During the past 15 years, as China’s economy has steadily grown, expenditures for mineral exploration have also consistently increased, despite cyclic spending for exploration in most other parts to the world. In addition to traditional investment by national and provincial governments, a huge amount of money has been invested in the Chinese minerals industry from private sources, joint venture companies, and even some foreign companies. China has had the world’s largest exploration budget since 2010, spending annually about two billion dollars (US) exploring for metals and approximately the same amount on bulk commodities, mainly iron ores and coal. Since the start of the century, newly discovered resources include 37 billion tonnes (Bt) of iron, 43 million tonnes (Mt) of copper, 42 Mt lead, 68 Mt zinc, 3.5 Mt tin, 3.1 Mt tungsten, 14 Mt Mo, 6000 tonnes (t) gold, and 19,000 t silver. These new ores are more than that of the recognized reserves for each of these commodities at the end of the past century.

New ore belts discovered: The newly discovered mineral resources are distributed over much of the country. Significant new ore belts that have been discovered include the Gangdese and Bangonghu-Nuijiang porphyry copper belts in Tibet, comprising the giant Qulong, Jiama, Xiongcun and Bolong Cu-Mo and Cu-Au porphyry deposits; the western Tianshan volcanic rocks-related iron ore belt with a reserve of 500 Mt of iron; and tungsten-rich porphyry and skarn deposits along the southern margin of the Middle to Lower Yangtze River Valley, such as the world-class Dahutang and Zhuxi deposits. The Dabieshan is now host to one of the world’s great porphyry Mo ore belts, which includes Shapinggou, the largest Mo deposit in the world, and the large Qian’echong and Tangjiapiing deposits. The Wulagen SEDEX Pb-Zn ore belt with Pb-Zn reserve of > 10 Mt located in Southwest Tianshan is defined. The Qimantage belt of Cu-Mo-Fe porphyry and skarn ores, and Cu-Ni ores in the eastern Kunlun Mountains is another region with important new discoveries.

New ore clusters and/or large deposits discovered in the ore belts or provinces known before: A great exploration successes have been taken place in the ore belts known before. In northeastern China, particularly in the Great Hinggan Range, where is traditionally known as Pb-Zn-Sn-Au polymetallic province, the Chalukou, Luming, and Daheishan world-class porphyry Mo deposits newly explored help define the second largest Mo ore province in the world, after the East Qinling-Dabieshan. In addition, several large epigenetic Pb-Zn-Ag deposits have been discovered and mined in northeastern China, such as Bairedaba, Weilasituo, Genhe, and Shuangjianshan. Furthermore, newly recognized low-sulfidation epithermal gold deposits have been explored near the border with Russia, which share many of the same characteristics of the ore previously mined at the Tuanjiegou deposit. The eastern Qinling, a long recognized region with Mo-rich porphyry and skarn deposits, is the site of several newly mined porphyry Mo discoveries, such as the Donggou, Xinyuku and Yuchiling deposits, and epigenetic Ag-Pb-Zn deposit, such as the Shagou. In the Nanling (or South Range) area in southeastern China, characterized by many occurrences enriched in W, Sn, rare metals, and HREE, several new magmatic deposits, such as the Furong and Xitian tin deposits, and the Heshangtian tungsten deposit have been developed. The Yuanzhuding Cu-Mo porphyry deposit in western part and the Longtougang skarn Cu-Mo deposit in eastern part are being explored in the Qin-Hang Cu-Pb-Zn ore belt, which has been recently defined along the suture between the Yangtze craton and Cathaysia block. The newly explored Zhongdian porphyry and skarn copper deposits are located in the eastern Sanjiang region

MAO Jingwen1,3, Richard GOLDFARB2,3 and DUAN Chao1

1 Institute of Mineral Resources, Chinese Academy of Geological Sciences, 100037 Beijing
2 USGS Denver Center, Colorado, US
3 China University of Geosciences Beijing

* Corresponding author. E-mail: jingwenmao@263.net
and include Triassic Cu-Au porphyries such as Pulang, and Cretaceous Cu-Mo porphyries and skarns represented by the Hongniu-Hongshan deposit. Moreover, the Jinchanghe and Hetaoping Cretaceous Pb-Zn, Fe, and Cu skarns have been explored in the Baoshan terrane in the western Three River ore belt. In the eastern Tianshan, several large deposits comprising the Tuwu-Yandong Cu-Mo porphyries, Weiquan Pb-Zn skarn-hydrothermal veins, Kalatage VMS Cu-Zn and Gobitan porphyry Mo deposits were discovered successively since the start of this century.

**New resources explored in brown fields:** Because of the limitation of past drilling technology, the depth of drilled ore deposits was typically less than 300 m and most explored orebodies were not well controlled prior to 2000. With the utilization of small diameter diamond drill technology, many deposits have been reevaluated and a great increase in ore reserves for all of the country, particularly in East China. For example, the gold reserve in the East Shandong Peninsular, China’s most important gold province, has doubled to more than 2000 t. Both An-Ben and Eastern Hebei in North China craton, the traditional BIF ore provinces, have increased 10 Bt iron ores. In addition to investments by Chinese companies themselves in targeting new resources, a highly successful national government project termed “Exploring Minerals for the Mines with Shortage of Resources”, with total funding of 4 billion Yuan, was implemented from 2004 – 2010. This brown fields program emphasized the targeting of new resources at depth in the areas surrounding historic mine workings. During the implementation of the project, new reserves were defined that comprised 4 Bt coal, 1 Bt iron, 12 Mt manganese, 543,000 t chromium, 3 Mt copper, 7 Mt lead and zinc, 360,000 t tungsten, 645 t gold, and >10,000 t silver.

It is through the great achievements from the above recent exploration activities that much of China’s minerals demand during the current rapid industrialization is being met. Nevertheless, there is still shortage of many commodities, particularly Cu, Al, Cr, K, and high-grade iron ores. It is noteworthy that, since late 2012, mining activities for many commodities have slowed down, in parallel to the present slowing of China’s remarkable economic development. However, China remains in an overall era of economic modernization, and demand for many minerals is likely to continue to increase in the long-term.