

# Long term trends in gold exploration

Essentially a modified version of  
my recent presentation to the  
NewGenGold Conference in Perth

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Adjunct Professor, Centre for Exploration Targeting , UWA

Technical talk to the Melbourne Branch of the AusIMM

28<sup>th</sup> November 2019

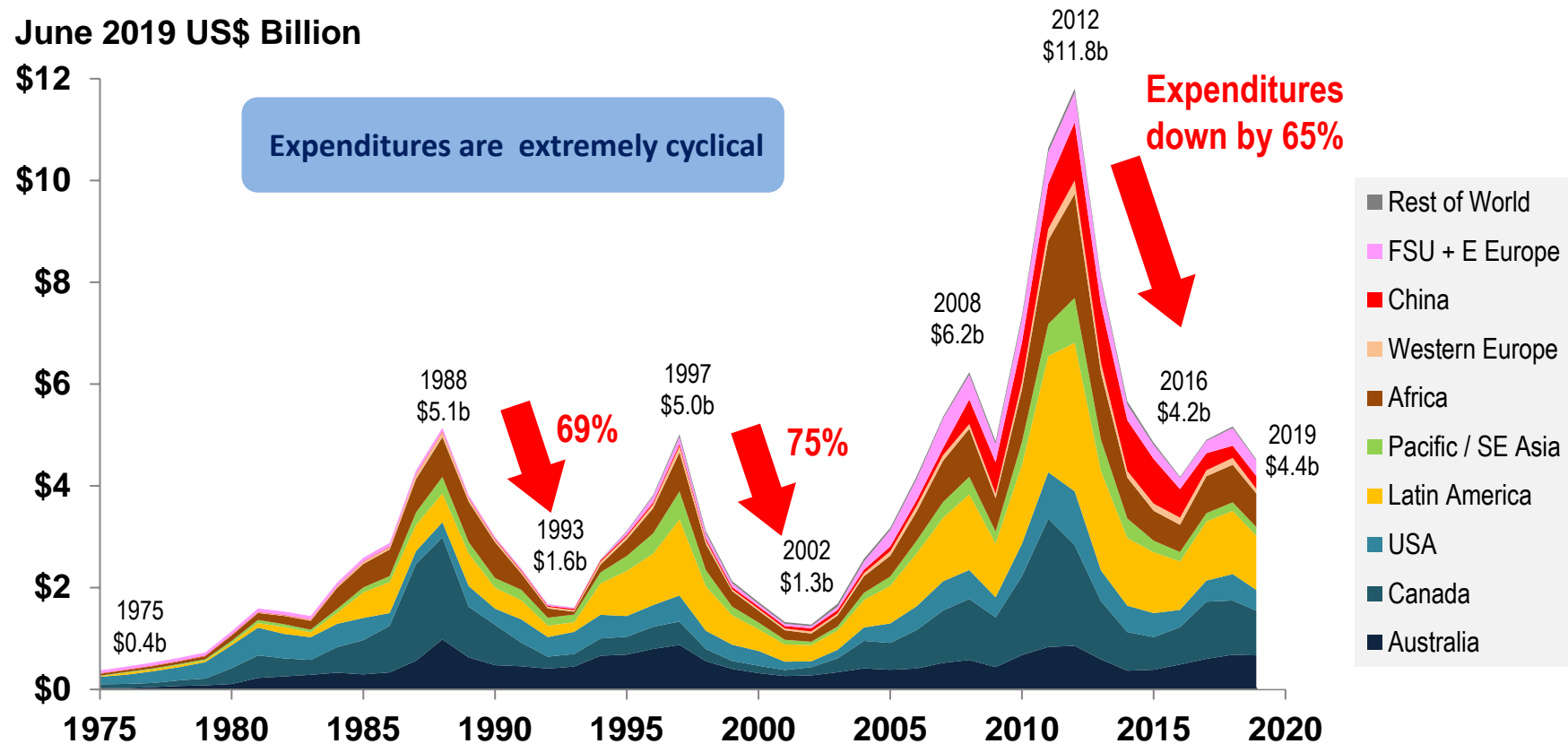
# Overview

1. Trends in exploration expenditures – *Australia vs Canada*
2. Trends in the number of discoveries and ounces – *How much found?*
3. Trends in the location of discoveries – *Where are the “hot spots”?*
4. Size and grade of discoveries - *Are we running out of “good” deposits?*
5. Depth of cover for discoveries – *What’s the average depth by Region?*
6. Who made the discoveries? – *Majors versus Juniors*
7. Quality of the discoveries – *Tiers 1, 2 & 3*
8. Trends in unit discovery costs – *\$/oz costs are rising over time*
9. Are we finding enough gold to replace what we mine?  
– *i.e. Is the industry sustainable?*
10. Summary / Conclusions

