LEARNING OBJECTIVES

Learning Objectives

By the end of this Lesson, learners will be able to:

- Identify the top producing countries for gold, Platinum Group Metals, and diamonds
- Identify the prominent uses for gold, PGMs and diamonds
- Describe the steps needed to take diamonds from prospecting and exploration to market
- Describe events that impacted the De Beers diamond monopoly and therefore impacted the industry as a whole
- Describe the role that organizations such as the GIA have in the jewellery industry

INTRODUCTION

Introduction

When considering significant people and groups of the gem and precious metal industry the whole spectrum from mine to market should be considered. Diamonds and gold play the largest roles in the industry and consequently the key players of those worlds can be considered the key players of the industry as a whole. We will also discuss the platinum group metals, the second most important non-gem material used in jewellery.

On the market end of the spectrum, most consumers will shop at smaller independent jewellery stores or retail chains but are familiar with a few of the more prominent luxury retailers and auction houses. Backing this interface with consumers is an entire network of association and organizations that provide support and education to the gem and jewellery industry, playing a vital role in establishing stability in a market that, in reality, is not necessary for everyday life.

Essential readings and topics for this lesson

None

Optional readings for this lesson

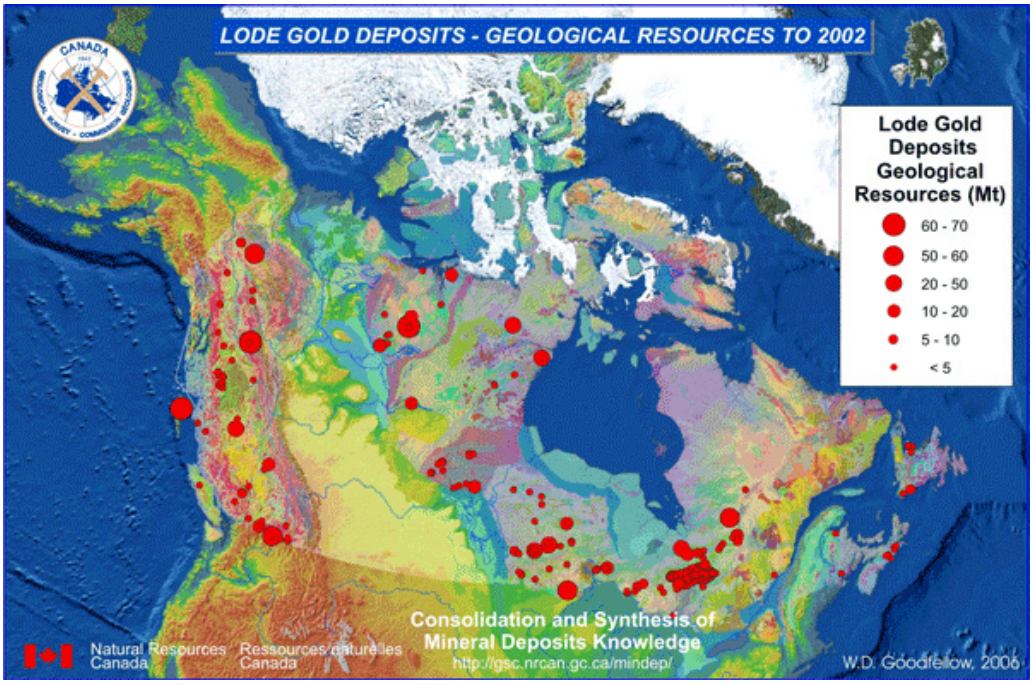
Websites given within the next pages.

