812 000 000 | 6 887 000 000 | 7 250 000 000 | 7 691 000 000 | 7 924 000 000 |

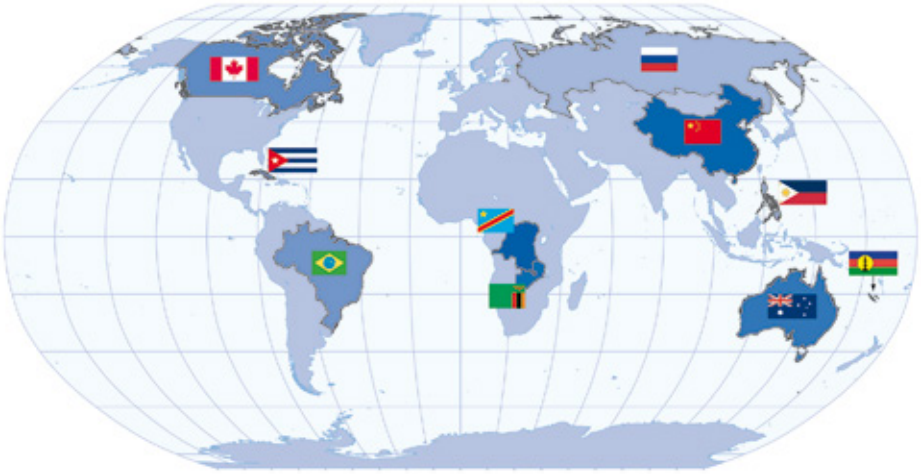
Note(s)
(1) There is no international agreement as to the separate definition of lignite and brown coal. In some cases they are distinguished. Elsewhere both may be aggregated under one or other term

(a) Spitzbergen: not including production from mines controlled by Russia
(b) Excluding production in Kosovo
(c) Including brown coal
(d) Including anthracite
(e) Years ended 30 June of that stated
(f) Includes a small amount of refuse recovery
(g) Including beneficiated and directly shipped material
(h) Years ended 31 March following that stated
(i) Years ended 20 March following that stated
(j) Coal; all forms
(k) Years ended 15 July of that shown
(l) Including lignite
(m) Including sub-bituminous

# Cobalt

*Symbol Co*

**Relative supply risk index**
**7.6**



## Top 10 producers

| | % of world total |
|---|---|
| Congo, D.R. of | 68% |
| China | 5% |
| Zambia | 4% |
| Australia | 4% |
| Cuba | 3% |
| Canada | 3% |
| Brazil | 3% |
| New Caledonia | 2% |
| Philippines | 2% |
| Russia | 2% |

## End uses

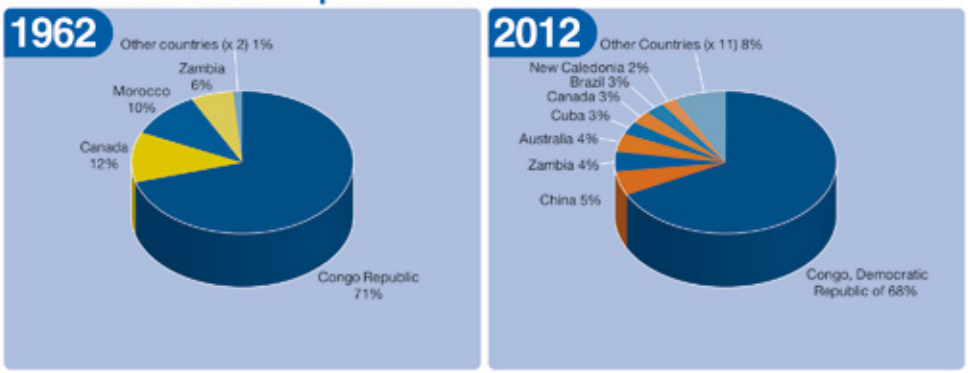
**Rechargeable batteries:** used in electronic devices such as mobile phones, laptops, etc.

**Super alloys:** for jet engines, automotives and chemical applications

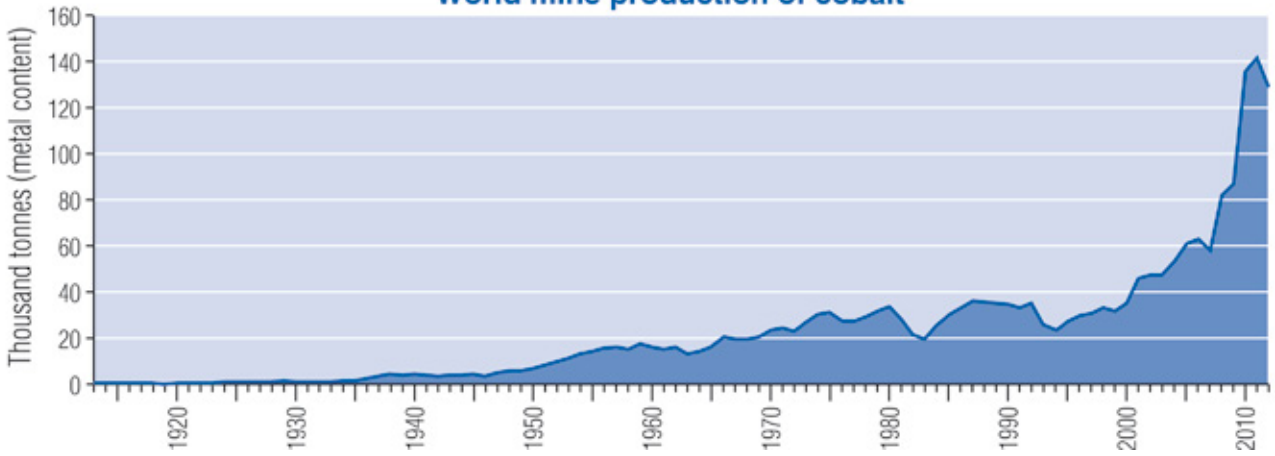
**Hard metals:** used in cutting tools, drilling and excavating

**Catalysts:** in the petrochemical and plastic industries.

## Distribution of world production




## World mine production of cobalt



## Mine production of cobalt

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Finland | * 100 | * 27 | * 140 | 480 | * 1 381 |
| Russia (a) | 2 502 | 2 352 | 2 460 | 2 337 | 2 186 |
| Botswana | 337 | 342 | 272 | 149 | 195 |
| Congo, Democratic Republic | 42 461 | 56 258 | 97 693 | 99 475 | 86 433 |
| Madagascar | — | — | — | — | 493 |
| Morocco (a) | 1 791 | 1 600 | 1 582 | 1 518 | 1 314 |
| South Africa (a) | 244 | 238 | 840 | 862 | 1 102 |
| Uganda (a) | 663 | 673 | 624 | 661 | 556 |
| Zambia (a) | 4 041 | 1 535 | 5 134 | 5 956 | 5 665 |
| Zimbabwe | 28 | 39 | 58 | 174 | 121 |
| Canada | 8 953 | 3 919 | 4 636 | 7 071 | 3 652 |
| Cuba | 3 175 | * 3 500 | 3 721 | 3 850 | * 3 700 |
| Brazil | 2 631 | 2 075 | 3 139 | 3 150 | 3 650 |
| China | 6 630 | 6 003 | 6 382 | 6 843 | * 7 000 |
| Indonesia | * 650 | * 650 | * 650 | * 650 | * 650 |
| Philippines | * 1 200 | * 1 500 | * 1 500 | * 1 500 | * 2 269 |
| Australia (b) | 5 770 | 5 365 | 4 838 | 4 254 | 5 413 |
| New Caledonia | 869 | 913 | 1 735 | 2 404 | 2 631 |
| Papua New Guinea | — | — | — | — | 473 |
| World Total | 82 000 | 87 000 | 135 000 | 141 000 | 128 000 |

Note(s)
(1) There is frequently a considerable disparity between the cobalt content of ore raised and cobalt actually recovered
(2) Figures in this table relate where possible to cobalt recovered. The principal exceptions to this are Brazil and New Caledonia, the figures for which relate to cobalt in ore raised

(a) Metal
(b) Years ended 30 June of that stated

## Production of cobalt metal

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Belgium (a) | 3 020 | 2 150 | 2 600 | 3 187 | 4 200 |
| Finland | 9 645 | 8 970 | 9 429 | 10 627 | 10 562 |
| France | 311 | 368 | 302 | 354 | 326 |
| Norway | 3 719 | 3 510 | 3 208 | 3 067 | 2 969 |
| Russia | 2 502 | 2 352 | 2 460 | 2 337 | 2 186 |
| Congo, Democratic Republic (b) | 1 049 | 2 950 | 4 182 | 3 083 | 2 999 |
| Morocco | 1 791 | 1 600 | 1 582 | 1 518 | 1 314 |
| South Africa (c) | 244 | 238 | 840 | 862 | 1 102 |
| Uganda | 663 | 673 | 624 | 661 | 556 |
| Zambia | 4 041 | 1 535 | 5 134 | 5 956 | 5 665 |
| Canada (d) | 5 637 | 4 918 | 4 711 | 6 038 | 5 981 |
| Brazil | 994 | 1 012 | 1 369 | 1 613 | 1 750 |
| China (a) | 18 239 | 25 544 | 35 929 | 34 969 | 29 784 |
| India | 858 | 1 001 | 1 187 | 1 299 | 800 |
| Japan | 1 071 | 1 332 | 1 935 | 2 007 | 2 542 |
| Australia | 3 618 | 4 050 | 4 117 | 4 722 | 4 769 |
| World Total | 57 400 | 62 200 | 79 600 | 82 300 | 77 500 |

Note(s)
(1) In addition to the production listed above, several countries, including the United Kingdom, Finland and France, are known to produce substantial amounts of cobalt compounds

(a) Some metal production in China is recorded in Belgium
(b) Excludes white alloy and matte which are believed to be further processed in Belgium and elsewhere
(c) Includes metal and metal contained in sulphate
(d) Including oxides

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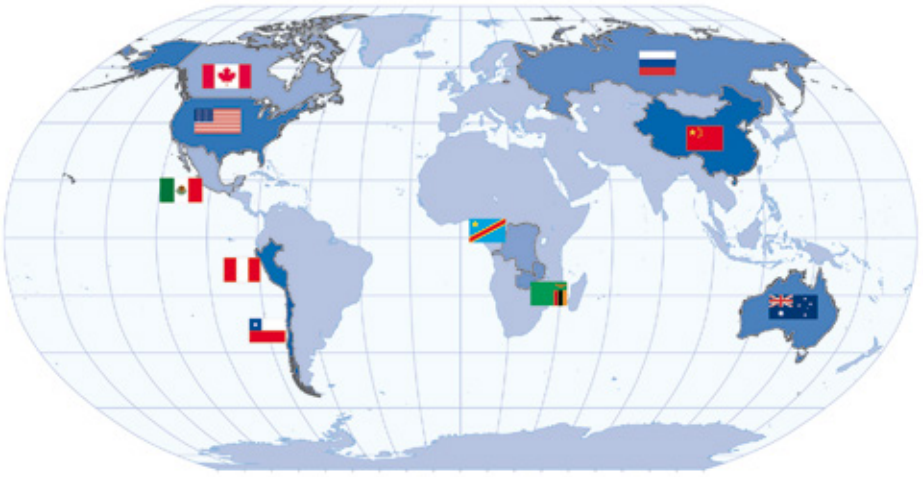
# Copper

*Symbol Cu*

**Relative supply risk index**
**4.3**



## Top 10 producers

| | % of world total |
|---|---|
| Chile | 32% |
| China | 10% |
| Peru | 8% |
| USA | 7% |
| Australia | 5% |
| Russia | 4% |
| Zambia | 4% |
| Congo, D.R of | 4% |
| Canada | 3% |
| Mexico | 3% |

## End uses

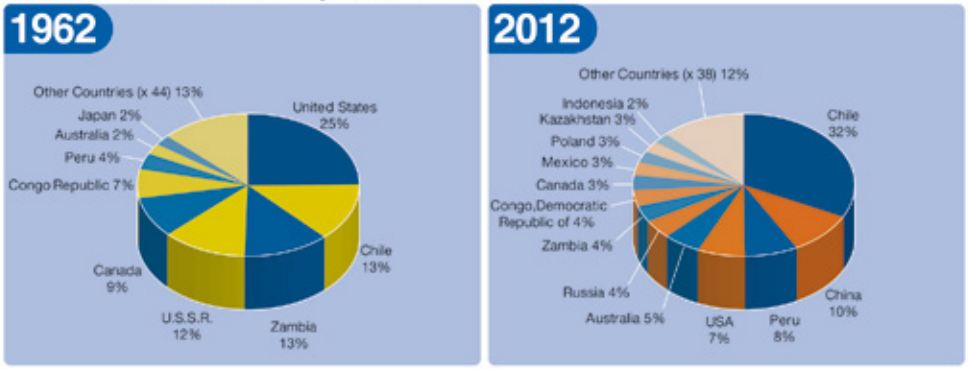
**Electrical equipment and products:** such as power cables, transformers, motors and generators

**Building construction:** for plumbing, valves, fittings etc.

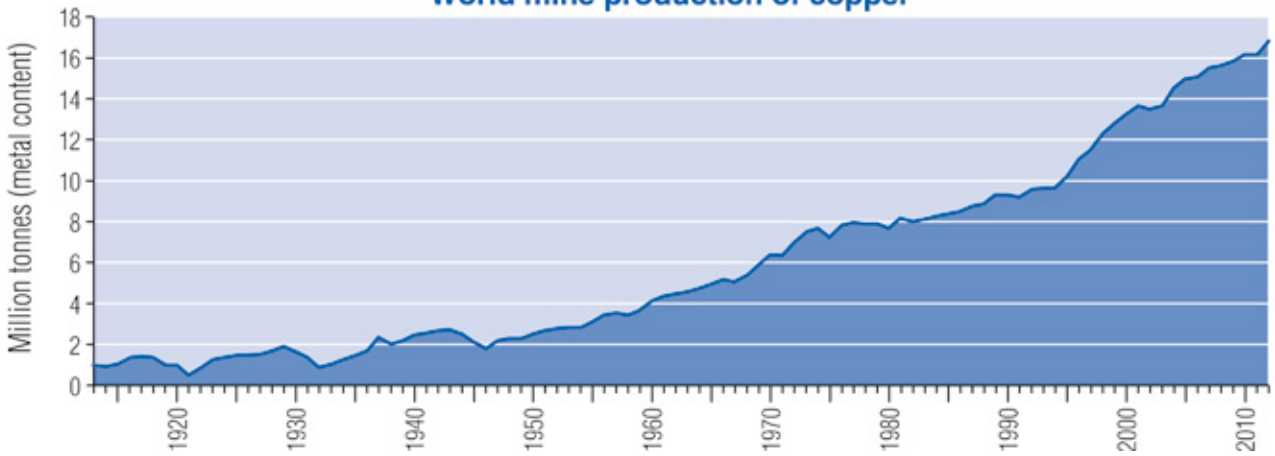
**Transportation:** used in motor vehicles, aircraft, trains and ships

**Industry:** used in machinery and equipment

## Distribution of world production




## World mine production of copper



## Mine production of copper

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Albania | 3 633 | 2 596 | 2 672 | 4 378 | 6 400 |
| Armenia | 18 754 | 23 233 | 31 062 | 33 597 | 40 441 |
| Bulgaria (a) | 107 195 | 110 652 | 112 904 | 114 603 | 118 255 |
| Cyprus | 2 986 | 2 380 | 2 595 | 3 660 | 4 328 |
| Finland | 13 300 | 14 600 | 14 700 | 14 000 | 25 446 |
| Georgia | 18 700 | 16 600 | 11 300 | 10 200 | 7 100 |
| Macedonia | 8 051 | 7 440 | 7 912 | 7 555 | 9 506 |
| Poland | 429 687 | 439 365 | 425 725 | 426 665 | 427 064 |
| Portugal | 89 026 | 86 462 | 74 011 | 79 686 | 74 043 |
| Romania | 308 | 3 129 | 5 127 | 6 355 | 5 902 |
| Russia | 705 000 | 675 700 | 702 700 | 713 100 | 720 000 |
| Serbia | 17 600 | 19 400 | 22 500 | 25 800 | 32 205 |
| Spain | 7 071 | 17 663 | 54 335 | 68 511 | 97 636 |
| Sweden | 57 688 | 55 414 | 76 514 | 82 967 | 82 422 |
| Turkey | 82 400 | 72 400 | 79 900 | 92 500 | 101 700 |
| Botswana | 23 146 | 24 382 | 48 026 | 31 929 | 35 768 |
| Congo, Democratic Republic | 239 200 | 299 300 | 378 300 | 480 000 | 608 400 |
| Mauritania | 33 073 | 36 608 | 36 969 | 35 281 | 37 670 |
| Morocco | 5 929 | 11 830 | 14 986 | 12 076 | 18 500 |
| Namibia | 8 800 | — | — | 3 366 | 5 304 |
| South Africa | 108 700 | 107 600 | 102 600 | 96 600 | 81 000 |
| Tanzania | 2 852 | 3 079 | 6 400 | 6 748 | 5 840 |
| Zambia | 567 700 | 601 200 | 731 700 | 739 759 | 629 020 |
| Zimbabwe | 2 827 | 3 572 | 4 629 | 6 555 | 4 724 |
| Canada | 607 957 | 484 605 | 525 129 | 566 124 | 578 586 |
| Dominican Republic | 2 109 | 12 937 | 10 015 | 11 777 | 11 737 |
| Mexico | 246 593 | 240 648 | 270 136 | 443 621 | 500 275 |
| USA | 1 310 000 | 1 180 000 | 1 110 000 | 1 120 000 | 1 170 000 |
| Argentina | 156 900 | 143 084 | 140 300 | 116 700 | 135 700 |
| Bolivia | 567 | 620 | 2 100 | 4 176 | 8 653 |
| Brazil | 218 295 | 211 692 | 213 548 | 213 760 | 219 600 |
| Chile | 5 327 600 | 5 394 400 | 5 418 900 | 5 262 800 | 5 433 900 |
| Colombia | 1 050 | 1 140 | 711 | 808 | 781 |
| Peru | 1 267 867 | 1 276 249 | 1 247 184 | 1 235 345 | 1 298 564 |
| Burma | 6 900 | 9 800 | * 12 000 | * 12 000 | * 12 000 |
| China | 1 092 700 | 1 062 000 | 1 179 500 | 1 294 700 | 1 642 300 |
| India (b) | 30 528 | 28 491 | 31 696 | 30 214 | 28 950 |
| Indonesia | 650 100 | 995 500 | 862 500 | 538 300 | 398 100 |
| Iran | 248 100 | 262 500 | 256 600 | 259 100 | 245 200 |
| Kazakhstan | 467 000 | 456 000 | 427 000 | 417 000 | 424 000 |
| Korea, Dem. P.R. of | * 2 400 | * 2 100 | * 4 600 | * 7 000 | * 6 700 |
| Laos | 89 004 | 121 581 | 132 047 | 138 756 | 149 580 |
| Malaysia | — | 240 | — | — | — |
| Mongolia | 129 600 | 132 300 | 127 600 | 124 000 | 123 900 |
| Oman | 18 728 | 19 659 | 20 880 | 26 736 | 24 864 |
| Pakistan | 18 700 | 19 600 | 19 400 | * 20 600 | * 24 000 |
| Philippines | 21 235 | 49 060 | 58 412 | 63 835 | 65 444 |
| Saudi Arabia | 1 465 | 1 719 | 1 603 | 1 954 | * 2 150 |
| Uzbekistan | * 80 000 | * 80 000 | * 80 000 | * 80 000 | * 80 000 |
| Vietnam | 11 520 | 12 935 | 12 260 | 11 252 | 11 266 |
| Australia | 886 000 | 856 000 | 871 000 | 959 000 | 914 000 |
| Papua New Guinea | 159 650 | 166 669 | 159 821 | 130 456 | 125 348 |
| World Total | 15 600 000 | 15 900 000 | 16 100 000 | 16 200 000 | 16 800 000 |

Note(s)
(a) Metal content of ore
(b) Years ended 31 March following that stated

## Smelter production of copper

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Armenia | 6 480 | 6 858 | 7 644 | 8 876 | 10 075 |
| Bulgaria | 257 100 | 256 200 | 265 000 | 285 000 | 264 200 |
| Finland | 142 154 | 110 479 | 112 687 | 116 455 | 124 527 |
| Germany | 295 000 | 251 000 | 378 700 | 346 200 | 352 400 |
| Norway | 37 000 | 33 900 | 36 200 | 36 000 | 38 000 |
| Poland | 492 942 | 457 510 | 469 656 | 481 875 | 466 715 |
| Russia | 616 800 | 620 700 | 647 100 | 652 200 | 633 200 |
| Serbia | 31 900 | 27 000 | 20 000 | 28 200 | 36 800 |
| Spain | 259 897 | 264 971 | 259 119 | 260 730 | 295 200 |
| Sweden | 203 700 | 183 400 | 181 500 | 206 100 | 207 300 |
| Turkey | 38 000 | — | — | * 25 000 | * 25 000 |
| Botswana | 25 000 | 24 700 | 22 823 | 16 105 | 17 625 |
| Namibia | 16 693 | 21 500 | 31 900 | 36 100 | 31 900 |
| South Africa | 94 800 | 86 900 | 75 900 | 82 400 | 62 300 |
| Zambia (a) | 232 000 | 334 000 | 487 000 | 511 200 | 519 200 |
| Canada | 443 710 | 316 510 | 318 006 | 304 724 | 310 400 |
| Mexico | 230 056 | 178 672 | 168 861 | 336 739 | 367 852 |
| USA | 573 800 | 597 400 | 601 200 | 538 400 | 485 300 |
| Brazil | 227 800 | 204 500 | 208 800 | 223 500 | 190 000 |
| Chile | 1 369 200 | 1 522 300 | 1 559 800 | 1 522 300 | 1 342 400 |
| Peru | 306 583 | 325 788 | 312 968 | 299 004 | 290 088 |
| China | 2 453 400 | 2 693 900 | 2 825 600 | 3 036 700 | 3 438 000 |
| India | 651 000 | 705 100 | 653 900 | 671 200 | 695 400 |
| Indonesia | 253 300 | 295 900 | 276 800 | 260 000 | 210 000 |
| Iran | 179 800 | 192 700 | 188 200 | 185 200 | 179 400 |
| Japan | 1 335 846 | 1 302 120 | 1 356 289 | 1 173 275 | 1 274 690 |
| Kazakhstan | 430 000 | 369 000 | 370 900 | 375 900 | 341 700 |
| Korea (Rep. of) | 502 000 | 455 400 | 475 900 | 449 200 | 477 300 |
| Korea, Dem. P.R. of | * 10 000 | * 10 000 | * 10 000 | * 10 000 | * 10 000 |
| Oman | 11 906 | 11 830 | 8 815 | 7 515 | 12 000 |
| Pakistan (b) | 16 201 | 17 799 | 18 121 | 15 672 | 17 931 |
| Philippines | 239 700 | 230 100 | 216 200 | 205 000 | 97 000 |
| Uzbekistan | 90 100 | * 90 000 | * 90 000 | * 90 000 | * 90 000 |
| Vietnam | * 2 200 | * 6 000 | * 8 000 | * 8 000 | * 8 000 |
| Australia | 449 000 | 422 000 | 410 000 | 441 000 | 422 000 |
| World Total | 12 500 000 | 12 600 000 | 13 100 000 | 13 200 000 | 13 300 000 |

Note(s)
(1) This table shows primary metal in the form of blister and anode produced from concentrates, and may include copper produced from scrap but this is excluded when it can be separately identified

(a) Including leach cathodes
(b) Years ended 30 June of that stated

## Production of refined copper

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria | 106 700 | 96 200 | 113 700 | 112 500 | 95 000 |
| Belgium | 395 800 | 373 600 | 389 000 | 393 600 | 401 600 |
| Bulgaria | 126 700 | 196 900 | 216 000 | 226 100 | 226 000 |
| Cyprus | 2 986 | 2 380 | 2 595 | 3 660 | 4 328 |
| Finland | 131 249 | 105 411 | 112 687 | 124 360 | 129 256 |
| Germany | 689 763 | 668 945 | 704 300 | 708 800 | 685 700 |
| Italy | 24 200 | 6 500 | 1 800 | 7 600 | 7 700 |
| Norway | 37 000 | 33 900 | 36 200 | 36 000 | 38 000 |
| Poland | 526 808 | 502 462 | 547 074 | 571 041 | 565 834 |
| Romania | 15 300 | 4 600 | — | — | — |
| Russia | 876 800 | 855 000 | 899 600 | 912 000 | 890 900 |
| Serbia | 33 800 | 27 400 | 22 200 | 25 300 | 34 700 |
| Spain | 319 050 | 329 356 | 347 518 | 353 790 | 406 600 |
| Sweden | 227 774 | 205 759 | 190 497 | 219 316 | 214 050 |
| Turkey | 88 000 | 33 500 | 47 300 | 85 000 | 86 300 |
| Ukraine | 21 700 | 20 000 | 23 400 | 20 000 | 24 000 |
| | | | | | |
| Congo, Democratic Republic | 57 700 | 169 900 | 258 600 | 354 800 | 453 400 |
| Egypt (a) | 2 664 | 2 842 | 2 620 | 2 789 | * 2 800 |
| South Africa | 92 700 | 85 330 | 81 129 | 86 166 | 66 416 |
| Zambia | 575 000 | 689 600 | 767 000 | 739 800 | 700 100 |
| Zimbabwe | 3 100 | 3 000 | 4 500 | 4 400 | 5 000 |
| | | | | | |
| Canada | 442 050 | 335 896 | 319 619 | 273 761 | 275 990 |
| Mexico | 295 000 | 260 700 | 247 300 | 400 000 | 370 300 |
| USA | 1 280 300 | 1 161 200 | 1 093 400 | 1 040 000 | 1 000 000 |
| | | | | | |
| Argentina | * 16 000 | * 16 000 | * 16 000 | * 16 000 | * 16 000 |
| Brazil | 255 808 | 252 399 | 245 297 | 245 300 | 199 000 |
| Chile | 3 057 600 | 3 276 600 | 3 243 900 | 3 092 400 | 2 902 000 |
| Peru | 463 933 | 423 393 | 393 638 | 367 554 | 311 200 |
| | | | | | |
| Burma | 6 900 | 9 800 | * 10 000 | * 10 000 | * 10 000 |
| China | 3 794 600 | 4 051 300 | 4 540 300 | 5 163 100 | 5 823 500 |
| India (b) | 513 640 | 532 865 | 512 124 | 504 677 | * 695 000 |
| Indonesia | 253 400 | 284 800 | 277 500 | 274 900 | 188 600 |
| Iran | 200 600 | 210 300 | 219 800 | 227 200 | 226 800 |
| Japan | 1 539 957 | 1 439 843 | 1 548 688 | 1 328 288 | 1 516 354 |
| Kazakhstan | 398 411 | 312 767 | 323 368 | 338 524 | 367 161 |
| Korea (Rep. of) | 537 925 | 531 701 | 564 600 | 595 447 | 591 000 |
| Korea, Dem. P.R. of | * 12 000 | * 12 000 | * 12 000 | * 12 000 | * 12 000 |
| Laos | 64 075 | 67 562 | 64 241 | 78 859 | 86 295 |
| Mongolia | 2 587 | 2 470 | 2 746 | 2 389 | 2 282 |
| Oman | 11 906 | 11 830 | 8 815 | 7 515 | * 8 000 |
| Philippines | 174 600 | 178 000 | 176 000 | 164 000 | 90 400 |
| Thailand | 438 | 490 | 529 | 459 | 486 |
| Uzbekistan | 70 400 | 82 500 | 82 500 | 90 000 | * 90 000 |
| Vietnam | 2 200 | * 6 000 | * 8 000 | * 8 000 | * 8 000 |
| | | | | | |
| Australia | 503 000 | 446 000 | 424 000 | 477 000 | 461 000 |
| | | | | | |
| World Total | 18 300 000 | 18 300 000 | 19 100 000 | 19 700 000 | 20 300 000 |

Note(s)
(1) Figures relate to both primary and secondary refined copper, whether electrolytic or fire refined. Metal recovered from secondary materials by remelting alone is excluded
(2) In addition to the countries listed, Albania and Colombia produce refined copper

(a) Years ended 30 June of that stated
(b) Years ended 31 March following that stated

# Diamond

## Top 10 producers

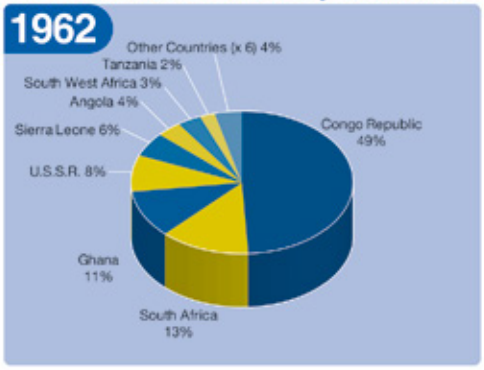
| | % of world total |
|---|---|
| Russia | 27% |
| Botswana | 16% |
| Congo, D.R of | 16% |
| Zimbabwe | 9% |
| Canada | 8% |
| Australia | 7% |
| Angola | 7% |
| South Africa | 6% |
| Namibia | 1% |
| China | 1% |

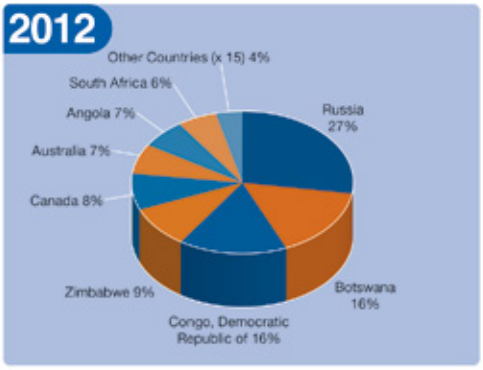
## End uses

**Industrial diamonds:** used for cutting and drilling, e.g. for machinery manufacture, stone and ceramic production and mineral exploration

**Gem-quality diamonds:** used in jewellery

## Distribution of world production




## World production of diamond

## Production of diamond

Carats

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia | 36 925 150 | 34 759 400 | 34 856 600 | 35 139 800 | 34 927 650 |
| Angola | 8 906 974 | 13 827 609 | 8 362 139 | 8 328 519 | 8 330 996 |
| Botswana | 32 595 000 | 17 734 000 | 22 019 000 | 22 903 000 | 20 478 000 |
| Cameroon (a) | * 12 000 | * 12 000 | * 12 000 | * 10 000 | * 10 000 |
| Central African Republic | 372 754 | 310 469 | 301 558 | 323 576 | 365 917 |
| Congo | 110 000 | 68 000 | 381 242 | 76 548 | 51 588 |
| Congo, Democratic Republic | 33 401 928 | 21 298 459 | 20 166 220 | 19 249 057 | 20 140 000 |
| Ghana | 598 042 | 354 443 | 308 679 | 283 369 | 215 118 |
| Guinea | 3 098 490 | 696 732 | 374 096 | 235 400 | 266 800 |
| Lesotho | 253 054 | 91 816 | 108 827 | 224 180 | 478 926 |
| Liberia | 46 963 | 36 828 | 22 018 | 39 865 | 34 271 |
| Namibia | 2 435 195 | 939 916 | 1 521 625 | 1 344 932 | 1 667 000 |
| Sierra Leone | 371 290 | 400 480 | 437 552 | 355 890 | 532 560 |
| South Africa | 12 901 018 | 6 118 974 | 8 870 967 | 7 046 644 | 7 245 403 |
| Tanzania | 237 676 | 181 874 | 80 498 | 40 691 | 127 174 |
| Togo | 8 787 | 125 | 96 | 71 | 456 |
| Zimbabwe | 797 198 | 963 502 | 8 435 224 | 8 502 648 | 12 060 163 |
| Canada | 14 802 699 | 10 946 098 | 11 773 000 | 10 795 000 | 10 529 215 |
| Brazil | 80 226 | 21 153 | 25 394 | 45 536 | 46 292 |
| Guyana | 168 926 | 143 982 | 49 920 | 52 273 | 40 763 |
| Venezuela | 9 381 | 7 730 | 2 099 | — | — |
| China | * 1 100 000 | * 1 100 000 | * 1 100 000 | * 1 100 000 | * 1 100 000 |
| India (b) | 536 | 16 891 | 11 222 | 18 489 | 32 065 |
| Indonesia | 27 688 | — | — | — | — |
| Australia | 15 670 000 | 10 795 000 | 9 998 000 | 7 562 000 | 8 626 000 |
| World Total | 164 900 000 | 120 800 000 | 129 200 000 | 123 700 000 | 127 300 000 |

Note(s)
(1) This table does not show production of synthetic diamond
(2) So far as possible the amounts shown include estimates for illegal production
(3) Production of diamond from Ivory Coast has been under United Nations sanctions since 2004. It is believed illegal production continues but it is not possible to estimate the quantity involved.