Exploration expenditures reached an all-time high in 2012

# **1. TRENDS IN EXPLORATION SPEND**

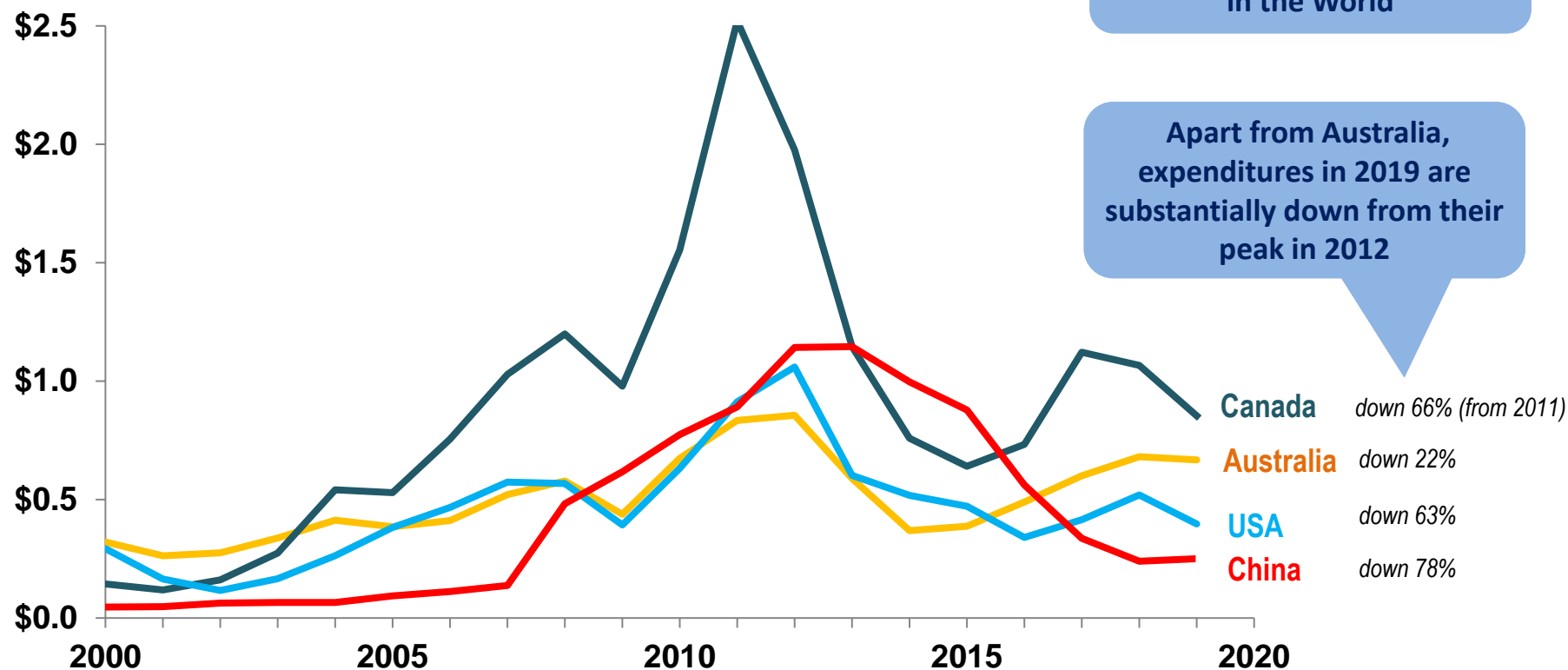
# Gold Exploration Expenditures: World



Sources: MinEx Consulting estimates, based on data from ABS, NRCan, MNR (China), Tilton (1988), Wallace (1992,93) and S&P © October 2019

# Exploration Expenditures: Top Four Countries

June 2019 US\$ Billion

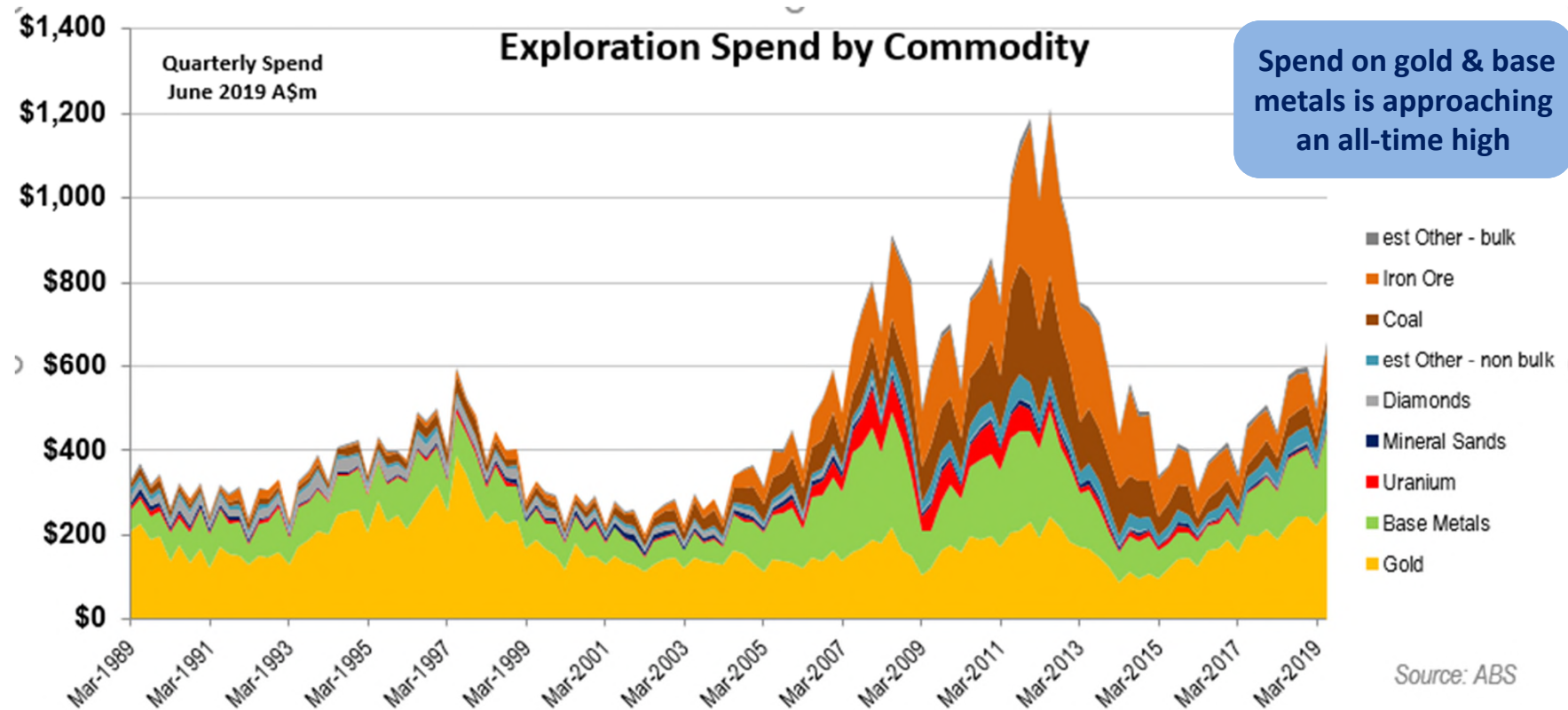


Sources: ABS, NRCAN, MNR (China) and S&P (for USA)

# Exploration Spend in Australia: By Commodity

## (In A\$ terms)

June 2019 A\$ Million



Note: Annualised spend is 4x higher than quarterly spend

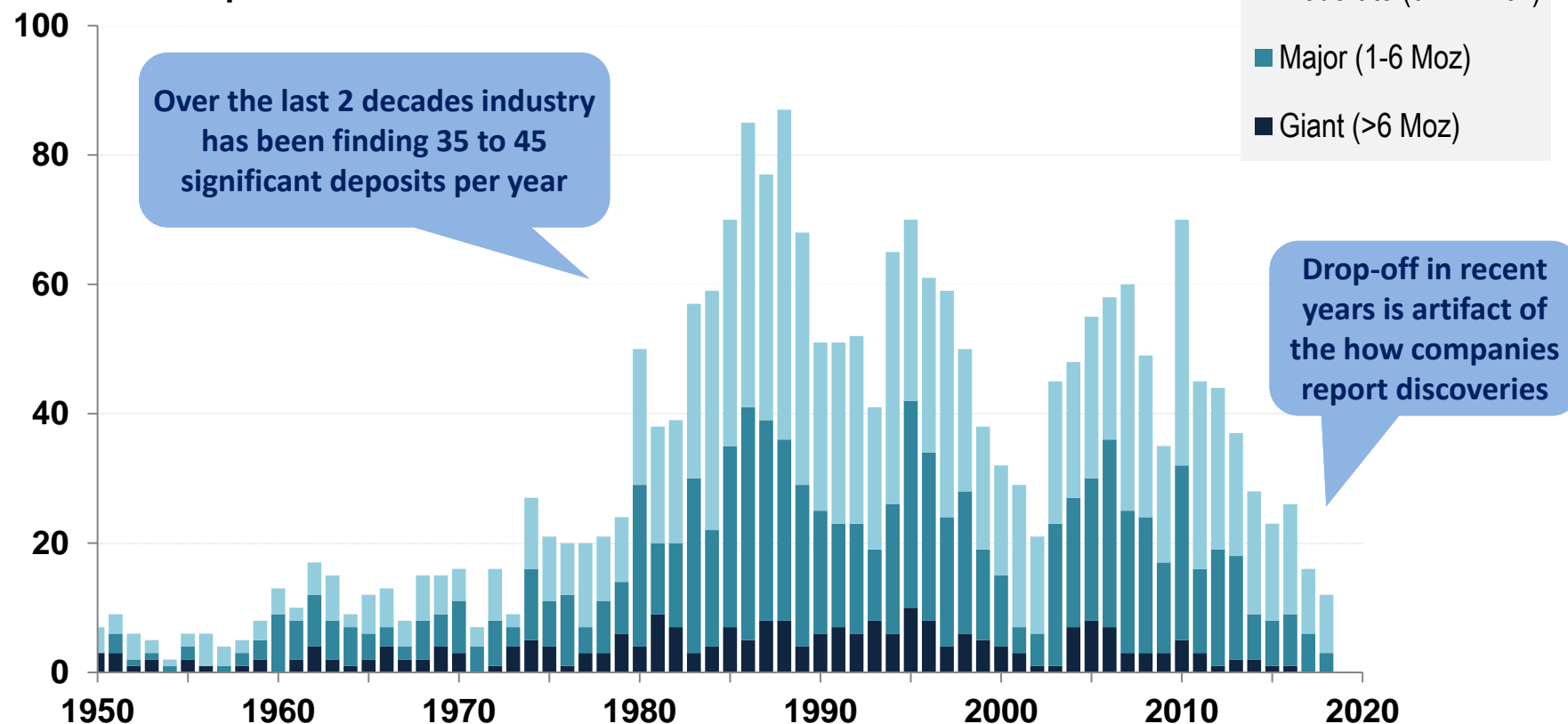
Discovery rates have plateaued (if not declining)

