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Analysing the world potash industry

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ABSTRACT

Commentators have usually viewed potash as a rather unglamorous commodity because of its limited applications, low prices, the relatively small size of the industry, a persistent supply overhang situation and high barriers to entry. Yet on closer inspection, potash provides an interesting mineral market case study.

Recently the industry has been operated as a cartel coordinated by two exporting companies—Canpotex in North America (owned by PotashCorp, Agrium and Mosaic) and the Belarusian Potash Company in the Former Soviet Union (owned by Uralkali and Belaruskali). The sector attracted new interest after 2007 when world potash prices more than doubled and the prospect of more rapidly growing demand emerged as oil and gas prices surged. Two notable recent developments have been the unsuccessful effort by BHP Billiton to acquire PotashCorp in 2010, and the attempt by Uralkali in late 2013 to increase its market share by withdrawing from its marketing agreement with Belaruskali, which now seems to have been thwarted.

Considering the demand and supply sides of the industry, the current paper reflects on its recent evolution and assesses likely developments in the coming decades.

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Introduction

The term “potash” describes a variety of mined and manufactured salts that contain the element potassium (K) in water-soluble form. As one of the three primary nutrients for plant growth, together with nitrogen and phosphorus, about 90 per cent of potash use is in the production of fertilisers. These include potassium chloride (muriate of potash), potassium sulphate, potassium–magnesium sulphate and potassium nitrate. The other uses of potash are in areas such as industrial water treatment, animal feed supplements, cement, fire extinguishers and textile production.

While initially produced from burning wood in pots, natural potash compounds were first mined in Germany in 1851 from the remains of the Zechstein Sea. As noted by authors such as Darst (1991), subsequent development of the potash industry resulted from a growing recognition of the key role of potassium in promoting plant growth. Reaching an estimated one million tonnes of potassium oxide (K₂O) equivalent by 1921, world potash production and consumption increased to about three million tonnes per year by 1950. Production then rose strongly and

consistently to almost 32 million tonnes by 1988, dropped back after the demise of the Soviet Union to just over 20 million tonnes in 1993, before increasing to 35 million tonnes in 2007. Though declining dramatically as a result of the Global Financial Crisis in 2009, it recovered again to 36.4 million tonnes by 2011 fell back to 32.7 million tonnes in 2012 and rose to 34.6 million tonnes in 2013—see Fig. 1.

While there are no regularly collected public domain data for total potash consumption, the International Fertilizer Association provides readily accessible estimates of potash consumption in fertiliser use. These are available annually since 1961. Standing at just under nine million tonnes at that time, they rose steadily to more than 27 million tonnes by 1988 – an average annual growth rate of 4.2 per cent.

At the end of the Soviet Union period between 1988 and 1993, estimated potash consumption for fertiliser production fell by more than 30 per cent to 19.1 million tonnes. Increasing at an average of 2.8 per cent annually, it then recovered to 29.1 million tonnes by 2007. In the aftermath of the Global Financial Crisis between mid-2008 and 2011, estimated potash consumption declined slightly—see Fig. 2.

The early development of potash mining that occurred in Germany and France was a result of a new understanding about the role of potassium in plant growth, and as agricultural demand worldwide increased, new potash resources were brought on stream. By 1930 three nations (Germany, France and the United

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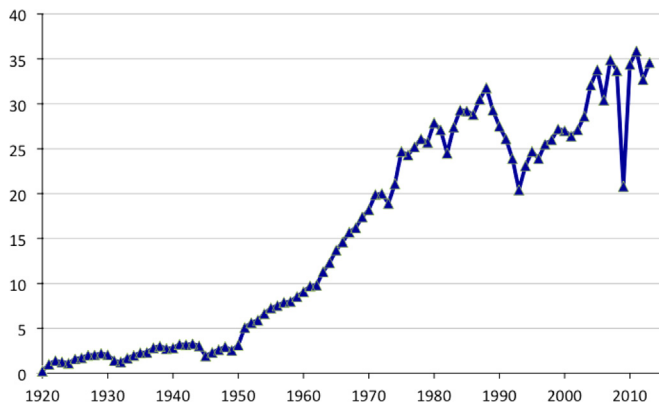


Fig. 1. World production of potash in million tonnes per annum 1920–2013.
Source: United States Geological Survey.

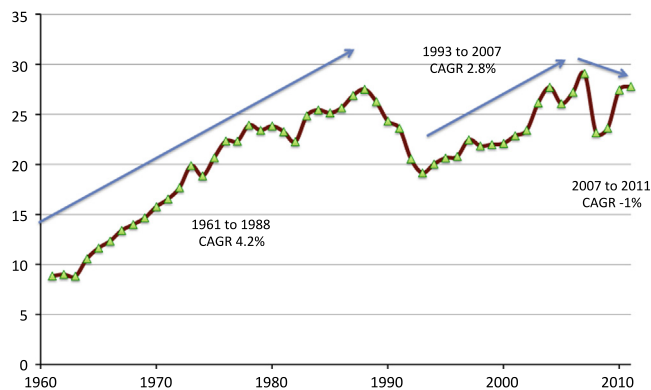


Fig. 2. World consumption of potash for fertiliser (million tonnes per annum)–1961–2011.