(a) Including artisanal production
(b) Years ended 31 March following that stated

## Production of diatomite

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Czech Republic | 31 000 | — | 32 000 | 46 000 | 43 000 |
| Denmark | | | | | |
| Moler (a) | 158 000 | 126 000 | 124 000 | 126 000 | 111 000 |
| France | * 75 000 | * 75 000 | * 75 000 | * 75 000 | * 75 000 |
| Hungary | — | 1 277 | 1 197 | 1 309 | * 1 300 |
| Poland | 600 | 670 | 1 000 | 580 | 600 |
| Spain (b) | 46 192 | 29 194 | 64 346 | 83 624 | 60 777 |
| Algeria | 1 677 | 1 847 | 2 231 | 2 000 | 2 000 |
| Ethiopia (c) | — | 4 104 | 4 104 | * 4 100 | * 4 000 |
| Kenya | 72 | 231 | * 250 | * 250 | * 250 |
| Mozambique | 379 | 213 | 123 | 49 | * — |
| Costa Rica | 14 700 | 24 500 | 29 900 | 8 700 | ... |
| Mexico | 128 536 | 80 807 | 91 710 | 84 231 | 84 537 |
| USA (d) | 764 000 | 575 000 | 595 000 | 813 000 | 820 000 |
| Argentina | 36 996 | 62 270 | 54 467 | 60 651 | * 70 000 |
| Brazil | 12 100 | 7 500 | 9 300 | 4 415 | * 4 500 |
| Chile | 25 497 | 23 027 | 30 925 | 22 938 | 23 021 |
| Peru | 12 200 | 9 946 | 18 886 | 54 163 | 93 786 |
| China | * 440 000 | * 440 000 | * 400 000 | * 440 000 | * 440 000 |
| Iran (e) | 2 000 | — | — | * — | * — |
| Japan | * 115 000 | * 110 000 | * 110 000 | * 100 000 | * 100 000 |
| Korea (Rep. of) | 2 540 | 2 440 | 2 200 | 5 150 | 6 000 |
| Saudi Arabia | * 1 000 | * 1 000 | * 1 000 | * 1 000 | * 1 000 |
| Thailand | 4 075 | 5 600 | 7 100 | 38 130 | 8 500 |
| Vietnam | * 10 000 | * 10 000 | * 10 000 | * 10 000 | * 10 000 |
| Australia (f) | * 21 000 | * 14 000 | * 13 000 | * 12 000 | * 12 000 |
| New Zealand | — | 10 | 95 | — | — |
| World Total | 1 903 000 | 1 605 000 | 1 678 000 | 1 993 000 | 1 971 000 |

Note(s)
(1) In addition to the countries listed, Egypt and Turkey are believed to produce diatomite

(a) Moler is an impure diatomite containing a large proportion of clay
(b) Including Tripoli
(c) Years ended 7 July of that stated
(d) Sold or used by producers
(e) Years ended 20 March following that stated
(f) Years ended 30 June of that stated

## Production of feldspar

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Bulgaria | * 90 000 | * 80 000 | * 80 000 | * 80 000 | * 80 000 |
| Czech Republic | 488 000 | 431 000 | 388 000 | 407 000 | 445 000 |
| Finland | 45 250 | 23 120 | 28 013 | 26 292 | 43 124 |
| France | * 650 000 | * 550 000 | * 650 000 | * 600 000 | 600 000 |
| Germany | 161 416 | 106 837 | * 204 000 | * 218 000 | * 220 000 |
| Greece | 62 000 | 55 737 | 23 050 | 10 200 | — |
| Italy | 4 727 000 | * 4 700 000 | * 4 700 000 | * 4 700 000 | * 4 700 000 |
| Macedonia | 28 920 | 19 377 | 23 188 | 25 032 | 17 168 |
| Norway | 62 000 | 48 000 | 56 000 | 25 271 | — |

## Production of feldspar

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Poland | 599 100 | 445 500 | 513 700 | 538 800 | 487 200 |
| Portugal | 230 427 | 210 266 | 169 722 | 187 159 | 167 287 |
| Romania | 22 995 | 14 317 | 6 049 | 3 814 | 4 112 |
| Russia | * 160 000 | * 160 000 | * 160 000 | * 160 000 | * 160 000 |
| Serbia | * 200 | 149 | 253 | 23 586 | 19 927 |
| Slovakia | 10 000 | 13 000 | — | — | — |
| Spain | 690 256 | 597 496 | 691 894 | 662 418 | 530 238 |
| Sweden | 22 000 | 18 000 | 22 000 | 30 000 | 27 000 |
| Turkey | 6 500 000 | 4 000 000 | 6 281 597 | 7 076 068 | * 8 000 000 |
| Ukraine | 83 420 | 84 757 | 146 016 | 178 614 | 146 286 |
| United Kingdom (a)(b) | 430 | — | — | — | * — |
| Algeria | 115 938 | 131 046 | 163 939 | 132 000 | 162 000 |
| Egypt | 168 673 | 353 700 | 405 600 | 406 000 | * 400 000 |
| Ethiopia (c) | 424 | 199 | 199 | 441 | * 400 |
| Morocco | 30 080 | * 35 000 | * 40 000 | 43 889 | * 45 000 |
| Nigeria | ... | 13 631 | 1 616 | * 1 600 | * 1 600 |
| South Africa | 105 815 | 101 394 | 94 307 | 101 559 | 94 458 |
| Cuba | 4 300 | 4 700 | 2 800 | 3 100 | * 3 000 |
| Guatemala | 45 854 | 5 672 | 15 720 | 7 516 | 19 356 |
| Mexico | 445 519 | 347 510 | 398 849 | 382 497 | 380 441 |
| USA | 680 000 | 550 000 | 670 000 | 650 000 | * 630 000 |
| Argentina | 220 234 | 213 551 | 217 213 | 216 721 | * 220 000 |
| Brazil | 122 000 | 115 264 | 276 448 | 333 352 | * 300 000 |
| Chile | 17 834 | 9 079 | 7 723 | 7 563 | 6 399 |
| Colombia | * 86 000 | * 85 000 | * 85 000 | * 85 000 | * 85 000 |
| Ecuador | * 60 000 | * 60 000 | * 60 000 | * 60 000 | * 60 000 |
| Peru | 13 333 | 5 154 | 3 589 | 11 645 | 26 359 |
| Uruguay | 1 920 | 910 | — | — | — |
| Venezuela | 96 783 | 100 451 | 57 760 | * 100 000 | * 100 000 |
| China | * 2 400 000 | * 2 400 000 | * 2 400 000 | * 2 400 000 | * 2 400 000 |
| India (d) | 534 032 | 496 997 | 546 472 | 660 371 | 998 309 |
| Indonesia | * 26 000 | 10 730 | * 20 000 | * 18 000 | * 18 000 |
| Iran (e) | 501 821 | 634 503 | 652 020 | 576 643 | * 570 000 |
| Japan (b) | * 700 000 | * 700 000 | * 650 000 | * 650 000 | * 600 000 |
| Jordan | 2 950 | — | — | — | — |
| Korea (Rep. of) | 344 257 | 622 770 | 496 511 | 384 221 | 360 413 |
| Malaysia | 457 377 | 410 053 | 455 497 | 379 629 | 482 906 |
| Pakistan (f) | 18 737 | 37 881 | 54 198 | 23 254 | 53 235 |
| Philippines | 15 838 | 16 394 | 15 882 | 22 050 | * 22 100 |
| Saudi Arabia | 55 000 | 55 000 | 42 300 | * 43 000 | * 43 000 |
| Sri Lanka | 55 212 | 73 365 | 75 405 | 53 337 | * 55 000 |
| Taiwan | 4 379 | — | 20 | 50 | 40 |
| Thailand | 670 618 | 718 692 | 641 900 | 1 041 152 | 1 100 619 |
| Uzbekistan | * 4 300 | * 4 300 | * 4 300 | * 4 300 | * 4 300 |
| Vietnam | * 200 000 | * 200 000 | * 200 000 | * 200 000 | * 200 000 |
| Australia (f) | * 102 000 | * 100 000 | * 103 000 | * 94 000 | * 87 000 |
| World Total | 22 941 000 | 20 171 000 | 23 002 000 | 24 045 000 | 25 176 000 |

Note(s)
(1) In addition to the countries listed, Slovakia is believed to produce feldspar

(a) China stone
(b) Including weathered granite feldspar
(c) Years ended 6 July of that stated
(d) Years ended 31 March following that stated
(e) Years ended 20 March following that stated
(f) Years ended 30 June of that stated

# Fluorspar

## Top 10 producers

| | % of world total |
|---|---|
| China | 62% |
| Mexico | 17% |
| Mongolia | 6% |
| South Africa | 3% |
| Spain | 2% |
| Russia | 1% |
| Kenya | 1% |
| Namibia | 1% |
| Morocco | 1% |
| Bulgaria | 1% |

## End uses

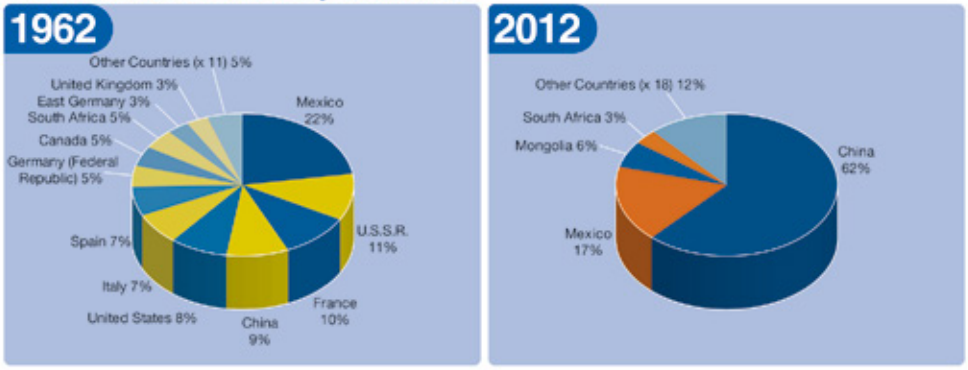
**Production of hydrofluoric acid:** used in many chemicals and pharmaceuticals

**Steel production:** used as a flux during the manufacture of steel

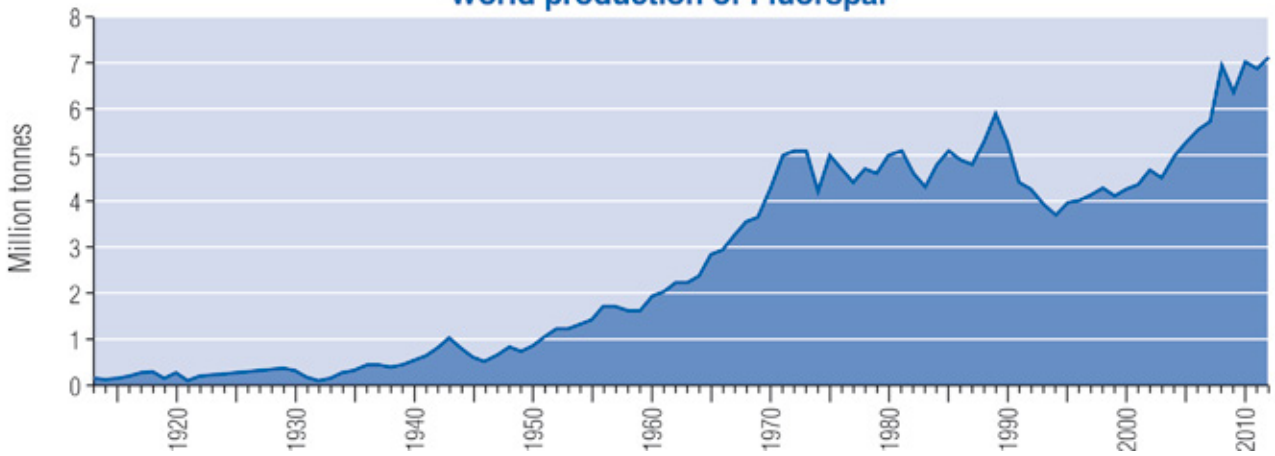
**Aluminium production:** used as a solvent during the manufacture of aluminium

**Many minor uses:** e.g. production of glass and ceramics

## Distribution of world production




## World production of Fluorspar



## Production of fluorspar

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Bulgaria | — | 32 | 10 | 31 800 | 69 700 |
| Germany | 48 519 | 49 962 | 59 086 | 65 619 | 54 202 |
| Russia | * 269 000 | * 140 000 | * 125 000 | * 110 000 | * 100 000 |
| Spain | 148 736 | 122 533 | 132 341 | 117 063 | 113 570 |
| United Kingdom | 36 801 | 18 536 | 26 420 | — | — |
| Egypt (a) | 9 115 | 4 343 | 5 953 | 3 808 | * 4 000 |
| Kenya | 98 248 | 15 667 | 40 800 | 95 100 | * 95 000 |
| Morocco | 56 724 | 72 096 | 89 680 | 79 207 | * 78 000 |
| Namibia | 118 263 | 80 857 | 104 494 | 94 032 | 90 834 |
| South Africa | 299 000 | * 204 000 | * 160 000 | * 240 000 | * 240 000 |
| Mexico | 1 057 649 | 1 045 940 | 1 067 386 | 1 206 907 | 1 237 091 |
| Argentina | 15 098 | 13 424 | 17 657 | 25 099 | * 18 000 |
| Brazil (b) | 63 241 | 43 964 | 24 447 | 25 040 | * 25 000 |
| China | * 4 200 000 | * 3 800 000 | * 4 600 000 | * 4 200 000 | * 4 400 000 |
| India (c) | 9 990 | 13 781 | 7 544 | * 8 000 | * 8 000 |
| Iran (d) | 61 592 | 71 409 | * 70 000 | 55 976 | * 55 000 |
| Kazakhstan | 66 300 | * 66 000 | * 66 000 | * 66 000 | * 66 000 |
| Korea, Dem. P.R. of | * 12 500 | * 12 500 | * 12 500 | * 12 500 | * 12 500 |
| Kyrgyzstan | * 4 000 | * 4 000 | * 4 000 | * 4 000 | * 4 000 |
| Mongolia | 334 800 | 459 500 | 367 000 | 404 000 | 428 900 |
| Pakistan (a) | 2 612 | 493 | 222 | 3 156 | 6 866 |
| Thailand | 29 529 | 119 840 | 30 487 | 5 093 | 9 602 |
| Vietnam | * 4 000 | * 4 000 | * 4 000 | * 4 000 | * 4 000 |
| World Total | 6 900 000 | 6 400 000 | 7 000 000 | 6 900 000 | 7 100 000 |

Note(s)
(1) In addition to the countries listed, Bulgaria is believed to produce fluorspar
(2) In addition, the USA produced the following amounts of fluorspar equivalent in fluorosilicic acid derived from processing phosphate rock ('000 t): 2008: 92; 2009: 97; 2010: 128; 2011: 70; 2012: 130

(a) Years ended 30 June of that stated
(b) Including beneficiated and directly shipped material
(c) Years ended 31 March following that stated
(d) Years ended 20 March following that stated

## Production of primary gallium

Accurate data for gallium is difficult to obtain because it is produced only as a by-product of bauxite or zinc processing using proprietary techniques and the majority of producers do not report production figures. The leading producing countries are believed to be China, Germany, Kazakhstan and Ukraine, with smaller quantities produced in the Republic of Korea, Russia, Hungary and Japan.

The following table provides the currently available information but this is incomplete. The United States Geological Survey estimates total world primary production as: 2008, 95 tonnes; 2009, 78 tonnes; 2010, 182 tonnes; 2011, 292 tonnes and 2012, 273 tonnes.

There is also believed to be significant production of refined gallium from scrap recycling, particularly in China, Japan, United Kingdom and USA.

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia | * 13 | * 13 | 13 | * 13 | * 13 |
| Japan | 7 | 7 | 5 | 5 | 8 |
| Kazakhstan | 19 | 19 | 19 | 19 | 16 |

# Gold

*Symbol Au*

**Relative supply risk index**
**5.7**

## Top 10 producers

| | % of world total |
|---|---|
| China | 15% |
| Australia | 10% |
| USA | 9% |
| Russia | 7% |
| Peru | 6% |
| South Africa | 6% |
| Canada | 4% |
| Mexico | 4% |
| Ghana | 4% |
| Uzbekistan | 3% |

## End uses

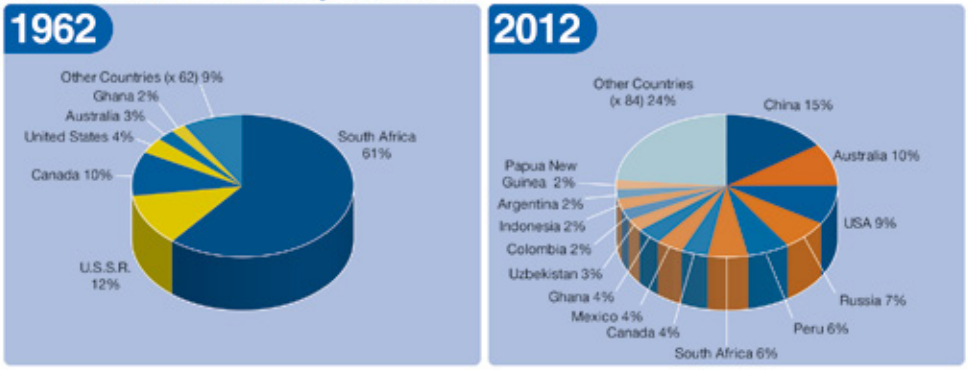
**Jewellery:** generally alloyed with silver, copper or platinum group metals or as gold plate

**Investment:** bars and coins

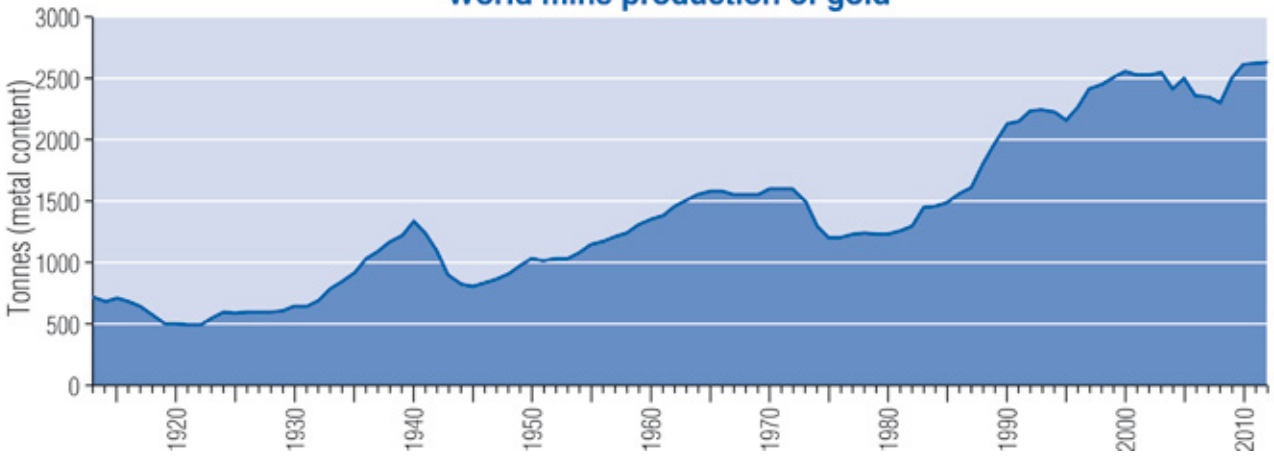
**Electronic equipment:** e.g. diodes, transistors, integrated circuits, etc.

**Dentistry:** used in alloys for fillings, etc.

## Distribution of world production




## World mine production of gold



## Mine production of gold

kilograms

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Armenia | * 565 | 682 | 1 033 | 1 056 | 1 941 |
| Azerbaijan | — | 333 | 2 093 | 1 775 | 1 424 |
| Bulgaria | 4 160 | 4 482 | 4 489 | 5 302 | 7 058 |
| Finland | 4 148 | 5 749 | 7 628 | 8 461 | 10 814 |
| Georgia | * 3 100 | * 3 100 | * 3 100 | * 3 100 | * 3 100 |
| Greenland | 1 648 | — | — | 103 | 307 |
| Poland (a) | 902 | 814 | 776 | 704 | 916 |
| Romania | 500 | * 500 | * 500 | * 500 | * 500 |
| Russia | 184 488 | 205 236 | 201 300 | 185 263 | 182 580 |
| Serbia (a) | * 712 | 818 | 856 | 1 534 | 1 400 |
| Slovakia | 198 | 346 | 534 | 398 | 546 |
| Spain | — | — | — | 290 | 1 333 |
| Sweden | 4 953 | 5 542 | 6 285 | 5 994 | 6 015 |
| Turkey | 11 016 | 14 450 | 16 400 | 23 248 | 27 884 |
| United Kingdom | 163 | 187 | 177 | 202 | 102 |
| | | | | | |
| Algeria | 647 | 998 | 723 | 340 | 264 |
| Botswana | 3 176 | 1 626 | 1 774 | 1 562 | 1 096 |
| Burkina Faso | 6 033 | 11 581 | 22 926 | 31 720 | 28 900 |
| Burundi | 2 170 | 980 | 293 | 1 052 | 2 |
| Cameroon | * 600 | * 600 | * 600 | * 600 | * 600 |
| Congo, Democratic Republic | 3 300 | 2 000 | 3 500 | 3 500 | 2 422 |
| Egypt | — | — | 4 675 | 6 305 | 8 175 |
| Eritrea | 32 | * 30 | * 30 | 11 788 | 9 735 |
| Ethiopia (b) | 3 631 | 4 005 | 6 003 | 10 322 | 12 581 |
| Gabon | 300 | 300 | 300 | * 300 | 680 |
| Ghana | 80 503 | 91 143 | 92 380 | 90 959 | 98 489 |
| Guinea | 17 981 | 21 402 | 24 836 | 15 779 | 14 723 |
| Ivory Coast | 4 205 | 6 947 | 5 316 | 10 685 | 9 831 |
| Kenya | 340 | 1 055 | 2 035 | * 2 100 | * 1 600 |
| Liberia | 624 | 524 | 666 | 469 | 641 |
| Madagascar | 50 | 17 | 46 | 1 | 157 |
| Mali | 41 160 | 42 364 | 38 524 | 40 415 | 50 272 |
| Mauritania | 5 528 | 7 838 | 8 326 | 8 211 | 7 647 |
| Morocco (a) | 587 | 470 | 650 | 520 | * 520 |
| Mozambique | 298 | 511 | 106 | 103 | * 100 |
| Namibia | 2 115 | 2 057 | 2 683 | 2 112 | 2 402 |
| Niger | 2 314 | 2 067 | 1 929 | 1 453 | 1 549 |
| Nigeria | 2 890 | 1 350 | 3 718 | * 3 700 | * 4 000 |
| Senegal | * 600 | 5 655 | 5 354 | 4 089 | 6 666 |
| Sierra Leone | 196 | 157 | 270 | 164 | 141 |
| South Africa | 212 744 | 197 628 | 188 702 | 180 184 | 154 178 |
| Sudan (c) | 7 508 | 14 914 | 26 317 | 23 739 | 46 133 |
| Tanzania | 36 434 | 39 113 | 39 448 | 40 390 | 39 012 |
| Togo | 11 835 | 12 955 | 10 452 | 16 469 | 18 551 |
| Uganda (c) | 2 055 | 931 | 918 | 163 | * 150 |
| Zambia (d) | 1 693 | 3 108 | 3 410 | 3 493 | 4 232 |
| Zimbabwe | 3 579 | 4 966 | 9 620 | 12 993 | 8 112 |
| | | | | | |
| Canada | 96 501 | 97 235 | 102 693 | 100 379 | 104 644 |
| Costa Rica | * 154 | * 205 | * 300 | * 500 | * 500 |
| Dominican Republic | 41 | 425 | 533 | 495 | 4 106 |
| Guatemala | 7 448 | 8 484 | 9 213 | 11 898 | 6 473 |
| Honduras | 1 846 | 2 127 | 2 200 | 1 893 | 1 859 |
| Mexico | 50 365 | 62 439 | 79 376 | 88 649 | 102 802 |
| Nicaragua | 2 960 | 2 590 | 4 924 | 6 395 | 6 292 |
| Panama (e) | — | 800 | 868 | 1 728 | 2 116 |
| USA | 233 327 | 223 323 | 231 000 | 234 000 | 235 000 |
| | | | | | |
| Argentina | 42 046 | 46 588 | 63 139 | 61 964 | 56 829 |
| Bolivia | 8 431 | 7 217 | 6 400 | 6 513 | 6 973 |
| Brazil | 54 000 | 60 330 | 62 047 | 65 200 | 31 300 |
| Chile | 39 162 | 40 834 | 39 494 | 45 137 | 49 936 |
| Colombia | 34 321 | 47 838 | 53 606 | 55 908 | 66 178 |
| Ecuador | 4 133 | 5 392 | 4 753 | 4 149 | * 3 400 |
| French Guiana | 1 941 | 1 250 | 1 140 | * 1 300 | * 1 000 |
| Guyana | 8 131 | 9 326 | 9 593 | 11 293 | 13 643 |
| Peru | 179 870 | 182 390 | 164 070 | 166 168 | 161 522 |

## Mine production of gold

kilograms

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Suriname | 10 290 | 12 800 | 12 933 | 11 975 | 11 881 |
| Uruguay | 2 429 | 2 010 | 1 704 | 1 899 | 1 881 |
| Venezuela | 10 815 | 12 232 | 6 991 | * 7 000 | * 7 000 |
| | | | | | |
| Burma (a) | * 100 | * 100 | * 100 | * 100 | * 100 |
| China (a) | 285 000 | 313 980 | 340 880 | 360 960 | 403 050 |
| India (f) | 2 438 | 2 084 | 2 399 | 2 192 | 1 589 |
| Indonesia | 64 390 | 140 488 | 119 726 | 76 764 | * 66 000 |
| Iran (a) | * 300 | * 350 | * 350 | * 1 000 | * 1 000 |
| Japan | 6 868 | 7 709 | 8 223 | 8 692 | 7 232 |
| Kazakhstan | 20 825 | 22 839 | 30 272 | 38 247 | 42 561 |
| Korea (Rep. of) | 175 | 274 | 235 | 209 | 336 |
| Korea, Dem. P.R. of | * 2 000 | * 2 000 | * 2 000 | * 2 000 | * 2 000 |
| Kyrgyzstan | 18 200 | 17 100 | 18 500 | 18 900 | 10 300 |
| Laos | 4 333 | 5 021 | 5 138 | 3 984 | 6 415 |
| Malaysia | 2 490 | 2 794 | 3 766 | 4 219 | 4 625 |
| Mongolia | 15 184 | 9 803 | 6 037 | 5 703 | 5 995 |
| Oman | 118 | 93 | 82 | 40 | 19 |
| Philippines | 35 568 | 37 047 | 40 847 | 31 120 | 15 762 |
| Saudi Arabia | 4 527 | 4 857 | 4 400 | 4 611 | 4 285 |
| Tajikistan | 1 672 | 1 361 | 2 049 | 2 240 | 2 400 |
| Thailand | 2 721 | 5 400 | 5 300 | 5 568 | 9 245 |
| Uzbekistan | 73 000 | 73 000 | 73 000 | * 73 000 | * 73 000 |
| Vietnam | * 3 000 | * 3 000 | * 3 000 | * 3 000 | * 3 000 |
| | | | | | |
| Australia | 215 000 | 223 000 | 261 000 | 258 000 | 253 000 |
| Fiji | 700 | 1 091 | 1 903 | 1 572 | 1 439 |
| New Zealand | 13 403 | 13 442 | 13 469 | 11 761 | 10 164 |
| Papua New Guinea | 67 466 | 68 173 | 66 901 | 62 271 | 55 839 |
| Solomon Islands | 141 | 130 | 130 | 1 588 | 2 109 |
| | | | | | |
| World Total | 2 300 000 | 2 500 000 | 2 620 000 | 2 630 000 | 2 640 000 |

Note(s)
(1) In several countries substantial amounts of gold produced in small operations are not recorded in the official statistics used when compiling this table
(2) In addition to the countries listed, Greece, Benin, Central African Republic, Congo, Rwanda and Taiwan produce less than 100 kg gold per year
(3) Greece and Norway are believed to produce gold

(a) Metal production
(b) Years ended 7 July of that stated
(c) Exports
(d) Contained in blister copper, refinery muds and electrolytic copper
(e) Fiscal years ending 31 May of the year following that stated
(f) Years ended 31 March following that stated

## Production of germanium metal

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Finland | — | — | 12 | 12 | 16 |
| USA (a) | 5 | 5 | 3 | 3 | * 3 |
| China | * 100 | * 100 | * 100 | * 100 | * 100 |
| Japan | * 2 | * 2 | * 2 | * 2 | * 2 |

Note(s)
(1) Germanium is also believed to be recovered from imported or domestic material in Belgium, Canada, Russia and Ukraine

(a) Including production of secondary metal

# Graphite

## Top 10 producers

| | % of world total |
|---|---|
| China | 86% |
| India | 6% |
| Brazil | 4% |
| Korea, Dem. P.R. of | 1% |
| Canada | 1% |
| Russia | 1% |
| Mexico | 0.4% |
| Norway | 0.3% |
| Ukraine | 0.2% |
| Zimbabwe | 0.2% |

## End uses

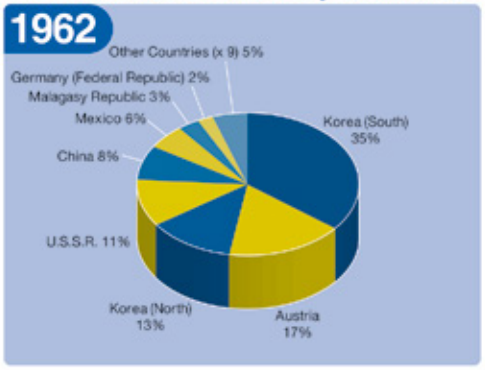
**Refractory and foundry applications:** used in the production of steel, glass, ceramics and cement

**Most types of batteries:** used as part of the anode

**Lubricants:** used as a dry lubricant in industrial processes and manufactured products

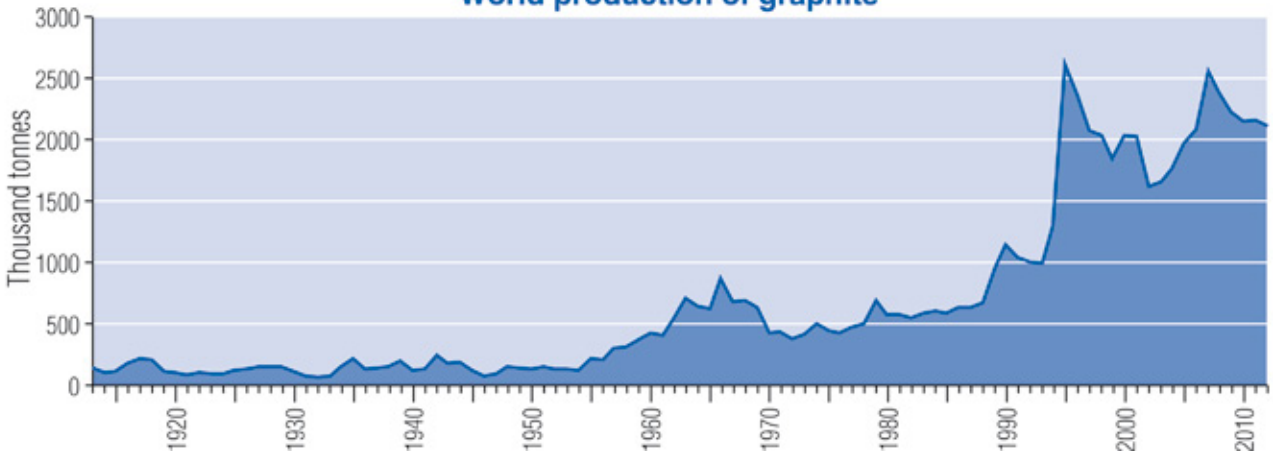
**Automotive parts:** e.g. brake linings

## Distribution of world production





## World production of graphite



## Production of graphite

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria (a) | 250 | 750 | 420 | 925 | 219 |
| Bosnia & Herzegovina | 272 084 | 133 819 | 45 079 | — | — |
| Czech Republic | 3 000 | — | — | — | — |
| Germany | — | — | — | — | 109 |
| Norway | 4 100 | 4 562 | 6 270 | 7 789 | 6 992 |
| Romania | — | 24 352 | 6 633 | — | — |
| Russia | * 14 000 | * 14 000 | * 14 000 | * 14 000 | * 14 000 |
| Turkey | 3 236 | 2 400 | — | — | — |
| Ukraine | 11 300 | 4 300 | 2 800 | 600 | 4 600 |
| Madagascar | 4 900 | 3 400 | 3 654 | 3 951 | 3 300 |
| Zimbabwe | 5 134 | 2 463 | 741 | 7 252 | 4 421 |
| Canada | 20 000 | * 7 000 | * 20 000 | * 20 000 | * 20 000 |
| Mexico | 7 229 | 5 105 | 6 628 | 7 348 | 7 520 |
| Brazil (b) | 80 500 | 59 425 | 92 364 | 105 188 | 80 000 |
| China (c) | * 1 800 000 | * 1 800 000 | * 1 800 000 | * 1 800 000 | * 1 800 000 |
| India (a)(d) | 117 767 | 124 625 | 115 697 | 148 974 | 129 765 |
| Korea (Rep. of) | 73 | 48 | 34 | — | — |
| Korea, Dem. P.R. of | * 30 000 | * 30 000 | * 30 000 | * 30 000 | * 30 000 |
| Pakistan (e) | — | 700 | 950 | 1 268 | — |
| Sri Lanka | 6 615 | 3 171 | 3 437 | 3 357 | * 3 400 |
| World Total | 2 400 000 | 2 200 000 | 2 100 000 | 2 200 000 | 2 100 000 |

Note(s)
(1) This table includes all forms of amorphous and crystalline graphite but excludes synthetic material
(2) In addition to the countries listed, Egypt, Namibia and the USA are believed to produce graphite

(a) Crude
(b) Including beneficiated and directly shipped material
(c) Including flake graphite
(d) Years ended 31 March following that stated
(e) Years ended 30 June of that stated

## Production of Gypsum

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Armenia | 45 900 | 40 100 | * 40 000 | * 40 000 | * 40 000 |
| Austria (a) | 1 087 259 | 910 945 | 872 273 | 815 438 | 791 961 |
| Azerbaijan | 27 898 | 44 413 | 48 887 | * 50 000 | * 50 000 |
| Bosnia & Herzegovina (a) | 150 039 | 74 302 | 64 570 | 71 870 | 73 365 |
| Bulgaria | 21 200 | 127 600 | 109 200 | 114 800 | 113 700 |
| Croatia | * 250 000 | 318 139 | 248 675 | 231 008 | 182 557 |
| Cyprus | 412 000 | 317 000 | 333 000 | 335 000 | 327 800 |
| Czech Republic | 35 000 | 13 000 | 5 000 | 11 000 | 14 000 |
| France (a) | 2 338 910 | 1 887 260 | 2 065 814 | 2 452 204 | * 2 500 000 |
| Germany (a) | 2 112 000 | 1 898 000 | 1 822 000 | 2 021 000 | 1 949 000 |
| Greece (a) | 1 000 000 | 730 000 | * 600 000 | 587 000 | 746 000 |
| Hungary (a) | 15 940 | 19 766 | 20 000 | 3 000 | — |
| Ireland, Republic of | * 600 000 | * 400 000 | * 300 000 | * 300 000 | * 200 000 |
| Italy | * 1 600 000 | * 1 600 000 | * 1 600 000 | * 1 600 000 | * 1 600 000 |
| Latvia (a) | 349 000 | 175 870 | 176 510 | 216 000 | 252 714 |
| Macedonia (a) | 242 400 | 154 550 | 143 118 | 162 984 | 157 844 |
| Moldova (b) | * 700 000 | * 200 000 | * 300 000 | * 400 000 | 375 900 |
| Norway (a)(c) | 70 013 | 68 103 | 36 395 | 88 953 | 85 296 |
| Poland (a) | 1 499 901 | 1 326 928 | 1 398 500 | 1 225 600 | 1 227 900 |
| Portugal | 372 731 | 335 189 | 336 755 | 337 272 | 264 427 |
| Romania | 832 248 | 720 713 | 639 010 | * 660 000 | * 600 000 |
| Russia | * 3 600 000 | * 2 900 000 | * 2 900 000 | * 3 000 000 | * 3 100 000 |
| Slovakia (a) | 152 000 | 131 000 | 87 000 | 88 000 | 88 000 |
| Spain | 11 955 753 | 8 181 315 | 6 990 249 | 7 825 747 | * 6 600 000 |
| Switzerland | * 300 000 | * 300 000 | * 300 000 | * 350 000 | * 320 000 |
| Turkey | 7 338 127 | 4 369 589 | 2 850 601 | 991 415 | * 1 000 000 |
| Ukraine | 1 160 910 | 711 490 | 678 610 | 675 950 | 2 224 300 |
| United Kingdom | * 1 700 000 | * 1 700 000 | * 1 700 000 | * 1 700 000 | * 1 700 000 |
| | | | | | |
| Algeria | 1 671 651 | 1 756 781 | 1 609 605 | 1 800 000 | 2 000 000 |
| Angola | — | 120 000 | 200 000 | * 200 000 | * 200 000 |
| Egypt (a) | 2 443 000 | 1 035 300 | * 1 668 000 | * 2 138 000 | * 2 193 000 |
| Eritrea | * 800 | * 800 | * 800 | * 800 | * 800 |
| Ethiopia (d) | 32 989 | * 36 000 | * 36 000 | * 36 000 | * 36 000 |
| Kenya (a) | * 11 000 | * 10 000 | * 11 000 | * 11 000 | * 11 000 |
| Libya | * 250 000 | * 250 000 | * 250 000 | * 125 000 | * 75 000 |
| Madagascar | * 300 | 156 | 127 | * 120 | * 100 |
| Mauritania | 44 428 | 36 928 | 65 245 | 72 153 | * 72 000 |
| Morocco | * 600 000 | * 600 000 | * 600 000 | * 600 000 | * 600 000 |
| Niger | 8 661 | 19 737 | 7 559 | * 8 000 | * 8 000 |
| Nigeria | * 380 000 | * 160 000 | — | * — | * — |
| Somalia | * 1 500 | * 1 500 | * 1 500 | * 1 500 | * 1 500 |
| South Africa | 571 343 | 597 571 | 1 026 620 | 476 118 | 558 242 |
| Sudan | 12 705 | 30 000 | 31 000 | * 32 000 | * 32 000 |
| Tanzania | 55 730 | 8 105 | 26 918 | 38 659 | 91 610 |
| Tunisia | 177 000 | 360 000 | 435 000 | * 435 000 | * 435 000 |
| Uganda | 84 | — | — | — | — |
| | | | | | |
| Canada (a) | 5 797 000 | 3 540 000 | 2 717 000 | 2 555 000 | 2 550 000 |
| Cuba | 110 000 | 77 800 | 111 300 | 131 400 | * 130 000 |
| Dominican Republic | 369 592 | 77 201 | 85 880 | 61 161 | * 60 000 |
| Guatemala | 127 387 | 18 733 | 58 924 | 77 009 | 99 628 |
| Honduras | * 5 500 | * 5 500 | * 5 500 | * 5 500 | * 5 500 |
| Jamaica | 238 274 | 156 877 | 147 143 | 79 521 | 57 400 |
| Mexico | 6 933 279 | 7 542 721 | 6 477 590 | 6 463 861 | 9 456 478 |
| Nicaragua | 49 900 | 37 400 | 20 300 | 29 700 | 32 000 |
| USA | 14 400 000 | 9 400 000 | 8 840 000 | 8 900 000 | * 9 900 000 |
| | | | | | |
| Argentina | 1 257 310 | 1 356 025 | 1 346 535 | * 1 350 000 | * 1 350 000 |
| Brazil | 3 100 000 | 2 348 390 | 2 638 096 | 3 228 931 | * 3 000 000 |
| Chile | 773 749 | 723 928 | 758 011 | 917 759 | 799 064 |
| Colombia | * 200 000 | * 190 000 | * 200 000 | * 200 000 | * 200 000 |
| Paraguay | * 4 500 | * 4 500 | * 4 500 | * 4 500 | * 4 500 |
| Peru | 463 134 | 321 012 | 313 025 | 479 950 | 390 705 |