## **2. TRENDS IN THE NUMBER OF DISCOVERIES AND OUNCES FOUND**

# Number of Gold Discoveries: World

## Primary Gold Deposits by Size : 1950-2018

Number of Deposits



Note: Discoveries are for Primary gold deposits >0.1 Moz Au  
Excludes satellite deposits within existing camps  
Data from 2009 onwards have been adjusted for unreported discoveries

Source: MinEx Consulting © October 2019

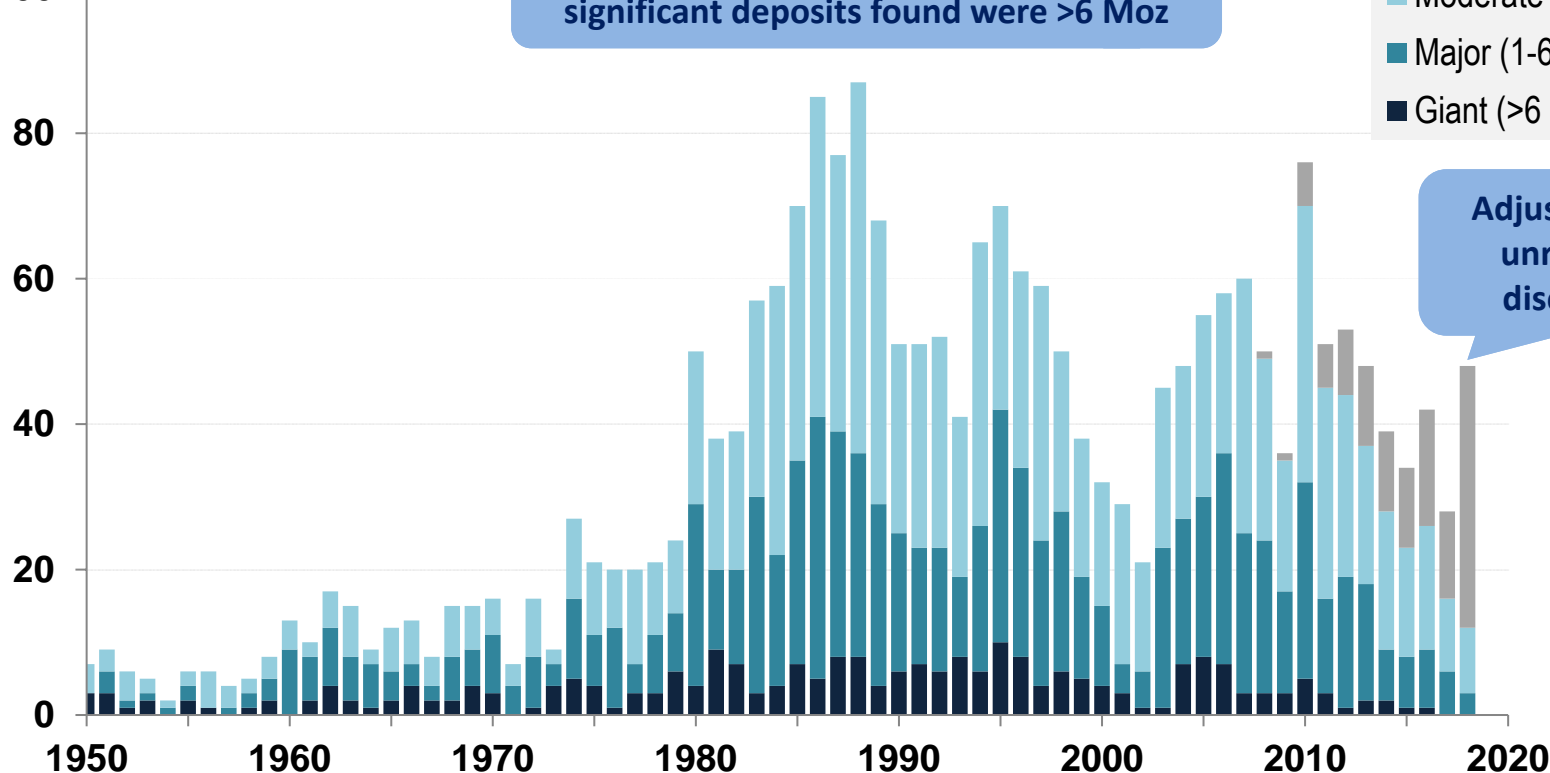


# Number of Gold Discoveries: World

## Primary Gold Deposits by **Size** : 1950-2018

Number of Deposits

100

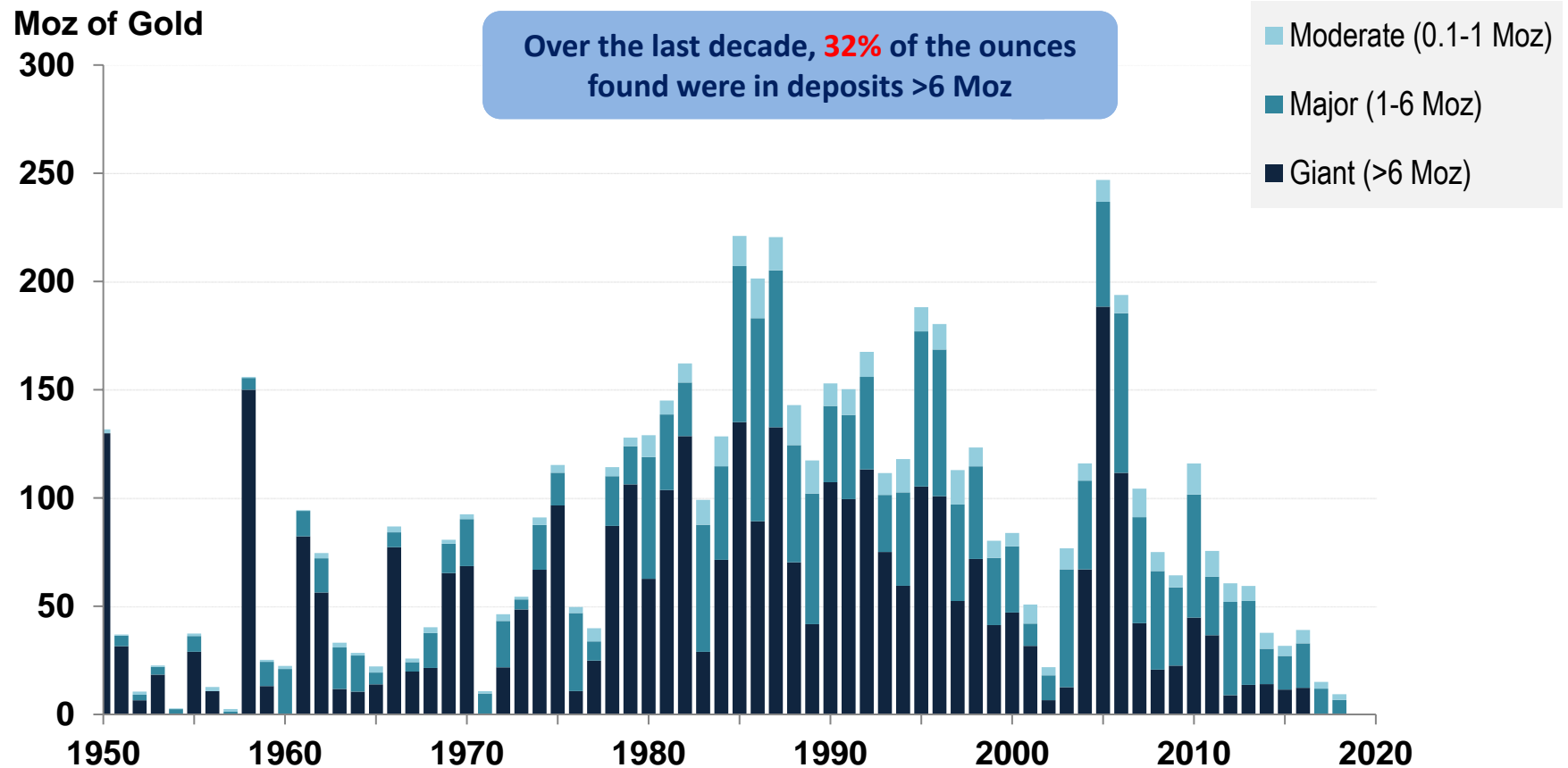


Note: Discoveries are for Primary gold deposits >0.1 Moz Au  
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Data from 2008 onwards have been adjusted for unreported discoveries