GOLD

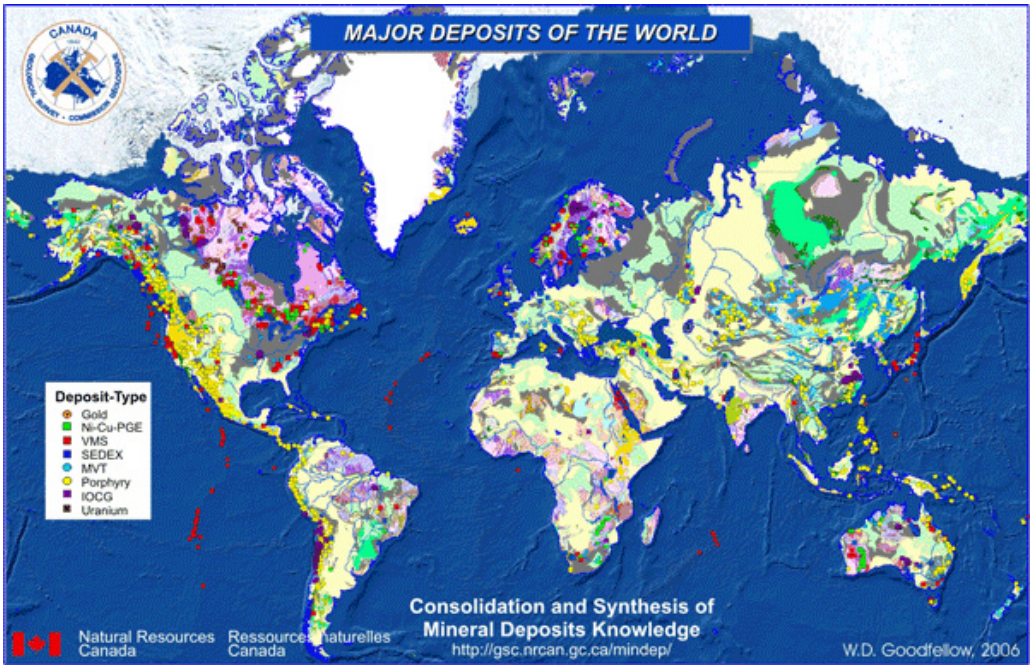
Gold

South Africa currently produces 11% of the world's newly mined gold (Chemical Symbol: Au) and has long been the world's largest producer of gold. However, in recent years China has produced slightly more gold per year (12%). Australia, North and South America all produce significant quantities as well, with Canada being the 8th largest producer in the world at 4% of the world's output. Most of the gold in Canada originates from hard rock mines in Ontario, Quebec, and British Columbia. The total global amount of gold produced on a yearly basis for the last five years averages ~2,500 tonnes. Jewellery production accounts for 83% of the global consumption of gold with the remainder being made up primarily by electronics, currencies and investments.

On a company basis, Barrick Gold of Canada is the largest non-Chinese producer of gold amongst those that have publicly released their production data. It is responsible for approximately 10% of the market share, generated from 27 active mines on 4 continents. AngloGold Ashanti of South Africa (20 mines in 10 countries on 4 continents) and Newmont Mining of the United States (mines in 9 countries on 5 continents) each produce 7% of the world's new gold. These large companies can exert significant leverage across borders and their combined large numbers of operations have inevitably led to questionable situations (politically, socially, and environmentally) for each of them. "New Gold" is distinguished from "Total Gold" in global production number because a significant amount of gold is recycled or pulled from central stockpiles when demand is high.



Lode Gold Deposits of Canada with size of circles indicating how much gold is present at each location. Figure by the Geological Survey of Canada.



Major metal deposits of the world. Figure by the Geological Survey of Canada.

Gold mines operated by AngloGold Ashanti.

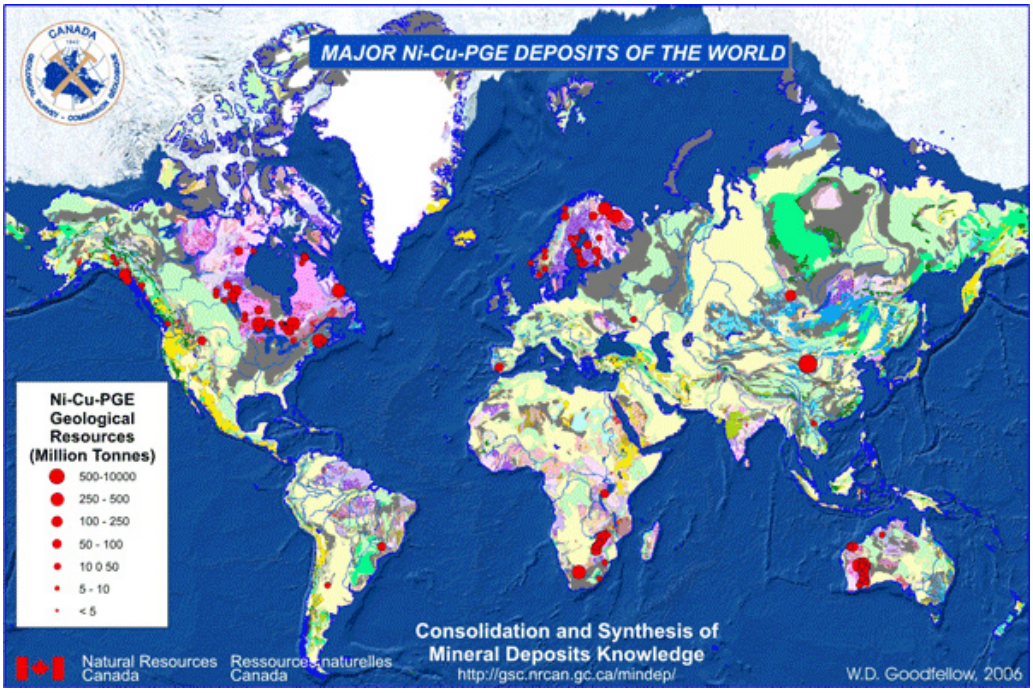
Platinum Group Metals (PGMs)