## Production of Gypsum

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Afghanistan | 44 180 | 42 120 | 57 243 | * 57 250 | * 57 250 |
| Bhutan | 248 445 | 299 735 | 344 034 | 352 234 | 313 173 |
| Burma (e) | 91 013 | 84 516 | 76 391 | 76 669 | * 76 000 |
| China | * 38 000 000 | * 37 000 000 | * 37 000 000 | * 37 000 000 | * 37 000 000 |
| India (e)(f) | 3 876 671 | 3 370 322 | 4 924 906 | 3 202 081 | 3 529 000 |
| Indonesia | * 6 000 | 8 133 | * 7 000 | * 7 500 | * 7 500 |
| Iran (g) | 11 251 070 | 13 615 547 | 11 913 979 | 14 657 191 | * 14 000 000 |
| Iraq | 1 279 000 | 5 026 495 | 8 276 733 | 11 350 170 | 9 424 214 |
| Israel | 9 975 | 9 152 | 99 730 | 20 437 | 45 407 |
| Jordan | 231 771 | 304 356 | 292 340 | 254 860 | * 250 000 |
| Kazakhstan | 696 900 | * 700 000 | * 700 000 | * 700 000 | * 700 000 |
| Laos | 337 304 | 761 331 | 553 300 | 686 100 | 619 300 |
| Mongolia | * 60 000 | * 60 000 | * 60 000 | * 60 000 | * 60 000 |
| Oman | 179 800 | 333 400 | 653 200 | 1 254 100 | 1 915 300 |
| Pakistan (h) | 660 473 | 800 084 | 853 590 | 885 368 | 1 260 021 |
| Saudi Arabia | * 750 000 | * 750 000 | * 750 000 | * 750 000 | * 750 000 |
| Sri Lanka | 617 | 358 | 104 | 542 | * 500 |
| Syria | 572 886 | 403 137 | * 405 000 | * 405 000 | * 405 000 |
| Tajikistan | 45 000 | 26 400 | 14 600 | 11 300 | 13 700 |
| Thailand | | | | | |
| Gypsum | 8 500 401 | 8 631 797 | 10 172 629 | 10 994 074 | 9 876 938 |
| Anhydrite | 488 681 | 633 820 | 536 120 | 614 148 | 857 172 |
| Uzbekistan | * 80 000 | * 80 000 | * 80 000 | * 80 000 | * 80 000 |
| Vietnam | * 5 000 | * 5 000 | * 5 000 | * 5 000 | * 5 000 |
| Yemen, Republic of | 104 000 | * 100 000 | * 100 000 | * 100 000 | * 100 000 |
| Australia (b) | 4 136 300 | 3 708 700 | 3 567 800 | 3 294 400 | * 3 013 000 |
| World Total | 151 700 000 | 137 200 000 | 137 800 000 | 143 600 000 | 147 100 000 |

Note(s)
(1) Some countries produce large quantities of synthetic gypsum. Where possible, this output is excluded from the table

(a) Including anhydrite
(b) Excluding output from the region east of the River Nistru and the Municipality of Bender
(c) Sales
(d) Years ended 7 July of that stated
(e) Years ended 31 March following that stated
(f) Including selenite
(g) Years ended 20 March following that stated
(h) Years ended 30 June of that stated

## Refinery production of indium

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Belgium | * 30 | * 30 | * 30 | * 30 | * 30 |
| Germany | * 10 | * 10 | * 10 | * 10 | * 10 |
| Italy | * 5 | * 5 | * 5 | * 5 | * 5 |
| Netherlands | 5 | * 5 | * 5 | * 5 | * 5 |
| Russia | * 10 | * 4 | * 4 | * 4 | * 4 |
| United Kingdom | * 5 | * 5 | * 5 | * 5 | * 5 |
| Canada | * 57 | * 50 | * 67 | * 75 | * 75 |
| Brazil | ... | * 5 | * 5 | * 5 | * 5 |
| Peru | 6 | 2 | — | * 2 | * 11 |
| China | * 340 | * 330 | * 340 | * 380 | * 390 |
| Japan | * 65 | * 67 | * 70 | * 70 | * 70 |
| Korea (Rep. of) | * 100 | * 100 | * 100 | * 100 | * 100 |

## Production of iodine

kilograms

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Azerbaijan | 116 400 | 148 700 | 191 300 | 200 000 | 350 000 |
| Russia | * 105 000 | * 105 000 | * 105 000 | * 105 000 | * 105 000 |
| USA | * 1 200 000 | * 1 250 000 | * 1 250 000 | * 1 270 000 | * 1 270 000 |
| Chile | 15 503 000 | 17 399 000 | 15 793 000 | 16 000 000 | 17 494 000 |
| China | * 570 000 | * 580 000 | * 590 000 | * 590 000 | * 600 000 |
| Indonesia | * 75 000 | * 75 000 | * 75 000 | * 75 000 | * 75 000 |
| Japan | 9 500 000 | 8 232 000 | 9 216 000 | 9 277 000 | * 9 300 000 |
| Turkmenistan | * 270 000 | * 270 000 | * 270 000 | * 270 000 | * 270 000 |
| Uzbekistan | * 2 000 | * 2 000 | * 2 000 | * 2 000 | * 2 000 |
| World Total | 27 300 000 | 28 100 000 | 27 500 000 | 27 800 000 | 29 500 000 |

# Iron ore

*Symbol Fe*

**Relative supply risk index for iron 5.2**

## Top 10 producers

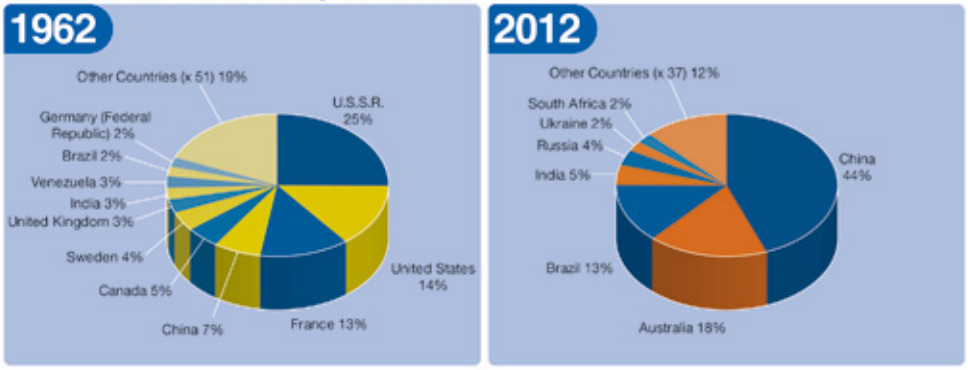
| | % of world total |
|---|---|
| China | 44% |
| Australia | 18% |
| Brazil | 13% |
| India | 5% |
| Russia | 4% |
| Ukraine | 2% |
| South Africa | 2% |
| USA | 2% |
| Kazakhstan | 2% |
| Iran | 2% |

## End uses

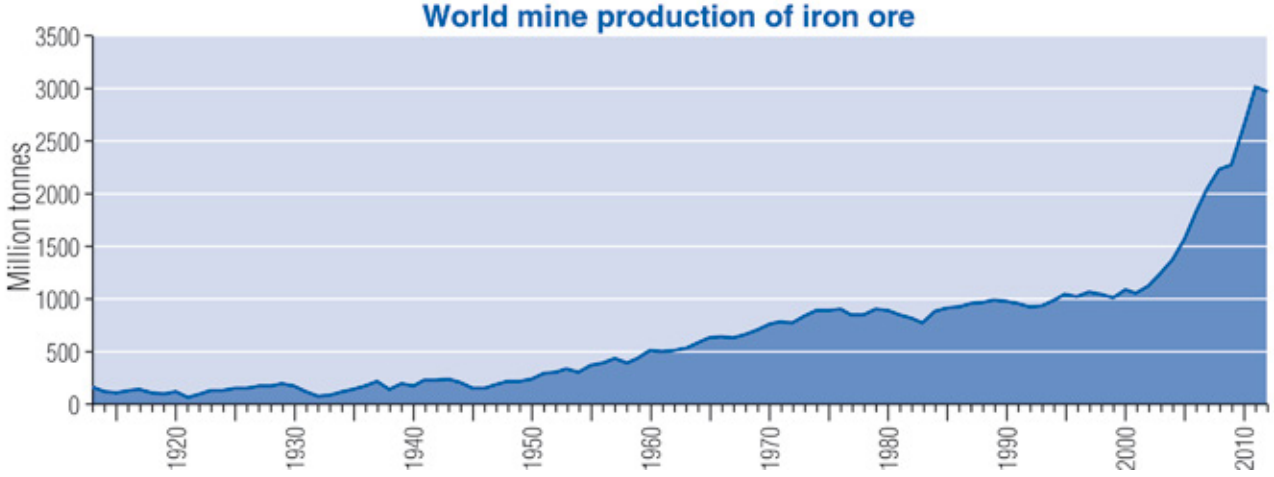
**Production of steel and pig iron:** iron is the major component of steel and pig iron which is refined to produce wrought iron and cast iron products

**Many minor uses:** e.g. cement production, in cattle feed, ferrites, etc.

## Distribution of world production




## World mine production of iron ore



## Production of iron ore

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria (a) | 2 032 671 | 2 002 131 | 2 068 853 | 2 206 910 | 2 142 255 |
| Azerbaijan | 28 100 | 30 000 | 57 800 | 214 300 | 213 600 |
| Bosnia & Herzegovina | 2 667 359 | 2 727 452 | 1 401 000 | 1 891 000 | 2 075 732 |
| Germany (b)(c) | 455 100 | 363 699 | 390 353 | 489 091 | 447 515 |
| Norway | 746 000 | 896 000 | 3 266 000 | 2 532 100 | 3 421 000 |
| Russia | 99 900 000 | 92 000 000 | 95 500 000 | 104 000 000 | 104 000 000 |
| Slovakia | 392 000 | — | — | — | — |
| Sweden | 23 888 000 | 17 677 000 | 25 292 000 | 26 113 000 | 26 540 000 |
| Turkey | 3 990 110 | 4 169 972 | 5 378 455 | 6 308 448 | * 7 000 000 |
| Ukraine | 72 688 000 | 66 452 000 | 78 541 000 | 80 900 000 | 67 149 000 |
| United Kingdom | 145 | — | — | — | — |
| | | | | | |
| Algeria | 2 077 000 | 1 307 000 | 1 474 279 | 1 700 000 | 1 700 000 |
| Egypt (d) | 773 000 | 1 780 162 | 2 314 425 | 3 320 878 | 3 930 002 |
| Mauritania | 10 968 000 | 10 275 049 | 11 109 000 | 11 176 000 | 11 500 000 |
| Morocco | 22 878 | 30 523 | 44 665 | 78 926 | * 100 000 |
| Nigeria | 62 000 | 99 424 | 50 000 | 70 000 | * 70 000 |
| Sierra Leone | — | — | — | 339 330 | 5 203 490 |
| South Africa (e) | 48 982 537 | 55 313 053 | 58 709 330 | 58 056 897 | 67 100 474 |
| Swaziland | — | — | — | 79 553 | 1 032 230 |
| Tunisia | 108 300 | 151 200 | 180 500 | 171 200 | 223 000 |
| Uganda | 1 740 | 972 | 3 795 | 2 134 | * 3 229 |
| Zimbabwe | 2 919 | — | 28 | — | — |
| | | | | | |
| Canada (f) | 32 102 000 | 31 699 000 | 37 001 000 | 33 573 000 | 39 427 100 |
| Guatemala | 452 | 5 463 | 1 604 | 1 160 | 10 808 |
| Mexico | 17 709 000 | 17 693 000 | 21 210 000 | 19 403 000 | 22 600 000 |
| USA | 53 600 000 | 26 700 000 | 49 500 000 | 54 700 000 | * 53 200 000 |
| | | | | | |
| Brazil | 351 200 000 | 331 000 000 | 372 300 000 | 460 400 000 | 400 600 000 |
| Chile | 9 315 580 | 8 242 300 | 9 129 500 | 12 624 600 | 17 330 000 |
| Colombia | 473 273 | 280 773 | 77 048 | 174 459 | 391 503 |
| Peru | 6 348 000 | 5 435 000 | 7 432 000 | 8 623 000 | 8 221 983 |
| Venezuela | 19 332 299 | 14 206 621 | 14 330 761 | * 20 000 000 | * 16 000 000 |
| | | | | | |
| Bhutan | — | — | — | — | 3 742 |
| China | 824 011 100 | 880 171 400 | 1 077 705 100 | 1 326 942 000 | 1 309 637 000 |
| India (g) | 212 960 000 | 218 553 000 | 207 157 000 | 167 289 000 | 136 518 000 |
| Indonesia | 4 455 259 | 4 561 059 | 8 975 507 | 11 814 544 | * 12 000 000 |
| Iran (h) | 31 225 935 | 31 993 513 | 35 548 974 | 44 355 304 | * 48 000 000 |
| Iraq | 3 000 | — | — | 26 639 | — |
| Kazakhstan | 44 847 000 | 46 248 000 | 50 190 000 | 51 742 000 | 52 614 000 |
| Korea (Rep. of) | 365 883 | 455 405 | 512 642 | 541 539 | 592 743 |
| Korea, Dem. P.R. of | * 5 316 000 | * 5 300 000 | * 5 300 000 | * 5 300 000 | * 5 300 000 |
| Malaysia (h) | 981 932 | 1 470 186 | 3 557 813 | 8 077 879 | 10 277 849 |
| Mongolia | 1 387 400 | 1 379 000 | 3 203 200 | 5 678 300 | 7 561 400 |
| Pakistan (d) | 286 255 | 320 214 | 447 541 | 329 100 | 384 893 |
| Philippines | — | — | — | 292 608 | 216 176 |
| Thailand | 1 709 750 | 616 399 | 976 937 | 489 359 | 256 333 |
| Vietnam | 1 371 600 | 1 904 500 | 1 972 100 | 2 371 000 | 1 523 000 |
| | | | | | |
| Australia | 342 435 000 | 394 069 000 | 433 452 000 | 477 332 000 | 519 693 000 |
| New Zealand | 2 020 227 | 2 092 640 | 2 438 641 | 2 357 440 | 2 394 848 |
| | | | | | |
| World Total | 2 233 000 000 | 2 280 000 000 | 2 628 000 000 | 3 014 000 000 | 2 969 000 000 |

Note(s)
(a) Including micaceous iron oxide
(b) Including manganiferous iron ore
(c) Used as aggregate in the construction industry
(d) Years ended 30 June of that stated
(e) Including by-product magnetite
(f) Including by-product iron ore
(g) Years ended 31 March following that stated
(h) Years ended 20 March following that stated

## Production of pig iron

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria | 5 795 000 | 4 353 000 | 5 621 000 | 5 815 000 | 5 751 000 |
| Belgium | 6 977 000 | 3 087 000 | 4 688 000 | 4 700 000 | 4 073 000 |
| Bosnia & Herzegovina | 243 000 | 482 469 | 620 935 | 684 734 | 749 539 |
| Bulgaria | 441 000 | — | — | — | — |
| Czech Republic | 4 737 000 | 3 483 000 | 3 987 000 | 4 137 000 | 3 935 207 |
| Finland | 2 942 946 | 2 042 000 | 2 564 000 | 2 600 000 | 2 461 000 |
| France | 11 371 879 | 8 104 318 | 10 136 827 | 9 697 535 | 9 531 844 |
| Germany | 29 105 000 | 20 104 000 | 28 560 000 | 27 943 000 | 27 046 000 |
| Hungary | 1 288 758 | 1 050 000 | 1 325 000 | 1 315 000 | 1 229 000 |
| Italy | 10 400 000 | 5 670 000 | 8 555 000 | 9 824 000 | 9 417 000 |
| Netherlands | 6 130 000 | 4 655 000 | 5 799 000 | 5 943 000 | 5 909 000 |
| Norway | * 100 000 | * 100 000 | * 100 000 | * 100 000 | * 100 000 |
| Poland | 4 933 781 | 2 983 500 | 3 637 995 | 3 974 930 | 3 943 968 |
| Romania | 2 957 715 | 1 576 679 | 1 723 418 | 1 595 000 | 1 580 000 |
| Russia | 48 300 000 | 43 900 000 | 48 200 000 | 48 200 000 | 50 500 000 |
| Serbia | 1 582 000 | 964 607 | 1 158 628 | 1 197 693 | 318 651 |
| Slovakia | 3 529 000 | 3 019 000 | 3 649 000 | 3 346 000 | 3 519 755 |
| Spain | 3 784 000 | 2 920 000 | 3 572 000 | 3 540 000 | 3 081 000 |
| Sweden | 3 708 000 | 1 966 000 | 3 447 000 | 3 240 000 | 2 805 000 |
| Turkey | 6 697 372 | 6 913 325 | 16 362 115 | 14 877 155 | 8 613 000 |
| Ukraine | 30 991 000 | 25 683 000 | 27 366 000 | 28 878 000 | 28 487 000 |
| United Kingdom | 10 136 800 | 7 671 100 | 7 233 000 | 6 625 000 | 7 183 100 |
| | | | | | |
| Algeria | 690 000 | 680 000 | 696 000 | 360 000 | * 366 000 |
| Egypt | 3 543 000 | 3 851 000 | 3 565 000 | 3 532 000 | 3 618 000 |
| Libya | 1 569 000 | 1 077 000 | 1 270 000 | 165 000 | 508 000 |
| South Africa | 6 540 000 | 5 784 000 | 6 386 000 | 6 165 000 | 6 421 000 |
| Zimbabwe | 1 000 | — | — | — | — |
| | | | | | |
| Canada | 9 474 000 | 5 615 000 | 8 266 000 | 8 025 000 | 8 496 000 |
| Mexico | 10 461 858 | 8 065 305 | 10 074 620 | 10 462 912 | 10 199 048 |
| Trinidad & Tobago | 1 601 000 | 1 181 700 | 1 751 800 | 1 705 600 | 1 684 300 |
| USA | 33 729 000 | 19 018 000 | 26 843 000 | 30 233 000 | 32 113 000 |
| | | | | | |
| Argentina | 4 428 000 | 2 849 000 | 4 098 500 | 4 470 900 | 3 683 000 |
| Brazil | 34 871 000 | 25 135 000 | 30 898 000 | * 32 460 000 | * 32 600 000 |
| Chile | 1 109 000 | 923 000 | 635 000 | 1 130 000 | 1 065 000 |
| Colombia | 308 100 | 342 000 | 327 000 | 295 000 | 345 000 |
| Paraguay | 95 000 | 71 000 | 81 000 | 45 000 | 68 000 |
| Peru | 466 000 | 100 000 | 100 000 | 95 000 | 95 000 |
| Venezuela | 6 827 200 | 5 508 000 | 3 760 000 | 4 470 000 | 4 594 000 |
| | | | | | |
| China | 478 244 200 | 552 834 600 | 597 333 400 | 629 693 000 | 657 905 000 |
| India | 58 229 000 | 61 677 000 | 64 987 000 | 66 460 000 | 62 057 000 |
| Indonesia | 1 209 000 | 1 119 000 | 1 274 000 | 1 228 000 | * 1 300 000 |
| Iran | 9 600 000 | 10 760 000 | 10 532 000 | 12 670 000 | 13 725 000 |
| Japan | 86 171 136 | 66 942 610 | 82 283 358 | 81 028 352 | 81 405 470 |
| Kazakhstan | 3 105 548 | 2 997 000 | 2 864 000 | 3 141 000 | 2 707 000 |
| Korea (Rep. of) | 31 042 782 | 27 474 604 | 35 064 568 | 42 212 717 | 41 718 000 |
| Korea, Dem. P.R. of | * 250 000 | * 250 000 | * 250 000 | * 250 000 | * 250 000 |
| Malaysia | 1 958 000 | 2 388 000 | 2 390 000 | 2 900 000 | * 2 900 000 |
| Pakistan (a) | 993 371 | 791 052 | 483 298 | 433 104 | 231 910 |
| Qatar | 1 637 778 | 2 096 282 | 2 040 037 | 2 212 999 | 2 420 000 |
| Saudi Arabia | 4 500 000 | 4 623 000 | 4 937 000 | 5 153 000 | 4 976 000 |
| Taiwan | 9 823 000 | 7 939 000 | 9 358 000 | 12 940 000 | 11 784 000 |
| Vietnam | 255 000 | 275 000 | 500 000 | 600 000 | * 600 000 |
| | | | | | |
| Australia | 6 057 000 | 4 370 000 | 6 259 000 | 5 296 000 | 3 710 000 |
| New Zealand | 622 000 | 608 000 | 667 000 | 659 000 | 670 000 |
| | | | | | |
| World Total | 1 006 000 000 | 978 000 000 | 1 108 000 000 | 1 159 000 000 | 1 174 000 000 |

Note(s)
(1) The data in this table include sponge iron and direct reduced iron (DRI), where these have been separately identified

(a) Years ended 30 June of that stated

## Production of crude steel

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Albania | 250 000 | 221 000 | 390 000 | 464 000 | * 500 000 |
| Austria | 7 594 000 | 5 662 000 | 7 206 000 | 7 474 000 | 7 421 000 |
| Azerbaijan | 278 100 | 150 300 | 129 125 | 234 002 | * 234 000 |
| Belarus | 2 478 131 | 2 329 694 | 2 530 829 | 2 778 792 | 2 869 373 |
| Belgium | 10 673 000 | 5 635 000 | 7 973 000 | 8 026 000 | 7 301 000 |
| Bosnia & Herzegovina | 587 878 | 495 150 | 590 952 | 649 085 | 700 341 |
| Bulgaria | 1 330 000 | 726 000 | 744 000 | 835 000 | 633 000 |
| Croatia | 121 759 | 54 266 | 103 429 | 162 709 | 1 016 |
| Czech Republic | 6 387 000 | 4 594 000 | 5 180 000 | 5 583 000 | 5 072 082 |
| Estonia | — | — | — | 1 | 185 |
| Finland | 4 416 792 | 3 066 000 | 4 029 000 | 3 989 000 | 3 759 000 |
| France | 17 879 161 | 12 840 108 | 15 413 577 | 15 780 639 | 15 607 227 |
| Germany | 45 832 000 | 32 670 000 | 43 830 000 | 44 284 000 | 42 661 000 |
| Greece | 2 477 000 | 2 000 000 | 1 821 000 | 1 934 000 | 1 247 000 |
| Hungary | 2 097 000 | 1 403 000 | 1 678 000 | 1 733 000 | 1 543 000 |
| Italy | 30 590 000 | 19 848 000 | 25 750 000 | 28 735 000 | 27 257 000 |
| Latvia | 635 000 | 692 000 | 655 000 | 568 000 | 804 000 |
| Luxembourg | 2 582 000 | 2 141 000 | 2 548 000 | 2 521 000 | 2 214 000 |
| Macedonia | 344 866 | 299 332 | 344 866 | 348 576 | 225 224 |
| Moldova (a) | 885 000 | 380 000 | 240 000 | 313 000 | 329 000 |
| Montenegro | 201 623 | 90 404 | 48 272 | 61 164 | 28 161 |
| Netherlands | 6 853 000 | 5 194 000 | 6 651 000 | 6 937 000 | 6 879 000 |
| Norway | 560 000 | 595 000 | 520 000 | 620 000 | 683 000 |
| Poland | 9 727 325 | 7 128 482 | 7 993 025 | 8 776 458 | 8 539 302 |
| Portugal | 1 630 000 | 1 557 000 | 1 504 000 | 1 871 000 | 1 908 000 |
| Romania | 5 035 164 | 2 772 679 | 3 720 775 | 3 835 000 | 3 780 000 |
| Russia | 68 700 000 | 59 200 000 | 66 300 000 | 68 400 000 | 70 400 000 |
| Serbia | 1 662 000 | 1 054 336 | 1 254 386 | 1 304 954 | 346 000 |
| Slovakia | 4 489 000 | 3 747 000 | 4 580 000 | 4 242 000 | 4 403 447 |
| Slovenia | 642 000 | 430 000 | 606 000 | 648 000 | 632 000 |
| Spain | 18 640 000 | 14 358 000 | 16 343 000 | 15 504 000 | 13 639 000 |
| Sweden | 5 197 600 | 2 803 700 | 4 845 600 | 4 867 000 | 4 326 000 |
| Switzerland | 1 312 000 | 934 000 | 1 320 000 | * 1 400 000 | * 1 400 000 |
| Turkey | 26 809 050 | 25 303 741 | 29 029 789 | 34 103 000 | 35 885 000 |
| Ukraine | 38 136 117 | 30 301 844 | 33 345 586 | 35 512 156 | 33 509 180 |
| United Kingdom | 13 520 500 | 10 074 500 | 9 708 000 | 9 478 000 | 9 579 100 |
| | | | | | |
| Algeria | 646 000 | 543 000 | 688 000 | 440 000 | * 507 000 |
| Egypt | 6 198 000 | 5 541 000 | 6 676 000 | 6 486 000 | 6 627 000 |
| Ethiopia | 150 000 | 150 000 | 150 000 | 130 000 | * 130 000 |
| Ghana | 25 000 | 25 000 | 25 000 | 25 000 | 25 000 |
| Libya | 1 137 000 | 914 000 | 825 000 | 100 000 | 315 000 |
| Morocco | 478 000 | 479 000 | 455 000 | 290 000 | 539 000 |
| Nigeria | * 100 000 | * 100 000 | * 100 000 | * 100 000 | * 100 000 |
| South Africa | 8 550 000 | 7 484 000 | 7 617 000 | 6 650 000 | 7 119 000 |
| Tunisia | 82 200 | 99 500 | 115 100 | 150 000 | * 150 000 |
| | | | | | |
| Canada | 14 845 000 | 9 286 000 | 13 009 000 | 12 891 000 | 13 507 000 |
| Cuba | 275 584 | 267 752 | 279 040 | 283 982 | 317 000 |
| Dominican Republic | * 68 000 | * 67 000 | * 60 000 | * 76 000 | * 56 000 |
| El Salvador | 71 000 | 56 000 | 51 000 | 100 000 | 102 000 |
| Guatemala | 250 000 | 224 000 | 274 000 | 445 000 | 334 000 |
| Mexico | 17 209 020 | 14 131 810 | 16 869 675 | 18 110 111 | 18 094 966 |
| Trinidad & Tobago | 489 600 | 417 000 | 571 600 | 603 400 | 623 800 |
| USA | 91 350 000 | 58 196 000 | 80 495 000 | 86 000 000 | 88 598 000 |
| | | | | | |
| Argentina | 5 541 400 | 4 013 000 | 5 138 500 | 5 610 500 | 4 996 000 |
| Brazil | 33 716 000 | 26 506 000 | 32 948 000 | 35 220 000 | 34 524 000 |
| Chile | 1 549 000 | 1 308 000 | 1 011 000 | 1 768 000 | 1 683 000 |
| Colombia | 1 053 000 | 1 052 000 | 1 207 000 | 1 244 000 | 1 324 000 |
| Ecuador | 128 000 | 259 000 | 357 000 | 463 000 | 473 000 |
| Paraguay | 82 800 | 54 000 | 59 000 | 28 000 | * 37 000 |
| Peru | 1 001 000 | 718 000 | 867 000 | 882 000 | 973 000 |
| Uruguay | 85 700 | 57 000 | 65 000 | 81 000 | 121 000 |
| Venezuela | 4 224 500 | 3 808 000 | 2 207 000 | 2 980 000 | 2 526 000 |

## Production of crude steel

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Burma | * 25 000 | * 25 000 | * 25 000 | * 25 000 | * 25 000 |
| China | 503 057 500 | 572 182 300 | 637 229 900 | 683 883 000 | 716 542 000 |
| India | 57 791 000 | 63 527 000 | 68 321 000 | 72 200 000 | 76 715 000 |
| Indonesia | 3 915 000 | 3 501 000 | 3 664 000 | 3 621 000 | * 3 700 000 |
| Iran | 9 964 000 | 10 873 000 | 11 995 000 | 13 040 000 | 14 463 000 |
| Israel | * 300 000 | * 300 000 | * 300 000 | * 300 000 | * 300 000 |
| Japan | 118 739 328 | 87 534 137 | 109 598 507 | 107 601 194 | 107 232 297 |
| Jordan | * 150 000 | * 150 000 | * 150 000 | * 150 000 | * 150 000 |
| Kazakhstan | 4 243 582 | 4 146 000 | 4 220 000 | 4 699 000 | 3 851 000 |
| Korea (Rep. of) | 53 322 000 | 48 572 000 | 58 914 125 | 68 519 191 | 69 073 000 |
| Korea, Dem. P.R. of | * 300 000 | * 250 000 | * 250 000 | * 250 000 | * 250 000 |
| Kuwait | * 500 000 | * 500 000 | * 500 000 | * 500 000 | * 500 000 |
| Malaysia | 6 423 000 | 5 354 000 | 5 694 000 | 5 900 000 | * 6 000 000 |
| Mongolia | 84 900 | 53 000 | 68 000 | 63 600 | 72 400 |
| Pakistan | * 1 000 000 | * 800 000 | * 800 000 | * 850 000 | * 850 000 |
| Philippines | 710 669 | 824 009 | 1 050 000 | 1 200 000 | 1 260 000 |
| Qatar | 1 434 652 | 1 472 612 | 1 974 937 | 2 010 000 | 2 100 000 |
| Saudi Arabia | 4 667 000 | 4 690 000 | 5 015 000 | 5 275 000 | 5 203 000 |
| Singapore | 764 000 | 664 000 | 728 000 | 752 000 | 688 000 |
| Syria | * 70 000 | * 70 000 | * 70 000 | * 70 000 | * 70 000 |
| Taiwan | 19 882 000 | 15 873 000 | 20 498 146 | 22 879 000 | 19 932 000 |
| Thailand | 5 211 212 | 3 645 586 | 4 144 908 | 4 238 000 | 3 328 000 |
| United Arab Emirates | * 90 000 | * 90 000 | * 500 000 | * 2 000 000 | * 2 800 000 |
| Uzbekistan | 682 000 | 716 000 | 716 000 | 733 000 | 736 000 |
| Vietnam | 2 250 000 | 2 700 000 | 4 314 000 | 4 900 000 | 4 900 000 |
| Australia | 7 724 000 | 5 135 000 | 7 408 000 | 6 538 000 | 4 893 000 |
| New Zealand | 799 000 | 765 000 | 853 000 | 844 000 | 912 000 |
| World Total | 1 334 000 000 | 1 231 000 000 | 1 430 000 000 | 1 518 000 000 | 1 547 000 000 |

Note(s)
(1) Unless otherwise indicated, these figures include production from scrap
(2) Small amounts of steel are believed to be produced in DR Congo, Kenya, Mauritania, Sri Lanka and Uganda

(a) Production from the region east of the River Nistru

## Production of ferro-alloys

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Albania | | | | | |
| Ferro-chrome | 16 315 | 5 705 | 23 233 | 28 433 | * 30 000 |
| Armenia | | | | | |
| Ferro-molybdenum | 5 323 | 5 154 | 5 126 | 5 525 | 5 836 |
| Austria | | | | | |
| Ferro-molybdenum | 4 500 | 4 000 | 4 000 | 4 000 | 4 000 |
| Ferro-nickel | 2 000 | 2 500 | 2 500 | 2 500 | 2 500 |
| Ferro-vanadium | 6 300 | 6 200 | 8 000 | 8 000 | 8 000 |
| Bosnia & Herzegovina | | | | | |
| Ferro-alloys | 14 216 | 10 242 | 17 972 | 17 527 | 15 874 |
| Bulgaria | | | | | |
| Ferro-silicon | 6 000 | * 3 000 | — | — | — |
| Czech Republic | | | | | |
| Ferro-vanadium | * 2 800 | * 1 900 | * 3 400 | * 4 600 | * 5 700 |
| Finland | | | | | |
| Ferro-chrome | 233 550 | 123 310 | 238 000 | 231 000 | 229 000 |
| France | | | | | |
| Ferro-manganese | 46 600 | 46 000 | 138 100 | 130 500 | * 131 000 |
| Ferro-silico-manganese | 60 200 | 54 100 | 62 400 | 63 400 | * 64 000 |
| Ferro-silicon | * 30 000 | * 18 300 | * 27 000 | * 59 000 | * 60 000 |
| Silicon metal | * 118 000 | * 80 000 | * 112 000 | * 128 000 | * 130 000 |
| Georgia | | | | | |
| Ferro-manganese | * 5 000 | * 4 500 | * 4 500 | * 4 500 | * 4 500 |
| Ferro-silico-manganese | 123 468 | 112 016 | 203 791 | 242 746 | 257 421 |
| Germany | | | | | |
| Ferro-chrome | 26 960 | 13 667 | * 17 300 | * 17 800 | * 17 800 |
| Other ferro-alloys | * 5 000 | 6 336 | * 9 200 | * 9 000 | * 9 000 |
| Silicon metal | 29 092 | 27 620 | 30 105 | 30 134 | 28 574 |
| Greece | | | | | |
| Ferro-nickel | 83 200 | 42 400 | 69 600 | 94 000 | 96 435 |
| Iceland | | | | | |
| Ferro-silicon | 107 882 | 112 992 | 114 230 | 120 076 | 131 818 |
| Italy | | | | | |
| Ferro-manganese | * 30 000 | * 20 000 | * 25 000 | * 25 000 | * 27 000 |
| Ferro-silico-manganese | 87 000 | 56 000 | 108 000 | 145 000 | 110 000 |
| Macedonia | | | | | |
| Ferro-silico-manganese | 54 931 | — | 36 705 | 50 756 | 14 179 |
| Ferro-nickel | 15 026 | 12 000 | 14 413 | 17 292 | 19 247 |
| Ferro-silicon | 42 674 | 7 657 | 30 044 | 56 167 | 42 402 |
| Norway | | | | | |
| Ferro-manganese | * 130 000 | * 130 000 | * 130 000 | * 130 000 | * 130 000 |
| Ferro-silico-manganese | 273 485 | 247 615 | 281 266 | 248 700 | 266 000 |
| Ferro-silicon | 185 344 | 233 974 | * 200 000 | 170 102 | 203 886 |
| Other ferro-alloys | * 60 000 | * 150 000 | * 150 000 | * 150 000 | * 150 000 |
| Silicon metal | 180 135 | 169 643 | * 170 000 | * 170 000 | * 170 000 |
| Poland | | | | | |
| Ferro-manganese | 8 475 | 1 736 | 800 | 800 | 800 |
| Ferro-silico-manganese | 25 061 | 72 | 100 | 400 | 200 |
| Ferro-silicon | 56 031 | 9 673 | 53 206 | 72 668 | 79 400 |
| Other ferro-alloys | 2 948 | 4 190 | 200 | 300 | 300 |
| Romania | | | | | |
| Ferro-chrome | 6 179 | 15 377 | 14 353 | — | — |
| Ferro-silico-manganese | 9 979 | — | 20 605 | * 30 000 | * 30 000 |
| Russia | | | | | |
| Spiegeleisen | * 7 000 | * 7 000 | * 7 000 | * 7 000 | * 7 000 |
| Ferro-chrome | 475 686 | 378 000 | 414 000 | * 414 000 | * 414 000 |
| Ferro-silico-chrome | 72 050 | 8 285 | 4 200 | * 4 200 | * 4 200 |
| Ferro-manganese | * 110 000 | 88 000 | 171 000 | * 170 000 | * 170 000 |
| Ferro-silico-manganese | * 40 000 | 98 700 | 147 900 | * 148 000 | * 148 000 |
| Ferro-molybdenum | 5 838 | 6 726 | 6 491 | 6 917 | 7 018 |
| Ferro-nickel | 31 411 | 31 529 | 34 363 | * 34 400 | * 34 000 |
| Ferro-silicon | 850 000 | 745 000 | 916 000 | * 916 000 | * 916 000 |
| Ferro-vanadium | 10 673 | 8 029 | 13 507 | 16 683 | 14 381 |
| Other ferro-alloys | * 34 000 | * 34 000 | * 34 000 | * 34 000 | * 34 000 |
| Silicon metal | * 54 000 | 23 900 | 48 700 | * 48 700 | * 48 000 |