Source: MinEx Consulting © October 2019

# Amount of Gold Discovered: World

## Primary Gold by Size : 1950-2018



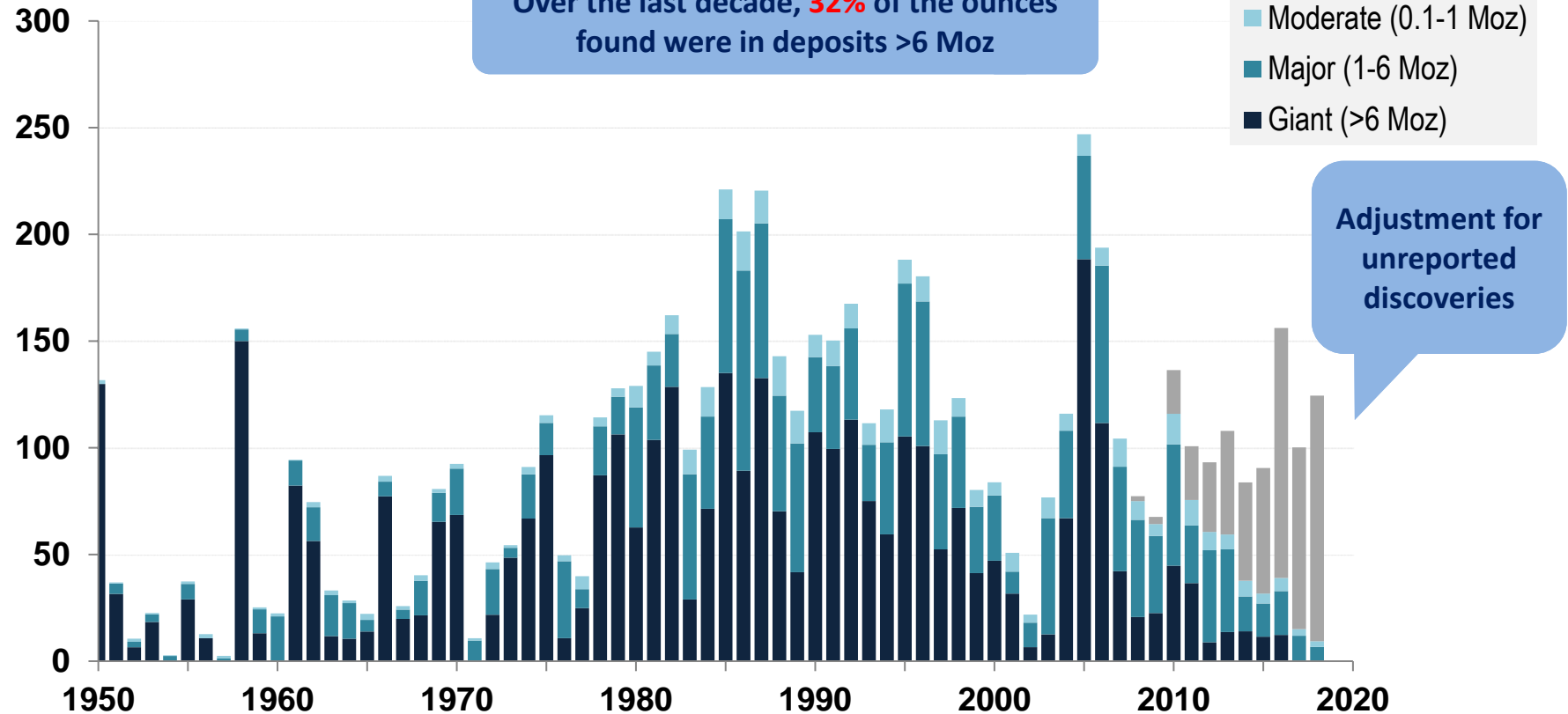
Note: Excludes by-product gold associated with base metal and other discoveries  
Excludes satellite deposits within existing camps  
Data from 2008 onwards have been adjusted for unreported discoveries

Source: MinEx Consulting © October 2019

# Amount of Gold Discovered: World

## Primary Gold by Size : 1950-2018

Moz of Gold



Note: Excludes by-product gold associated with base metal and other discoveries  
Excludes satellite deposits within existing camps  
Data from 2008 onwards have been adjusted for unreported discoveries