Platinum (Chemical Symbol: Pt) is commonly found with five other similar metals in nature: palladium (Pd), rhodium (Rh), ruthenium (Ru), iridium (Ir) and osmium (Os). They are rarer than gold, have a number of high-tech applications and less are produced annually. The price of each metal fluctuates according to industrial applications, but in general Rh is the most expensive, Pd is the least expensive and Pt has normally sat between the two. The graphs at the end of this page show plots of historical prices for the platinum group metals.

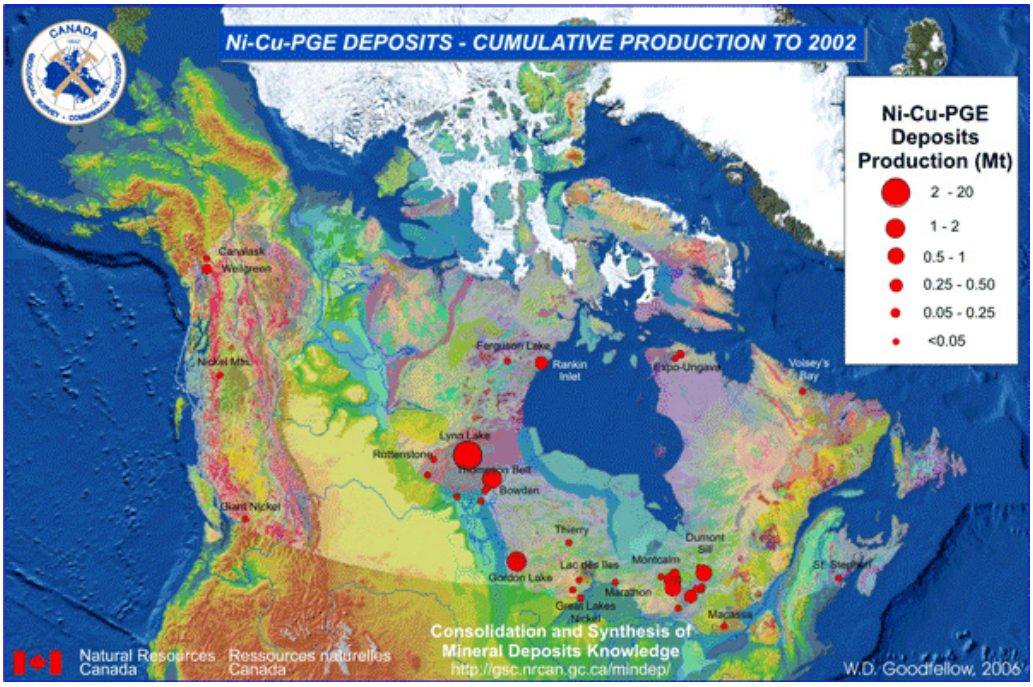
The PGMs have a higher melting point than gold and exhibit very good durability and strength. Use in jewellery accounts for approximately 30% of the global consumption of platinum and palladium with the rest going primarily to autocatalysts (with 15% into electronics). The market for platinum sales is a free market and prices of PGMs are largely dictated by the global supply balanced by the demand in the autocatalyst and jewellery markets. With a global supply of platinum group metals on the order of 475 tonnes (or ~17 million ounces), and much of that coming from the South African Bushveld Region, PGM prices are subject to large swings especially if conflict slows or halts production in South Africa.

The two main producers of PGMs are South Africa (79%) and Russia (12%), with significant tonnages provided by the US (2%) and Canada (4%). The total annual output of Pt and Pd in 2005 from all mines was 216 and 214 tonnes, respectively, with about 23.5 tonnes of Rh produced as well. In South Africa, the Bushveld Complex is the primary geologic structure that hosts the mines that are producing the majority of the PGMs. Minor contributions come from Palabora and the Witwatersrand Basin. Canada's production comes largely from the Lac des Iles operation near Thunder Bay and as a secondary product from the Sudbury Complex's nickel deposit in Sudbury, Ontario. The Stillwater Complex is the primary resource of the United States. Anglo Platinum Group Ltd. is the largest producer of platinum with several operations in South Africa and Canada.