## Production of ferro-alloys

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Slovakia | | | | | |
| Ferro-silico-manganese | 59 940 | 32 000 | 34 960 | 25 036 | 50 089 |
| Ferro-silicon | 10 844 | 4 600 | 26 419 | 32 304 | 32 726 |
| Other ferro-alloys | 61 194 | 22 250 | 38 860 | 18 575 | 12 862 |
| Spain | | | | | |
| Ferro-manganese | * 161 000 | * 60 100 | * 134 000 | * 108 000 | * 108 000 |
| Ferro-silico-manganese | * 158 000 | * 59 200 | * 132 000 | * 164 000 | * 165 000 |
| Ferro-silicon | * 74 000 | * 44 000 | * 64 400 | * 57 000 | * 57 000 |
| Silicon metal | * 33 000 | * 23 000 | * 32 500 | * 43 000 | 45 000 |
| Sweden | | | | | |
| Ferro-chrome | 118 700 | 31 100 | 64 400 | 80 140 | 35 800 |
| Turkey | | | | | |
| Ferro-chrome | 75 840 | 41 028 | * 60 000 | * 60 000 | * 60 000 |
| Ferro-silico-chrome | 6 094 | 2 903 | * 3 000 | * 3 000 | * 3 000 |
| Ukraine | | | | | |
| Ferro-manganese | 361 501 | 135 339 | 285 643 | 187 897 | 163 921 |
| Ferro-silico-manganese | 958 667 | 771 950 | 1 000 329 | 930 337 | 823 131 |
| Ferro-nickel | 97 848 | 76 487 | 102 940 | 89 903 | 119 652 |
| Ferro-silicon | 201 706 | 193 034 | 253 801 | 186 306 | 150 265 |
| Other ferro-alloys | 43 127 | 23 882 | 28 546 | 25 126 | 22 115 |
| | | | | | |
| Egypt | | | | | |
| Ferro-silicon (a) | 59 192 | 78 355 | 47 205 | 25 516 | 52 421 |
| Other ferro-alloys (a) | * 30 000 | * 30 000 | 37 194 | * 30 000 | * 30 000 |
| South Africa | | | | | |
| Ferro-chrome | 3 268 659 | 2 346 132 | 3 607 132 | 3 421 911 | * 3 000 000 |
| Ferro-manganese | * 498 000 | * 265 000 | * 517 000 | * 696 000 | * 654 000 |
| Ferro-silico-manganese | * 263 000 | * 140 000 | * 273 000 | * 368 000 | * 346 000 |
| Ferro-silicon | * 137 000 | * 110 000 | * 128 000 | * 135 000 | * 133 000 |
| Ferro-vanadium | * 19 000 | * 13 000 | * 19 000 | * 18 000 | * 16 000 |
| Silicon metal | * 49 146 | * 39 000 | * 46 000 | * 48 000 | * 47 000 |
| Zimbabwe | | | | | |
| Ferro-chrome | 145 430 | 72 223 | 154 336 | 161 839 | 60 205 |
| Ferro-silicon | 1 612 | 603 | — | — | — |
| | | | | | |
| Canada | | | | | |
| Ferro-niobium | * 4 384 | 4 620 | 4 620 | 4 620 | * 4 600 |
| Ferro-silicon | 35 000 | 25 820 | 36 786 | 31 039 | * 31 000 |
| Silicon metal | * 50 000 | * 30 000 | * 30 000 | * 30 000 | * 30 000 |
| Dominican Republic | | | | | |
| Ferro-nickel | 47 408 | — | — | 34 576 | * 39 000 |
| Mexico | | | | | |
| Ferro-manganese | 97 366 | 42 492 | 81 019 | 73 684 | 61 939 |
| Ferro-silico-manganese | 114 320 | 85 065 | 134 470 | 139 047 | 161 336 |
| USA | | | | | |
| Ferro-silicon | 248 000 | 194 000 | 370 000 | * 294 000 | * 294 000 |
| Silicon metal | * 143 000 | * 143 000 | * 143 000 | * 143 000 | * 143 000 |
| | | | | | |
| Argentina | | | | | |
| Ferro-silico-manganese | 9 172 | 6 644 | 10 900 | 21 000 | * 20 000 |
| Ferro-silicon | * 10 400 | * 11 300 | * 11 000 | * 11 000 | * 11 000 |
| Brazil | | | | | |
| Ferro-chrome | 209 273 | 108 893 | 172 800 | 145 000 | 165 500 |
| Ferro-silico-chrome | 13 674 | 1 750 | 13 100 | 11 600 | * 12 000 |
| Ferro-silico-magnesium | 30 800 | 18 300 | 33 600 | 20 900 | * 20 000 |
| Ferro-manganese | 149 900 | 44 600 | 87 200 | 77 000 | * 80 000 |
| Ferro-silico-manganese | 238 000 | 109 500 | 218 700 | 218 600 | * 220 000 |
| Ferro-nickel | 26 300 | 31 600 | 23 800 | 45 600 | 94 400 |
| Ferro-niobium | 81 600 | 48 900 | 77 200 | 81 900 | 50 400 |
| Ferro-silicon | 183 000 | 175 000 | 247 300 | 210 900 | 204 000 |
| Other ferro-alloys | 47 800 | 21 200 | 36 650 | 32 700 | * 35 000 |
| Silicon metal | 219 600 | 154 000 | 184 100 | 210 400 | * 200 000 |
| Colombia | | | | | |
| Ferro-nickel | 126 638 | 153 628 | 145 239 | 103 371 | 138 966 |

## Production of ferro-alloys

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Venezuela | | | | | |
| Ferro-manganese | 20 000 | 15 800 | 5 300 | 12 000 | * 12 000 |
| Ferro-silico-manganese | 52 000 | 45 800 | 16 500 | 24 000 | * 24 000 |
| Ferro-nickel | 42 300 | 40 113 | 45 200 | 51 800 | * 50 000 |
| Ferro-silicon | 88 000 | 52 100 | 76 800 | 70 000 | * 70 000 |
| Bhutan | | | | | |
| Ferro-silicon | * 30 800 | * 90 800 | * 97 500 | * 96 700 | * 97 300 |
| China | | | | | |
| Ferro-chrome | 1 505 800 | 1 813 000 | (b) ... | (b) ... | (b) ... |
| Ferro-silico-chrome | 72 300 | 116 000 | (b) ... | (b) ... | (b) ... |
| Other ferro-alloys | 16 722 000 | 20 171 000 | * 26 100 000 | * 28 400 000 | * 30 000 000 |
| Silicon metal | * 1 100 000 | * 993 000 | * 1 140 000 | * 1 050 000 | * 1 050 000 |
| India | | | | | |
| Ferro-aluminium (c) | 8 170 | 7 017 | 7 538 | 7 393 | * 7 400 |
| Ferro-chrome (c) | 817 239 | 892 923 | 1 003 598 | 906 556 | * 900 000 |
| Ferro-silico-magnesium (c) | 13 400 | 17 132 | 19 079 | 24 452 | * 25 000 |
| Ferro-manganese (c) | 384 577 | 356 123 | 402 017 | 446 733 | * 450 000 |
| Ferro-silico-manganese (c) | 891 458 | 1 116 047 | 1 242 139 | 1 478 403 | * 1 500 000 |
| Ferro-molybdenum (c) | 2 162 | 2 822 | 3 090 | 4 362 | * 4 100 |
| Ferro-silicon (c) | 99 595 | 97 682 | 115 164 | 127 092 | * 130 000 |
| Ferro-titanium (c) | 1 661 | 1 929 | 2 172 | 2 217 | * 2 200 |
| Ferro-vanadium (c) | 1 501 | 1 389 | 1 521 | 2 459 | * 2 500 |
| Other ferro-alloys (c) | 541 | 569 | 595 | 730 | * 700 |
| Indonesia | | | | | |
| Ferro-manganese | * 12 000 | * 12 000 | * 12 000 | * 12 000 | * 12 000 |
| Ferro-silico-manganese | * 7 000 | * 7 000 | * 8 000 | * 8 000 | * 8 000 |
| Ferro-nickel | 17 566 | 12 550 | 18 688 | 19 690 | 18 372 |
| Iran | | | | | |
| Ferro-chrome (d) | * 8 000 | * 8 000 | * 8 000 | * 8 000 | * 8 000 |
| Ferro-silicon (d) | * 50 000 | * 50 000 | * 50 000 | * 50 000 | * 50 000 |
| Japan | | | | | |
| Ferro-chrome | 13 888 | 7 698 | 16 208 | 17 217 | 19 392 |
| Ferro-manganese | 431 181 | 361 375 | 453 265 | 456 798 | 436 171 |
| Ferro-silico-manganese | 58 884 | 49 205 | 49 865 | 49 798 | 52 287 |
| Ferro-molybdenum | 4 554 | 3 598 | 4 615 | 5 167 | 4 616 |
| Ferro-nickel | 301 361 | 284 884 | 348 420 | 279 944 | 371 913 |
| Ferro-vanadium | 3 477 | 2 560 | 4 190 | 3 980 | 4 403 |
| Other ferro-alloys | 14 478 | 12 957 | 16 374 | 20 913 | 19 364 |
| Kazakhstan | | | | | |
| Ferro-chrome | 1 220 315 | 1 173 286 | 1 311 302 | 1 289 917 | 1 305 343 |
| Ferro-silico-chrome | 133 828 | 60 829 | 159 765 | 143 296 | 164 853 |
| Ferro-silico-manganese | 179 939 | 200 374 | 224 627 | 232 039 | 251 530 |
| Ferro-silicon | 54 964 | 33 100 | 4 813 | 1 683 | 464 |
| Other ferro-alloys | 1 473 | 1 205 | 1 283 | 1 754 | 1 845 |
| Korea (Rep. of) | | | | | |
| Ferro-manganese | 251 125 | 182 308 | 286 259 | 355 047 | * 355 000 |
| Ferro-silico-manganese | 76 184 | 148 509 | 120 779 | 195 650 | * 196 000 |
| Other ferro-alloys | ... | 3 921 | 4 059 | 4 162 | * 4 200 |
| Korea, Dem. P.R. of | | | | | |
| Ferro-alloys | * 10 000 | * 10 000 | * 10 000 | * 10 000 | * 10 000 |
| Ferro-Alloys | | | | | |
| Australia | | | | | |
| Ferro-manganese & ferro-silico-manganese (g) | 254 000 | 212 000 | 219 000 | 267 000 | 198 000 |
| Silicon metal | * 33 000 | * 36 000 | * 37 000 | * 34 000 | * 43 000 |
| New Caledonia | | | | | |
| Ferro-nickel | 148 960 | 156 553 | 165 506 | 169 513 | 184 476 |

Note(s)
(a) Years ended 30 June of that stated
(b) Included with 'other ferro-alloys'
(c) Years ended 31 March following that stated
(d) Years ended 20 March following that stated

# Kaolin

## Top 10 producers

| | % of world total |
|---|---|
| USA | 23% |
| Germany | 17% |
| China | 12% |
| Brazil | 7% |
| Iran | 6% |
| Turkey | 5% |
| United Kingdom | 4% |
| Korea (Rep. of) | 3% |
| Vietnam | 2% |
| Czech Republic | 2% |

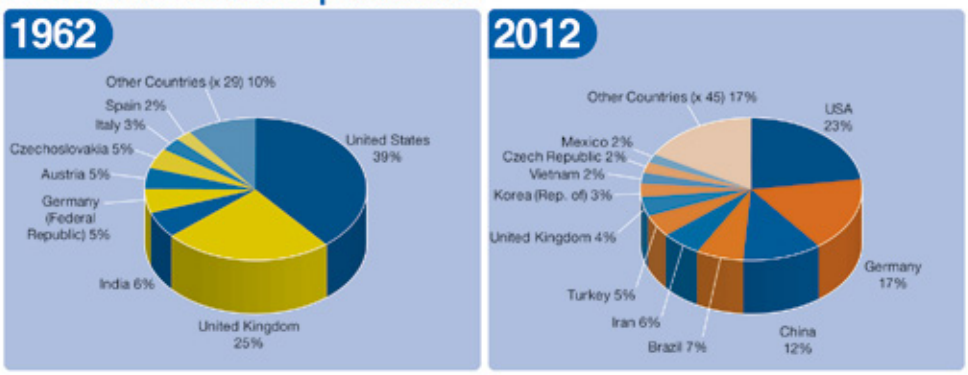
## End uses

**Ceramics:** including sanitaryware, tableware and tiles

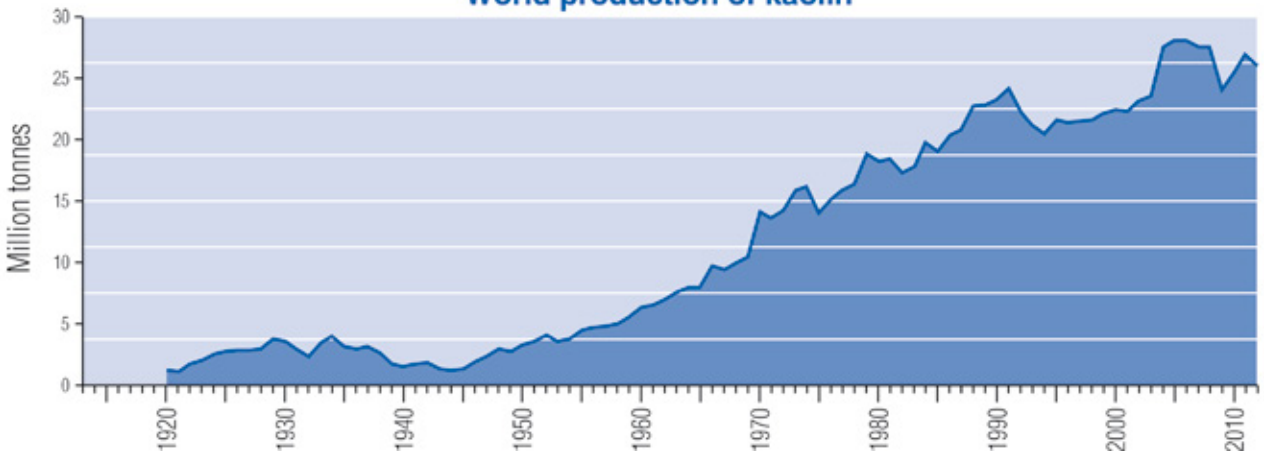
**Paper production:** as a filler and coating

**Many minor uses:** e.g. glass fibre, paint, plastics, adhesives and pharmaceuticals, etc.

## Distribution of world production




## World production of kaolin



## Production of kaolin

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria | 16 460 | 18 148 | 18 914 | 18 897 | * 14 000 |
| Belgium | * 300 000 | * 300 000 | * 300 000 | * 300 000 | * 300 000 |
| Bosnia & Herzegovina | 259 325 | 148 384 | 41 808 | 232 147 | 149 495 |
| Bulgaria | * 220 000 | * 140 000 | * 190 000 | * 250 000 | * 240 000 |
| Czech Republic (a) | 664 000 | 488 000 | 636 000 | 660 000 | 624 000 |
| France | 335 520 | 350 000 | 350 000 | 310 000 | 308 000 |
| Germany (b) | 3 622 159 | 4 513 753 | 4 578 097 | 4 898 516 | 4 398 796 |
| Greece | 4 360 | — | 3 493 | 7 250 | 5 583 |
| Italy | * 180 000 | * 180 000 | * 180 000 | * 180 000 | * 180 000 |
| Poland (c) | 165 615 | 136 561 | 125 000 | 163 600 | 137 800 |
| Portugal | 217 434 | 274 925 | 273 890 | 322 041 | 317 489 |
| Romania | 3 060 | 651 | 326 | — | — |
| Russia | * 45 000 | * 45 000 | * 45 000 | * 45 000 | * 45 000 |
| Serbia | 398 917 | 163 616 | 76 197 | 90 472 | 69 487 |
| Slovakia | 44 000 | 10 000 | — | 4 000 | 3 000 |
| Spain (c) | 355 739 | 270 298 | 310 993 | 384 179 | 331 707 |
| Turkey | 232 746 | 234 614 | 787 287 | 1 229 352 | * 1 300 000 |
| Ukraine (a) | 240 000 | * 100 000 | * 100 000 | * 100 000 | * 100 000 |
| United Kingdom | 1 355 365 | 1 059 848 | * 1 140 000 | * 1 290 000 | * 1 150 000 |
| | | | | | |
| Algeria | 50 788 | 87 766 | 71 065 | 108 000 | 100 000 |
| Egypt | 523 327 | 523 300 | 304 200 | 304 000 | * 300 000 |
| Eritrea | * 200 | * 175 | * 200 | * 200 | * 200 |
| Ethiopia (d) | 177 | 1 613 | 1 613 | 4 498 | * 4 000 |
| Kenya | 940 | * 850 | * 900 | * 900 | 900 |
| Madagascar | * — | 90 | 259 | * — | * — |
| Nigeria | * 100 000 | * 100 000 | * 100 000 | * 100 000 | * 100 000 |
| South Africa | 39 506 | 31 048 | 29 929 | 15 220 | 20 499 |
| Sudan | 87 151 | 36 799 | 32 696 | * 33 000 | * 33 000 |
| Tanzania | 13 926 | 18 624 | 42 649 | * 43 000 | * 45 000 |
| Uganda | 3 738 | 4 721 | 27 237 | 20 883 | * 39 806 |
| | | | | | |
| Cuba | — | — | 100 | — | — |
| Guatemala | 2 803 | 1 879 | 2 143 | 1 620 | 1 866 |
| Mexico | 690 366 | 406 421 | 516 850 | 372 506 | 514 730 |
| USA (e) | 6 750 000 | 5 290 000 | 5 370 000 | 5 480 000 | 5 900 000 |
| | | | | | |
| Argentina | 73 838 | 78 792 | 78 722 | 54 166 | * 50 000 |
| Brazil (a) | 2 667 000 | 1 987 000 | 1 900 000 | 2 200 000 | 1 800 000 |
| Chile | 63 526 | 48 354 | 62 226 | 59 912 | 60 429 |
| Ecuador | 15 000 | * 15 000 | * 15 000 | * 15 000 | * 15 000 |
| Paraguay | * 66 000 | * 66 000 | * 66 000 | * 66 000 | * 66 000 |
| Peru | 13 215 | 9 655 | 16 446 | 18 169 | 34 585 |
| Venezuela | 1 896 | 300 | 9 444 | * 10 000 | * 10 000 |
| | | | | | |
| Bangladesh (f) | * 6 500 | — | — | — | * — |
| China | * 3 000 000 | * 3 000 000 | * 3 000 000 | * 3 000 000 | * 3 000 000 |
| India (g)(h) | 96 344 | 79 963 | 76 498 | 67 130 | * 61 000 |
| Indonesia | * 150 000 | * 186 000 | * 170 000 | * 175 000 | * 175 000 |
| Iran (i) | 1 274 092 | 907 487 | 1 480 291 | * 1 500 000 | * 1 500 000 |
| Iraq | 1 524 | 1 980 | 2 606 | — | — |
| Japan | * 12 000 | * 12 000 | * 12 000 | * 13 000 | * 13 000 |
| Jordan | 181 018 | 177 471 | 114 931 | 89 903 | 70 000 |
| Korea (Rep. of) | 1 182 199 | 890 157 | 962 275 | 1 051 772 | 796 603 |
| Malaysia | 506 462 | 487 632 | 530 331 | 442 550 | 438 923 |
| Pakistan (f) | 31 512 | 17 169 | 22 769 | 16 055 | 21 555 |
| Philippines | 2 391 | 2 389 | 2 490 | 3 529 | * 3 600 |
| Saudi Arabia | 5 560 | 4 166 | 66 166 | 70 000 | 80 000 |
| Sri Lanka | 10 039 | 9 538 | 8 207 | 11 157 | * 10 000 |
| Taiwan | 33 745 | 18 413 | 18 097 | 16 936 | 26 376 |
| Thailand (a) | 162 215 | 131 131 | 156 827 | 175 881 | 175 464 |
| Uzbekistan (g) | * 150 000 | * 150 000 | * 150 000 | * 150 000 | * 150 000 |
| Vietnam | * 650 000 | * 650 000 | * 650 000 | * 650 000 | * 650 000 |

## Production of kaolin

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Australia (f) | 181 655 | 120 013 | 114 157 | 46 388 | * 49 000 |
| New Zealand | 12 761 | 9 016 | 107 761 | 21 545 | 11 578 |
| World Total | 27 500 000 | 24 000 000 | 25 500 000 | 26 900 000 | 26 000 000 |

Note(s)
(1) In addition to the countries listed Denmark is believed to produce kaolin

(a) Beneficiated
(b) Washed and dried
(c) Washed
(d) Years ended 7 July of that stated
(e) Sold or used by producers
(f) Years ended 30 June of that stated
(g) Beneficiated; excludes directly used natural kaolin
(h) Years ended 31 March following that stated
(i) Years ended 20 March following that stated

## Mine production of lead

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Bosnia & Herzegovina | 3 316 | 2 080 | 3 196 | 3 656 | 3 700 |
| Bulgaria (a) | 14 577 | 12 981 | 12 705 | 14 369 | 15 949 |
| Greece | 14 000 | 10 000 | 12 200 | 13 400 | 13 300 |
| Ireland, Republic of | 50 200 | 49 500 | 39 100 | 50 700 | 47 400 |
| Kosovo | — | 3 000 | 5 700 | 4 530 | 5 295 |
| Macedonia | 49 877 | 46 788 | 41 293 | 37 295 | 39 184 |
| Poland | 67 070 | 62 910 | 48 050 | 40 492 | 73 231 |
| Portugal | — | — | — | — | 87 |
| Romania | — | * 3 000 | * 3 000 | * 3 000 | * 5 500 |
| Russia | 60 000 | 72 000 | 97 000 | 123 000 | 138 000 |
| Serbia | 1 600 | 1 800 | 1 800 | 2 100 | 2 500 |
| Spain | — | 1 000 | 229 | 5 705 | 6 800 |
| Sweden | 63 489 | 69 293 | 67 697 | 62 028 | 63 551 |
| Turkey | 31 800 | 21 600 | 38 500 | 39 500 | * 57 017 |
| United Kingdom | * 300 | 243 | 251 | 280 | 61 |
| | | | | | |
| Morocco | 33 477 | 34 517 | 32 647 | 30 850 | * 31 000 |
| Namibia | 14 062 | 10 129 | 10 140 | 8 330 | 9 270 |
| Nigeria | 3 500 | 5 200 | 3 300 | 9 100 | 11 300 |
| South Africa | 46 440 | 49 149 | 50 625 | 54 460 | 52 489 |
| | | | | | |
| Canada | 99 810 | 68 839 | 64 844 | 54 797 | 61 224 |
| Guatemala | — | — | — | — | 7 985 |
| Honduras | 12 545 | 14 471 | 16 954 | 13 100 | 12 400 |
| Mexico | 141 173 | 143 838 | 192 062 | 223 717 | 238 091 |
| USA | 410 100 | 405 800 | 369 000 | 342 000 | 345 000 |
| | | | | | |
| Argentina | 20 788 | 24 753 | 22 600 | 26 100 | * 26 000 |
| Bolivia | 81 602 | 84 538 | 72 803 | 100 051 | 81 100 |
| Brazil | 15 000 | 8 917 | 12 832 | 8 545 | 9 000 |
| Chile | 3 985 | 1 511 | 695 | 841 | 410 |
| Peru | 345 109 | 302 459 | 261 990 | 230 199 | 249 179 |
| | | | | | |
| Burma | * 1 000 | * 5 000 | * 7 000 | * 8 700 | * 9 800 |
| China | 1 402 700 | 1 604 100 | 1 981 300 | 2 405 700 | 2 838 400 |
| India (b) | 82 053 | 82 629 | 84 825 | 92 601 | 106 005 |
| Iran (c) | 26 905 | 39 254 | * 40 000 | * 35 000 | * 40 000 |
| Kazakhstan | 38 800 | 34 000 | 35 000 | 38 800 | 38 000 |
| Korea (Rep. of) | 225 | 1 032 | 584 | 1 289 | 1 434 |
| Korea, Dem. P.R. of | * 33 000 | * 22 000 | * 26 000 | * 32 000 | * 40 000 |
| Laos | 710 | 400 | 542 | 544 | 66 |
| Pakistan | — | — | 1 000 | 2 200 | 800 |
| Saudi Arabia | 347 | 685 | 543 | 400 | * 1 000 |
| Tajikistan | — | 2 400 | 3 900 | 8 900 | 16 000 |
| Vietnam | * — | * 6 000 | * 3 700 | * 4 100 | * 300 |
| | | | | | |
| Australia | 650 000 | 566 000 | 712 000 | 621 000 | 622 000 |
| | | | | | |
| World Total | 3 800 000 | 3 900 000 | 4 400 000 | 4 800 000 | 5 300 000 |

Note(s)
(a) Metal content of ore
(b) Years ended 31 March following that stated
(c) Years ended 20 March following that stated

## Production of refined lead

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria | 26 900 | 22 200 | 25 500 | 26 200 | 24 504 |
| Belgium | 104 000 | 109 000 | 121 000 | 119 000 | 119 000 |
| Bosnia & Herzegovina | 46 | 35 | 4 474 | 3 370 | 3 327 |
| Bulgaria | 90 900 | 83 100 | 80 600 | 71 000 | 66 000 |
| Czech Republic | 36 000 | 29 000 | 30 000 | 34 000 | 30 000 |
| Estonia | 10 000 | 10 000 | 10 000 | 10 000 | 8 000 |
| France | 82 100 | 62 000 | 71 000 | 80 000 | 75 000 |
| Germany | 415 100 | 390 600 | 405 400 | 429 100 | 423 000 |
| Greece | * 11 000 | * 11 000 | * 11 000 | * 11 000 | * 6 000 |
| Ireland, Republic of | 20 000 | 19 000 | 19 000 | 18 000 | 16 000 |
| Italy | 199 900 | 149 000 | 150 000 | 146 500 | 138 400 |
| Kosovo | 900 | * 1 000 | * 1 000 | * 1 000 | * 1 000 |
| Netherlands | * 16 000 | * 21 000 | * 20 000 | * 21 000 | * 22 000 |
| Poland | 108 300 | 100 400 | 120 300 | 135 500 | 141 000 |
| Portugal | 5 000 | 4 000 | 4 000 | 4 000 | 5 000 |
| Romania | 39 596 | 8 687 | 11 263 | 6 854 | * 13 000 |
| Russia | 112 000 | 90 000 | 96 000 | 103 000 | 115 000 |
| Slovenia | 15 000 | 14 000 | 14 000 | 15 000 | 12 000 |
| Spain | 145 000 | 138 000 | 165 000 | 177 000 | 160 000 |
| Sweden | 56 812 | 51 574 | 59 179 | 52 438 | 61 528 |
| Switzerland | * 8 000 | 800 | — | — | — |
| Turkey | * 6 000 | * 6 000 | * 6 000 | 8 230 | * 10 000 |
| Ukraine | 54 700 | 60 600 | 71 500 | 55 300 | 43 200 |
| United Kingdom | 283 000 | 301 865 | 297 453 | 274 055 | 311 930 |
| | | | | | |
| Algeria | 6 000 | 6 000 | 9 000 | 9 000 | 6 000 |
| Kenya | * 1 000 | * 1 000 | * 1 000 | * 1 000 | * 1 000 |
| Morocco | 37 400 | 20 100 | 38 237 | 36 469 | 23 400 |
| Nigeria | 8 000 | 8 000 | 11 000 | 9 000 | 9 000 |
| South Africa | 62 000 | 58 000 | 51 000 | 56 000 | 54 000 |
| Zambia | * 500 | * 800 | * 2 400 | * 3 100 | * 2 000 |
| | | | | | |
| Canada | 259 074 | 258 854 | 272 937 | 282 268 | 278 065 |
| Costa Rica | — | — | — | 4 000 | 4 000 |
| El Salvador | 11 000 | — | — | — | — |
| Guatemala | 12 000 | 17 000 | 22 000 | 24 000 | 10 000 |
| Honduras | — | — | — | 956 | — |
| Mexico | 206 364 | 200 411 | 225 980 | 251 729 | 262 431 |
| USA (a) | 1 280 500 | 1 214 100 | 1 256 000 | 1 250 000 | 1 221 000 |
| | | | | | |
| Argentina | 62 500 | 83 000 | 87 400 | 83 100 | * 81 000 |
| Brazil | 144 000 | 155 000 | 172 000 | 184 000 | 188 000 |
| Colombia | 10 000 | 10 000 | 10 000 | 10 000 | * 10 000 |
| Peru | 114 259 | 26 082 | * — | * — | — |
| Venezuela | * 37 000 | * 31 000 | * 31 000 | * 26 000 | * 25 000 |
| | | | | | |
| Burma | * 200 | * 200 | * 200 | * 200 | * 200 |
| China | 3 451 800 | 3 772 900 | 4 157 500 | 4 603 600 | 4 645 700 |
| India | 294 000 | 337 000 | 380 000 | 426 000 | 463 000 |
| Indonesia | * 42 000 | * 45 000 | * 45 000 | * 47 000 | * 45 000 |
| Iran | 75 000 | 72 000 | 75 000 | 82 000 | 81 000 |
| Israel | 27 000 | 26 000 | 27 000 | 27 000 | 26 000 |
| Japan | 278 071 | 247 634 | 267 206 | 252 562 | 258 527 |
| Kazakhstan | 105 766 | 80 994 | 103 400 | 111 518 | 88 099 |
| Korea (Rep. of) | 268 000 | 329 000 | 321 000 | 416 900 | 460 000 |
| Korea, Dem. P.R. of | * 6 000 | * 4 000 | * 3 000 | * 3 000 | * 3 000 |
| Malaysia | 39 000 | 54 000 | 26 000 | 44 000 | 32 000 |
| Pakistan (b) | — | 385 | 1 545 | 1 569 | 1 414 |
| Philippines | * 34 000 | * 32 000 | * 30 000 | * 34 000 | * 32 000 |
| Saudi Arabia | 38 000 | 37 000 | 39 000 | 35 000 | 39 000 |
| Taiwan | 38 000 | 36 000 | 35 000 | 36 000 | 35 000 |
| Thailand | 73 303 | 55 504 | 55 504 | 42 223 | 86 507 |
| United Arab Emirates | * 2 000 | * 2 000 | * 2 000 | * 2 000 | * 2 000 |

## Production of refined lead

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Australia | 260 000 | 234 000 | 213 000 | 232 000 | 207 000 |
| New Zealand | * 11 000 | * 11 000 | * 11 000 | * 11 000 | * 3 000 |
| World Total | 9 100 000 | 9 100 000 | 9 800 000 | 10 400 000 | 10 500 000 |

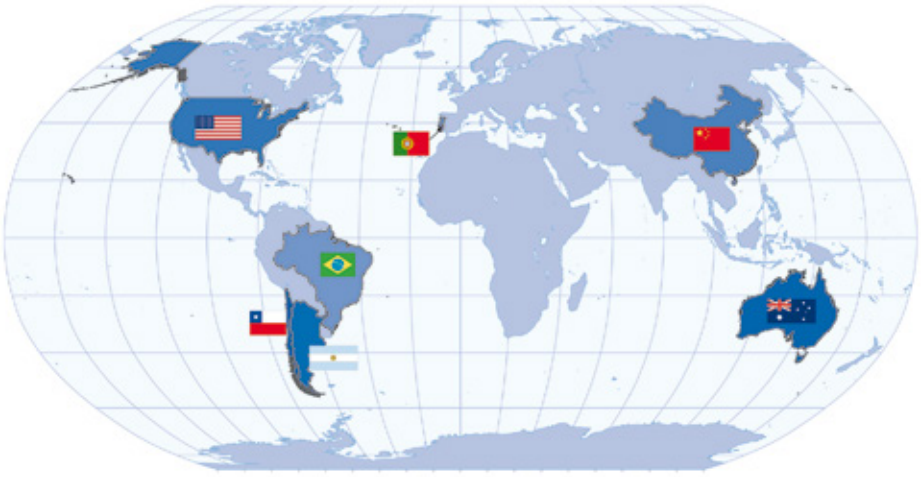
Note(s)
(1) Figures relate to both primary and secondary refined lead and include the lead content of antimonial lead

(a) Excluding lead content of primary antimonial lead
(b) Years ended 30 June of that stated

# Lithium

*Symbol Li*

**Relative supply risk index**
**6.7**



## Top producers

| | % of world total |
|---|---|
| Chile | 49% |
| Australia | 30% |
| Argentina | 9% |
| USA | 5% |
| China | 4% |
| Portugal | 1% |
| Brazil | 1% |

## End uses

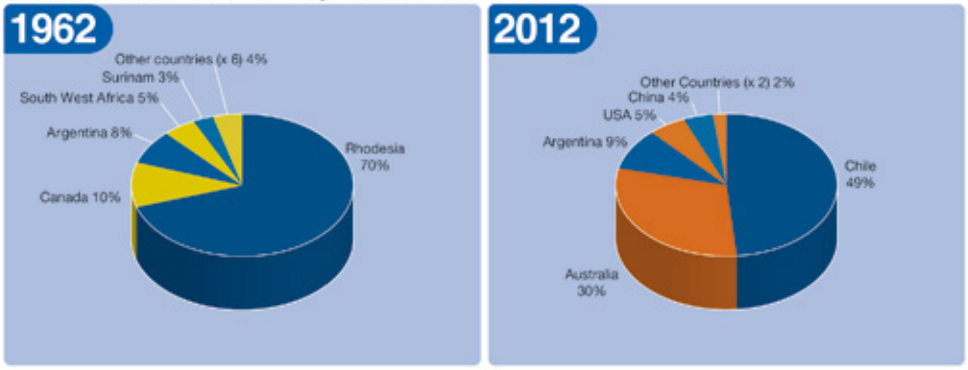
**Rechargeable batteries:** used in portable electronic devices, portable power tools, electric cars etc.

**Ceramics and glass:** used during manufacture to reduce energy requirements and improve quality

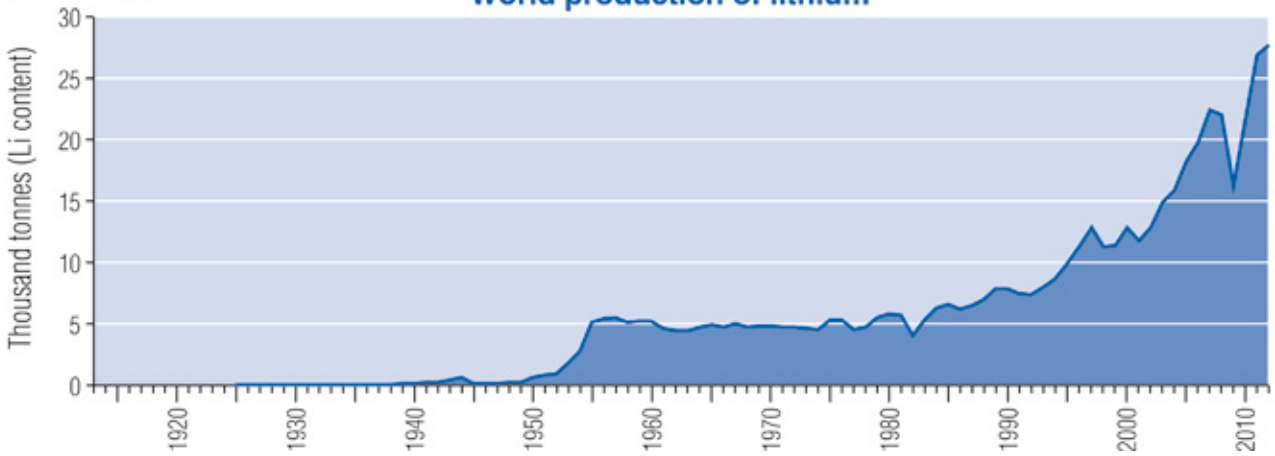
**Lubricating greases:** used to thicken lubricating oils used for automotive and industrial purposes

**Glass-ceramics:** used for specialist applications such as cooking hobs, cookware

## Distribution of world production




## World production of lithium



## Production of lithium minerals

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Portugal | | | | | |
| Lepidolite | 34 888 | 37 359 | 40 109 | 37 534 | 20 698 |
| Spain | | | | | |
| Lepidolite | 9 342 | 4 270 | 7 824 | — | — |
| Canada | * 22 000 | * 10 000 | * — | * — | * — |
| USA (a) | * 1 500 | * 1 500 | * 1 500 | * 1 500 | * 1 500 |
| Argentina (b)(c) | 17 691 | 17 570 | 12 853 | 14 706 | * 15 000 |
| Brazil | | | | | |
| Spodumene | 14 460 | 15 929 | 15 733 | 7 820 | * 8 000 |
| Chile (b) | 56 881 | 30 538 | 52 851 | 69 597 | 71 594 |
| China | * 46 000 | * 53 000 | * 55 000 | * 58 000 | * 60 000 |
| Australia | | | | | |
| Spodumene | 239 528 | 197 482 | 303 729 | 421 228 | 452 921 |
| World Total (Li content) | 22 000 | 16 300 | 21 600 | 27 000 | 27 800 |

Note(s)
(1) In addition to the countries listed, Russia has also produced lithium minerals in the past.

(a) Li content
(b) Carbonate
(c) Chloride

# Magnesite

## Top 10 producers

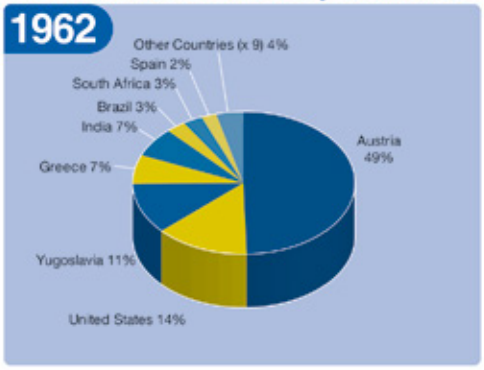
| | % of world total |
|---|---|
| China | 65% |
| Russia | 11% |
| Turkey | 4% |
| Austria | 3% |
| Spain | 3% |
| Slovakia | 3% |
| Australia | 3% |
| Brazil | 2% |
| Greece | 1% |
| Netherlands | 1% |

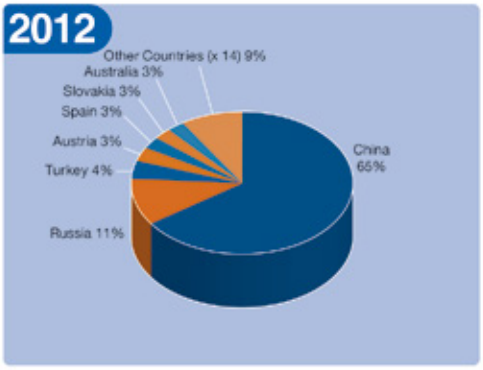
## End uses

**Refractory applications:** for steel, cement and glass production

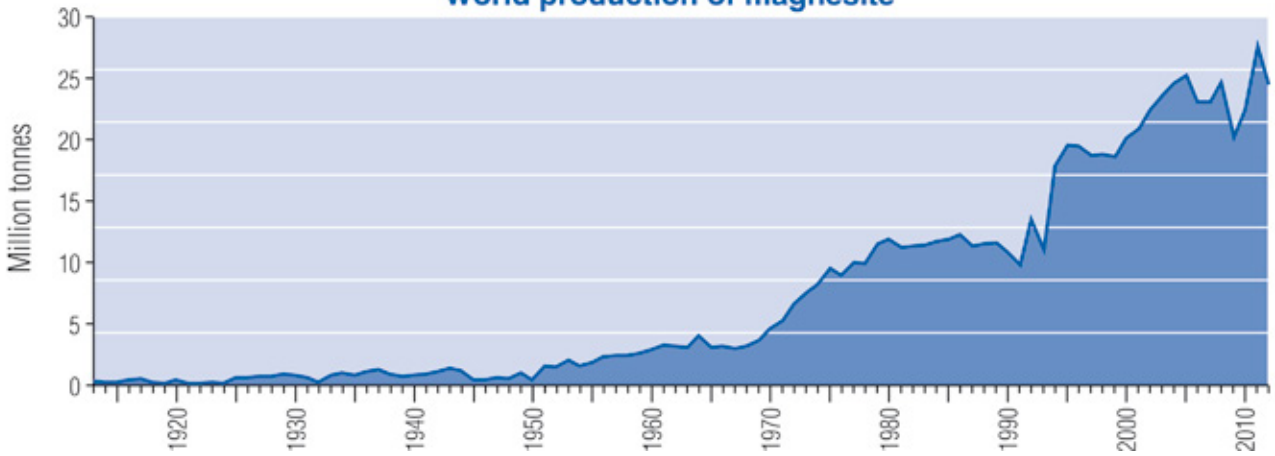
**Many minor uses:** e.g. in cements, fertilisers, food additives, water treatment products, etc.