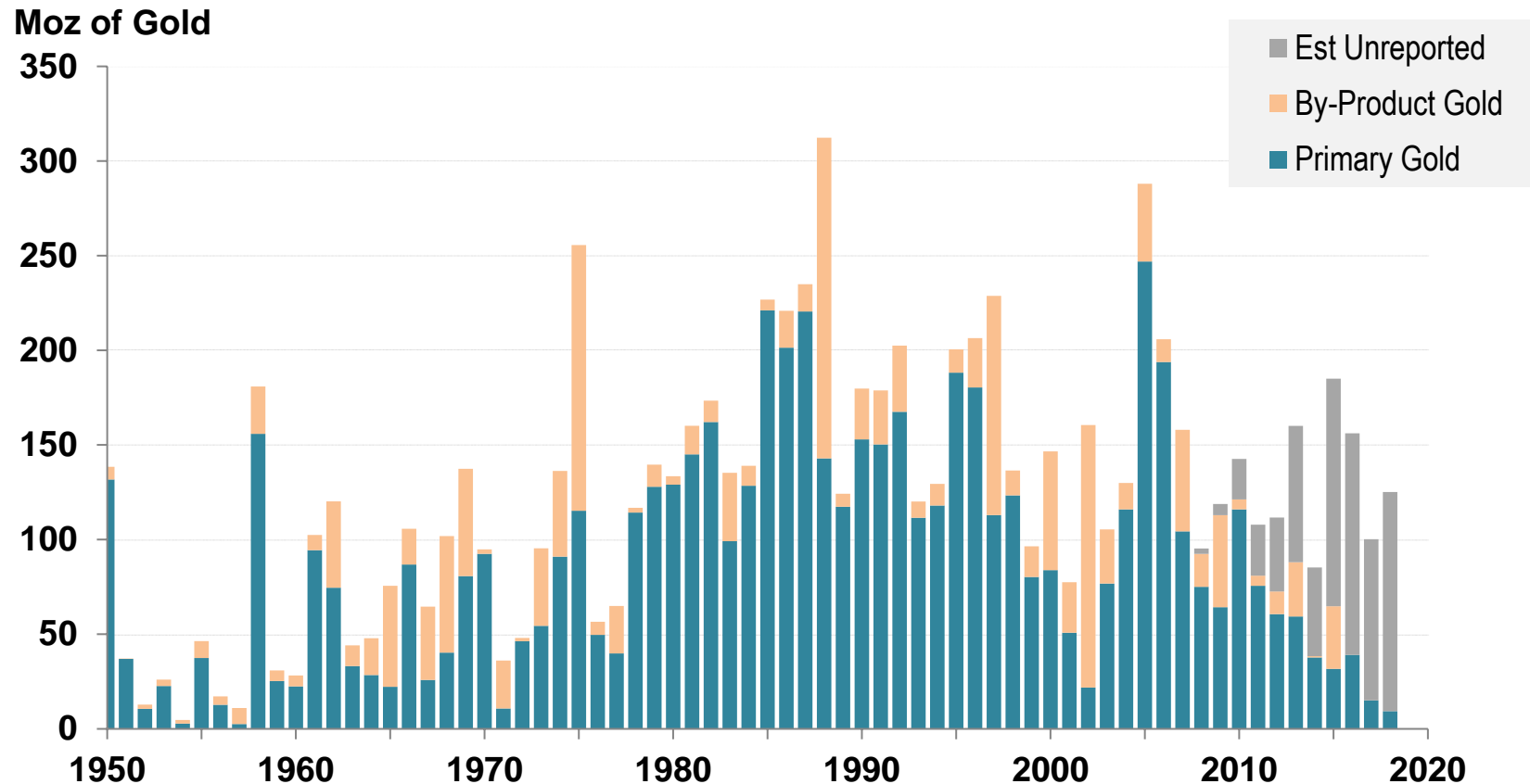
Source: MinEx Consulting © October 2019

## **Need to take into account by-Product Gold**

Industry also finds gold in base-metal and other deposits

# Amount of Gold Discovered: World

All deposits (i.e. Primary & By-Product Gold) : 1950-2018

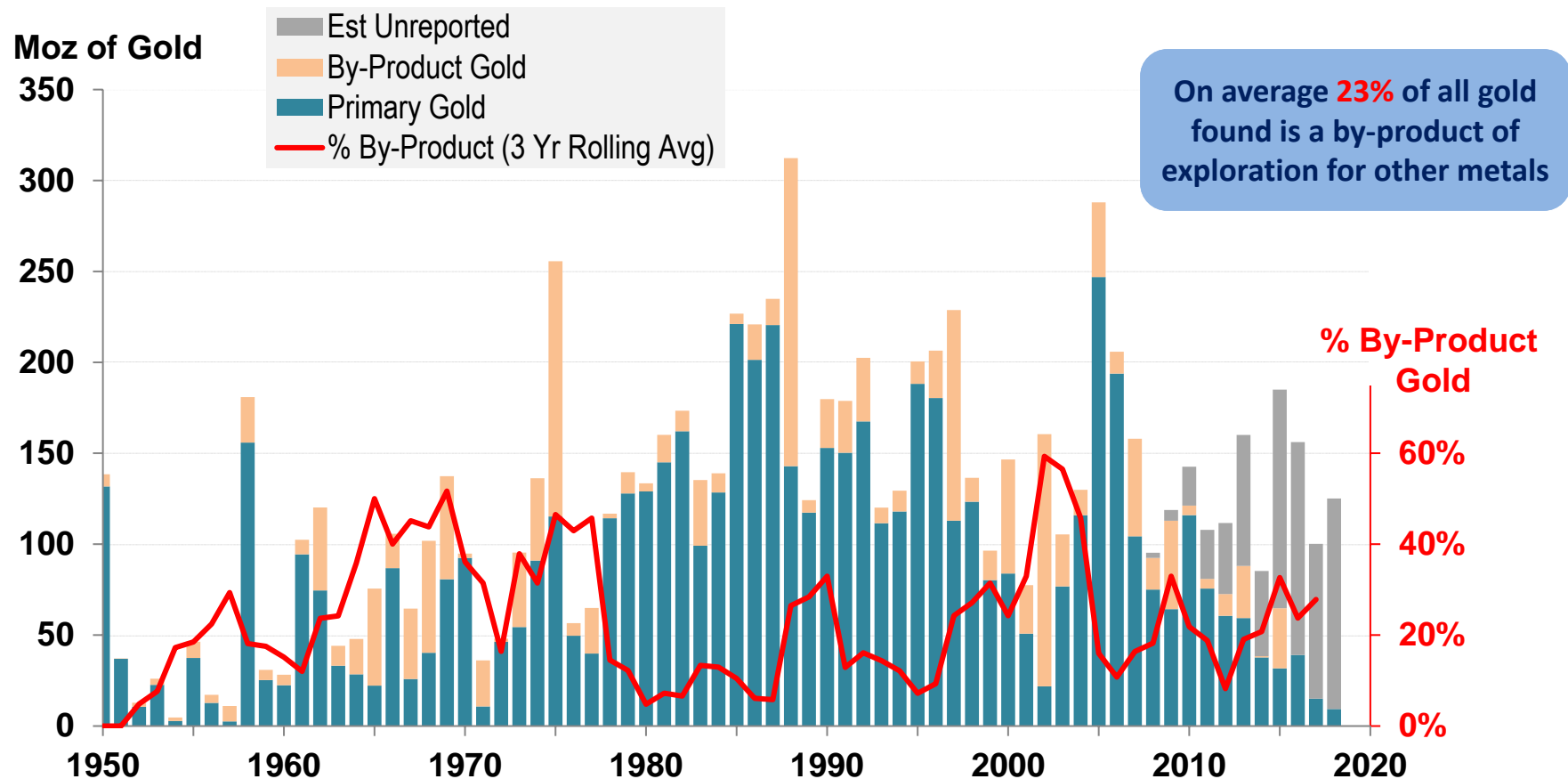


Note: Excludes satellite deposits within existing camps  
Data from 2008 onwards includes estimates for unreported discoveries