The Platinum Group Metals are also commonly referred to as the Platinum Group Elements (PGE). Similarly, the minerals that host PGE are sometimes referred to as Platinum Group Minerals. These are important distinctions that we will better delineate as we learn about **elements** of the periodic table, **minerals**, **native elements**, **native metals**, and **refined metals**.

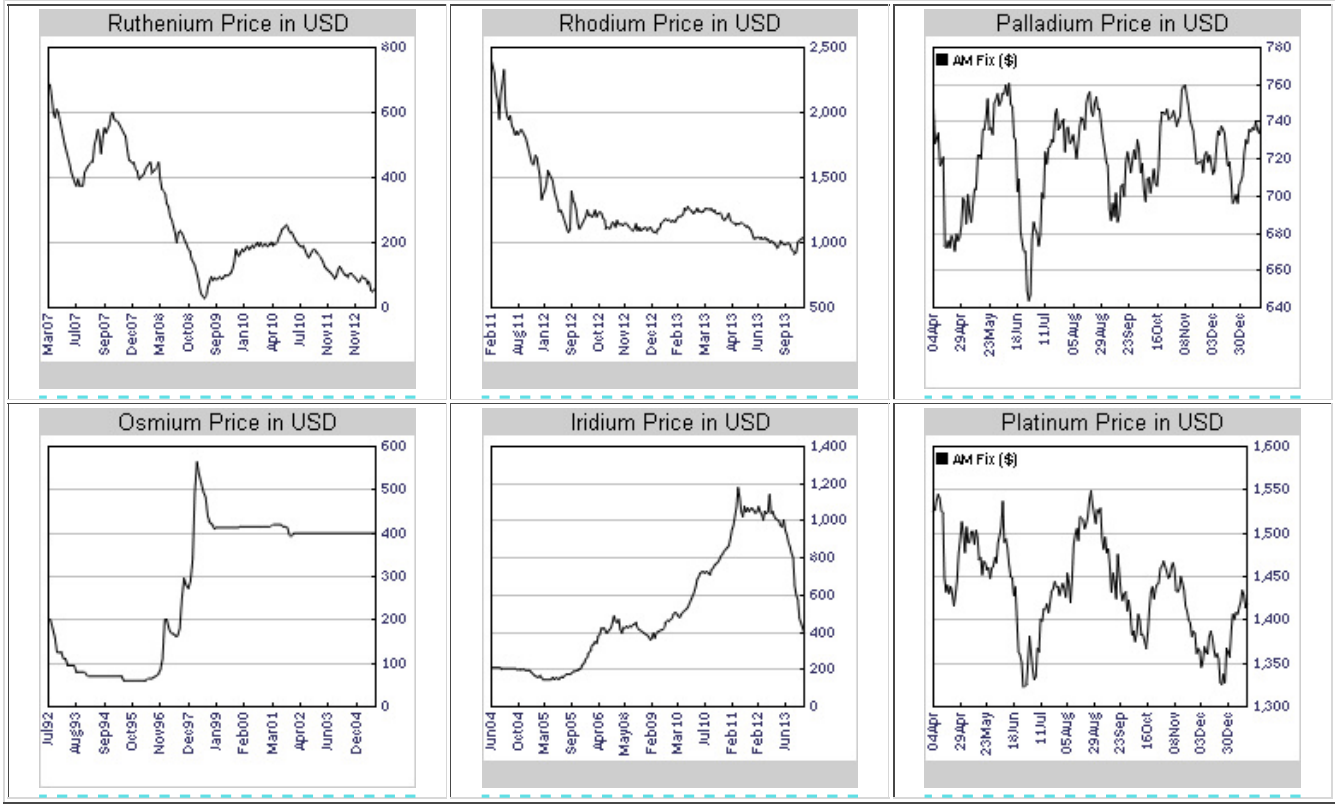


Major nickel, copper, and Platinum Group Element deposits of the world, with size of circles indicating the total contained amount of metal present. Figure by the Geological Survey of Canada.



Major nickel, copper, and Platinum Group Element deposits of Canada, with size of circles indicating the total contained amount of metal present. Figure by the Geological Survey of Canada.