## Distribution of world production




## World production of magnesite



## Production of magnesite

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria | 837 476 | 544 716 | 757 063 | 867 912 | 778 810 |
| Greece | 361 165 | 380 834 | 396 497 | 393 880 | 349 998 |
| Netherlands (a) | 316 264 | 183 256 | 236 053 | 274 877 | 290 873 |
| Poland | 60 000 | 47 000 | 63 000 | 75 350 | 84 000 |
| Russia | * 2 600 000 | * 2 600 000 | * 2 600 000 | * 2 600 000 | * 2 600 000 |
| Slovakia | 806 500 | 477 600 | 650 100 | 751 700 | 618 400 |
| Spain | 442 339 | 390 311 | 462 959 | 577 725 | 649 977 |
| Turkey | 2 143 047 | 861 180 | 1 541 860 | * 1 000 000 | * 1 000 000 |
| South Africa | 83 900 | * 80 000 | * 80 000 | * 80 000 | * 80 000 |
| Zimbabwe | 2 549 | 449 | — | 169 | — |
| Canada (b) | * 140 000 | * 140 000 | * 150 000 | * 150 000 | * 150 000 |
| Guatemala | 11 757 | 17 247 | — | 311 | 27 132 |
| Mexico | — | — | — | — | 100 724 |
| Brazil (c) | 421 300 | 409 909 | 483 882 | 476 805 | * 470 000 |
| Colombia | 38 000 | * — | * — | * — | — |
| China | * 15 600 000 | * 13 000 000 | * 14 000 000 | * 19 000 000 | * 16 000 000 |
| India (d) | 252 880 | 301 070 | 235 762 | 217 662 | 215 038 |
| Iran (e) | 115 987 | 130 575 | 126 702 | * 172 697 | * 170 000 |
| Israel (f) | 108 852 | 132 636 | 135 930 | 126 988 | 105 610 |
| Korea, Dem. P.R. of | * 150 000 | * 150 000 | * 150 000 | * 150 000 | * 150 000 |
| Pakistan (g) | 3 940 | 2 639 | 5 159 | 4 908 | 5 444 |
| Philippines | 3 976 | 3 872 | 4 186 | 4 784 | * 4 800 |
| Australia (g) | 147 698 | 366 188 | 301 142 | 671 073 | * 617 000 |
| World Total | 24 600 000 | 20 200 000 | 22 400 000 | 27 600 000 | 24 500 000 |

Note(s)
(1) In addition to the countries listed, Bulgaria is believed to produce magnesite

(a) Chloride produced from solution mining
(b) Officially described as magnesitic dolomite and brucite
(c) Including beneficiated and directly shipped material
(d) Years ended 31 March following that stated
(e) Years ended 20 March following that stated
(f) Magnesium chloride
(g) Years ended 30 June of that stated

## Production of primary magnesium metal

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia | * 30 000 | * 30 000 | * 30 000 | * 30 000 | * 30 000 |
| Ukraine | * 2 000 | * 2 000 | * 2 000 | * 2 000 | * 2 000 |
| USA | * 40 000 | * 40 000 | * 40 000 | * 40 000 | * 40 000 |
| Brazil | * 5 000 | * 5 000 | * 5 000 | * 5 000 | * 5 000 |
| China | 630 700 | 525 600 | 650 800 | 674 900 | 698 300 |
| India | * 200 | * 200 | * 200 | * 200 | * 200 |
| Israel | 32 051 | 19 405 | 23 309 | 26 284 | 27 292 |
| Kazakhstan (a) | * 21 000 | * 21 000 | * 21 000 | * 21 000 | * 21 000 |

Note(s)
(a) Not marketed as metal but used in titanium production

## Production of manganese ore

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Bulgaria | 39 100 | 28 300 | 106 000 | 85 600 | 39 100 |
| Georgia (a) | * 370 000 | * 370 000 | * 370 000 | * 370 000 | * 370 000 |
| Hungary | 49 579 | 43 000 | 55 000 | 58 000 | * 51 000 |
| Romania | 43 590 | 20 304 | 13 120 | 3 180 | 8 993 |
| Ukraine | (a) 1 447 000 | (a) 932 000 | (a) 1 589 000 | 1 391 228 | 1 234 007 |
| Burkina Faso | — | — | 57 355 | 49 715 | * 50 000 |
| Egypt (b) | 16 912 | * 12 500 | 6 508 | 37 194 | 62 388 |
| Gabon | 3 250 000 | 1 992 060 | 3 200 570 | 3 562 330 | * 3 600 000 |
| Ghana | 1 089 025 | 1 012 941 | 1 194 074 | 1 827 692 | 1 490 634 |
| Ivory Coast | 148 120 | * 100 000 | * 80 000 | * 60 000 | * 50 000 |
| Morocco | 102 285 | 51 788 | 75 614 | 58 000 | 45 400 |
| Namibia | 28 237 | 51 471 | 35 728 | 41 876 | * 42 000 |
| South Africa | | | | | |
| Metallurgical | 6 798 187 | 4 564 855 | 7 156 338 | 8 635 863 | 8 931 472 |
| Chemical | 9 327 | 10 911 | 15 407 | 15 979 | 11 943 |
| Sudan | — | 500 | 378 990 | * 380 000 | * 400 000 |
| Mexico | 477 147 | 330 328 | 466 649 | 437 264 | 510 942 |
| Brazil | 2 400 000 | 2 320 000 | 3 125 000 | 3 483 000 | 2 400 000 |
| Chile | 5 096 | 1 642 | — | — | — |
| Burma | * 356 000 | * 607 000 | * 754 000 | * 586 000 | * 286 000 |
| China | * 11 000 000 | * 12 000 000 | * 13 000 000 | * 14 000 000 | * 15 000 000 |
| India (c) | 2 789 025 | 2 491 950 | 3 056 385 | 2 349 300 | 2 294 000 |
| Iran (d) | 115 199 | 125 506 | 131 561 | 194 428 | * 195 000 |
| Kazakhstan | 2 485 000 | 2 457 400 | 3 045 000 | 2 963 000 | 2 975 000 |
| Malaysia | 536 675 | 567 963 | 899 703 | 597 917 | 1 099 585 |
| Thailand | 111 000 | 64 930 | 50 450 | 398 | 8 151 |
| Australia | 4 819 000 | 4 444 000 | 6 474 000 | 6 961 000 | 7 172 000 |
| World Total | 38 500 000 | 34 600 000 | 45 300 000 | 48 100 000 | 48 300 000 |

Note(s)
(1) In addition to the countries listed, Colombia, Cuba and Vietnam are believed to produce manganese ore

(a) Marketable
(b) Fiscal years ending 30 June of that stated
(c) Years ended 31 March following that stated
(d) Years ended 20 March following that stated

## Production of mercury

kilograms

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Finland | 33 120 | 6 210 | 9 000 | 5 000 | — |
| Russia | * 50 000 | * 50 000 | * 50 000 | * 50 000 | * 50 000 |
| Morocco | 17 400 | * 18 000 | * 20 000 | * 20 000 | * 20 000 |
| Mexico (a) | * 43 100 | * 10 600 | * 11 000 | * 120 300 | * 261 800 |
| USA | * 15 000 | * 15 000 | * 15 000 | * 15 000 | * 15 000 |
| Argentina | 1 200 | 9 468 | 24 600 | 11 000 | * 10 000 |
| Chile (b) | * 50 000 | * 88 000 | * 176 000 | * 89 200 | * 48 600 |
| China | 1 333 000 | 1 425 000 | 1 585 000 | 1 493 000 | 1 347 000 |
| Kyrgyzstan | 270 000 | 140 000 | 99 000 | 112 000 | 74 000 |
| Tajikistan | * 30 000 | 30 000 | 30 000 | 30 000 | 32 000 |
| World Total | 1 800 000 | 1 800 000 | 2 000 000 | 1 900 000 | 1 900 000 |

Note(s)
(1) Several countries are believed to have unrecorded production of mercury from copper electrowinning processes and by recovery from effluents

(a) BGS estimates based on net exports
(b) From copper solvent extraction and electrowinning processes

## Production of mica

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Finland | 10 706 | 7 855 | 13 809 | 12 896 | 12 112 |
| France (a) | * 20 000 | * 18 000 | * 19 000 | * 19 000 | * 18 000 |
| Russia | * 10 000 | * 9 000 | * 9 000 | * 9 000 | * 9 000 |
| Spain (a) | 4 254 | 3 655 | 4 034 | 3 775 | 3 515 |
| Turkey | 8 392 | 4 172 | * 4 500 | * 4 500 | * 4 500 |
| Egypt | 50 | * 50 | * 50 | * 50 | * 50 |
| Madagascar | 1 233 | 358 | 947 | 1 165 | * 1 200 |
| South Africa | 393 | 299 | 904 | 633 | 400 |
| Sudan | 66 | 100 | 10 | 378 | 324 |
| Canada | * 17 000 | * 15 000 | * 15 000 | * 17 000 | * 16 000 |
| Mexico | 5 000 | 5 000 | 160 | — | 160 |
| USA (b)(a) | 85 000 | 51 000 | 53 000 | 50 000 | * 44 000 |
| Argentina | 8 790 | 8 668 | 9 638 | 10 226 | * 10 000 |
| Brazil | 4 000 | 4 379 | 4 709 | 6 193 | * 6 000 |
| China (c) | * 139 000 | * 91 000 | * 126 000 | * 132 000 | * 149 000 |
| India (d) | 1 462 | 1 061 | 1 333 | 1 807 | 1 315 |
| Iran (e) | 1 510 | 6 797 | 2 860 | * 2 900 | * 3 000 |
| Korea (Rep. of) (f) | 49 474 | 27 078 | 36 486 | 31 260 | 25 594 |
| Malaysia (g) | 5 593 | 4 324 | 4 515 | 4 245 | 3 966 |
| Sri Lanka | 2 364 | 2 347 | 2 095 | 2 927 | 2 200 |
| Taiwan | 3 179 | 557 | — | 1 455 | 6 844 |
| World Total | 377 000 | 261 000 | 308 000 | 311 000 | 317 000 |

Note(s)
(1) In addition to the countries listed, Romania is believed to produce mica

(a) Including mica recovered from mica schists and/or kaolin beneficiation
(b) Sold or used by producers
(c) Conservative BGS estimates, based on exports
(d) Years ended 31 March following that stated
(e) Years ended 20 March following that stated
(f) Mainly sericite
(g) Sericite

## Mine production of molybdenum

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Armenia | 4 472 | 4 365 | 4 377 | 4 817 | 5 446 |
| Russia | * 4 800 | * 4 800 | * 4 800 | * 4 800 | * 4 800 |
| Canada | 8 602 | 8 721 | 8 648 | 8 326 | 8 849 |
| Mexico | 7 812 | 10 167 | 10 849 | 10 787 | 11 366 |
| USA | 55 900 | 47 800 | 59 400 | 63 700 | * 57 000 |
| Argentina | 228 | 1 148 | 468 | 1 708 | 3 233 |
| Brazil | 760 | 262 | 337 | 263 | * 250 |
| Chile | 33 639 | 34 786 | 37 044 | 40 698 | 34 793 |
| Peru | 16 721 | 12 297 | 16 963 | 19 141 | 16 790 |
| China | * 81 000 | 90 270 | 96 615 | 103 320 | * 105 000 |
| Iran (a) | 3 628 | 3 882 | 3 676 | 3 365 | * 3 300 |
| Kazakhstan | 400 | — | — | — | — |
| Mongolia | 1 900 | 2 410 | 2 198 | 1 957 | 1 904 |
| World Total | 220 000 | 221 000 | 245 000 | 263 000 | 253 000 |

Note(s)
(1) In addition to the countries listed, Australia, Georgia, India, Democratic P.R. of Korea, Romania and Tajikistan are believed to produce molybdenum

(a) Years ended 20 March following that stated

## Production of nepheline syenite

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Norway | 346 000 | 270 000 | 327 000 | 330 000 | 320 000 |
| Russia | | | | | |
| Nepheline syenite | 4 760 000 | 4 400 000 | 4 900 000 | 4 608 000 | 4 947 000 |
| Nepheline concentrates | ... | 500 000 | 1 000 000 | 997 000 | 1 056 700 |
| Canada | 646 000 | 513 000 | 581 000 | 610 000 | 592 000 |

# Nickel

*Symbol Ni*

**Relative supply risk index**
**6.2**

## Top 10 producers

| | % of world total |
|---|---|
| Philippines | 17% |
| Russia | 14% |
| Indonesia | 13% |
| Australia | 13% |
| Canada | 11% |
| New Caledonia | 7% |
| China | 5% |
| Brazil | 5% |
| Cuba | 4% |
| Colombia | 3% |

## End uses

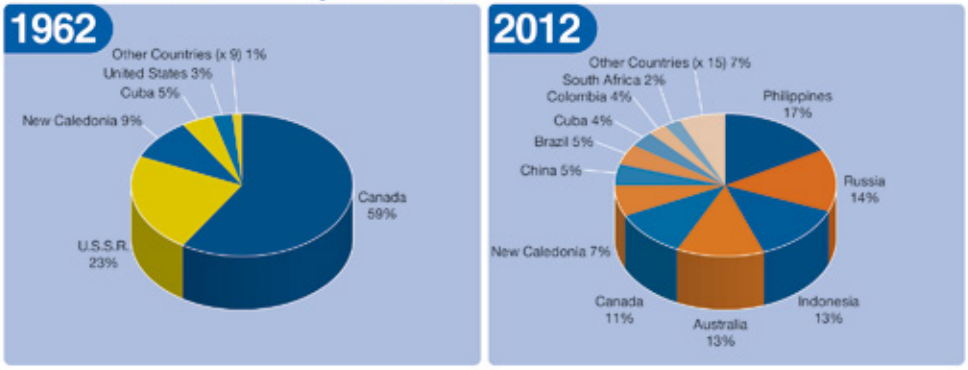
**Stainless steel and other alloys:** e.g. food preparation and medical equipment

**Non-ferrous alloys:** e.g. cupro nickel in coins and superalloys in aerospace

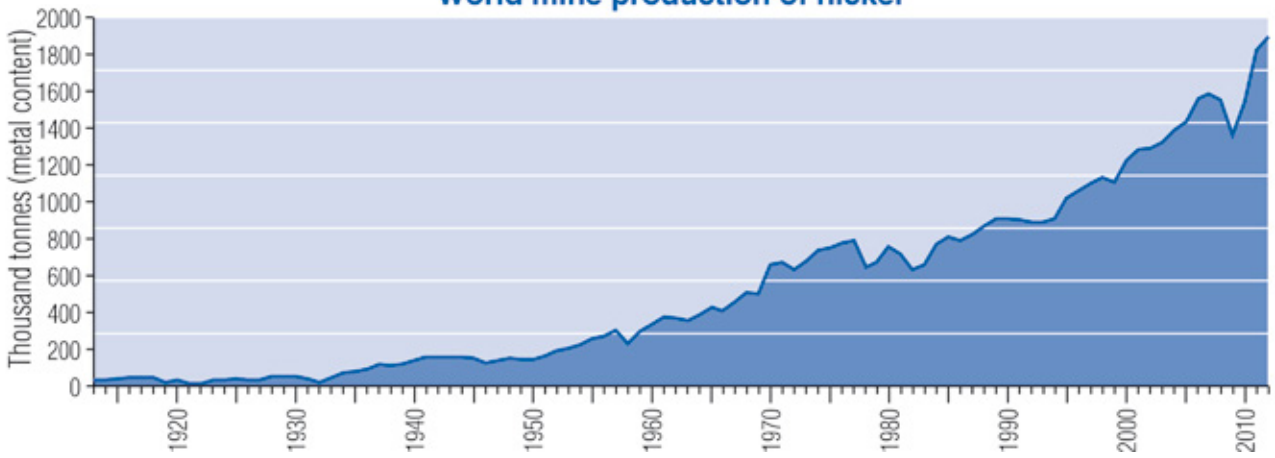
**Plating:** e.g. in medical equipment and construction materials

**Many minor uses:** e.g. catalysts, batteries, etc.

## Distribution of world production




## World mine production of nickel



## Mine production of nickel

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Albania | 3 500 | 550 | 1 954 | 914 | 700 |
| Finland | 6 200 | 1 600 | 12 100 | 18 800 | 19 568 |
| Greece | 18 600 | 9 600 | 16 100 | 21 700 | 21 600 |
| Kosovo | 3 655 | 10 565 | 9 100 | 7 728 | 4 436 |
| Macedonia | 15 000 | 12 000 | 14 200 | 25 600 | 19 200 |
| Norway | 377 | 336 | 348 | 339 | 351 |
| Russia | 266 800 | 261 900 | 270 000 | 270 000 | 268 700 |
| Spain | 8 136 | 8 029 | 6 296 | — | 2 398 |
| Turkey | * 1 500 | 1 199 | * 1 900 | * 4 300 | * 3 200 |
| Ukraine | * 8 000 | — | — | * — | * — |
| Botswana | 28 940 | 29 616 | 24 931 | 15 675 | 17 948 |
| Madagascar | — | — | — | — | 5 695 |
| Morocco | 100 | 733 | 317 | 217 | 47 |
| South Africa (a) | 31 700 | 34 610 | 39 960 | 43 321 | 45 945 |
| Zambia | 800 | 1 500 | 2 809 | 2 869 | — |
| Zimbabwe | 6 354 | 4 858 | 6 133 | 7 992 | 5 716 |
| Canada | 259 651 | 135 037 | 158 376 | 219 612 | 204 461 |
| Cuba | 67 300 | 60 000 | 66 000 | 66 000 | 68 300 |
| Dominican Republic | 18 782 | — | — | 13 528 | 15 186 |
| Brazil | 67 116 | 56 950 | 66 200 | 74 000 | 87 300 |
| Colombia | 41 638 | 51 802 | 49 433 | 37 800 | 51 595 |
| Venezuela | 10 886 | 13 749 | 12 063 | 13 400 | 8 100 |
| China | 79 500 | 84 800 | 79 800 | 89 800 | 93 300 |
| Indonesia | 223 000 | 183 900 | 217 300 | 226 300 | 253 400 |
| Kazakhstan | * 1 600 | — | — | * — | * — |
| Philippines | 80 645 | 137 350 | 184 330 | 319 354 | 317 621 |
| Australia | 200 000 | 166 000 | 169 000 | 215 000 | 244 000 |
| New Caledonia | 105 883 | 95 649 | 131 309 | 128 732 | 131 693 |
| Papua New Guinea | — | — | — | — | 4 758 |
| World Total | 1 556 000 | 1 362 000 | 1 540 000 | 1 823 000 | 1 895 000 |

Note(s)
(a) Includes metal and metal content of sulphate and concentrates

## Smelter/refinery production of nickel

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria | 500 | 700 | 1 000 | 1 000 | 1 000 |
| Finland | 51 963 | 41 556 | 49 772 | 49 823 | 46 275 |
| France | 13 700 | 13 900 | 14 400 | 13 700 | 14 500 |
| Greece | 16 640 | 8 269 | 13 960 | 18 530 | 18 630 |
| Kosovo | 5 777 | 6 365 | 7 200 | 7 500 | 9 000 |
| Macedonia | 15 000 | 12 000 | 14 400 | 17 292 | 19 200 |
| Norway | 88 700 | 88 577 | 92 185 | 92 000 | 92 000 |
| Russia | 257 700 | 244 800 | 262 300 | 265 700 | 252 500 |
| Ukraine | 24 700 | 15 800 | 21 900 | 17 100 | 20 800 |
| United Kingdom | 40 800 | 17 800 | 31 600 | 37 400 | 34 300 |
| Madagascar | — | — | — | — | 5 695 |
| South Africa | 38 200 | 39 900 | 40 300 | 41 500 | 43 300 |
| Zimbabwe | 11 300 | 9 200 | 4 400 | * 3 500 | * 2 400 |
| Canada | 167 732 | 116 909 | 105 413 | 142 445 | 139 800 |
| Cuba | 35 600 | 33 000 | 33 000 | 33 600 | 27 000 |
| Dominican Republic | 18 782 | — | — | 13 528 | 15 186 |
| Brazil | 36 000 | 32 800 | 41 900 | 43 100 | 66 300 |
| Colombia | 41 638 | 51 802 | 49 443 | 37 817 | 51 595 |
| Venezuela | 10 886 | 10 400 | 11 700 | 13 400 | 8 100 |
| China | 200 300 | 253 800 | 332 300 | 435 200 | 519 200 |
| Indonesia | 17 566 | 12 550 | 18 688 | 19 690 | 18 372 |
| Japan | 156 500 | 143 500 | 166 100 | 156 900 | 168 900 |
| Korea (Rep. of) | 7 113 | 19 333 | 21 461 | 18 580 | 21 769 |
| Australia | 108 000 | 131 000 | 102 000 | 110 000 | 129 000 |
| New Caledonia | 37 467 | 38 230 | 39 802 | 40 513 | 43 030 |
| World Total | 1 403 000 | 1 342 000 | 1 475 000 | 1 630 000 | 1 768 000 |

Note(s)
(1) Data relate to refined nickel plus the nickel content of ferro-nickel, nickel oxide and nickel salts

## Production of perlite

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Armenia | * 35 000 | * 35 000 | * 35 000 | * 35 000 | * 35 000 |
| Bulgaria | 7 400 | 14 800 | — | — | 3 700 |
| Greece | 1 000 000 | 862 935 | 760 000 | 720 000 | 680 000 |
| Hungary | 132 000 | 82 058 | 70 990 | 70 900 | * 70 000 |
| Italy | * 60 000 | * 60 000 | * 60 000 | * 60 000 | * 60 000 |
| Russia | * 45 000 | * 45 000 | * 45 000 | * 45 000 | * 45 000 |
| Slovakia | 25 000 | 25 000 | 23 000 | 23 000 | 24 000 |
| Turkey | 551 266 | 522 832 | 737 077 | 642 657 | * 650 000 |
| Ukraine | * 36 000 | * 36 000 | * 36 000 | * 36 000 | * 36 000 |
| South Africa | * 400 | * 400 | * 400 | * 400 | * 400 |
| Mexico | 43 180 | 51 395 | 31 779 | 30 750 | 29 950 |
| USA | 434 000 | 348 000 | 414 000 | 420 000 | * 424 000 |
| Argentina | 26 545 | 21 802 | 27 182 | 27 446 | * 27 000 |
| China | * 700 000 | * 700 000 | * 700 000 | * 700 000 | * 700 000 |
| Iran (a) | * 47 000 | 753 183 | 547 617 | * 550 000 | * 550 000 |
| Japan | * 230 000 | * 220 000 | * 210 000 | * 200 000 | * 200 000 |
| Philippines | 10 100 | 10 100 | 10 500 | 13 800 | * 14 000 |
| Thailand | 7 000 | 13 500 | 14 700 | 26 500 | 41 400 |
| Australia (b) | 6 942 | 7 649 | 6 616 | 2 362 | 940 |
| New Zealand | — | 8 848 | 5 088 | — | 3 598 |

Note(s)
(1) In addition to the countries listed, Algeria, Canada, Djibuti, Iceland, Mozambique and former Yugoslavia are believed to produce perlite

(a) Years ended 20 March following that stated
(b) Years ended 30 June of that stated

## Production of crude petroleum

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Albania | 577 301 | 576 739 | 742 012 | 894 530 | 876 000 |
| Austria | 861 639 | 905 031 | 875 969 | 838 052 | 837 561 |
| Azerbaijan | 42 074 700 | 48 353 700 | 48 580 900 | 43 195 200 | 43 400 000 |
| Belarus | 1 740 020 | 1 720 010 | 1 700 140 | 1 681 470 | 1 660 000 |
| Bulgaria | 23 000 | 23 800 | 22 400 | 21 400 | 22 900 |
| Croatia | 867 027 | 807 424 | 748 791 | 664 440 | 597 246 |
| Czech Republic | 236 000 | 217 000 | 173 000 | 163 000 | 150 000 |
| Denmark | 14 338 000 | 13 045 000 | 12 090 000 | 10 908 900 | 10 086 000 |
| Estonia (a) | 1 869 500 | 1 733 000 | 2 080 000 | 2 173 132 | 2 180 313 |
| France | 975 000 | 971 000 | 903 000 | 901 000 | 888 000 |
| Georgia | 51 660 | 52 731 | 50 413 | 48 942 | 42 194 |
| Germany | 3 053 998 | 2 800 063 | 2 511 174 | 2 677 136 | 2 621 352 |
| Greece | 66 000 | 87 000 | 86 000 | 87 126 | 83 143 |
| Hungary | 811 000 | 796 000 | 735 900 | 657 000 | 700 931 |
| Italy | 5 219 751 | 4 550 816 | 5 080 498 | 5 286 042 | 5 376 629 |
| Lithuania | 127 658 | 114 956 | 114 464 | 113 895 | 101 644 |
| Netherlands | 2 163 000 | 1 704 000 | 1 414 000 | 1 464 000 | 1 467 000 |
| Norway | 121 611 000 | 115 612 000 | 105 146 000 | 100 343 000 | 94 497 000 |
| Poland | 754 907 | 686 992 | 686 487 | 618 163 | 677 664 |
| Romania | 4 528 000 | 4 388 940 | 4 172 411 | 4 081 979 | 3 992 011 |
| Russia | 488 000 000 | 494 000 000 | 505 000 000 | 509 000 000 | 517 000 000 |
| Serbia | 636 383 | 663 005 | 865 499 | 1 020 490 | 1 124 794 |
| Slovakia | 21 000 | 19 000 | 16 000 | 18 000 | 14 000 |
| Slovenia | 174 | 138 | 233 | 263 | 279 |
| Spain | 127 542 | 106 817 | 121 528 | 99 925 | 143 526 |
| Turkey | 2 222 594 | 2 489 914 | 2 602 114 | 2 383 000 | 2 334 000 |
| Ukraine | 4 328 000 | 3 960 000 | 3 549 000 | 3 363 000 | 3 345 000 |
| United Kingdom | 66 745 000 | 64 001 000 | 63 903 000 | 52 650 000 | 45 431 000 |
| | | | | | |
| Algeria | 85 600 000 | 77 800 000 | 75 500 000 | 74 300 000 | 73 000 000 |
| Angola | 93 100 000 | 87 600 000 | 90 500 000 | 83 800 000 | 86 900 000 |
| Cameroon | 4 300 000 | 3 700 000 | 3 200 000 | 3 200 000 | 3 200 000 |
| Chad | 6 700 000 | 6 200 000 | 6 400 000 | 6 000 000 | 5 300 000 |
| Congo | 11 558 259 | 13 335 006 | 15 581 948 | 14 828 348 | 13 250 062 |
| Congo, Democratic Republic | 995 000 | 1 100 000 | 1 050 000 | 1 010 000 | 1 002 059 |
| Egypt | 34 700 000 | 35 300 000 | 35 000 000 | 35 300 000 | 35 400 000 |
| Equatorial Guinea | 17 200 000 | 15 200 000 | 13 600 000 | 12 500 000 | 13 200 000 |
| Gabon | 12 000 000 | 11 829 000 | 12 431 000 | 12 170 000 | 12 300 000 |
| Ghana | 301 000 | 301 000 | 360 000 | 383 000 | 393 000 |
| Ivory Coast | 2 964 000 | 2 897 000 | 2 197 000 | 1 984 000 | 1 898 902 |
| Libya | 85 500 000 | 77 400 000 | 77 700 000 | 22 500 000 | 71 100 000 |
| Mauritania | 592 679 | 550 143 | 412 465 | 385 234 | 327 447 |
| Morocco | 9 000 | 9 300 | 10 400 | 9 600 | * 9 500 |
| Niger | — | — | — | 350 000 | 1 042 857 |
| Nigeria | 105 300 000 | 101 500 000 | 117 200 000 | 117 400 000 | 116 200 000 |
| Senegal | 13 400 | 33 600 | 53 800 | 54 500 | 7 700 |
| South Africa | 403 000 | 270 000 | 316 000 | 179 000 | 137 000 |
| South Sudan | — | — | — | — | (n) 1 500 000 |
| Sudan | 23 700 000 | 23 400 000 | 22 900 000 | 22 300 000 | (n) 4 100 000 |
| Tunisia | 4 146 000 | 3 902 000 | 3 731 400 | 3 203 300 | 3 160 400 |
| | | | | | |
| Barbados | 39 760 | 38 030 | 42 069 | 40 179 | 37 369 |
| Canada | 135 500 000 | 134 600 000 | 140 400 000 | 149 000 000 | 158 900 000 |
| Cuba | 3 003 100 | 2 731 300 | 3 024 800 | 3 110 000 | 2 949 000 |
| Guatemala | 715 400 | 523 700 | 605 100 | 554 100 | 537 620 |
| Mexico | 163 220 000 | 153 600 000 | 152 670 000 | 151 842 000 | 150 601 000 |
| Trinidad & Tobago | 5 904 500 | 5 056 600 | 5 061 410 | 4 736 250 | 4 222 897 |
| USA | 309 706 456 | 334 637 399 | 346 213 286 | 360 155 048 | 324 402 030 |
| | | | | | |
| Argentina | 32 365 564 | 31 930 560 | 31 170 941 | 29 356 595 | 29 149 460 |
| Bolivia | 1 806 400 | 1 565 000 | 1 599 700 | 1 644 800 | 1 925 800 |
| Brazil | 98 500 000 | 105 000 000 | 110 600 000 | 113 400 000 | 111 470 000 |
| Chile | 137 000 | 192 000 | 217 750 | 246 810 | 321 305 |
| Colombia | 29 236 400 | 33 288 500 | 38 990 438 | 45 433 683 | 49 900 000 |
| Ecuador | 25 767 000 | 24 747 000 | 24 810 000 | 25 487 000 | 25 686 000 |
| Peru | 5 921 000 | 7 175 000 | 7 753 000 | 7 533 000 | 7 494 774 |
| Suriname | 952 000 | 945 300 | 953 300 | 966 300 | 958 219 |
| Venezuela | 15 100 000 | 149 900 000 | 142 500 000 | 139 600 000 | 139 700 000 |

## Production of crude petroleum

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Afghanistan | * 3 000 | * 3 000 | * 3 000 | * 3 000 | * 3 000 |
| Bahrain | 1 636 000 | 1 603 000 | 1 646 984 | 2 393 357 | * 2 400 000 |
| Brunei | 8 680 000 | 8 291 000 | 8 448 000 | 8 248 000 | 7 955 925 |
| Burma (b) | 973 000 | 983 000 | 958 000 | 935 000 | * 900 000 |
| China (c) | 190 430 600 | 189 489 600 | 203 014 000 | 203 646 000 | 207 478 000 |
| East Timor | (d)* 3 000 000 | (d) 3 066 000 | (d) 2 760 000 | (e) 3 095 000 | (e) 3 661 000 |
| India (b) | 33 506 000 | 33 691 000 | 37 712 000 | 38 088 000 | 37 809 000 |
| Indonesia | 48 973 000 | 47 440 000 | 47 245 000 | 45 105 000 | 43 105 000 |
| Iran | 209 800 000 | 202 400 000 | 207 100 000 | 205 800 000 | 174 900 000 |
| Iraq | 115 411 000 | 117 533 000 | 120 400 000 | 136 900 000 | 152 400 000 |
| Israel | 2 200 | 2 010 | 1 791 | 4 638 | 4 384 |
| Japan | 899 000 | 840 000 | 796 000 | 759 000 | 724 000 |
| Jordan | 2 200 | 1 300 | 1 300 | * 1 300 | * 1 300 |
| Kazakhstan | 70 671 000 | 76 482 000 | 79 684 000 | 80 060 900 | 79 225 000 |
| Kuwait (f) | 137 300 000 | 121 300 000 | 122 500 000 | 139 700 000 | 152 500 000 |
| Kyrgyzstan | 71 000 | 77 300 | 82 800 | 90 300 | 83 600 |
| Malaysia | 32 900 000 | 31 500 000 | 30 500 000 | 27 200 000 | 28 000 000 |
| Mongolia | 162 000 | 257 000 | 300 000 | 351 000 | 500 137 |
| Oman | 37 700 000 | 40 500 000 | 43 100 000 | 44 100 000 | 45 803 815 |
| Pakistan (g) | 3 413 700 | 3 204 400 | 3 160 800 | 3 205 500 | 3 276 442 |
| Philippines | 902 000 | 1 150 000 | 1 092 000 | 1 016 000 | 876 596 |
| Qatar | 60 800 000 | 57 900 000 | 65 700 000 | 78 200 000 | 83 300 000 |
| Saudi Arabia (f) | 515 300 000 | 459 500 000 | 466 600 000 | 525 800 000 | 547 000 000 |
| Syria | 18 900 559 | 18 853 258 | 19 100 000 | 16 500 000 | 8 200 000 |
| Taiwan | 16 134 | 15 995 | 14 477 | 11 344 | 11 379 |
| Tajikistan | 25 800 | 26 200 | 27 000 | 28 300 | 29 800 |
| Thailand | 12 400 000 | 12 900 000 | 13 000 000 | 12 100 000 | * 12 950 000 |
| Turkmenistan | 10 200 000 | 10 200 000 | 10 700 000 | 10 700 000 | 11 000 000 |
| United Arab Emirates | 142 900 000 | 126 300 000 | 130 800 000 | 151 300 000 | 154 100 000 |
| Uzbekistan | 4 800 000 | 4 500 000 | 3 600 000 | 3 600 000 | 3 200 000 |
| Vietnam (e) | 15 100 000 | 16 579 500 | 15 562 700 | 15 769 100 | 17 305 300 |
| Yemen, Republic of | 14 400 000 | 14 000 000 | 18 000 000 | 14 600 000 | 13 200 000 |
| Australia | 21 569 000 | 22 527 000 | 24 796 000 | 21 967 000 | 21 814 000 |
| New Zealand (e) | 2 724 580 | 2 574 440 | 2 462 220 | 2 109 720 | 1 851 660 |
| Papua New Guinea | 1 950 000 | 1 813 000 | 1 683 000 | 1 424 000 | 1 346 000 |
| World Total | 3 799 000 000 | 3 840 000 000 | 3 931 000 000 | 3 985 000 000 | 4 008 000 000 |

Note(s)
(1) The figures shown in this table include natural gas liquids

(a) From oil shale
(b) Years ended 31 March following that stated
(c) Including oil from shale and coal
(d) Entirely natural gas liquids
(e) Including natural gas liquids
(f) Including shares of production from the Neutral Zone
(g) Years ended 30 June of that stated