Source: MinEx Consulting © October 2019

# Amount of Gold Discovered: World

All deposits (i.e. Primary & By-Product Gold) : 1950-2018

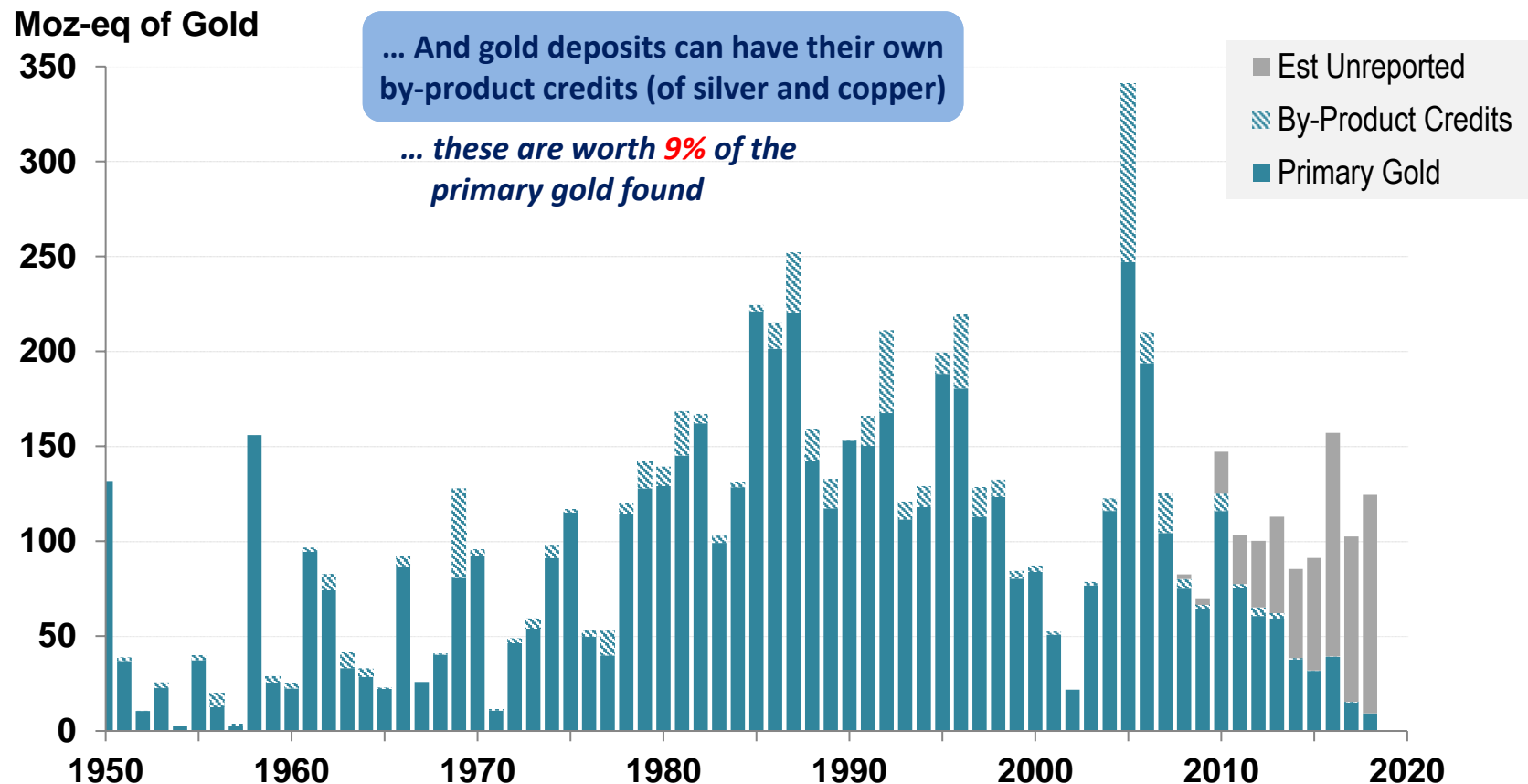


Note: Excludes satellite deposits within existing camps  
Data from 2008 onwards includes estimates for unreported discoveries

Source: MinEx Consulting © October 2019

# Amount of Gold Discovered: World

Primary Gold deposits only plus associated By-Product Credits : 1950-2018



Note: Excludes by-product gold associated with base metal and other discoveries  
Includes gold –equivalent value of base metal and other credits associated with the primary gold deposit  
Data from 2008 onwards have been adjusted for unreported discoveries