Historical and Current Commodity Prices for the Platinum Group Metals



*Note the more current data for Pt and Pd, while there are different data ranges for the other PGMs

Data and Figures From The Bullion Desk

DIAMONDS

Module A. Diamonds and Due Diligence

Lesson 3 - Significant People and Groups

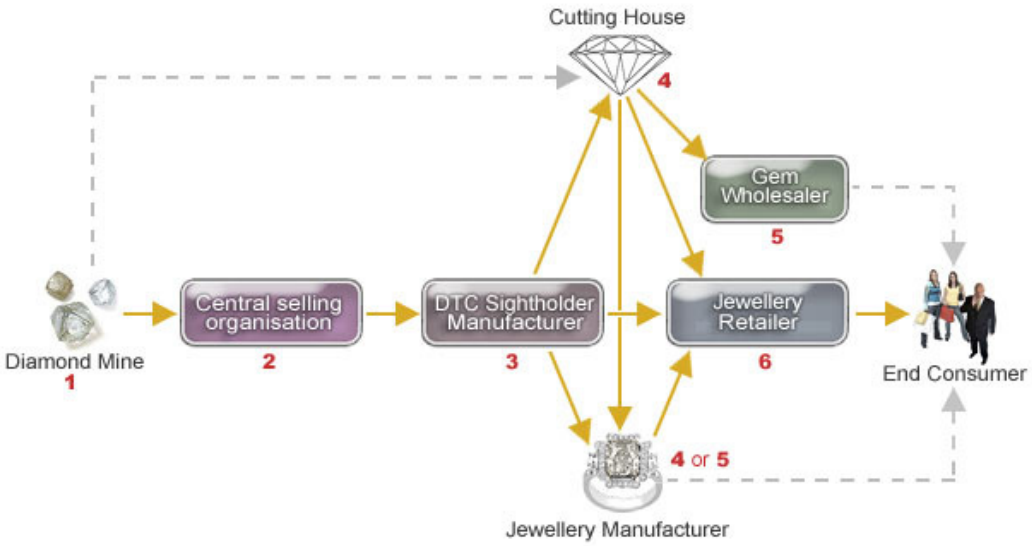
Diamonds

When one thinks of diamonds, the name De Beers immediately comes to mind, and with good reason. De Beers Consolidated Mines Ltd. has essentially controlled the entire diamond market since its inception in 1888 with the Kimberley Mine in South Africa up until the last two decades. In addition to controlling the movement of diamonds from most mines through the Central Selling Organization, the Diamond Trading Company (DTC) and global network of Sightholders and Diamond Bourses, De Beers has also conducted very successful marketing campaigns and kept prices high for this tightly moderated commodity. As demand from consumers varied through time, so has the limited release of diamonds to retailers even though supplies from diamond mines has remained quite high at times.

The following is a typical, but generalized, view of the steps involved in bringing a diamond to the market:

1. Geological prospecting, exploration and development of mine site
2. Production of rough diamonds from mine(s) go to the Central Selling Organization
3. Sorting, valuing, and sighting of rough stones by DTC to Sightholders

4. Cutting and polishing into finished diamonds
5. Jewellery and gem manufacturing and distribution
6. Retail stores and sales



Schematic showing the "Diamond Pipeline" from mine to market.

Once diamonds have been found through exploration and mined from the ground (step **1**) they are sorted into gem, near-gem and non-gem parcels by the Central Selling Organization (step **2**). In step **3**, the Diamond Trading Company coordinates delivery of raw goods into optimized parcels for the Sightholders. Within these parcels are also divisions based on size, colour, and clarity of the rough diamonds. These packages are called 'sights' and their sales are tightly monitored; only registered Sightholders are normally allowed to purchase sights.