## Production of natural gas

million cubic metres

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Albania | 12 | 9 | 2 | 2 | * 1 |
| Austria | 1 544 | 1 559 | 1 713 | 1 591 | 1 729 |
| Azerbaijan | 16 337 | 16 325 | 16 673 | 16 361 | 15 600 |
| Belarus | 203 | 205 | 213 | 222 | 218 |
| Bulgaria | 218 | 15 | 74 | 443 | 390 |
| Croatia | 2 729 | 2 591 | 2 727 | 2 471 | 2 013 |
| Czech Republic | 168 | 180 | 201 | 187 | 204 |
| Denmark | 9 562 | 7 980 | 7 792 | 6 263 | 5 617 |
| France | 925 | 813 | 736 | 623 | 510 |
| Georgia | 14 | 12 | 8 | 6 | 5 |
| Germany | 16 547 | 15 554 | 13 666 | 12 952 | 11 784 |
| Greece | 14 | 11 | 7 | 6 | 6 |
| Hungary | 2 703 | 2 748 | 2 600 | 2 315 | 2 205 |
| Ireland, Republic of (a) | 506 | 414 | 402 | 361 | 380 |
| Italy | 9 070 | 7 909 | 8 265 | 8 339 | 8 511 |
| Netherlands | 79 325 | 74 659 | 83 944 | 76 429 | 76 020 |
| Norway | 99 300 | 104 800 | 107 800 | 101 697 | 114 918 |
| Poland | 5 382 | 5 537 | 5 666 | 5 921 | 5 871 |
| Romania | 11 520 | 11 273 | 11 138 | 11 164 | 11 095 |
| Russia | 664 000 | 584 000 | 649 000 | 669 000 | 653 000 |
| Serbia | 282 | 279 | 423 | 616 | 672 |
| Slovakia | 111 | 114 | 106 | 106 | 106 |
| Slovenia | 3 | 3 | 7 | 2 | 1 |
| Spain | 46 | 19 | 58 | 58 | 65 |
| Turkey | 894 | 660 | 626 | 756 | * 760 |
| Ukraine | 21 444 | 24 189 | 20 382 | 20 646 | 20 491 |
| United Kingdom | 74 937 | 63 031 | 59 684 | 47 790 | 40 603 |
| | | | | | |
| Algeria | 85 800 | 79 600 | 80 400 | 78 000 | 81 500 |
| Angola | 680 | 690 | 733 | 752 | * 760 |
| Congo | 368 | 538 | 934 | 1 161 | * 1 200 |
| Egypt | 59 000 | 62 700 | 61 300 | 61 400 | 60 900 |
| Equatorial Guinea | 6 670 | 5 900 | 6 136 | 6 235 | * 6 800 |
| Gabon | * 170 | * 170 | * 170 | * 110 | * 110 |
| Ivory Coast | 1 300 | 1 300 | 1 352 | 1 317 | * 1 500 |
| Libya | 14 300 | 14 300 | 15 100 | 7 100 | 11 000 |
| Morocco | 50 | 41 | 50 | 53 | * 50 |
| Mozambique | 3 300 | 3 600 | 3 744 | 3 548 | * 3 500 |
| Nigeria | 35 000 | 24 800 | 36 600 | 39 900 | 43 200 |
| South Africa | 1 500 | 1 200 | 1 600 | 1 400 | 1 186 |
| Tunisia | 2 596 | 3 056 | 3 402 | 2 935 | 2 826 |
| | | | | | |
| Barbados | 21 | 19 | 20 | 20 | * 20 |
| Canada | 167 515 | 156 046 | 151 023 | 145 285 | 141 274 |
| Cuba | 1 161 | 1 155 | 1 073 | 1 020 | * 1 000 |
| Mexico | 53 400 | 59 400 | 57 600 | 58 300 | 58 500 |
| Trinidad & Tobago | 41 842 | 43 221 | 44 624 | 42 883 | 42 604 |
| USA (b) | 571 000 | 584 001 | 603 596 | 648 506 | 681 382 |
| | | | | | |
| Argentina | 50 509 | 48 416 | 47 097 | 45 524 | 44 124 |
| Bolivia | 14 895 | 12 786 | 14 923 | 15 790 | 18 700 |
| Brazil | 15 510 | 13 370 | 16 152 | 18 280 | 20 845 |
| Chile | 1 828 | 1 889 | 1 792 | 1 440 | 1 207 |
| Colombia | 9 100 | 10 378 | 10 599 | 10 810 | 12 000 |
| Ecuador | 255 | 296 | 340 | 224 | * 300 |
| Peru | 3 386 | 3 470 | 7 149 | 12 034 | 5 170 |
| Venezuela | 30 000 | 28 700 | 30 200 | 31 200 | 32 800 |
| | | | | | |
| Afghanistan | 155 | 142 | 142 | * 142 | * 142 |
| Bahrain | 12 320 | 12 475 | 12 785 | 19 638 | 14 200 |
| Bangladesh (c) | 17 015 | 18 511 | 19 919 | 20 075 | 21 056 |
| Brunei | 11 665 | 10 733 | 12 283 | 12 797 | 12 565 |
| Burma (d) | 11 476 | 12 441 | 12 746 | 12 888 | 12 700 |
| China | 80 299 | 85 269 | 94 848 | 102 500 | 107 200 |
| East Timor | 5 986 | 5 063 | 4 710 | 4 982 | 4 776 |
| India (d) | 32 849 | 47 510 | 52 222 | 46 576 | 39 733 |
| Indonesia | 74 129 | 77 427 | 86 342 | 81 896 | 71 100 |
| Iran | 116 300 | 131 200 | 146 200 | 151 800 | 160 500 |

## Production of natural gas

million cubic metres

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Iraq | 1 900 | 1 200 | 1 300 | 900 | 800 |
| Israel | 3 436 | 2 825 | 3 234 | 4 320 | 2 558 |
| Japan | 3 735 | 3 539 | 3 396 | 3 298 | 3 276 |
| Jordan | 250 | 220 | 185 | * 185 | * 185 |
| Kazakhstan | 32 889 | 35 942 | 37 406 | 39 531 | 40 299 |
| Kuwait (e) | 12 700 | 11 200 | 11 600 | 13 500 | 14 500 |
| Kyrgyzstan | 17 | 15 | 23 | 27 | 29 |
| Malaysia | 60 820 | 59 970 | 61 250 | 61 260 | 62 050 |
| Oman | 25 968 | 24 800 | 29 279 | 30 848 | 37 919 |
| Pakistan (c) | 41 178 | 41 367 | 41 995 | 41 676 | 44 151 |
| Philippines | 3 883 | 3 910 | 3 683 | 3 976 | 3 905 |
| Qatar | 77 000 | 89 300 | 116 700 | 145 300 | 157 000 |
| Saudi Arabia (e) | 80 440 | 77 500 | 87 700 | 99 200 | 102 800 |
| Syria | 7 574 | 7 948 | 7 700 | 8 300 | 7 600 |
| Taiwan | 357 | 351 | 290 | 330 | 442 |
| Tajikistan | 16 | 20 | 23 | 19 | 11 |
| Thailand | 27 559 | 26 347 | 29 565 | 29 041 | * 32 700 |
| Turkmenistan | 66 100 | 36 400 | 42 400 | 59 500 | 64 400 |
| United Arab Emirates | 50 240 | 59 100 | 60 500 | 52 300 | 51 700 |
| Uzbekistan | 62 200 | 60 000 | 59 600 | 49 100 | 47 900 |
| Vietnam | 7 499 | 8 010 | 9 402 | 8 480 | 9 403 |
| Australia | 38 256 | 42 813 | 52 081 | 53 958 | 59 661 |
| New Zealand | 4 052 | 4 168 | 4 420 | 3 995 | 4 277 |
| Papua New Guinea | 151 | 156 | 151 | 158 | 149 |
| World Total | 3 159 000 | 3 084 000 | 3 298 000 | 3 384 000 | 3 439 000 |

Note(s)
(1) So far as possible the figures in this table exclude flared or reinjected gas

(a) Sales
(b) Dry gas
(c) Years ended 30 June of that stated
(d) Years ended 31 March following that stated
(e) Including one-half of the output of the Neutral Zone

# Phosphate rock

## Top 10 producers

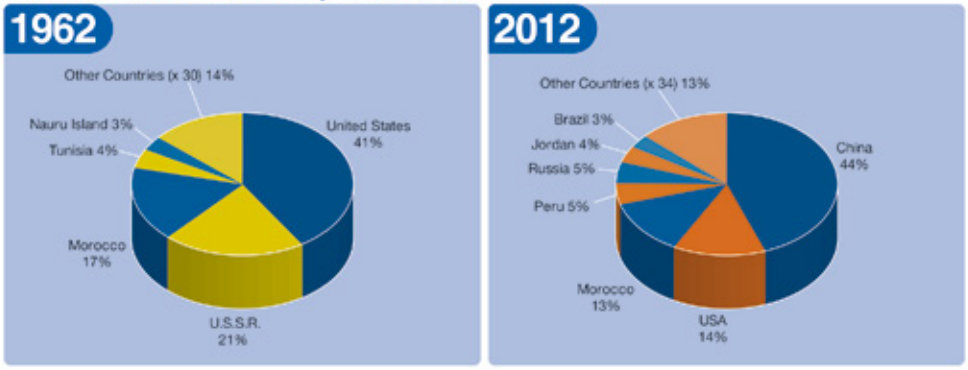
| | % of world total |
|---|---|
| China | 44% |
| USA | 14% |
| Morocco | 13% |
| Peru | 5% |
| Russia | 5% |
| Jordan | 4% |
| Brazil | 3% |
| Tunisia | 1% |
| Israel | 1% |
| Egypt | 1% |

## End uses

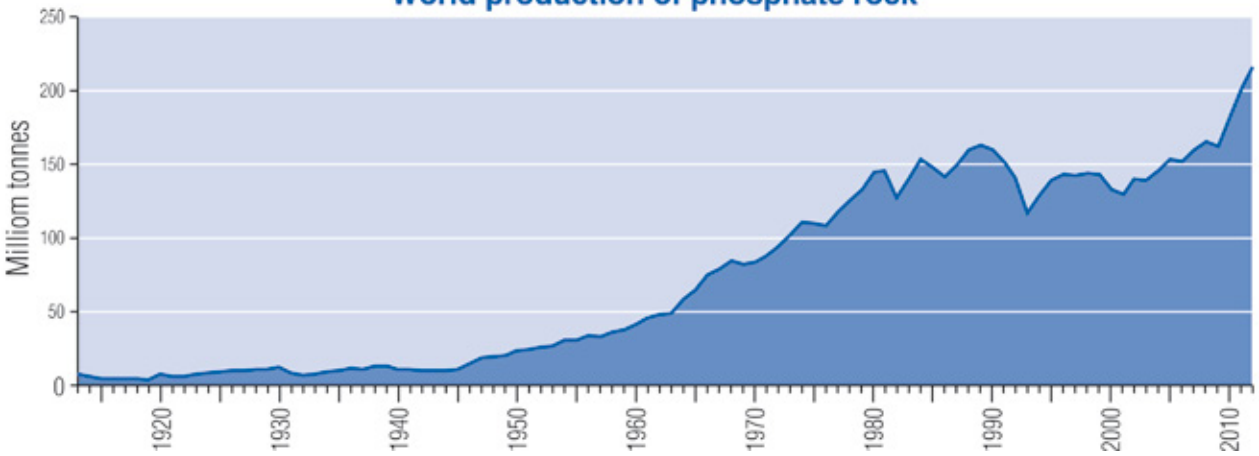
**Chemical fertiliser:** for agriculture and domestic use

**Many minor uses:** e.g. animal feed supplements, food preservatives, etc.

## Distribution of world production




## World production of phosphate rock



## Production of phosphate rock

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Finland | 780 000 | 658 347 | 817 289 | 869 694 | 858 005 |
| Russia | 9 810 200 | 9 537 800 | 10 843 500 | 10 304 300 | 10 282 400 |
| | | | | | |
| Algeria | 1 805 000 | 1 017 000 | 1 525 234 | 1 281 100 | 1 250 300 |
| Burkina Faso | * 2 400 | * 2 400 | * 2 400 | * 2 400 | * 2 400 |
| Egypt (a) | 2 356 523 | 6 227 424 | 3 021 335 | 1 392 990 | 2 456 562 |
| Malawi | — | — | — | — | 12 403 |
| Morocco | 24 861 000 | 18 307 000 | 26 603 000 | 28 052 000 | 27 000 000 |
| Senegal | 645 000 | 948 600 | 976 200 | 1 411 000 | 1 380 900 |
| South Africa | 2 286 794 | 2 237 128 | 2 493 904 | 2 564 820 | 2 242 213 |
| Tanzania | 28 684 | 18 000 | 17 180 | 17 000 | 8 500 |
| Togo | 842 508 | 725 547 | 695 123 | 865 616 | 1 100 000 |
| Tunisia | 7 691 700 | 7 409 000 | 8 148 500 | 2 479 400 | 2 762 300 |
| Zimbabwe | 21 051 | 32 100 | 56 656 | 46 047 | 34 600 |
| | | | | | |
| Canada | 983 000 | 901 388 | 826 858 | 851 308 | 516 000 |
| Mexico | 969 094 | 1 421 823 | 1 507 402 | 1 690 606 | 1 724 662 |
| USA | 30 200 000 | 26 400 000 | 25 800 000 | 28 100 000 | * 29 200 000 |
| | | | | | |
| Brazil (b) | 6 730 000 | 6 084 000 | 6 192 000 | 6 738 000 | 6 500 000 |
| Chile | | | | | |
| Phosphate | 41 186 | 13 292 | 50 528 | 15 929 | 15 601 |
| Guano | 2 892 | 1 649 | 845 | 1 625 | 1 266 |
| Colombia | * 48 000 | * 48 000 | * 50 000 | * 50 000 | * 50 000 |
| Peru | — | — | 1 134 086 | 8 889 295 | 10 345 925 |
| Venezuela | 213 981 | 362 753 | 85 240 | 81 500 | 159 400 |
| | | | | | |
| China | 50 740 600 | 60 208 900 | 68 070 000 | 81 223 000 | 95 296 000 |
| Christmas Island (a)(c)(d) | * 700 000 | 563 000 | 566 645 | 616 000 | 653 000 |
| India (e) | 1 803 954 | 1 605 489 | 2 097 490 | 2 326 876 | 2 136 000 |
| Iran | 42 097 | 61 231 | * 62 000 | 98 081 | * 100 000 |
| Iraq | — | 45 000 | 55 000 | 52 720 | 100 000 |
| Israel | 3 088 000 | 2 697 000 | 2 777 200 | 3 021 955 | 2 488 496 |
| Jordan | 6 266 000 | 5 280 693 | 6 528 708 | 7 643 228 | * 8 000 000 |
| Kazakhstan | 2 470 600 | 1 204 700 | 1 755 000 | 1 716 200 | 1 868 200 |
| Korea, Dem. P.R. of | * 300 000 | * 100 000 | * 100 000 | * 100 000 | * 100 000 |
| Pakistan (a) | 6 580 | 17 625 | 47 385 | 30 950 | 69 400 |
| Philippines | | | | | |
| Phosphate | 2 271 | 2 257 | 2 308 | 2 778 | * 2 800 |
| Guano | 254 | 251 | 272 | 310 | * 320 |
| Sri Lanka | 41 947 | 36 347 | 47 778 | 58 254 | * 59 000 |
| Syria | 3 221 379 | 2 466 150 | 3 764 900 | 3 541 900 | 1 780 300 |
| Thailand | 3 675 | 658 | 35 783 | 3 300 | 1 990 |
| Uzbekistan | 700 000 | 700 000 | 657 900 | 652 600 | 664 300 |
| Vietnam | 2 100 700 | 2 047 400 | 2 324 500 | 2 395 300 | 2 364 500 |
| | | | | | |
| Australia (a) | 2 156 848 | 1 962 893 | 2 135 801 | 2 388 038 | 884 643 |
| Nauru (c) | 497 469 | 146 816 | 407 654 | 436 563 | 521 491 |
| | | | | | |
| World Total | 164 000 000 | 161 000 000 | 182 000 000 | 202 000 000 | 215 000 000 |

Note(s)
(1) In addition to the countries listed, Indonesia and Nigeria are believed to produce phosphate rock

(a) Years ended 30 June of that stated
(b) Including beneficiated and directly shipped material
(c) Exports
(d) Including phosphate dust
(e) Years ended 31 March following that stated

# Platinum group metals

*Platinum (Pt), Palladium (Pd), Rhodium (Rh), Ruthenium (Ru), Iridium (Ir), Osmium (Os)*

**Relative supply risk index**
**7.6**

## Top 10 producers

| | % of world total |
|---|---|
| South Africa | 59% |
| Russia | 27% |
| Canada | 5% |
| USA | 4% |
| Zimbabwe | 4% |
| Botswana | 1% |
| China | 0.5% |
| Colombia | 0.3% |
| Australia | 0.2% |
| Poland | 0.01% |

## End uses

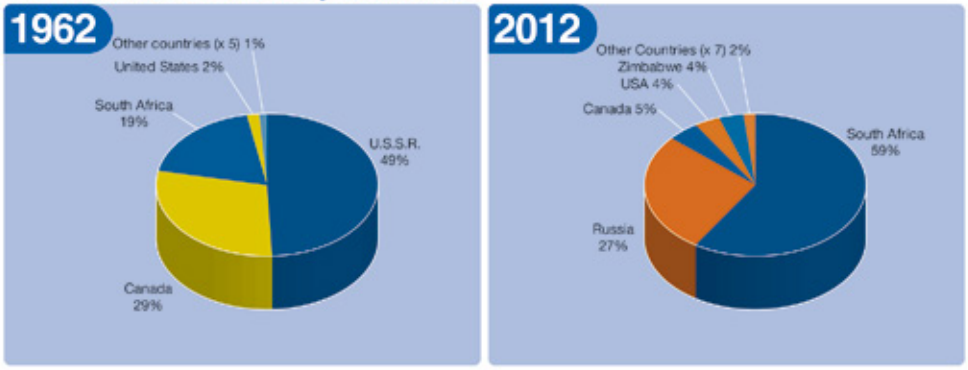
**Autocatalysts:** used in catalytic converters to reduce engine emissions

**Jewellery:** commonly alloyed with copper

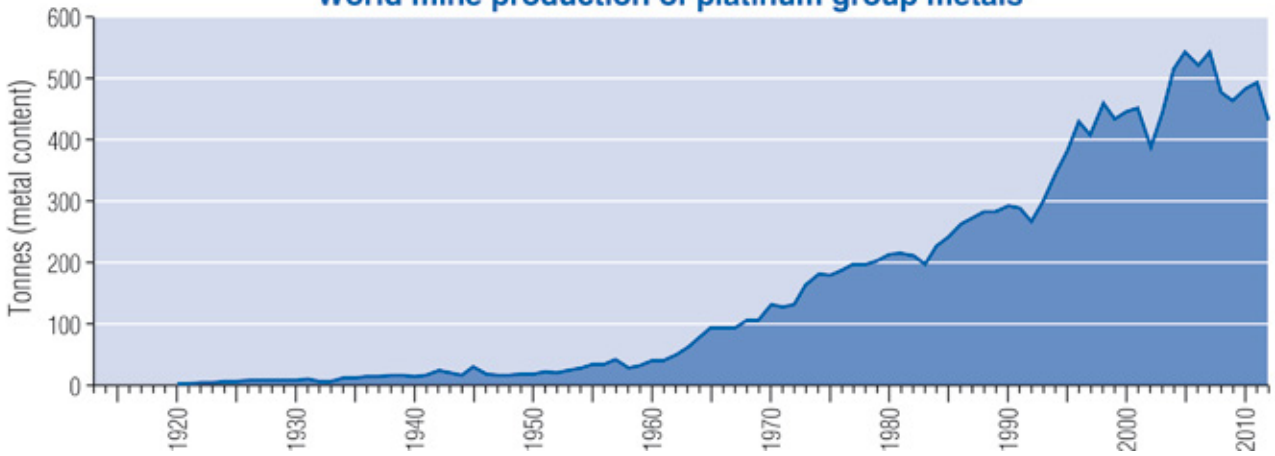
**Investment:** bars, coins and exchange-traded funds

**Catalysts:** e.g. for the production of nitric acid and other chemicals

## Distribution of world production




## World mine production of platinum group metals



## Mine production of platinum group metals

kilograms (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Finland | | | | | |
| Platinum | — | — | — | — | 429 |
| Palladium | — | — | — | — | 379 |
| Poland | | | | | |
| Platinum | 30 | 30 | 30 | * 30 | * 30 |
| Palladium | 20 | 20 | 20 | * 20 | * 20 |
| Russia | | | | | |
| Platinum (a) | 25 000 | 24 400 | 26 500 | 26 500 | 24 900 |
| Palladium (a) | 113 800 | 113 100 | 115 700 | 107 500 | 89 900 |
| Other platinum metals (a) | 2 600 | 2 200 | 2 200 | 2 100 | 2 800 |
| Serbia | | | | | |
| Platinum | — | 12 | — | — | 6 |
| Palladium | 70 | 38 | 22 | 20 | 4 |
| Botswana | | | | | |
| Platinum | 591 | 746 | 498 | 373 | 435 |
| Palladium | 2 955 | 4 728 | 2 830 | 2 115 | 2 613 |
| Ethiopia | | | | | |
| Platinum (b) | 10 | 8 | 1 | 1 | * 1 |
| South Africa | | | | | |
| Platinum | 146 141 | 140 819 | 147 790 | 148 008 | 128 590 |
| Palladium | 75 537 | 75 118 | 82 222 | 82 731 | 74 738 |
| Other platinum metals | 54 089 | 55 456 | 57 292 | 58 111 | 51 010 |
| Zimbabwe | | | | | |
| Platinum | 5 495 | 6 849 | 8 639 | 10 827 | 7 664 |
| Palladium | 4 274 | 5 354 | 6 916 | 8 422 | 5 901 |
| Other platinum metals | 928 | 1 190 | 1 536 | 2 162 | 2 090 |
| Canada | | | | | |
| Platinum | * 8 500 | * 4 000 | * 3 600 | * 8 000 | * 7 000 |
| Palladium | * 14 700 | * 6 900 | * 6 200 | * 14 000 | * 12 000 |
| Other platinum metals | * 1 000 | * 500 | * 400 | * 900 | * 800 |
| USA | | | | | |
| Platinum | 3 577 | 3 826 | 3 450 | 3 700 | * 3 700 |
| Palladium | 11 944 | 12 659 | 11 600 | 12 400 | * 12 200 |
| Colombia | 1 370 | 929 | 997 | 1 231 | 1 460 |
| China | | | | | |
| Platinum | * 1 400 | * 1 400 | * 1 400 | * 1 400 | * 1 400 |
| Palladium | * 700 | * 700 | * 700 | * 700 | * 700 |
| Australia | | | | | |
| Palladium (c) | 710 | 1 034 | 781 | 445 | 706 |
| World Total | 475 000 | 462 000 | 481 000 | 492 000 | 431 000 |

Note(s)

(1) Wherever possible, figures relate to quantities of platinum group metals thought to be recovered from ores originating in the country stated

(2) Figures for metal production are only given for countries where recovery is thought to be based predominantly on domestic materials or on imported materials which have not been recorded as mine production elsewhere in the table

(3) In addition to the production listed, concentrates produced in Spain, and possibly other countries, are believed to be processed in China to recover platinum group metals

(a) Sales from mine production and stocks

(b) Years ending 7 July of that stated

(c) Platinum group metals; all forms

## Production of potash

tonnes ($K_2O$ content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Belarus | 4 967 000 | 2 485 400 | 5 222 600 | 5 305 800 | 4 830 700 |
| Germany | | | | | |
| Potassic salts | 3 280 467 | 1 825 139 | 3 023 941 | 3 214 696 | 3 149 386 |
| Russia | 5 935 400 | 3 690 900 | 6 128 100 | 6 526 300 | 5 403 300 |
| Spain | | | | | |
| Chloride | 472 952 | 481 455 | 418 778 | 436 026 | 421 652 |
| United Kingdom | | | | | |
| Chloride | 403 800 | * 403 800 | * 403 800 | * 462 000 | * 462 000 |
| Canada | | | | | |
| Chloride | 10 379 000 | 4 318 000 | 9 788 000 | 11 005 000 | 8 962 717 |
| USA | | | | | |
| Potassic salts | 1 100 000 | 700 000 | 930 000 | 1 000 000 | * 900 000 |
| Brazil | | | | | |
| Chloride | 383 000 | 452 698 | 417 990 | 423 850 | 548 500 |
| Chile | | | | | |
| Chloride | 578 000 | 713 000 | 961 000 | 864 000 | 1 062 437 |
| China | 1 980 000 | 2 062 000 | 2 344 500 | 2 598 800 | 2 559 000 |
| Israel | | | | | |
| Chloride | 2 134 000 | 2 446 200 | 2 041 342 | 1 789 721 | 2 115 468 |
| Jordan | 1 200 000 | 1 199 400 | 1 284 791 | 1 355 160 | 1 094 400 |
| World Total | 32 800 000 | 20 800 000 | 33 000 000 | 35 000 000 | 31 500 000 |

## Production of rare earth oxides

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia | 2 470 | * 2 500 | * 2 500 | * 2 500 | * 2 500 |
| USA | — | — | — | — | * 4 200 |
| Brazil | 540 | 200 | 160 | * 188 | * 190 |
| China (a) | * 124 500 | * 129 400 | * 118 900 | * 105 000 | * 95 000 |
| India (b)(c) | 22 | 16 | — | — | — |
| Malaysia | 150 | 20 | 471 | 498 | 114 |
| Australia | — | — | — | 2 188 | 2 612 |

Note(s)
(1) All the figures in this table are either reported as rare earth oxides or are calculated to rare earth oxide equivalent.
(2) Prior to the 2005-2009 edition of this book, a table for the production of 'rare earth minerals' was included rather than the current 'rare earth oxides'. Users should exercise caution when comparing statistics over longer time periods.
(3) Although rare earth minerals are believed to be extracted in other countries, there is insufficient evidence to suggest that rare earth oxides are produced in those countries.

(a) Includes production from iron ore extraction, bastnasite concentrates and ion absorption clays
(b) Years ending 31 March following that stated
(c) May include small quantities of other rare earth compounds

## Production of rhenium

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Armenia | * 0 | * 0 | * 0 | * 1 | * 1 |
| Poland | 5 | 4 | 4 | 5 | * 5 |
| Russia | * 2 | * 2 | * 2 | * 1 | * 1 |
| USA | 8 | 6 | 6 | 9 | * 9 |
| Chile | * 28 | * 25 | * 25 | * 27 | * 27 |
| Peru | * 5 | * 5 | * 5 | * — | * — |
| China | * 1 | * 1 | * 1 | * 1 | * 1 |
| Kazakhstan | * 6 | * 3 | * 2 | * 3 | * 3 |
| Uzbekistan | * 1 | * 0 | * 0 | * 0 | * 0 |

## Production of salt

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Albania | | | | | |
| Sea salt | * 47 000 | * 47 000 | * 47 000 | * 47 000 | * 47 000 |
| Armenia | 37 334 | 29 402 | 29 440 | 35 570 | 37 798 |
| Austria | | | | | |
| Rock salt | 503 | 50 | 95 | 169 | 222 |
| Salt in brine | 866 674 | 1 035 044 | 1 071 842 | 1 150 474 | 3 193 216 |
| Azerbaijan | 7 527 | 5 466 | 4 449 | 18 848 | * 19 000 |
| Belarus | 1 866 499 | 2 089 282 | 2 411 683 | 2 617 565 | 2 176 650 |
| Bosnia & Herzegovina | 538 357 | 556 089 | 566 101 | 721 046 | 743 807 |
| Bulgaria | 2 100 000 | 1 300 000 | 1 900 000 | 2 200 000 | 2 100 000 |
| Croatia | 54 937 | 57 186 | 66 835 | 53 963 | 45 992 |
| Denmark | 496 593 | 511 063 | 601 046 | * 600 000 | * 600 000 |
| France (a) | * 6 100 000 | * 6 100 000 | * 6 100 000 | * 6 100 000 | * 6 100 000 |
| Germany | | | | | |
| Rock salt | 5 545 438 | 7 709 844 | 9 992 156 | 8 765 168 | 5 938 855 |
| Brine salt | 989 208 | 1 862 630 | 2 118 484 | 2 217 205 | 2 182 440 |
| Salt in brine | 7 306 745 | * 7 300 000 | * 4 500 000 | * 6 500 000 | * 10 900 000 |
| Greece | * 220 000 | * 189 000 | * 190 000 | * 190 000 | * 190 000 |
| Italy | | | | | |
| Rock salt & brine salt | 5 412 449 | 3 678 234 | 4 006 882 | 2 912 128 | 2 862 440 |
| Montenegro | | | | | |
| Sea salt | 25 200 | 17 000 | 11 200 | 10 000 | 16 000 |
| Netherlands | 6 200 000 | 5 967 000 | 5 982 000 | 6 866 000 | 6 513 000 |
| Poland | | | | | |
| Rock salt | 618 111 | 988 545 | 1 221 700 | 1 254 000 | 793 000 |
| Brine salt | 2 783 198 | 2 533 413 | 2 464 363 | 2 633 300 | 2 732 200 |
| Other salt | 706 618 | 763 385 | 763 515 | 768 000 | 724 000 |
| Portugal | | | | | |
| Rock salt | 606 545 | 594 578 | 618 961 | 631 295 | 520 284 |
| Sea salt | 69 249 | 72 325 | 44 574 | 47 267 | 88 693 |
| Romania | 2 526 774 | 2 072 744 | 2 388 357 | 2 248 940 | 1 888 516 |
| Russia | 1 800 000 | 1 600 000 | * 2 000 000 | * 2 000 000 | * 2 000 000 |
| Serbia | 30 115 | 28 782 | 30 816 | 23 334 | 16 506 |
| Slovakia | 109 510 | 41 000 | — | — | — |
| Slovenia | 535 | 2 924 | 59 | 4 291 | 5 684 |
| Spain | | | | | |
| Rock salt | 2 909 907 | 2 763 081 | 3 115 940 | 3 096 383 | 2 785 959 |
| Sea salt | 1 290 672 | 1 338 789 | 1 242 718 | 1 314 529 | 1 155 475 |
| Other salt | 102 149 | 99 853 | 92 644 | 92 850 | 100 643 |
| Switzerland | 368 000 | 554 000 | 643 000 | 478 324 | * 528 000 |
| Turkey | 3 271 009 | 3 765 564 | 3 134 749 | * 4 000 000 | * 4 000 000 |
| Ukraine | 4 425 317 | 5 394 512 | 4 908 186 | 5 938 000 | 6 181 415 |
| United Kingdom | 5 565 000 | 6 166 000 | 6 666 000 | 6 060 000 | * 6 100 000 |

## Production of salt

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Algeria | | | | | |
| Brine salt & sea salt | 201 603 | 269 255 | 187 160 | 245 000 | 178 000 |
| Angola | * 35 000 | * 35 000 | * 50 000 | * 40 000 | * 40 000 |
| Botswana | 170 994 | 241 114 | 364 761 | 446 525 | 389 481 |
| Burkina Faso | * 5 000 | * 5 000 | * 5 000 | * 5 000 | * 5 000 |
| Djibouti | — | — | 30 000 | 30 000 | * 30 000 |
| Egypt (b) | 1 879 351 | 2 951 636 | 2 703 250 | 2 460 462 | 2 883 577 |
| Eritrea | 26 071 | * 26 000 | * 26 000 | * 26 000 | * 26 000 |
| Ethiopia (c) | 30 414 | 41 847 | 31 401 | 125 087 | * 100 000 |
| Ghana | 238 727 | * 250 000 | * 85 000 | * 100 000 | * 150 000 |
| Guinea | * 15 000 | * 15 000 | * 15 000 | * 15 000 | * 15 000 |
| Kenya (d) | 24 345 | 24 125 | * 24 000 | * 24 000 | * 24 000 |
| Libya | * 40 000 | * 40 000 | * 40 000 | * 20 000 | * 10 000 |
| Madagascar | * 70 000 | * 70 000 | * 70 000 | * 70 000 | * 70 000 |
| Mali | * 6 000 | * 6 000 | * 6 000 | * 6 000 | * 6 000 |
| Mauritania | 570 | 455 | 391 | 690 | * 700 |
| Mauritius (e) | 5 042 | 2 301 | 3 000 | 4 000 | 3 800 |
| Morocco | 219 187 | 310 376 | 503 351 | 720 814 | * 720 000 |
| Mozambique (e) | * 110 000 | * 110 000 | * 110 000 | * 110 000 | * 110 000 |
| Namibia | 732 000 | 807 348 | 783 036 | 792 000 | 738 000 |
| Niger | * 1 300 | * 1 300 | * 1 300 | * 1 300 | * 1 300 |
| Senegal | 240 600 | 222 500 | 231 400 | 258 200 | 237 300 |
| Somalia | * 1 000 | * 1 000 | * 1 000 | * 1 000 | * 1 000 |
| South Africa | 415 996 | 408 422 | 394 493 | 381 177 | 399 135 |
| Sudan | 10 581 | 35 793 | 141 840 | 150 000 | 150 000 |
| Tanzania | 25 897 | 27 393 | 34 455 | 32 297 | 34 016 |
| Tunisia (e) | 1 063 500 | 1 260 100 | 1 804 000 | 1 180 500 | 1 131 200 |
| | | | | | |
| Bahamas | 1 024 400 | 1 043 000 | 1 183 300 | * 1 000 000 | * 1 000 000 |
| Bonaire | — | — | — | * 300 000 | * 400 000 |
| Canada | | | | | |
| Rock salt | 13 323 350 | 13 644 520 | 9 536 288 | 11 629 830 | 9 820 792 |
| Other salt (f) | 1 086 787 | 1 006 375 | 1 001 200 | 994 718 | 1 023 832 |
| Cuba | 157 300 | 265 700 | 271 800 | 280 800 | * 280 000 |
| Dominican Republic | | | | | |
| Sea salt | * 50 000 | * 50 000 | * 50 000 | * 50 000 | * 50 000 |
| El Salvador (e) | 88 650 | 87 300 | 114 100 | 98 200 | 103 100 |
| Guatemala (e) | * 60 000 | * 50 000 | * 50 000 | * 50 000 | * 50 000 |
| Honduras | * 40 000 | * 40 000 | * 40 000 | * 40 000 | * 40 000 |
| Mexico | 8 808 714 | 7 445 025 | 8 634 098 | 9 361 454 | 10 100 935 |
| Netherlands Antilles | 343 457 | 303 565 | 337 321 | — | — |
| Nicaragua (e) | * 30 000 | * 30 000 | * 30 000 | * 30 000 | * 30 000 |
| Panama (e) | 21 053 | 19 548 | 27 587 | 16 577 | 15 596 |
| USA | | | | | |
| Rock salt (g) | 19 800 000 | 20 700 000 | 19 052 000 | 19 360 000 | 14 472 000 |
| Salt in brine (g) | 18 900 000 | 17 480 000 | 16 454 000 | 16 720 000 | 18 894 000 |
| Evaporated salt (g) | 8 580 000 | 8 280 000 | 7 794 000 | 7 920 000 | 6 834 000 |
| | | | | | |
| Argentina | 1 681 313 | 1 477 532 | 1 532 124 | 1 884 899 | * 1 900 000 |
| Brazil | | | | | |
| Rock salt | 1 528 000 | 1 443 000 | 1 415 373 | 1 300 000 | * 1 300 000 |
| Sea salt | 5 200 000 | 4 462 000 | 5 614 959 | 4 800 000 | * 5 000 000 |
| Chile | 6 431 029 | 8 382 215 | 7 694 879 | 9 966 038 | 8 057 130 |
| Colombia | | | | | |
| Rock salt | 245 170 | 255 332 | 288 676 | 305 706 | 308 547 |
| Sea salt | 386 461 | 356 797 | 139 810 | 116 265 | 211 721 |
| Ecuador | * 75 000 | * 75 000 | * 75 000 | * 75 000 | * 75 000 |
| Peru | 1 276 274 | 1 567 279 | 1 228 900 | 1 468 266 | 1 242 765 |
| Venezuela (e) | * 350 000 | * 350 000 | * 350 000 | * 350 000 | * 350 000 |

## Production of salt

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Afghanistan | 145 532 | 163 641 | 168 827 | * 169 000 | * 169 000 |
| Bangladesh (b) | 1 349 000 | 1 368 323 | 1 388 557 | 1 409 239 | 1 430 329 |
| Burma (a)(h) | 242 088 | 408 767 | 125 218 | 162 319 | 223 747 |
| Cambodia (i) | * 78 000 | * 30 000 | * 170 000 | * 95 000 | * 80 000 |
| China | 66 644 300 | 66 627 900 | 70 377 600 | 64 294 000 | 62 158 000 |
| India | | | | | |
| Rock salt (h) | 2 100 | 2 300 | 1 200 | — | — |
| Sea salt (h) | 13 970 500 | 17 478 600 | 14 202 300 | 18 188 300 | (a) 24 500 000 |
| Other salt (h) | 5 178 600 | 6 470 400 | 4 406 600 | 3 990 800 | ... |
| Indonesia | * 700 000 | 585 000 | * 600 000 | * 650 000 | * 650 000 |
| Iran (j) | 2 158 280 | 2 816 235 | 3 291 063 | 2 714 735 | * 2 800 000 |
| Iraq | 108 870 | 113 130 | 102 000 | 136 007 | 143 441 |
| Israel (e) | 420 809 | 356 889 | 420 749 | 399 649 | 414 984 |
| Japan (h) | 1 132 000 | 1 095 000 | 1 122 000 | 978 000 | 925 000 |
| Jordan | 25 400 | 2 500 | 32 542 | — | — |
| Kazakhstan | 438 047 | 222 942 | 276 131 | 364 222 | 463 960 |
| Korea (Rep. of) | 384 304 | 382 270 | 222 509 | 372 230 | 308 847 |
| Korea, Dem. P.R. of | * 500 000 | * 500 000 | * 500 000 | * 500 000 | * 500 000 |
| Kuwait | * 50 000 | * 50 000 | * 50 000 | * 50 000 | * 50 000 |
| Laos | 25 100 | 27 700 | 32 240 | 35 100 | 47 600 |
| Lebanon | * 15 000 | * 15 000 | * 15 000 | * 15 000 | * 15 000 |
| Mongolia | 1 177 | 1 402 | 1 862 | 2 183 | 2 461 |
| Oman | 10 400 | 30 600 | 12 300 | 12 400 | 12 800 |
| Pakistan | | | | | |
| Rock salt (b) | 1 849 199 | 1 917 486 | 1 943 527 | 1 953 711 | 2 135 760 |
| Sea salt (b) | 240 269 | 31 293 | 174 786 | 286 697 | 292 135 |
| Philippines (e) | 510 059 | 516 066 | 557 644 | 720 146 | * 725 000 |
| Saudi Arabia | | | | | |
| Rock salt & brine salt | 1 600 000 | 1 600 000 | 1 800 000 | 1 900 000 | * 2 000 000 |
| Sri Lanka | 65 972 | 102 500 | 104 000 | 87 256 | * 85 000 |
| Syria | 88 600 | 78 263 | * 80 000 | * 80 000 | * 80 000 |
| Taiwan | 118 046 | 171 583 | 262 594 | 104 854 | 70 750 |
| Tajikistan | 47 446 | 49 772 | 50 365 | 26 994 | 27 954 |
| Thailand | | | | | |
| Rock salt | 1 211 581 | 1 376 037 | 1 405 406 | 1 359 493 | 1 363 539 |
| Other salt | * 100 000 | * 100 000 | * 100 000 | * 100 000 | * 100 000 |
| Turkmenistan | * 215 000 | * 215 000 | * 215 000 | * 215 000 | * 215 000 |
| Uzbekistan | * 60 000 | * 60 000 | * 60 000 | * 60 000 | * 60 000 |
| Vietnam | 717 500 | 679 000 | 975 300 | 862 000 | 1 177 900 |
| Yemen, Republic of | 69 000 | * 70 000 | * 70 000 | * 70 000 | * 70 000 |
| Australia | 11 160 000 | 10 316 000 | 12 054 000 | 11 403 000 | 10 821 000 |
| New Zealand | 67 000 | 67 000 | 60 000 | 70 000 | 88 000 |
| World Total | 271 800 000 | 279 300 000 | 276 900 000 | 280 800 000 | 276 500 000 |

Note(s)
(1) This table does not include production of refined salt
(2) Salt is known to be produced in many countries for which statistics are not available.