Source: MinEx Consulting © October 2019

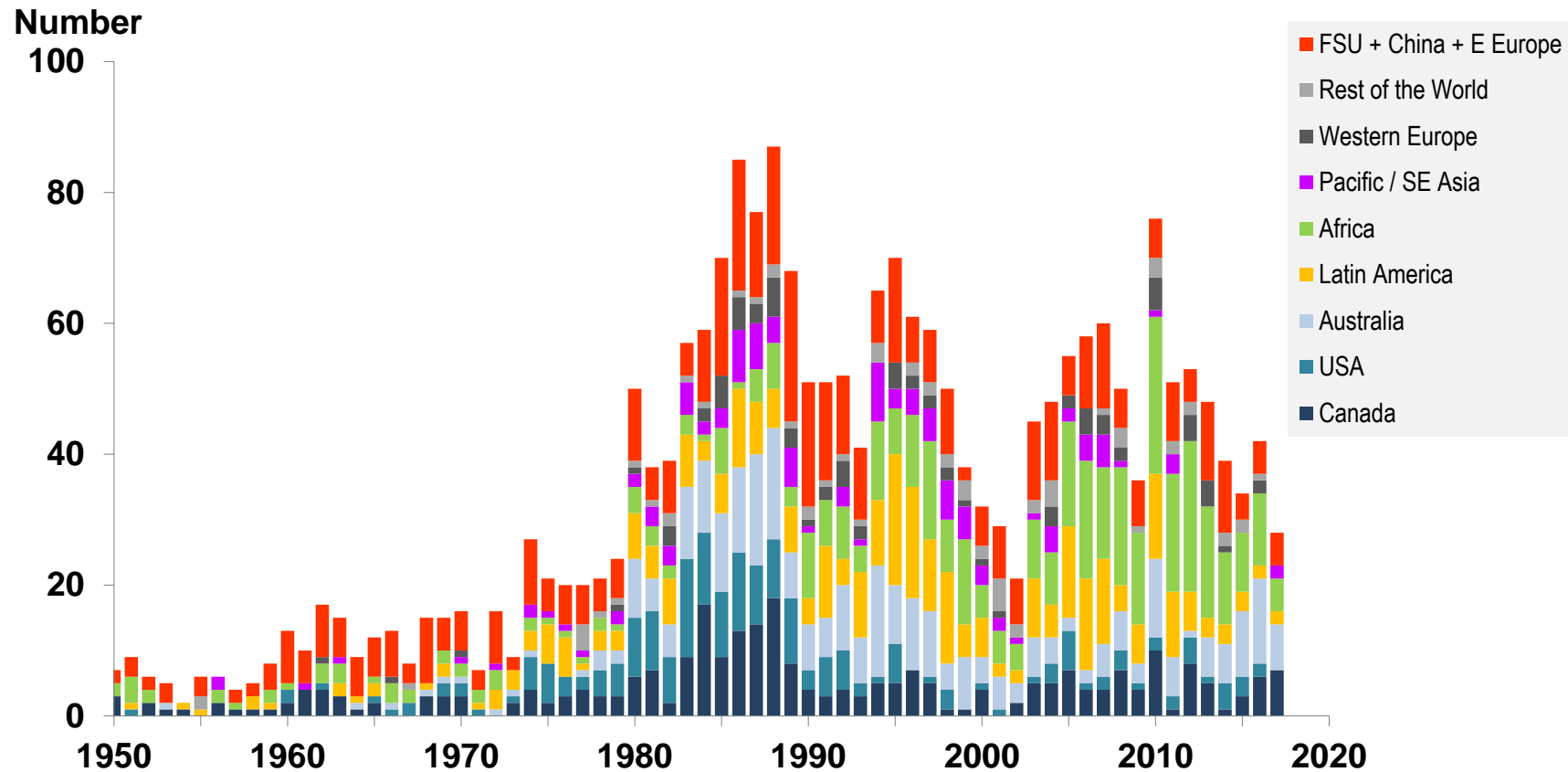
There has been a progressive geographic shift in where gold is being discovered in the World

### **3. TRENDS IN THE LOCATION OF DISCOVERIES**



# Number of Gold Discoveries by Region

Primary Gold deposits > 0.1 Moz found : 1950-2017



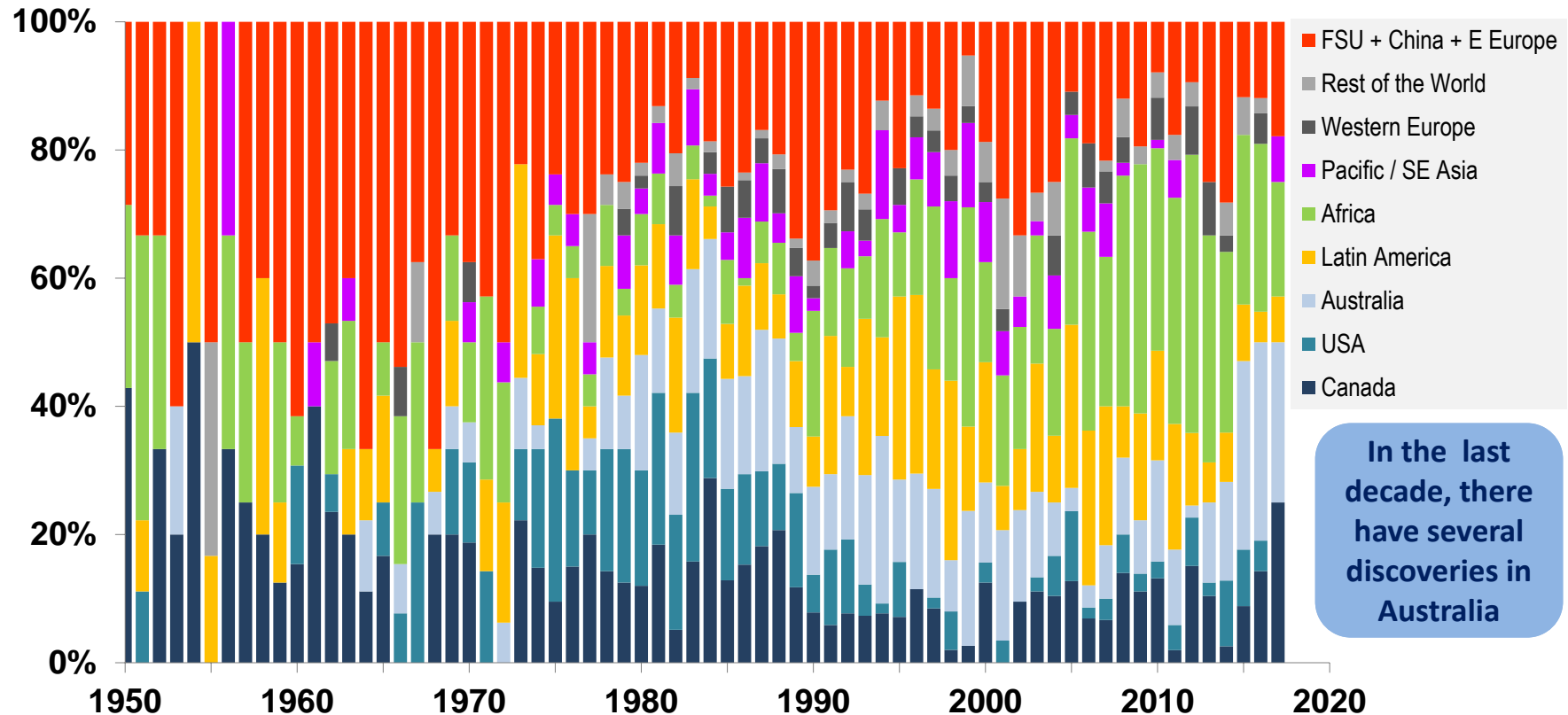
Note: Includes an adjustment for unreported discoveries in recent years