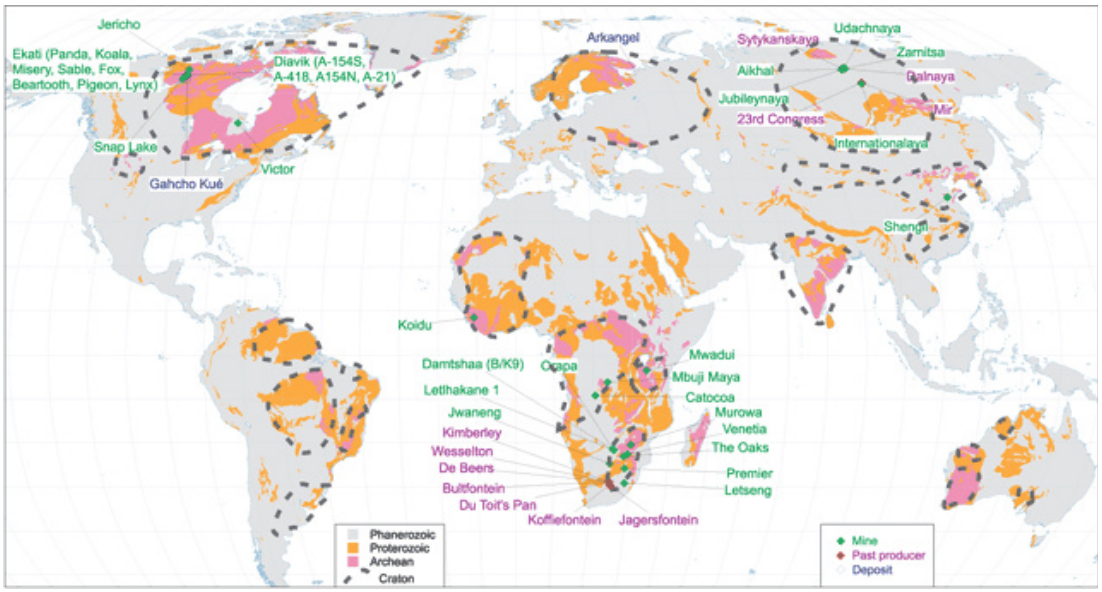
It is difficult to value rough diamonds and there are not necessarily any fixed formulas to determine this. Once the parcels have been bought, the rough diamonds are then faceted and transformed into what we as consumers usually encounter - polished gemstones (step **4**). There are a number of 'cutting houses' around the world, but some of the historical centers are in Antwerp, Mumbai, New York and Johannesburg. Lower cost cutting facilities have become more common and are located in places such as India, Thailand, and China. Jewellery manufacturing (steps **4** and/or **5**) happens on both large and small scales. Some of the larger retail outlets have their own manufacturing arms. However, most retail outlets are 'independents' and source their finished products from manufacturers around the globe. Each manufacturer will typically have a specific target clientele in which they design their jewellery for (e.g., middle class consumers or high end luxury brands). Eventually diamond jewellery, and sometimes loose diamonds, makes its way to jewellery retailers (step **6**) where we, the end consumer, have the opportunity to purchase at the end of this long procedure!

Exceptions to this chain of custody, however, have changed the way diamonds have moved from mine to market. De Beers' strong control of the global diamond trade began to diminish with the establishment of Australia's Argyle Mine in the 1980's. The Argyle Mine was not owned by De Beers and although it ran some of its large production of diamonds through the central Diamond Trading Company, much of their material bypassed this conventional port to the consumer. Political changes and the deregulation of diamond distribution in Russia (due to political collapse) and Angola (due to abundant small scale diamond production) in the early 1990's also delivered a large blow to the DeBeers control.

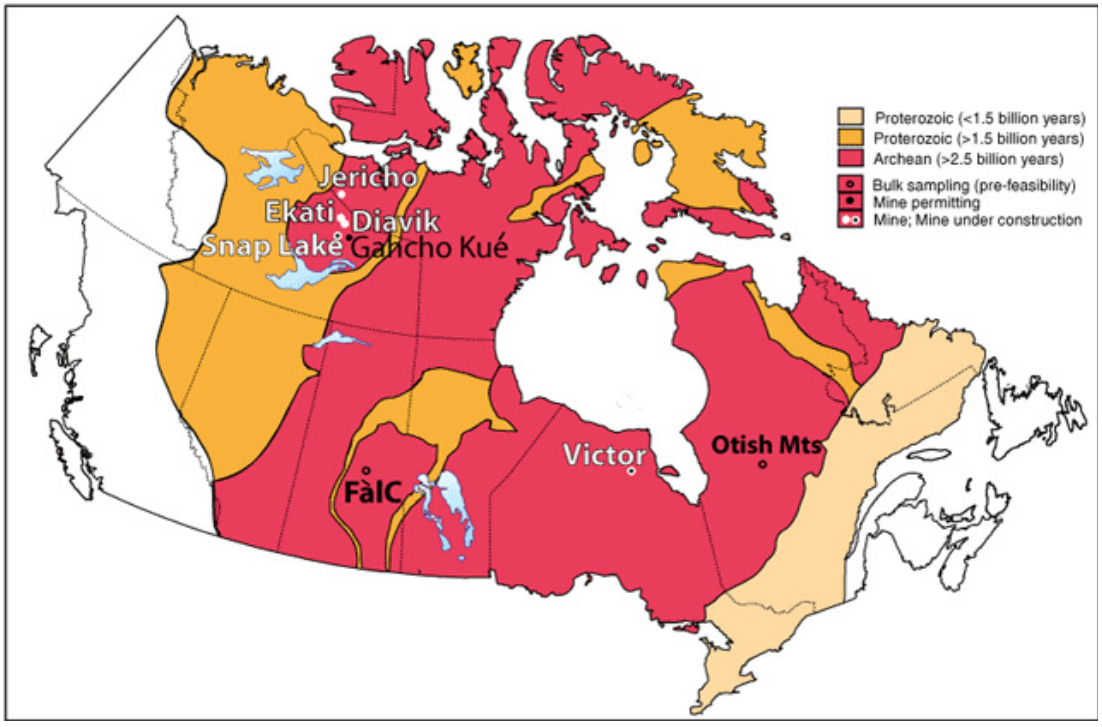
In the late 1990's the first diamond mine in Canada, Ekati (operated by BHP Billiton), started to bring more high quality material to the market but also not through De Beers. In 2003, Rio Tinto opened Canada's second diamond mine, Diavik, followed by Tahera Diamond Corp's Jericho Project that started production in 2006 and the nearby Snap Lake Project. By the end of 2007 these three diamond mines in Canada were already providing 12% of the global production of diamonds with a value of ~Can$1.7 billion.