Source: International Fertilizer Association (2014)

States) mined potash—see Table 1. Since that time firms operating in Canada, Russia, Belarus, China, Israel, Jordan, Chile, the United Kingdom and Spain have also entered the industry. By 2010, Canada, Russia and Belarus had become the leading producing countries, with Germany, the United States, China, Israel, Jordan and Chile also being significant players.

The two major ore deposit types currently exploited are deeply buried marine evaporite deposits and surface brine deposits. The latter are associated with saline water bodies such as the Dead Sea in the Middle East, the Great Salt Lake in the United States and the Salar de Atacama in northern Chile. In 2012, almost eighty per cent of global capacity of potash production came from conventional underground mines, six per cent from underground solution mines and the remainder by harvesting natural brines from potassium-rich water bodies, typically using solar evaporation.

The recent concentration of more than 60 per cent of potash production in Canada, Russia and Belarus has been associated with several companies having access to large high quality deposits, possessing significant market power and adopting cartel-type behaviour. Yet, as Taylor and Moss (2013) note, there has been a continuing history of such behaviour for more than a century.¹ The percentage shares of key potash producing companies in 2012 are shown in Fig. 3.

PotashCorp, Mosaic and Agrium collaborate in the export of their respective product from Saskatchewan in Canada using the jointly owned Canpotex company, while PotashCorp also holds

significant equity shares in the Israel Chemical Company,² the Arab Potash Company in Jordan, SQM in Chile and the Chinese potash importing company, Sinofert. Israel Chemical Limited fully owns the only Spanish potash producer, Iberopotash, and Cleveland Potash Limited, the one potash producer in the United Kingdom.

Between 2005 and August, 2013, Uralkali and Belaruskali marketed their production using the Belarusian Potash Company (BPC), a co-operative distribution agreement from their operations in Russia and Belarus, respectively. In August 2013, Uralkali suddenly abandoned this co-operative arrangement with Belaruskali, in a bold effort to increase its own market share. Although this co-operation has now apparently been restored, its effects during the latter part of 2013 were profound, as prices fell sharply.

While Carter (2009) described potash as “one of those behind-the-scenes commodities somewhat lacking in glamour,” recent events may have significantly changed that perception. As Fig. 4³ shows, there was a consistent decline in real prices of muriate of potash⁴ during the first half of the 20th century. Its real price (in \$US 1998) hovered around \$US 200 per tonne for around sixty years after the end of World War II. This lack of glamour changed by 2007 and 2008 when fertiliser prices spiked and established firms mining potash for around \$US 100 per tonne were selling it for more than \$US 800 per tonne. At that time there was considerable optimism about growth in fertiliser demand associated with the growing population and greater use of ethanol as an alternative fuel to oil and gas.

Responding to the changed market situation, BHP Billiton made a takeover bid for PotashCorp. Though eventually rejected under foreign investment guidelines by the Canadian Industry Minister, the episode highlighted the increased visibility for potash. In association with this move, BHP Billiton also purchased the large undeveloped Jansen project in Saskatchewan, with a view to developing it fully, either alone or in co-operation with one or more other partner companies.⁵

Even though prices fell in the aftermath of the Global Financial Crisis, they then made a recovery, reaching \$US 750 per tonne in 2012 before falling back dramatically in 2013 as the result of a short-term breakdown of Uralkali and Belaruskali agreement.

Given this background, the purpose of this paper is to develop a greater appreciation of the demand and supply sides of the potash industry. This provides a foundation to consider its development in coming decades. The discussion in the next section reflects on the demand side of potash. It addresses in particular the key factors affecting its use. In the section [Factors affecting potash supply](#), we consider the major factors that influence the supply of potash. This leads to a broader discussion of likely future developments in the section [Looking to the future](#). Some concluding comments are then offered.

Factors affecting potash demand

The demand for minerals is overwhelmingly a derived demand, arising from their use as an input in producing final goods. As we have already noted, about 90 per cent of potash consumption derives from its application in making fertilisers, used mainly by farmers as an input for crops and pasture. If applied in an optimal way with other fertilisers, potash use increases farm profitability.

² It has also taken a significant equity position in Allana Potash, which has a promising new project in Ethiopia.

³ There was a spike in potash prices in World War I to more than \$US 7000 per tonne (in 1998 \$US prices) that would distort this diagram unnecessarily if all points were plotted.

⁴ This statement also applies to other potash compounds.

⁵ A press release on this matter appeared on 20 August, 2013 (BHP Billiton, 2013).

¹ Some notable contributions in this field include those by Tosdal (1913) and Stocking (1931).

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