(a) Salt; all forms
(b) Years ended 30 June of that stated
(c) Years ended 7 July of that stated
(d) Lake salt
(e) Sea salt
(f) Including salt in brine
(g) Sold or used by producers
(h) Years ended 31 March following that stated
(i) Seasons beginning in November and ending in May of the year stated.
(j) Years ended 20 March following that stated

## Production of selenium metal

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Belgium | * 200 | * 200 | * 200 | * 200 | * 200 |
| Finland | 65 | 59 | 73 | 86 | 93 |
| Germany | * 250 | * 230 | * 250 | * 250 | * 250 |
| Poland | 82 | 80 | 79 | 85 | 90 |
| Russia | * 170 | * 160 | * 170 | * 265 | * 172 |
| Sweden | 139 | 129 | 72 | * 70 | * 70 |
| Canada | 191 | 173 | 97 | 35 | 144 |
| Mexico | — | — | 62 | 95 | 95 |
| Peru | 60 | 61 | 59 | 54 | 42 |
| China | * 65 | * 65 | * 65 | * 65 | * 65 |
| Japan | 754 | 709 | 754 | 809 | 820 |
| Kazakhstan | * 130 | * 120 | * 130 | * 130 | * 130 |
| Philippines | * 65 | * 65 | * 65 | * 65 | * 70 |
| Uzbekistan | * 20 | * 20 | * 20 | * 20 | * 20 |

Note(s)
(1) In addition to the countries listed, Australia, Chile, the Republic of Korea and Zimbabwe are believed to produce selenium

## Production of sillimanite minerals

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| France | | | | | |
| Andalusite | * 65 000 | * 65 000 | * 65 000 | * 65 000 | * 68 000 |
| South Africa | | | | | |
| Andalusite | 216 667 | * 245 000 | * 245 000 | * 295 000 | * 265 000 |
| USA | | | | | |
| Kyanite (a) | 97 200 | 71 000 | 93 000 | 98 000 | * 95 000 |
| Brazil | | | | | |
| Kyanite (b) | * 200 | * 200 | * 200 | * 200 | * 200 |
| India | | | | | |
| Kyanite (c) | 4 620 | 5 495 | 5 954 | 4 064 | 1 061 |
| Sillimanite (c) | 33 702 | 33 687 | 48 784 | 58 043 | 43 867 |
| Nepal | | | | | |
| Kyanite (d) | 15 | 10 | * 24 | 25 | 29 |

Note(s)
(1) A number of other countries produce sillimanite minerals but details of output are not reported
(2) In addition to the countries listed above as producing sillimanite minerals, synthetic mullite is believed to be produced in Brazil, Germany and Hungary.
(3) Production capacity for synthetic mullite also exists in China, India, Japan, USA and United Kingdom but output is believed to be zero.

(a) Including related minerals
(b) Including beneficiated and directly shipped material
(c) Years ended 31 March following that stated
(d) Years ending 15 July of that stated

## Mine production of silver

kilograms (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Armenia | 9 200 | 9 000 | 16 400 | 16 100 | 14 000 |
| Azerbaijan | — | — | 1 400 | 3 805 | 3 700 |
| Bulgaria | * 55 000 | * 55 000 | * 55 000 | * 55 000 | * 55 000 |
| Finland | 69 906 | 70 062 | 64 596 | 73 081 | 128 200 |
| Greece | 33 500 | 27 500 | 29 000 | * 29 000 | * 31 000 |
| Greenland | — | — | — | 9 | 27 |
| Ireland, Republic of | 7 172 | 5 267 | 3 818 | 6 109 | 9 454 |
| Macedonia | * 40 000 | * 35 000 | * 32 000 | * 30 000 | * 31 000 |
| Poland | 1 221 000 | 1 221 000 | 1 183 000 | 1 167 000 | 1 149 000 |
| Portugal | 26 273 | 20 483 | 20 561 | 28 027 | 29 890 |
| Romania | * 18 000 | * 18 000 | * 18 000 | * 18 000 | * 18 000 |
| Russia (a) | 1 132 200 | 1 312 600 | 1 144 600 | 1 134 000 | 1 399 600 |
| Serbia (a) | 2 300 | 4 424 | 4 384 | 7 380 | 8 388 |
| Slovakia | 198 | 201 | 320 | 330 | 441 |
| Spain | — | 2 200 | 20 800 | 29 900 | 32 603 |
| Sweden | 293 068 | 288 590 | 302 145 | 301 959 | 309 337 |
| Turkey | * 294 000 | 351 600 | 348 000 | 292 400 | 236 400 |
| United Kingdom | 398 | 514 | 506 | 531 | 230 |
| | | | | | |
| Algeria | 114 | 200 | 147 | 70 | 42 |
| Congo, Democratic Republic | 34 100 | — | 5 875 | 9 187 | 12 342 |
| Ethiopia (b) | 2 714 | 771 | 771 | 715 | 25 078 |
| Ghana | 3 200 | 3 928 | * 3 900 | * 3 900 | * 3 900 |
| Morocco | 201 195 | 210 000 | 243 000 | 227 100 | 230 200 |
| Namibia | (a) 1 215 | (a) 700 | — | 1 841 | 2 376 |
| Niger | 289 | 256 | 326 | * 300 | * 300 |
| South Africa | 75 199 | 77 780 | 79 315 | 73 180 | 67 304 |
| Sudan | — | 413 | 631 | * 700 | 700 |
| Tanzania | 10 388 | 8 231 | 12 040 | 13 524 | 11 227 |
| Zimbabwe | 500 | — | — | — | — |
| | | | | | |
| Canada | 755 103 | 617 777 | 591 482 | 572 333 | 705 392 |
| Dominican Republic | 2 934 | 23 120 | 22 816 | 18 169 | 27 296 |
| Guatemala | 99 131 | 127 836 | 190 973 | 272 771 | 204 555 |
| Honduras | 58 936 | 57 698 | 58 158 | 48 365 | 50 605 |
| Mexico | 3 236 312 | 3 553 841 | 4 410 749 | 4 777 710 | 5 358 195 |
| Nicaragua | 3 720 | 4 491 | 6 995 | 7 928 | 9 082 |
| USA | 1 250 000 | 1 245 000 | 1 270 000 | 1 120 000 | 1 055 000 |
| | | | | | |
| Argentina | 355 596 | 415 235 | 693 600 | 702 000 | 750 000 |
| Bolivia | 1 114 000 | 1 325 730 | 1 259 000 | 1 215 586 | 1 207 000 |
| Brazil | 17 412 | 14 590 | 14 630 | 15 238 | * 15 200 |
| Chile | 1 405 020 | 1 301 018 | 1 286 688 | 1 291 272 | 1 194 521 |
| Colombia | 9 162 | 10 827 | 15 300 | 24 045 | 19 368 |
| Ecuador | 300 | 100 | 1 200 | 1 400 | * 1 500 |
| Peru | 3 685 931 | 3 922 708 | 3 640 444 | 3 418 862 | 3 480 587 |
| | | | | | |
| China | * 2 800 000 | * 2 900 000 | 3 085 441 | 3 231 626 | 3 639 100 |
| India (c) | 105 284 | 138 780 | 148 303 | 207 142 | * 328 000 |
| Indonesia | 226 051 | 359 451 | 335 040 | 227 173 | * 200 000 |
| Iran | * 40 000 | * 40 000 | * 40 000 | * 40 000 | * 40 000 |
| Japan | 3 726 | 4 469 | 4 981 | 4 486 | 3 536 |
| Kazakhstan (a) | 645 627 | 613 544 | 552 060 | 650 649 | 963 182 |
| Korea (Rep. of) | 1 500 | 1 700 | 2 025 | 2 649 | 2 925 |
| Korea, Dem. P.R. of | * 50 000 | * 50 000 | * 50 000 | * 50 000 | * 50 000 |
| Laos | 6 706 | 14 726 | 17 234 | 17 976 | 20 221 |
| Malaysia | 349 | 367 | 436 | 459 | 1 627 |
| Mongolia | 19 954 | 20 397 | 19 641 | 19 107 | 19 118 |
| Oman | 2 140 | 2 162 | 1 290 | 1 979 | 486 |
| Philippines | 14 224 | 33 808 | 41 004 | 45 530 | 67 477 |
| Saudi Arabia | 8 233 | 8 527 | 7 600 | 5 800 | * 5 500 |
| Tajikistan | 3 100 | 3 100 | 3 100 | 1 800 | 1 800 |
| Thailand | 5 465 | 15 300 | 15 300 | 16 423 | 24 524 |
| Uzbekistan | 74 600 | 52 900 | 59 100 | * 60 000 | * 60 000 |

## Mine production of silver

kilograms (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Australia | 1 926 000 | 1 631 000 | 1 880 000 | 1 725 000 | 1 757 000 |
| Fiji | 265 | 313 | 328 | 418 | 342 |
| New Zealand | 18 269 | 14 264 | 17 136 | 14 324 | 5 630 |
| Papua New Guinea | 48 062 | 55 082 | 83 957 | 90 055 | 81 332 |
| Solomon Islands | — | — | — | 592 | 902 |
| World Total | 21 524 000 | 22 304 000 | 23 417 000 | 23 422 000 | 25 161 000 |

Note(s)
(a) Smelter and/or refinery production
(b) Years ended 7 July of that stated
(c) Years ended 31 March following that stated

## Production of natural sodium carbonate

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Botswana | 263 566 | 215 188 | 240 898 | 257 851 | 248 629 |
| Ethiopia (a) | 3 707 | 4 046 | 4 046 | 3 650 | * 4 000 |
| Kenya | 502 846 | 404 904 | 473 689 | 499 100 | * 500 000 |
| USA | 11 300 000 | 9 310 000 | 10 600 000 | 10 700 000 | * 10 900 000 |

Note(s)
(a) Years ended 7 July of that stated

## Production of strontium minerals

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Spain | 138 590 | 57 466 | 83 035 | 97 102 | 84 818 |
| Turkey | * 1 600 | — | — | — | — |
| Morocco | * 2 700 | * 2 600 | * 2 500 | * 2 500 | * 2 500 |
| Mexico | 29 621 | 36 127 | 31 429 | 40 669 | 46 190 |
| Argentina (a) | 14 910 | 8 169 | 8 512 | 1 056 | * 1 000 |
| China | * 700 000 | * 700 000 | * 700 000 | * 700 000 | * 700 000 |
| Iran | — | 15 396 | * 15 500 | 40 000 | * 40 000 |
| Pakistan (b) | 1 310 | 470 | 160 | — | — |

Note(s)
(1) In addition to the countries listed, Germany and Poland are believed to produce strontium minerals

(a) May contain unbeneficiated material
(b) Years ended 30 June of that stated

## Production of sulphur and pyrites

tonnes (sulphur content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria | | | | | |
| Recovered (a) | 48 024 | 48 624 | 40 512 | 48 612 | 47 572 |
| Belarus | | | | | |
| Recovered (a) | 44 016 | 47 188 | 41 606 | 45 625 | 58 322 |
| Denmark | | | | | |
| Recovered (a) | 3 467 | 4 200 | 3 246 | 3 045 | 3 925 |
| Finland | | | | | |
| Pyrites | 226 000 | 153 600 | 250 000 | 338 000 | 375 000 |
| Recovered (b) | 331 000 | 273 600 | 270 000 | 940 000 | 990 000 |
| Recovered (a) | 117 000 | 127 000 | 122 000 | 133 300 | * 140 000 |
| Germany | | | | | |
| Recovered (a) | 1 578 000 | 1 504 000 | 1 455 000 | 1 465 000 | * 1 460 000 |
| Recovered (c) | 39 000 | 565 000 | 513 000 | 542 210 | 493 169 |
| Lithuania | | | | | |
| Recovered (a) | 73 870 | 69 722 | 73 470 | 76 699 | 73 040 |
| Norway | | | | | |
| Recovered (b) | * 95 000 | * 90 000 | * 96 000 | * 96 000 | * 96 000 |
| Recovered (a) | 28 000 | 25 000 | 22 000 | 19 000 | * 20 000 |
| Poland | | | | | |
| Frasch | 762 119 | 262 769 | 516 742 | 657 100 | 676 500 |
| Recovered (b) | 294 000 | 257 000 | 253 000 | 310 500 | * 300 000 |
| Recovered (a) | 215 000 | 214 382 | 250 075 | 259 000 | 285 000 |
| Russia | | | | | |
| Pyrites | 161 000 | 71 000 | * 71 000 | * 71 000 | * 71 000 |
| Recovered (a) | 6 513 000 | 5 514 000 | 6 406 000 | 6 557 000 | * 6 600 000 |
| Recovered (c) | 752 000 | 703 000 | 898 700 | 915 000 | * 920 000 |
| Sulphur ore | * 50 000 | * 50 000 | * 50 000 | * 50 000 | * 50 000 |
| Spain | | | | | |
| Recovered (b) | 551 000 | 533 000 | 547 000 | 490 000 | * 450 000 |
| Recovered (a) | * 100 000 | * 100 000 | * 100 000 | * 100 000 | * 100 000 |
| Sweden | | | | | |
| Recovered (b) | 199 600 | 186 100 | 179 833 | 202 289 | 194 279 |
| Recovered (a) | 84 456 | 83 646 | 83 947 | 92 973 | 93 442 |
| Other Europe (d) | 3 628 000 | 3 606 000 | 3 571 000 | 3 674 000 | 3 625 000 |
| | | | | | |
| South Africa | | | | | |
| Pyrites | 61 278 | 60 244 | 30 309 | — | — |
| Recovered (b) | 187 000 | 185 000 | 165 000 | * 109 000 | * 100 000 |
| Recovered (a) | 323 000 | 291 000 | 262 000 | * 229 000 | * 230 000 |
| Zimbabwe | | | | | |
| Pyrites | 30 308 | — | — | — | — |
| Other Africa (d) | 381 000 | 436 000 | 475 000 | 358 000 | 330 000 |
| | | | | | |
| Canada | | | | | |
| Recovered (b) | 1 147 732 | 890 899 | 979 232 | 638 000 | 638 000 |
| Recovered (a) | 7 007 706 | 6 570 503 | 6 492 699 | 5 970 000 | 5 545 000 |
| Mexico | | | | | |
| Recovered (b) | 441 000 | 412 000 | 425 000 | 523 000 | * 520 000 |
| Recovered (a) | 1 040 546 | 1 114 028 | 991 802 | 959 463 | 1 010 900 |
| USA | | | | | |
| Recovered (b) | 753 000 | 749 000 | 791 000 | 720 000 | * 650 000 |
| Recovered (a) | 8 550 000 | 8 190 000 | 8 290 000 | 8 210 000 | * 8 400 000 |
| Other North and Central America (d) | 156 000 | 79 000 | 38 000 | 89 000 | 61 000 |
| | | | | | |
| Brazil | | | | | |
| Pyrites | 18 200 | 25 110 | 24 803 | 17 744 | * 20 000 |
| Recovered (b) | 359 586 | 275 593 | 286 875 | 290 000 | * 300 000 |
| Recovered (a) | 135 354 | 143 599 | 143 147 | 170 136 | * 170 000 |
| Chile | | | | | |
| Recovered (b) | 1 541 000 | 1 601 000 | 1 601 000 | 1 650 000 | * 1 650 000 |
| Colombia | | | | | |
| Recovered (a) | 6 277 | 7 311 | 7 013 | 6 375 | 7 138 |
| Sulphur ore | 56 892 | 54 367 | 59 556 | 58 073 | 63 790 |
| Other South America (d) | 1 205 000 | 1 047 000 | 868 000 | 947 000 | 948 000 |

## Production of sulphur and pyrites

tonnes (sulphur content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Abu Dhabi | | | | | |
| Recovered (a) | 1 900 000 | 1 760 000 | 1 800 000 | 1 875 000 | * 1 880 000 |
| Bahrain | | | | | |
| Recovered (a) | 80 000 | 108 439 | 138 477 | 125 648 | * 130 000 |
| China | | | | | |
| Pyrites | 6 022 000 | 4 946 000 | 6 342 900 | 6 964 300 | * 7 000 000 |
| Recovered | 5 268 000 | 5 843 000 | 6 403 900 | 7 026 100 | * 7 000 000 |
| Sulphur ore | 1 537 000 | 1 700 000 | 3 200 000 | 4 000 000 | * 4 000 000 |
| India | | | | | |
| Recovered (b) | 1 103 000 | 1 078 000 | 1 143 800 | 1 209 100 | * 1 200 000 |
| Recovered (a)(c) | 1 101 000 | 1 451 000 | 1 600 000 | 1 600 000 | * 1 600 000 |
| Iran | | | | | |
| Recovered (a) | 1 629 000 | 1 429 000 | 1 500 000 | 1 575 000 | * 1 600 000 |
| Japan | | | | | |
| Recovered (b)(e) | 1 797 000 | 1 675 000 | 1 818 600 | 1 626 500 | * 1 700 000 |
| Recovered (a) | 2 034 000 | 1 863 596 | 1 891 875 | 1 755 329 | 1 747 246 |
| Jordan | | | | | |
| Recovered (a) | * 310 000 | * 310 000 | * 310 000 | * 310 000 | * 310 000 |
| Kazakhstan | | | | | |
| Recovered (b) | 392 000 | 490 000 | 522 900 | 549 000 | * 550 000 |
| Recovered (a) | 1 732 600 | 2 250 000 | 2 350 000 | 2 450 000 | * 2 450 000 |
| Korea (Rep. of) | | | | | |
| Recovered (b) | 990 000 | 899 000 | 1 029 400 | 1 078 400 | * 1 100 000 |
| Recovered (a) | * 660 000 | * 660 000 | * 660 000 | * 660 000 | * 660 000 |
| Oman | | | | | |
| Recovered (a) | * 30 000 | * 30 000 | * 30 000 | * 30 000 | * 30 000 |
| Pakistan | | | | | |
| Recovered (f) | 29 485 | 25 784 | 26 641 | 27 645 | 25 560 |
| Qatar | | | | | |
| Recovered (a) | 526 666 | 657 954 | 1 124 210 | 1 655 937 | 1 724 117 |
| Saudi Arabia | | | | | |
| Recovered (a) | 3 100 000 | 3 214 000 | 3 200 000 | 3 250 000 | * 3 200 000 |
| Syria | | | | | |
| Recovered (a) | 40 491 | 40 000 | 50 000 | 60 000 | * 60 000 |
| Taiwan | | | | | |
| Recovered | 211 869 | 252 392 | 231 700 | 219 975 | 231 296 |
| Other Asia (d) | 2 576 000 | 2 495 000 | 2 530 000 | 2 640 000 | 2 626 000 |
| Australasia (d) | 964 000 | 1 024 000 | 1 026 000 | 1 026 000 | 1 025 000 |
| World Total | | | | | |
| Pyrites | 6 600 000 | 5 400 000 | 6 800 000 | 7 500 000 | 7 600 000 |
| Frasch | 800 000 | 300 000 | 500 000 | 700 000 | 700 000 |
| Recovered | 64 200 000 | 63 300 000 | 65 900 000 | 67 400 000 | 67 200 000 |
| Sulphur Ore | 1 800 000 | 1 900 000 | 3 400 000 | 4 200 000 | 4 200 000 |

Note(s)
(1) Other Europe includes: Belgium, Bosnia & Herzegovina, Bulgaria, Croatia, Czech Republic, France, Greece, Hungary, Italy, Netherlands, Portugal, Romania, Serbia, Slovakia, Turkey, Ukraine and the United Kingdom
(2) Other Africa includes: Algeria, Egypt, Libya and Zambia
(3) Other North and Central America includes: Aruba, Cuba, Curacao, Netherlands Antilles and Trinidad and Tobago
(4) Other South America includes: Argentina, Ecuador, Peru and Venezuela
(5) Other Asia includes: Indonesia, Iraq, Israel, Korea (Dem. P.R. of), Kuwait, Philippines, Singapore, Thailand and Uzbekistan
(6) Australasia includes: Australia and New Zealand

(a) From petroleum refining and/or natural gas
(b) From metal sulphide processing
(c) Other
(d) Sulphur; all forms
(e) Including S content of sulphur ore
(f) Years ended 30 June of that stated

## Production of talc

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria | 154 577 | 111 388 | 138 367 | 132 018 | 134 665 |
| Finland | 527 686 | 375 302 | 419 345 | 429 494 | 396 332 |
| France | * 420 000 | 400 000 | 400 000 | 400 000 | * 400 000 |
| Greece | * 200 | * 200 | * 200 | * 200 | * 200 |
| Italy | * 110 000 | * 110 000 | * 110 000 | * 110 000 | * 110 000 |
| Macedonia | 977 | 682 | 1 292 | 547 | 286 |
| Norway | * 30 000 | 23 350 | 6 392 | 8 191 | 7 983 |
| Portugal | 11 657 | 11 567 | 11 981 | 15 462 | 15 131 |
| Romania | 1 843 | 570 | 296 | 131 | 13 |
| Russia | * 150 000 | * 150 000 | * 150 000 | * 150 000 | * 150 000 |
| Slovakia | — | — | 7 000 | 7 000 | 2 000 |
| Spain | | | | | |
| Talc | 59 299 | 47 218 | 51 897 | 11 957 | 8 857 |
| Pyrophyllite | — | — | — | 5 600 | * 5 000 |
| Sweden | 4 000 | 4 000 | 4 000 | 3 000 | — |
| United Kingdom | 2 410 | 2 861 | 2 633 | 3 708 | 3 667 |
| | | | | | |
| Egypt (a) | 68 806 | 72 090 | 35 474 | 12 934 | 21 516 |
| Morocco | | | | | |
| Talc | 220 | — | — | 516 | * 500 |
| Pyrophyllite | 25 782 | 33 442 | 27 066 | 4 613 | * 4 600 |
| South Africa | | | | | |
| Talc | 5 145 | 4 718 | 3 150 | 4 453 | 4 765 |
| Pyrophyllite | 80 704 | 114 666 | 122 511 | 121 368 | 18 734 |
| Sudan | 4 667 | 1 167 | — | * — | * — |
| | | | | | |
| Canada | 64 000 | 44 000 | 100 000 | 147 000 | 154 000 |
| Guatemala | 1 030 | 6 355 | 2 175 | 3 273 | 2 449 |
| Mexico | 16 405 | 33 421 | 870 | 51 221 | 463 214 |
| USA | 706 000 | 511 000 | 604 000 | 616 000 | * 623 000 |
| | | | | | |
| Argentina (b) | 22 218 | 22 762 | 24 820 | 24 379 | * 25 000 |
| Brazil (b) | 513 433 | 442 663 | 412 359 | 443 533 | * 450 000 |
| Chile | 961 | 790 | 238 | — | — |
| Peru | | | | | |
| Talc | 18 003 | 13 359 | 19 767 | 28 296 | 31 559 |
| Pyrophyllite | — | — | — | — | 30 399 |
| Uruguay | 890 | 1 070 | 830 | 54 880 | * 50 000 |
| | | | | | |
| Bhutan | 56 077 | 64 948 | 26 302 | 8 562 | 16 063 |
| China | * 2 200 000 | * 2 300 000 | * 2 000 000 | * 2 200 000 | * 2 200 000 |
| India | | | | | |
| Pyrophyllite (c) | 255 699 | 240 747 | 240 082 | 239 811 | 243 825 |
| Steatite (c) | 888 470 | 876 548 | 902 686 | 958 746 | * 950 000 |
| Iran (d) | 89 110 | 66 383 | 95 767 | 58 987 | * 60 000 |
| Japan | | | | | |
| Talc | * 26 000 | * 25 000 | * 24 000 | * 24 000 | * 25 000 |
| Pyrophyllite | * 350 000 | * 340 000 | * 340 000 | * 350 000 | * 340 000 |
| Korea (Rep. of) | | | | | |
| Talc | 6 438 | 5 997 | 5 729 | 15 068 | 21 625 |
| Pyrophyllite | 892 625 | 617 411 | 673 936 | 510 708 | 483 133 |
| Korea, Dem. P.R. of | * 50 000 | * 50 000 | * 50 000 | * 50 000 | * 50 000 |
| Nepal (e) | 7 996 | 6 601 | 5 674 | 3 556 | 6 935 |
| Pakistan (a) | 37 999 | 13 923 | 53 991 | 47 561 | 55 515 |
| Taiwan | — | — | 360 | 659 | 778 |
| Thailand | | | | | |
| Talc | 3 264 | 504 | 672 | 2 304 | 5 856 |
| Pyrophyllite | 106 600 | 124 384 | 2 205 | 5 300 | 35 000 |
| Vietnam | | | | | |
| Pyrophyllite | * 16 000 | * 16 000 | * 16 000 | * 16 000 | * 16 000 |

## Production of talc

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Australia (a) | * 130 000 | * 92 000 | * 80 000 | * 99 000 | * 135 000 |
| World Total | 8 100 000 | 7 400 000 | 7 200 000 | 7 400 000 | 7 800 000 |

Note(s)
(a) Years ended 30 June of that stated
(b) Including talc, agalmatolite and pyrophyllite
(c) Years ended 31 March following that stated
(d) Years ended 20 March following that stated
(e) Years ended 15 July of that stated

## Production of tantalum and niobium minerals

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Burundi | | | | | |
| Columbite-tantalite | 117 | 44 | 67 | 159 | 229 |
| Congo, Democratic Republic | | | | | |
| Columbite-tantalite | 509 | 490 | 279 | 383 | 261 |
| Ethiopia | | | | | |
| Tantalite (a) | 183 | 206 | 400 | 207 | * 200 |
| Madagascar | | | | | |
| Columbite | — | — | 21 | 8 | * 8 |
| Mozambique | | | | | |
| Tantalite | 396 | 405 | 55 | 139 | * 150 |
| Nigeria | | | | | |
| Tantalite | ... | 83 | ... | ... | ... |
| Columbite | 335 | * 300 | 128 | * 128 | * 128 |
| Rwanda | | | | | |
| Columbite-tantalite | 922 | 952 | 560 | 829 | * 900 |
| Canada | | | | | |
| Pyrochlore | * 10 200 | * 9 500 | * 10 100 | * 10 800 | * 10 900 |
| Tantalite | 161 | 266 | — | — | — |
| Brazil | | | | | |
| Pyrochlore | * 241 000 | * 276 000 | * 276 000 | * 248 000 | * 244 000 |
| Columbite-tantalite | * 440 | * 250 | * 310 | * 380 | ... |
| China | | | | | |
| Columbite-tantalite | * 350 | * 350 | * 350 | * 350 | * 350 |
| Malaysia | | | | | |
| Struverite | 216 | 176 | 84 | 110 | 262 |
| Australia | | | | | |
| Tantalite | * 940 | * 140 | — | * 240 | * 300 |
| World Total concentrates | 256 000 | 289 000 | 288 000 | 262 000 | 258 000 |
| Nb content | * 106 000 | * 120 500 | * 120 600 | * 123 400 | * 123 500 |
| Ta content | * 1 300 | * 900 | * 600 | * 700 | * 800 |

Note(s)
(1) Niobium and tantalum minerals are believed to be produced in Namibia, Russia and South Africa.
(2) The figures in this table refer to gross tonnage of tantalum and niobium concentrates
(3) Tantalum is also recovered from tin slags and is believed to have accounted for approximately 20% of raw material supplied.

(a) Years ended 7 July of that stated

## Production of tellurium metal

**tonnes (metric)**

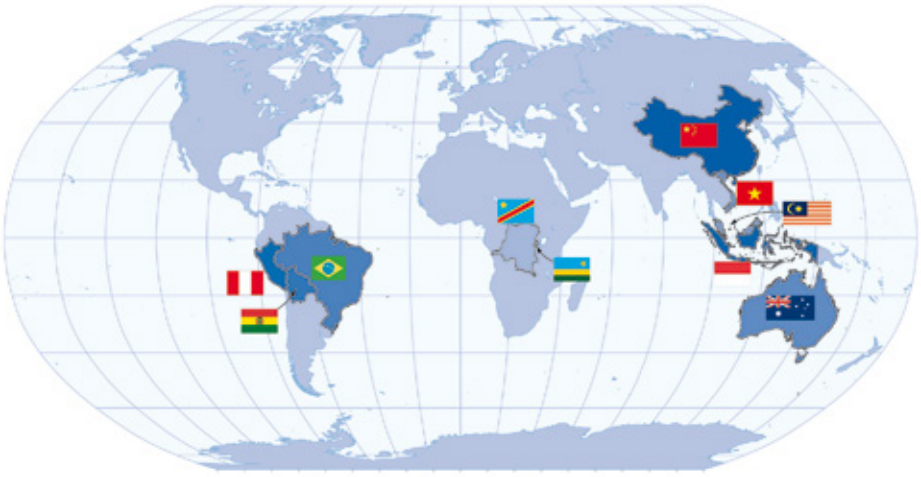
| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Canada | 20 | 16 | 8 | 6 | 11 |
| USA | 50 | 50 | 50 | * 50 | * 50 |
| Peru | 28 | 7 | — | — | — |
| Japan | * 47 | * 49 | 47 | 47 | 43 |

Note(s)
(1) In addition to the countries listed, Germany is believed to produce tellurium metal

# Tin

*Symbol Sn*

**Relative supply risk index**
**6.7**



## Top 10 producers

| | % of world total |
|---|---|
| China | 40% |
| Indonesia | 31% |
| Peru | 9% |
| Bolivia | 7% |
| Brazil | 4% |
| Australia | 2% |
| Vietnam | 2% |
| Malaysia | 1% |
| Rwanda | 1% |
| Congo, D.R of | 1% |

## End uses

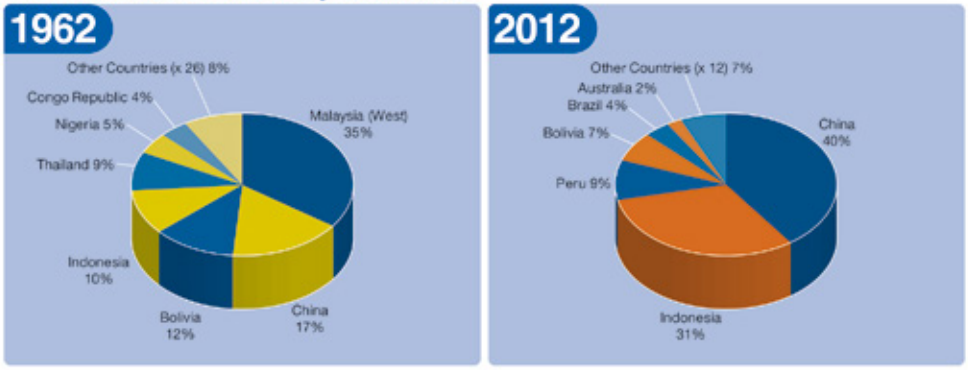
**Solder:** e.g. in electronic circuits and automotives

**Tinplate:** e.g. in food packaging

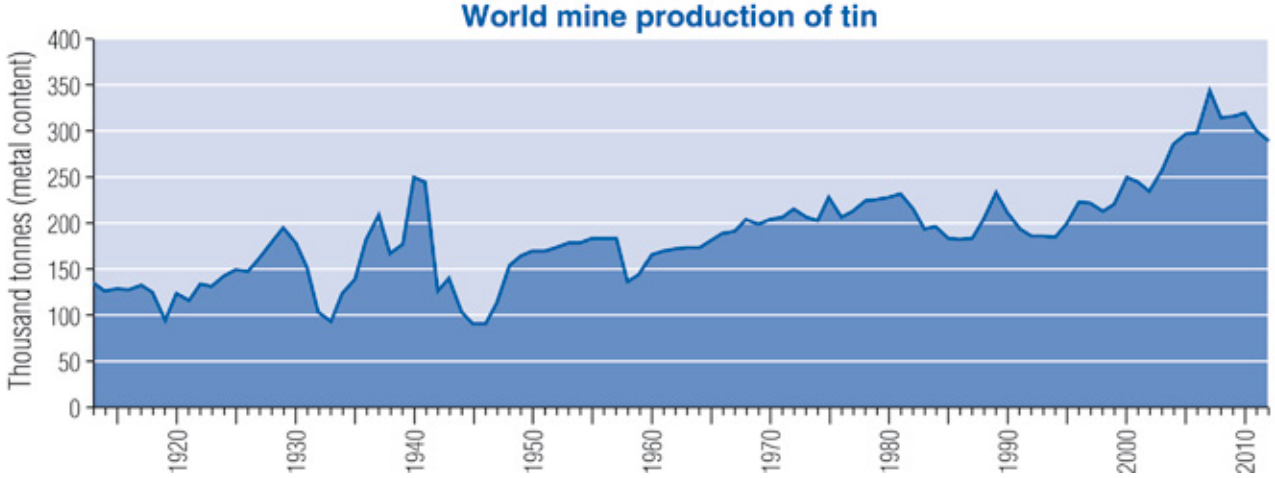
**Many chemical uses:** e.g. in dyes, glazes, textiles, mirror coatings, etc.