The monopoly on the diamond market by De Beers is now effectively gone. However, the tight control of diamonds on a global scale continues with the aid of the Kimberley Process. The diamond market is now more competitive but because of the huge amount of money invested in creating this industry, the flow of finished goods to the consumer is still tightly controlled but just not from one individual company now.

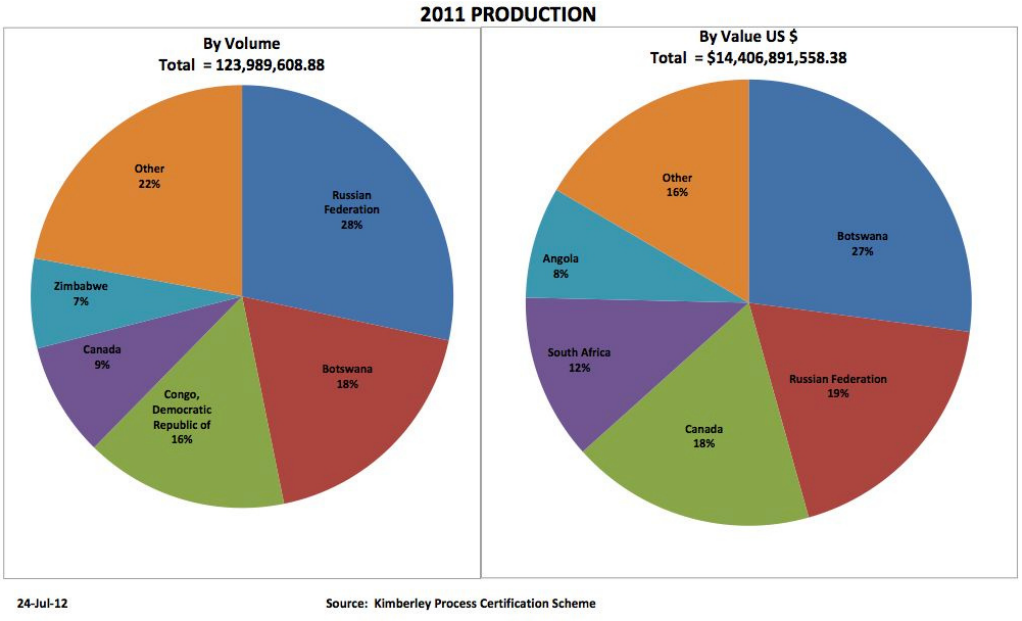
Of all the diamonds being mined only about 20% actually end up being of good enough gem quality to turn into polished goods. And of that 20% considerable loss is incurred when a diamond is taken from its rough form and turned into a finished gemstone. The remaining 80% of the non-gem diamonds are used in industrial applications. These non-gem diamonds are often called bort and exploited for their phenomenal physical properties. The most common use for these diamonds is as abrasives.



Diamond mines of the world, and the old 'Archean Rocks' they typically occur within. Figure by the Geological Survey of Canada.



Diamond mines (actively being mined or developed) and deposits (not actively being mined) of Canada. Figure by the Geological Survey of Canada.



Pie charts showing the proportional contributions of countries to the global diamond production by volume and value in 2011. Click to see larger format.

Retailer and Industry Organizations

An important part of the diamond and jewellery industry is independent evaluations and training of certified gemologists. An independent evaluation of diamonds is significant because small differences in the grade of a diamond (e.g., between a D and F coloured stone) can be substantial. If a retailer is selling a stone, they may wish to 'upsell' the quality of a diamond, whereas the consumer would prefer to 'downsell' the diamond. An independent evaluation of the stone in question eliminates these aspects and protects both the consumer and the retailer. Various laboratories conduct evaluations, or certification, of a diamond but in North America, the Gemological Institute of America (GIA) is the most reputable and most stringent diamond grader. Other labs include the International Gemological Institute (IGI), American Gem Society (AGS), and European Gemological Laboratories (EGL). All of the reports generated by the above organizations will include documentation of the cut quality, colour, clarity and carat weight of the investigated stone. Physical dimensions of the stone are also recorded and enhancements to the diamond are also recorded along with any information pertaining to the stone's origin.

Logos for the Gemological Institute of America and the International Gemological Institute.

Retailers and manufacturers have created organizations to form a collective voice for the industry and provide functions and forums for collaboration and discussion of current topics. The American Gem Trade Association (AGTA), Canadian Gemological Association (CGA), Canadian Jewellers Association (CJA), and Jewelers Circular Keystone (JCK) are all groups that provide benefits to their members. Many of these groups, along with the GIA and AGS also offer educational programs where students may learn the techniques required for certified gemological testing. For example, the GIA offers a Graduate Gemologist Diploma Program that is highly respected in the gem and jewellery industry.

Logos for the American Gem Trade Association and the Jewelers Circular Keystone group.

Auction Houses and Luxury Brands

When we discussed famous gemstones and jewellery in the previous Lesson it was apparent that polished diamonds over 50 carats were highly unusual and did not follow the conventional path of being sold from a retailer to a consumer. Your mid-range and high-end jewellery stores will often carry stones up to 15 carats in their jewellery selection, but pieces over that size are often in cases mostly for show rather than as regular pieces. So where does one acquire fantastic stones or pieces of jewellery that don't reside in castles and in Royal Vaults? Luxury and high end auction houses. The two most renowned auction houses are Christie's and Sotheby's whose auction lots include magnificent gemstone and jewellery pieces. These pieces are routed through these companies for sale; this is where record prices are typically set for gems and jewellery.

Many luxury brands exist in today's market, however, many more have faded away in the past. Only a few have survived long enough to become household names across North America.

Tiffany & Co. , Harry Winston, Inc. and Van Cleef and Arpels are synonymous with exquisite luxury jewels. Each has claims to fame and have played important roles in the jewellery industry by adorning the wealthy and famous with magnificent jewels. Tiffany & Co. was founded in New York in 1837 and is well associated with "The Tiffany Diamond", a 128.54 carat fancy yellow diamond.

Logos for Tiffany & Co. Ltd., Harry Winston, Inc. and Van Cleef & Arpels

Harry Winston was an entrepreneur born in the late 19th century and started a very successful jewellery company in the US. A work of note by Winston are the 12 Jonker gems. He also dealt with creating jewellery for dozens of large diamonds and was involved in the buying and selling of famous pieces (such as the Spanish Inquisition Necklace) throughout his career. Harry Winston has also donated many stones to the Smithsonian Institution (e.g., the Hope Diamond and the Oppenheimer Diamond) and helped create one of the most fantastic publicly owned gemstone collections in the world. Van Cleef & Arpels was founded in 1896 in Paris, France, and served much of the European elite. Examples of their work include the Princie Pink Diamond Pendant and the Empress' Crown of the Iranian Crown Jewels.

Learning Objectives

- Identify the top producing countries for gold, Platinum Group Metals, and diamonds
- Identify the prominent uses for gold, PGMs and diamonds
- Describe the steps needed to take diamonds from prospecting and exploration to market
- Describe events that impacted the De Beers diamond monopoly and therefore impacted the industry as a whole
- Describe the role that organizations such as the GIA have in the jewellery industry

Check Your Understanding

- How has DeBeers historically had such a strong hold on the diamond market?
- How are diamonds sorted into sights? Who can purchase a sight?

L03 CYU Form

Which is a top producing country for both diamonds and PGM's

- Namibia
- Australia
- Canada
- South Africa

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