**Alloys:** e.g. brass used in valves, bearings and locks

## Distribution of world production




## World mine production of tin



## Mine production of tin

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Portugal | 29 | 34 | 22 | 39 | 42 |
| Russia (a) | 1 500 | 1 200 | 1 000 | 600 | 600 |
| Spain | — | — | — | 9 | 69 |
| | | | | | |
| Burundi | 96 | 20 | 29 | 52 | 69 |
| Congo, Democratic Republic | 10 845 | 8 532 | 7 378 | 3 746 | 2 462 |
| Niger | * 10 | 6 | 6 | — | — |
| Nigeria | 1 800 | 1 800 | 1 300 | 1 800 | * 1 800 |
| Rwanda | 2 135 | 3 154 | 3 970 | 4 508 | * 3 500 |
| Uganda | 40 | — | 24 | 0 | 0 |
| | | | | | |
| Bolivia | 17 320 | 19 575 | 20 190 | 20 373 | 19 700 |
| Brazil | 13 899 | 9 500 | 10 400 | 10 725 | 10 800 |
| Peru (b) | 39 037 | 37 503 | 33 848 | 28 882 | 26 105 |
| | | | | | |
| Burma | * 500 | * 600 | * 400 | * 500 | * 700 |
| China | 121 200 | * 128 000 | 129 600 | 127 400 | 115 900 |
| Indonesia | * 96 000 | * 84 000 | * 84 000 | * 78 000 | * 91 000 |
| Laos | 358 | 389 | 723 | 434 | 965 |
| Malaysia | 2 605 | 2 410 | 2 668 | 3 340 | 3 726 |
| Mongolia | 45 | 8 | 7 | 42 | ... |
| Thailand | 235 | 166 | 291 | 282 | 199 |
| Vietnam | * 5 400 | * 5 400 | * 5 400 | * 5 400 | * 5 400 |
| | | | | | |
| Australia | 1 783 | 13 269 | 18 646 | 14 637 | 6 158 |
| | | | | | |
| World Total | 315 000 | 316 000 | 320 000 | 301 000 | 289 000 |

Note(s)
(a) Metal
(b) Recoverable

## Smelter production of tin

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Belgium | 9 200 | 8 700 | 9 900 | 10 000 | 11 400 |
| Russia | 1 700 | 1 300 | 1 800 | 1 200 | 1 400 |
| Bolivia (a) | 12 666 | 14 715 | 15 000 | 14 500 | 14 300 |
| Brazil | 11 020 | 8 311 | 9 098 | 9 382 | 9 600 |
| Peru | 38 865 | 34 388 | 36 451 | 32 290 | 24 811 |
| China | 139 900 | 140 400 | 149 000 | 155 500 | 148 100 |
| India (b) | 27 | 27 | 24 | 23 | — |
| Indonesia | 54 830 | 50 859 | 49 810 | 53 428 | * 50 000 |
| Japan | 956 | 757 | 841 | 947 | 1 133 |
| Malaysia | 31 691 | 35 443 | 38 771 | 40 281 | 37 822 |
| Thailand | 21 860 | 19 423 | 23 551 | 20 670 | 19 996 |
| Vietnam | 3 583 | 2 747 | 3 042 | 3 900 | * 4 000 |
| World Total | 326 000 | 317 000 | 337 000 | 342 000 | 323 000 |

Note(s)
(1.) Figures relate to both primary and secondary metal
(2.) In addition to the countries listed, many countries produce small amounts of secondary metal

(a) Refined, including alloys
(b) Years ended 31 March following that stated

## Production of titanium minerals

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Norway | | | | | |
| Ilmenite | 915 000 | 671 000 | 864 000 | 870 000 | 831 000 |
| Ukraine | | | | | |
| Ilmenite | * 600 000 | * 600 000 | * 600 000 | * 600 000 | * 600 000 |
| Rutile | * 100 000 | * 100 000 | * 100 000 | * 100 000 | * 100 000 |
| Egypt | | | | | |
| Ilmenite | 88 000 | 88 000 | 11 000 | 11 000 | * — |
| Gambia | | | | | |
| Ilmenite | — | 54 655 | 69 940 | — | * — |
| Madagascar | | | | | |
| Ilmenite | — | 160 000 | * 273 000 | 489 900 | 529 800 |
| Rutile | — | * 3 200 | 9 600 | 17 000 | * 20 000 |
| Mozambique | | | | | |
| Ilmenite | 328 875 | 471 524 | 678 400 | 636 800 | 574 500 |
| Rutile | 6 552 | 1 800 | 4 700 | 6 500 | * 6 500 |
| Sierra Leone | | | | | |
| Ilmenite | 17 260 | 15 200 | 18 206 | 14 576 | 21 400 |
| Rutile | 78 910 | 63 860 | 68 198 | 67 970 | 94 490 |
| South Africa | | | | | |
| Ilmenite (a) | * 1 360 000 | * 1 445 000 | * 1 200 000 | * 1 369 000 | * 1 400 000 |
| Rutile | 132 000 | 134 000 | 135 000 | 129 000 | * 130 000 |
| Canada | | | | | |
| Ilmenite (a)(b) | * 2 600 000 | * 2 000 000 | * 2 400 000 | * 2 500 000 | * 2 700 000 |
| USA | * 200 000 | * 200 000 | * 200 000 | * 300 000 | * 300 000 |
| Brazil | | | | | |
| Ilmenite | 110 000 | 39 000 | 123 000 | 69 000 | * 70 000 |
| Rutile | 3 000 | 3 000 | 3 000 | 2 000 | * 2 000 |

## Production of titanium minerals

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| China | | | | | |
| Ilmenite | * 1 080 000 | * 900 000 | * 1 000 000 | * 1 100 000 | * 1 100 000 |
| India | | | | | |
| Ilmenite (c) | 588 127 | 713 605 | 663 217 | * 700 000 | * 700 000 |
| Rutile (c) | 19 098 | 18 573 | 26 594 | * 27 000 | * 27 000 |
| Kazakhstan | * 16 000 | * 17 000 | * 17 000 | * 17 000 | * 17 000 |
| Korea (Rep. of) | | | | | |
| Ilmenite | 226 069 | 120 236 | — | — | — |
| Malaysia | | | | | |
| Ilmenite | 36 779 | 15 983 | 19 036 | 28 782 | 22 275 |
| Rutile | 1 834 | 1 502 | 7 567 | 10 810 | 20 008 |
| Sri Lanka | | | | | |
| Ilmenite | 56 824 | 122 424 | 52 637 | 62 955 | 44 707 |
| Rutile | 3 405 | 2 276 | 2 568 | 1 970 | 1 590 |
| Vietnam | | | | | |
| Ilmenite (d) | * 710 000 | * 700 000 | * 881 000 | * 870 000 | * 1 164 000 |
| Rutile | 681 | 631 | 592 | * 600 | * 600 |
| | | | | | |
| Australia | | | | | |
| Ilmenite | 2 060 000 | 1 626 000 | 1 339 000 | 1 277 000 | 1 344 000 |
| Rutile | 318 000 | 302 000 | 438 000 | 474 000 | 439 000 |
| Leucoxene | 126 000 | 137 000 | 160 000 | 225 000 | 228 000 |
| | | | | | |
| World Total | | | | | |
| Ilmenite (wt of concs) | 11 000 000 | 10 000 000 | 10 400 000 | 10 900 000 | 11 400 000 |
| Rutile (wt of concs) | 700 000 | 600 000 | 800 000 | 800 000 | 800 000 |
| All forms ($TiO_2$ content) | * 5 900 000 | * 5 400 000 | * 5 700 000 | * 6 100 000 | * 6 300 000 |

Note(s)
(1) The figures in this table refer to gross tonnage of titanium concentrates
(2) Some ilmenite is converted to synthetic rutile in Australia, India, Japan, Taiwan and USA
(3) In 2012 South Africa produced an estimated 800 000 tonnes of slag (85% TiO2) and Canada produced an estimated 1 200 000 tonnes of slag (80-95% TiO2)

(a) It is believed that the majority of this is processed into slag.
(b) Canada produces some ilmenite which is sold as such and not processed into slag, but tonnages are small
(c) Years ended 31 March following that stated
(d) BGS estimates, based on known imports into certain countries

# Tungsten

*Symbol W*

**Relative supply risk index**
**9.5**

## Top 10 producers

| | % of world total |
|---|---|
| China | 83% |
| Russia | 6% |
| Canada | 3% |
| Bolivia | 2% |
| Rwanda | 1% |
| Portugal | 1% |
| Austria | 1% |
| Spain | 1% |
| Peru | 0.5% |
| Brazil | 0.4% |

## End uses

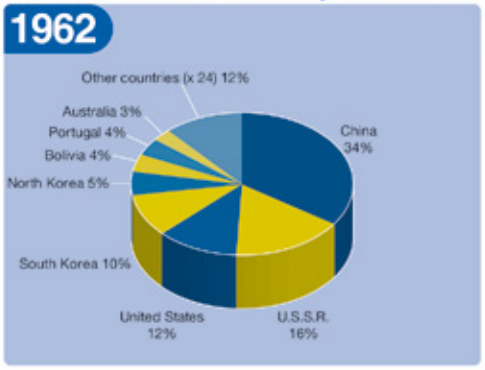
**Hard Metals:** Cemented carbides used in drill bits, cutting tools, the tips of ball-point pens, etc.

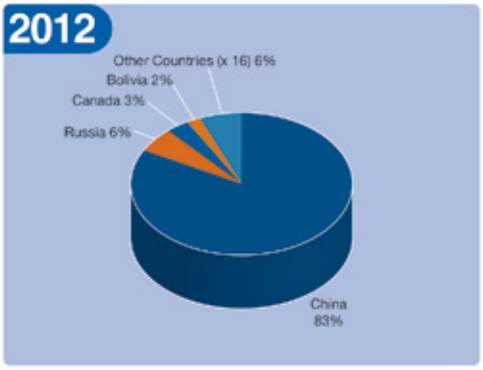
**Steel and other alloys:** used in steel tools, bearings, erosion shields, etc.

**Mill products:** used in light bulbs, other electrical components, etc.

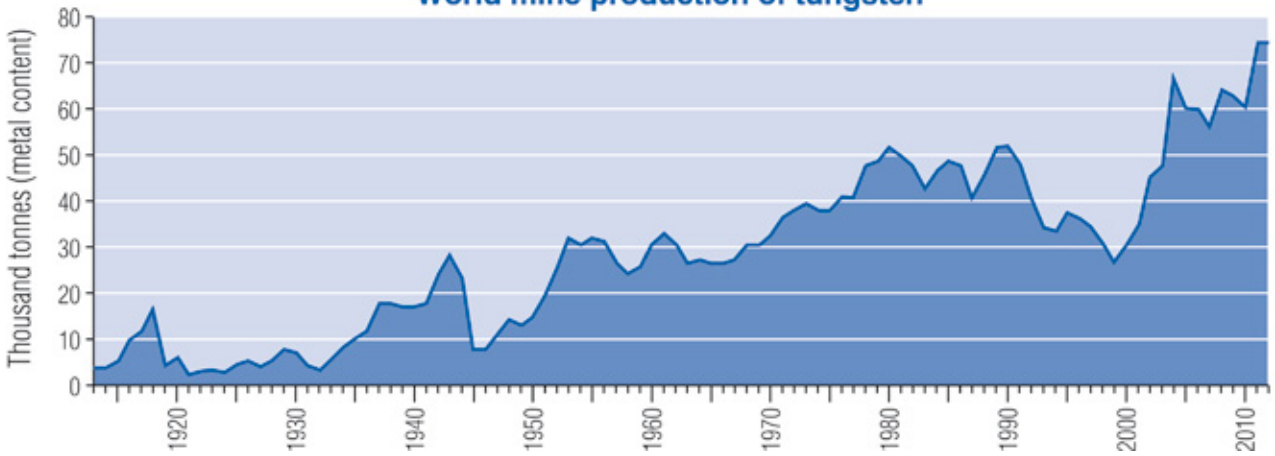
**Chemicals:** colouring agent for porcelain, catalysts, paints, etc.

## Distribution of world production




## World mine production of tungsten



## Mine production of tungsten

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Austria | 1 122 | 887 | 975 | 861 | 706 |
| Portugal (a) | 981 | 823 | 799 | 818 | 763 |
| Russia | * 4 000 | * 5 500 | * 3 000 | * 4 200 | * 4 200 |
| Spain | 194 | 284 | 303 | 425 | 496 |
| | | | | | |
| Burundi | 230 | 100 | * 100 | * 100 | * 100 |
| Congo, Democratic Republic | 372 | 190 | 40 | 23 | 4 |
| Rwanda | 1 037 | 690 | 630 | 950 | 1 105 |
| Uganda | 48 | 7 | 44 | 8 | * 21 |
| | | | | | |
| Canada | 2 795 | 2 501 | 364 | 2 368 | 2 505 |
| | | | | | |
| Bolivia | 1 148 | 1 023 | 1 203 | 1 418 | * 1 500 |
| Brazil (b) | 408 | 192 | 166 | * 300 | * 300 |
| Peru | 456 | 634 | 716 | 546 | 365 |
| | | | | | |
| Burma (c) | 136 | 87 | 163 | 140 | * 140 |
| China | * 50 000 | 49 432 | 51 287 | 61 802 | * 62 000 |
| Korea, Dem. P.R. of | * 270 | * 100 | * 100 | * 100 | * 100 |
| Kyrgyzstan | * 100 | * 100 | * 100 | * 100 | 100 |
| Mongolia | 97 | 27 | 13 | 13 | 8 |
| Thailand (a) | 718 | 274 | 481 | 229 | 107 |
| Uzbekistan | * 300 | * 300 | * 300 | * 300 | * 300 |
| | | | | | |
| Australia (d)(e) | 11 | 17 | 11 | 40 | 22 |
| | | | | | |
| World Total | 64 400 | 63 200 | 60 800 | 74 700 | 74 800 |

Note(s)
(a) Wolframite and scheelite
(b) Mainly scheelite
(c) Including tungsten content of tin-wolframite concentrates
(d) Scheelite
(e) Years ended 30 June of that stated

# Uranium

*Symbol U*

**Relative supply risk index**
**5.7**

## Top 10 producers

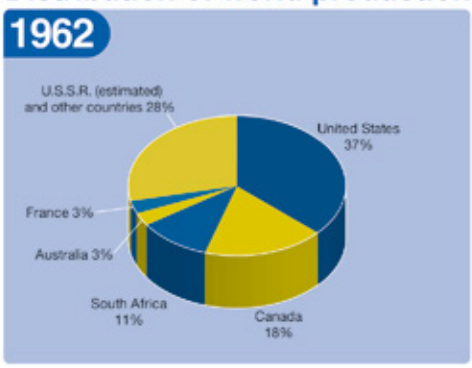
| | % of world total |
|---|---|
| Kazakhstan | 36% |
| Canada | 16% |
| Australia | 12% |
| Niger | 8% |
| Namibia | 7% |
| Uzbekistan | 5% |
| Russia | 5% |
| USA | 3% |
| Malawi | 3% |
| China | 3% |

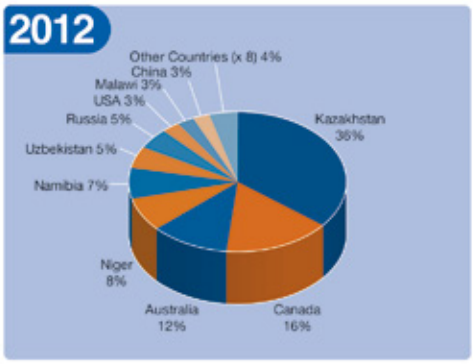
## End uses

**Electricity generation:** in nuclear power stations

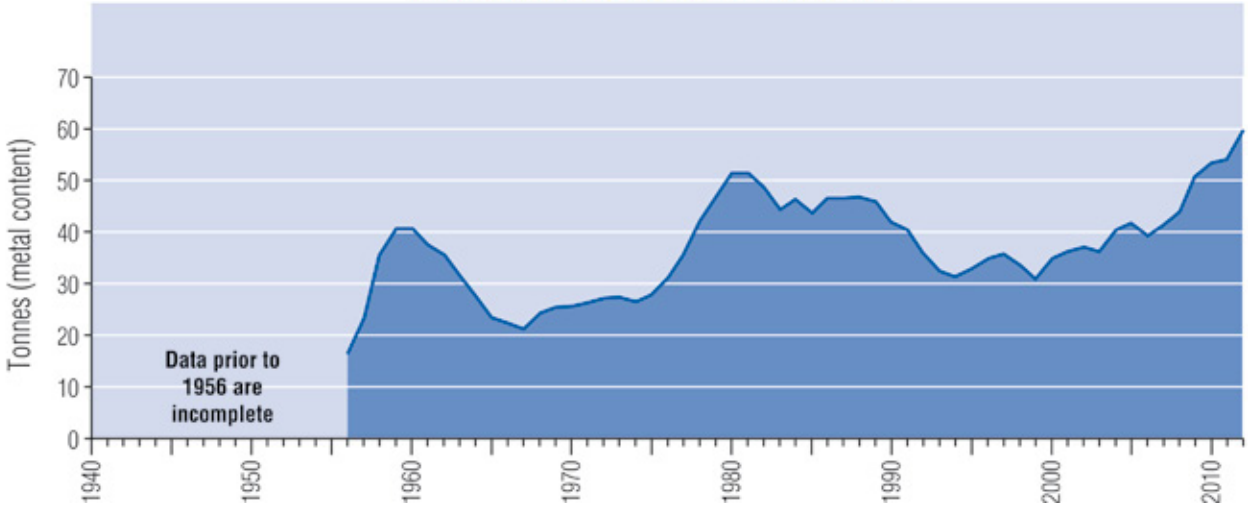
**Other minor uses:** including propulsion of ships, research and seawater desalination

## Distribution of world production




## World mine production of uranium



## Mine production of uranium

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Czech Republic | 290 | 286 | 259 | 252 | 222 |
| Germany | — | — | * 8 | 52 | 50 |
| Romania | * 77 | * 75 | * 77 | * 77 | * 90 |
| Russia | 3 521 | 3 565 | 3 563 | 2 993 | 2 862 |
| Ukraine | * 800 | 840 | 850 | 890 | * 960 |
| Malawi | — | 90 | 671 | 785 | 1 505 |
| Namibia | 4 371 | 4 631 | 4 500 | 3 262 | 4 249 |
| Niger | 2 993 | 3 241 | 4 198 | 4 159 | 4 667 |
| South Africa | 654 | 629 | 583 | 656 | 551 |
| Canada | 9 001 | 10 176 | 9 518 | 8 923 | 9 576 |
| USA | 1 503 | 1 428 | 1 628 | 1 537 | 1 596 |
| Brazil | 330 | 345 | 148 | 265 | 231 |
| China | * 769 | * 750 | * 827 | * 1 500 | * 1 500 |
| India | * 271 | * 290 | * 400 | * 400 | * 385 |
| Kazakhstan | 8 521 | 13 900 | 17 803 | 19 451 | 21 317 |
| Pakistan | * 45 | * 50 | * 45 | * 45 | * 45 |
| Uzbekistan | 2 338 | 2 429 | 2 400 | 3 000 | 3 000 |
| Australia | 8 471 | 7 942 | 5 971 | 5 961 | 6 987 |
| World Total | 44 000 | 50 700 | 53 400 | 54 200 | 59 800 |
| World Total ($U_3O_8$ equivalent) | 51 900 | 59 800 | 63 000 | 63 200 | 70 600 |

Note(s)
(1) Excluding uranium production from decommissioning operations in France, Germany and Spain

## Mine production of vanadium

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia | 10 591 | 13 106 | 12 293 | 12 860 | 14 856 |
| South Africa | 20 295 | 14 353 | 22 606 | 21 652 | 19 500 |
| USA | 520 | 230 | 1 060 | 590 | * 270 |
| China | * 26 000 | * 29 000 | * 32 000 | * 36 000 | * 39 000 |
| Kazakhstan | * 1 000 | * 1 000 | * 1 000 | * 1 000 | * 1 000 |
| World Total | 58 000 | 58 000 | 69 000 | 72 000 | 75 000 |

Note(s)
(1) This table includes vanadium in slag products but excludes vanadium recovered as a by-product of the refining and burning of heavy oils

## Production of vermiculite

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia | * 30 000 | * 30 000 | * 30 000 | * 30 000 | * 30 000 |
| Egypt | 7 560 | 4 650 | — | 2 865 | 2 093 |
| South Africa | 199 764 | 193 334 | 199 285 | 170 571 | 132 886 |
| Uganda | — | — | 1 121 | 7 960 | 3 087 |
| Zimbabwe | 16 123 | 3 211 | — | — | — |
| Mexico | 132 | 291 | 98 | 241 | 500 |
| USA (a) | * 100 000 | * 110 000 | * 100 000 | * 100 000 | * 100 000 |
| Argentina | 1 813 | 2 150 | 2 500 | 1 000 | * 1 000 |
| Brazil | 32 503 | 50 438 | 49 976 | 54 970 | * 55 000 |
| China | * 120 000 | * 120 000 | * 120 000 | * 120 000 | * 120 000 |
| India (b) | 12 647 | 11 662 | 19 234 | 9 746 | 7 574 |
| Japan | * 6 000 | * 6 000 | * 6 000 | * 6 000 | * 6 000 |
| Australia (c) | 8 319 | 6 548 | 7 922 | 8 297 | 9 256 |

Note(s)
(1) In addition to the countries listed Malawi is believed to produce vermiculite

(a) Sold or used by producers
(b) Years ended 31 March following that stated
(c) Years ended 30 June of that stated

## Production of wollastonite

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Finland | 15 600 | 9 200 | 12 100 | 11 500 | * 11 500 |
| Spain | 10 100 | 7 000 | 6 000 | 7 417 | 10 918 |
| Namibia | * 55 | — | — | — | — |
| Mexico | 46 844 | 29 728 | 46 548 | 47 523 | 55 204 |
| USA | * 90 000 | * 65 000 | * 67 000 | * 70 000 | * 70 000 |
| China | * 325 000 | * 300 000 | * 300 000 | * 300 000 | * 300 000 |
| India (a) | 111 581 | 132 385 | 183 381 | 184 445 | 148 567 |

Note(s)
(1) In addition to the countries listed, Turkey is believed to produce wollastonite

(a) Years ended 31 March following that stated

# Zinc

*Symbol Zn*

**Relative supply risk index**
**4.8**

## Top 10 producers

| | % of world total |
|---|---|
| China | 36% |
| Australia | 11% |
| Peru | 9% |
| India | 6% |
| USA | 5% |
| Mexico | 5% |
| Canada | 5% |
| Kazakhstan | 3% |
| Bolivia | 3% |
| Ireland, Republic of | 2% |

## End uses

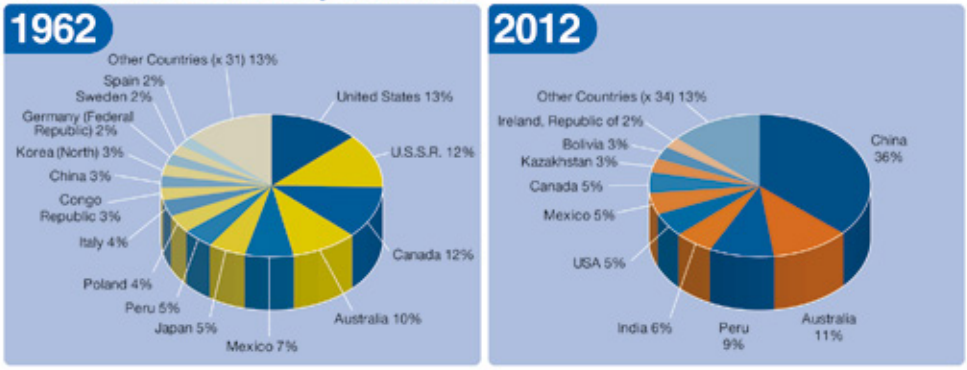
**Galvanisation of steel:** for use in construction, etc.

**Zinc-based alloys:** e.g. die casting for the automotive industry

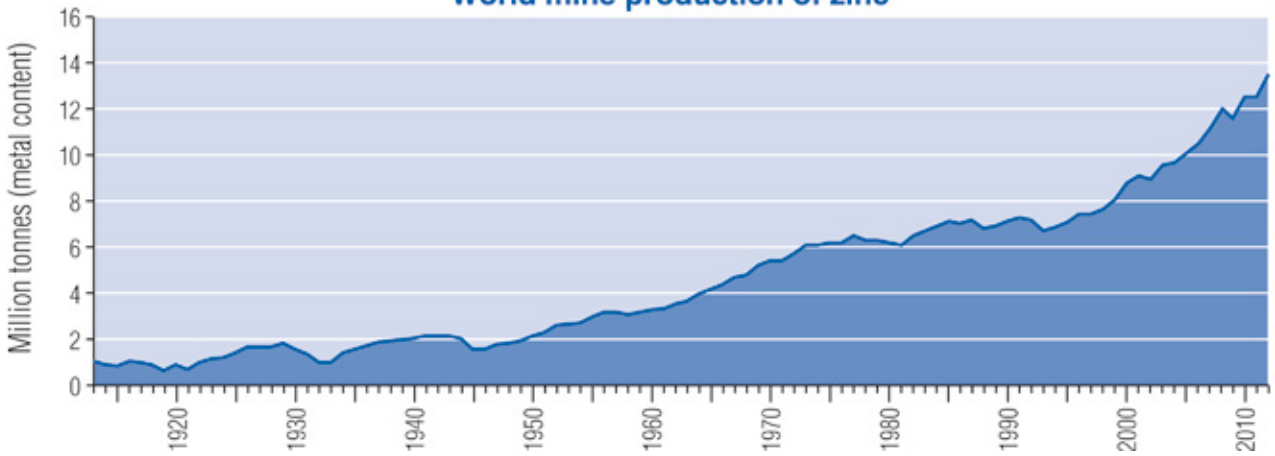
**Other alloys:** e.g. brass used in valves, bearings and locks

**Many minor uses:** e.g. chemicals, batteries, etc.

## Distribution of world production




## World mine production of zinc



## Mine production of zinc

tonnes (metal content)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Armenia | 3 880 | 3 564 | 7 468 | 8 106 | 8 431 |
| Bosnia & Herzegovina | 4 727 | 3 425 | 5 514 | 6 862 | 7 600 |
| Bulgaria (a) | 12 819 | 9 339 | 9 904 | 10 977 | 12 116 |
| Finland | 27 800 | 30 233 | 55 562 | 64 115 | 52 200 |
| Greece | 24 200 | 17 800 | 18 400 | 21 200 | 20 800 |
| Ireland, Republic of | 398 200 | 385 700 | 342 500 | 344 000 | 337 000 |
| Kosovo | — | 2 500 | 4 100 | 2 872 | 3 817 |
| Macedonia | 38 737 | 38 648 | 32 872 | 28 132 | 28 037 |
| Poland | 132 400 | 115 500 | 107 700 | 87 200 | 76 700 |
| Portugal | 37 900 | 501 | 6 422 | 4 227 | 30 006 |
| Romania | 14 | * 3 000 | * 7 700 | * 9 000 | * 8 400 |
| Russia | 204 000 | 214 000 | 235 000 | 243 000 | 246 000 |
| Serbia | 2 400 | 2 700 | 2 600 | 3 100 | 7 500 |
| Spain | — | 5 900 | 17 323 | 33 197 | 28 634 |
| Sweden | 187 987 | 192 502 | 198 687 | 194 021 | 188 325 |
| Turkey | 126 800 | 136 300 | 196 400 | 158 300 | 195 793 |
| | | | | | |
| Congo, Democratic Republic | 7 733 | 9 848 | 4 612 | 7 379 | * 5 286 |
| Morocco | 80 747 | 44 800 | 43 680 | 45 065 | 40 000 |
| Namibia | 193 000 | 198 000 | 204 200 | 192 500 | 193 600 |
| South Africa | 29 002 | 28 200 | 36 142 | 36 629 | 37 034 |
| | | | | | |
| Canada | 750 502 | 699 145 | 648 905 | 611 577 | 641 260 |
| Honduras | 28 462 | 36 370 | 33 839 | 26 000 | 26 000 |
| Mexico | 453 588 | 489 766 | 570 004 | 631 859 | 660 349 |
| USA | 778 100 | 735 700 | 748 000 | 769 000 | 738 000 |
| | | | | | |
| Argentina | 30 349 | 31 869 | 32 600 | 38 000 | 42 000 |
| Bolivia | 383 618 | 430 879 | 411 409 | 427 129 | 389 800 |
| Brazil | 173 933 | 172 688 | 211 203 | 186 000 | 163 000 |
| Chile | 40 519 | 27 801 | 27 662 | 36 602 | 26 762 |
| Peru | 1 602 597 | 1 512 931 | 1 470 450 | 1 256 383 | 1 281 224 |
| | | | | | |
| Burma | * 7 000 | * 6 000 | * 7 000 | * 8 000 | * 10 000 |
| China | 3 342 600 | 3 324 400 | 3 842 200 | 4 050 000 | 4 930 200 |
| India (b) | 647 537 | 677 824 | 730 171 | 722 528 | 763 707 |
| Iran | 86 000 | 115 000 | 128 000 | 138 000 | 138 000 |
| Kazakhstan | 446 000 | 442 000 | 459 000 | 462 000 | 425 000 |
| Korea (Rep. of) | 1 836 | 2 221 | 355 | 743 | 1 434 |
| Korea, Dem. P.R. of | * 48 000 | * 29 000 | * 38 000 | * 34 000 | * 35 000 |
| Laos | 1 121 | 760 | 1 140 | 1 642 | 883 |
| Mongolia | 71 800 | 70 750 | 56 300 | 52 350 | 59 550 |
| Pakistan (c) | — | 1 000 | 10 000 | 11 123 | 10 024 |
| Philippines | 1 619 | 10 035 | 9 268 | 18 170 | 19 559 |
| Saudi Arabia | 3 663 | 4 952 | 4 879 | 4 934 | * 10 000 |
| Thailand | 17 811 | 27 493 | 21 971 | 22 259 | 24 996 |
| Vietnam | * 42 000 | * 38 000 | * 36 000 | * 34 000 | * 42 000 |
| | | | | | |
| Australia | 1 519 000 | 1 290 000 | 1 480 000 | 1 516 000 | 1 542 000 |
| | | | | | |
| World Total | 12 000 000 | 11 600 000 | 12 500 000 | 12 600 000 | 13 500 000 |

Note(s)
(a) Metal content of ore
(b) Years ended 31 March following that stated
(c) Years ended 30 June of that stated

## Production of slab zinc

tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Belgium | 251 000 | 137 000 | 260 000 | 282 000 | 250 000 |
| Bulgaria | 101 700 | 92 700 | 93 800 | 88 400 | 73 100 |
| Finland | 297 722 | 295 049 | 307 144 | 307 352 | 314 742 |
| France | 118 000 | 161 000 | 162 000 | 164 000 | 161 000 |
| Germany | 292 284 | * 153 000 | 165 000 | 170 000 | 169 000 |
| Italy | 107 100 | 103 400 | 104 700 | 110 200 | 97 200 |
| Netherlands | 250 000 | 224 000 | 264 000 | 261 000 | 257 000 |
| Norway | 145 469 | 138 973 | 148 862 | 153 200 | 152 647 |
| Poland | 142 600 | 139 100 | 135 000 | 144 100 | 138 300 |
| Romania | 61 978 | 1 000 | — | — | — |
| Russia | 263 000 | 208 000 | 241 000 | 252 000 | 257 000 |
| Spain | 466 000 | 515 000 | 517 100 | 527 100 | 528 300 |
| Ukraine | 3 800 | 8 800 | 7 600 | 6 600 | 7 000 |
| | | | | | |
| Algeria | 30 752 | 28 000 | 31 000 | 25 000 | 20 000 |
| Namibia | 145 400 | 153 815 | 151 688 | 145 639 | 144 755 |
| South Africa | 82 000 | 87 000 | 90 000 | 73 000 | — |
| Zambia | 2 000 | — | — | — | — |
| | | | | | |
| Canada | 764 310 | 685 504 | 691 222 | 662 151 | 648 614 |
| Mexico | 305 188 | 313 044 | 322 508 | 321 000 | 323 600 |
| USA | 286 000 | 203 500 | 248 000 | 240 500 | 261 000 |
| | | | | | |
| Argentina | 42 600 | 35 600 | 47 700 | 43 500 | 37 500 |
| Brazil | 248 874 | 242 136 | 288 107 | 284 770 | 246 500 |
| Peru | 190 324 | 149 494 | 223 112 | 313 714 | 319 280 |
| | | | | | |
| China | 4 042 300 | 4 286 300 | 5 208 900 | 5 212 200 | 4 829 400 |
| India | 589 000 | 640 000 | 735 000 | 810 000 | 711 000 |
| Iran | 120 000 | 115 200 | 120 000 | 132 000 | 148 000 |
| Japan | 615 533 | 540 604 | 574 008 | 544 674 | 571 312 |
| Kazakhstan | 365 572 | 327 873 | 318 858 | 319 847 | 319 847 |
| Korea (Rep. of) | 738 000 | 722 000 | 750 000 | 828 735 | 875 000 |
| Korea, Dem. P.R. of | * 41 000 | * 26 000 | * 36 000 | * 30 000 | * 31 000 |
| Thailand | 107 753 | 104 695 | 95 219 | 98 370 | 107 711 |
| Uzbekistan | 70 400 | 19 000 | 50 000 | 65 000 | 72 000 |
| Vietnam | * 16 000 | * 17 000 | * 16 000 | * 18 000 | * 18 000 |
| | | | | | |
| Australia | 500 000 | 525 000 | 498 000 | 507 000 | 498 000 |
| | | | | | |
| World Total | 11 800 000 | 11 400 000 | 12 900 000 | 13 100 000 | 12 600 000 |

## Production of zirconium minerals

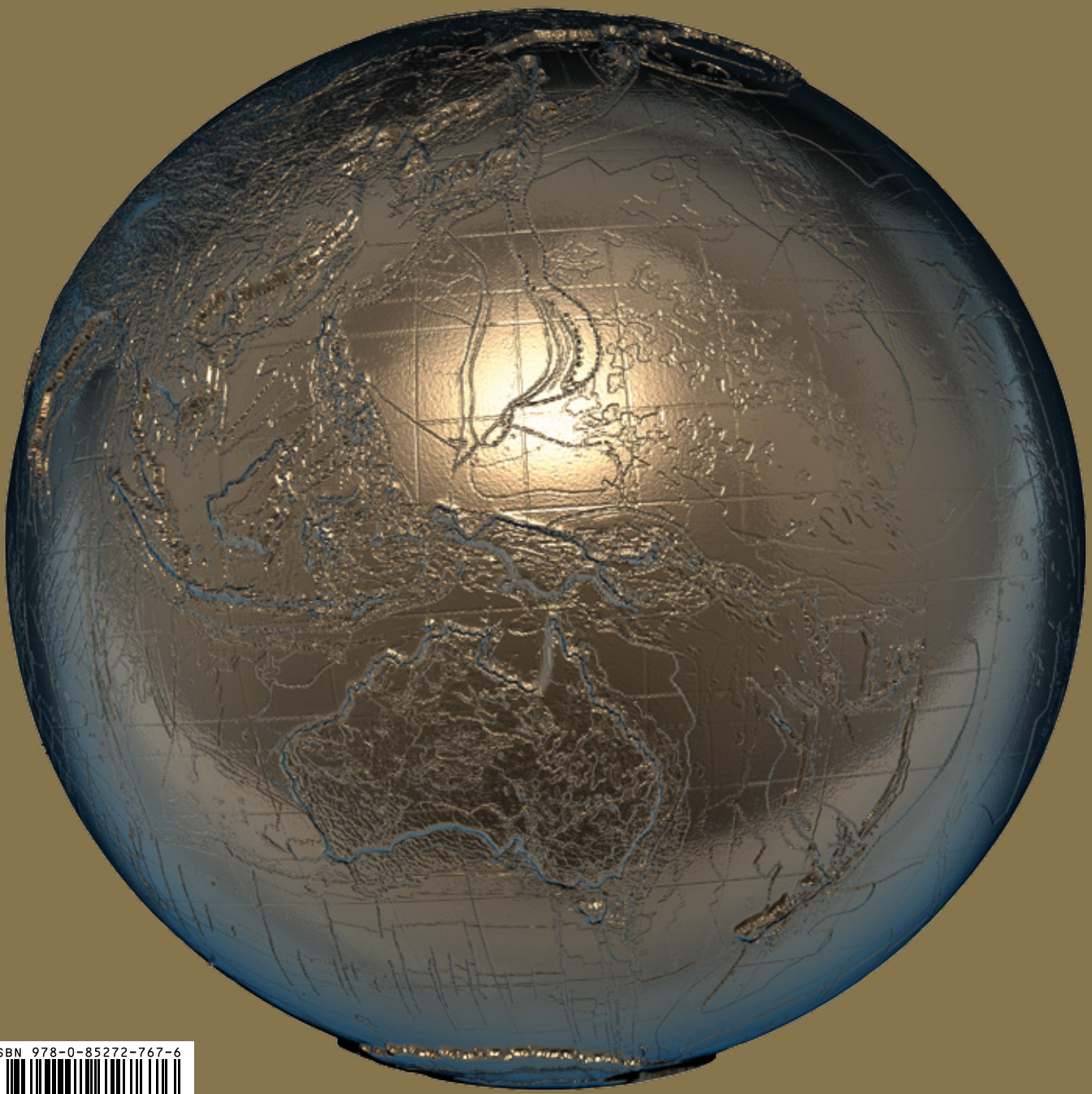
tonnes (metric)

| Country | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Russia (a) | * 7 000 | * 5 000 | * 8 000 | * 10 000 | * 10 000 |
| Ukraine | * 35 000 | * 35 000 | * 35 000 | * 35 000 | * 35 000 |
| Madagascar (b) | — | * 3 300 | * 15 600 | * 18 900 | * 67 900 |
| Mozambique | 32 985 | 21 100 | 37 100 | 43 600 | 46 900 |
| Sierra Leone | — | 5 560 | 7 092 | 8 350 | 610 |
| South Africa | 404 000 | 392 000 | 381 000 | 383 000 | * 380 000 |
| USA | 122 000 | * 100 000 | * 110 000 | * 115 000 | * 115 000 |
| Brazil (a) | 25 300 | 34 248 | 23 235 | 23 283 | * 25 000 |
| China | * 38 000 | * 31 500 | * 33 500 | * 33 500 | * 33 500 |
| India cf) | 29 158 | 28 049 | 33 209 | * 33 000 | * 33 000 |
| Indonesia | * 65 000 | * 63 000 | * 50 000 | * 127 000 | * 109 000 |
| Malaysia | 984 | 1 145 | 1 267 | 1 685 | 442 |
| Sri Lanka | 1 447 | 10 267 | 9 200 | 641 | * 650 |
| Vietnam | 25 303 | 19 368 | 23 730 | 24 020 | * 21 000 |
| Australia | 528 000 | 431 000 | 549 000 | 762 000 | 605 000 |
| World Total | 1 314 000 | 1 181 000 | 1 317 000 | 1 619 000 | 1 483 000 |

Note(s)
(1) In this table the term 'zirconium minerals' is understood to mean zircon, unless otherwise stated

(a) Including caldasite rock containing zircon and baddeleyite
(b) Conservative BGS estimates, based on exports
(c) Years ending 31 March following that stated

NERC
SCIENCE OF THE ENVIRONMENT



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