Source: MinEx Consulting © October 2019

# Number of Gold Discoveries by Region

Primary Gold deposits > 0.1 Moz found : 1950-2017

Percentage of deposits found

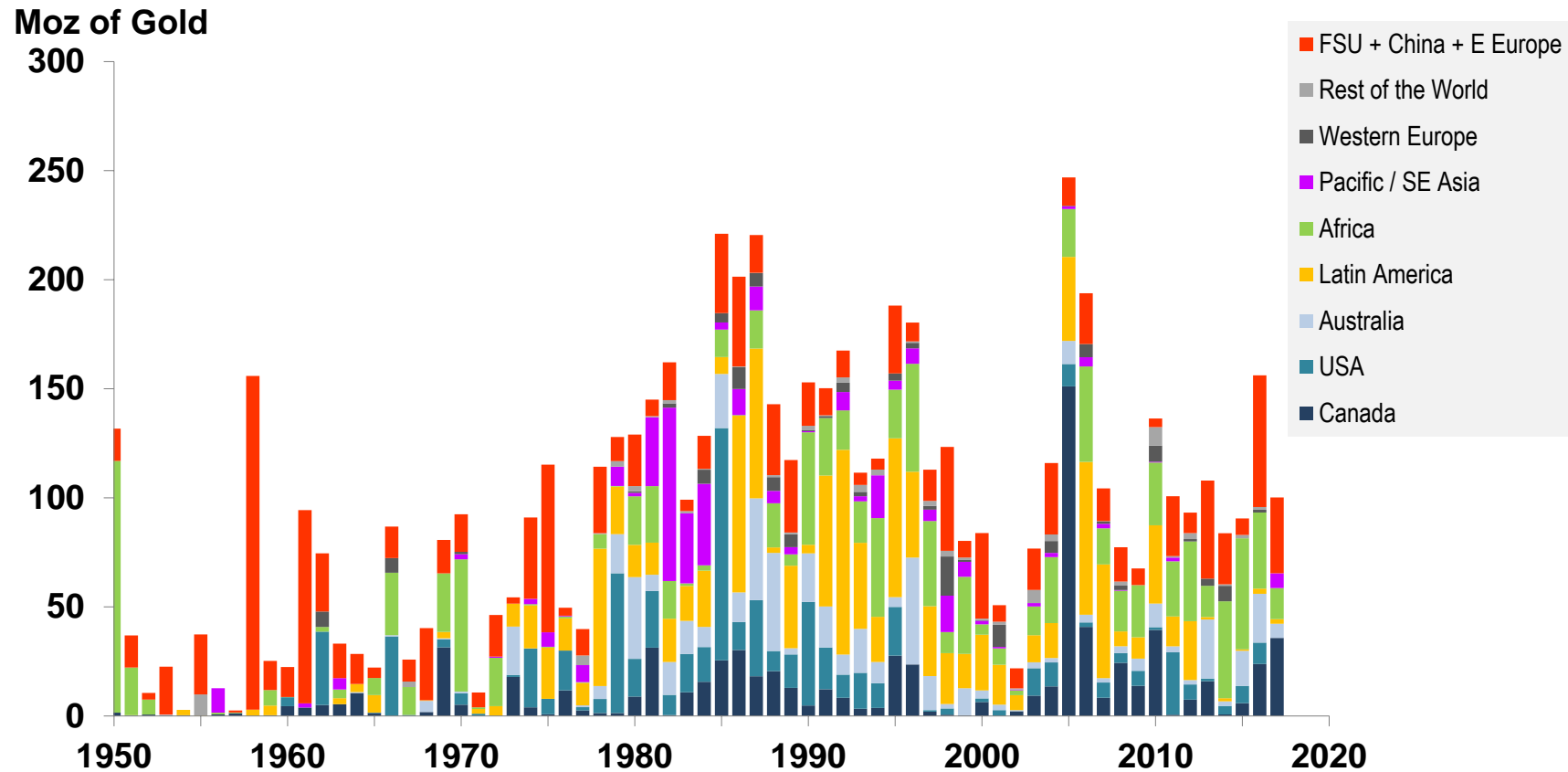


Note: Includes an adjustment for unreported discoveries in recent years

Source: MinEx Consulting © October 2019

# Ounces discovered by Region

Primary Gold deposits found : 1950-2017



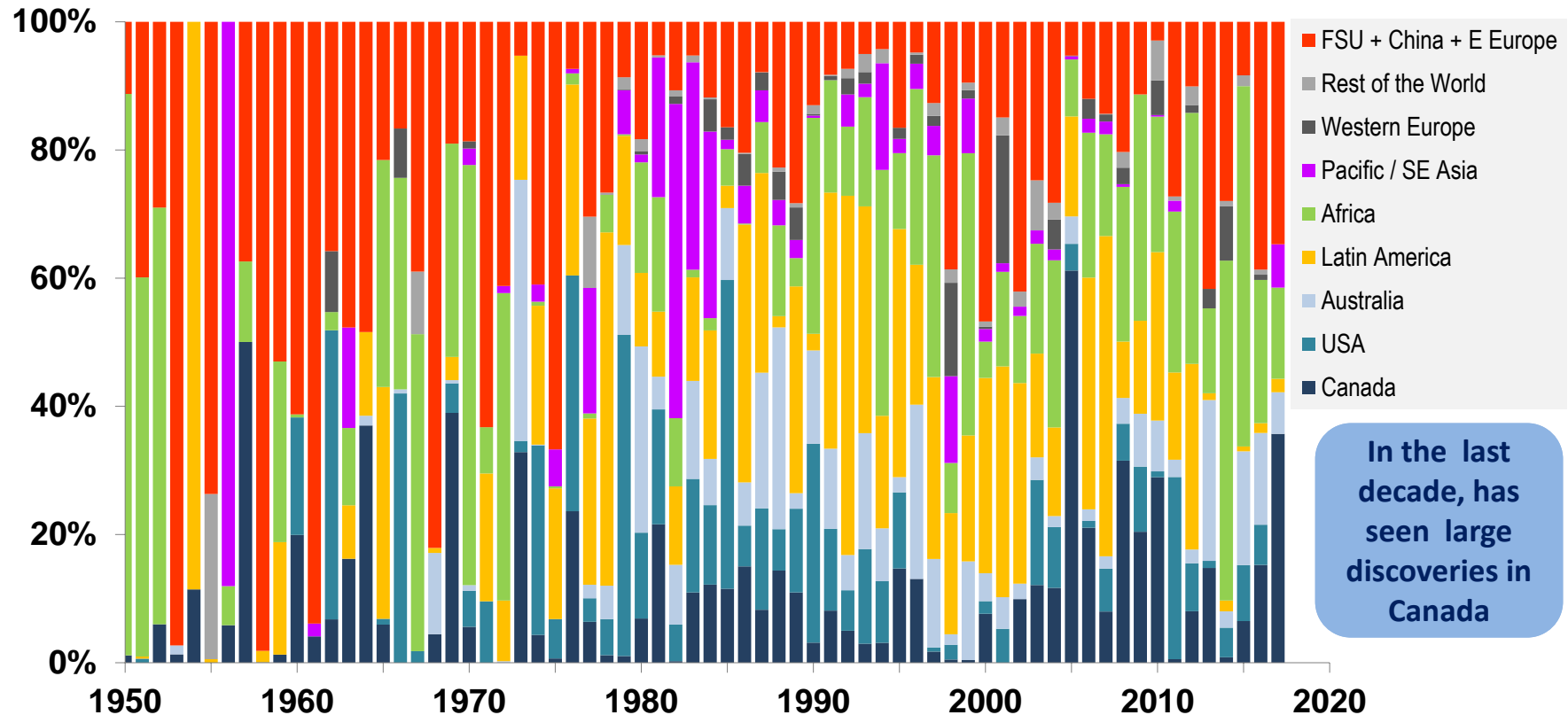
Note: Includes an adjustment for unreported discoveries in recent years  
Excludes by-product credits

Source: MinEx Consulting © October 2019

# Ounces discovered by Region

Primary Gold deposits found : 1950-2017

Percentage of ounces found



Note: Includes an adjustment for unreported discoveries in recent years  
Excludes by-product credits

Source: MinEx Consulting © October 2019

**Smoothed Data**  
(3 year rolling average)

# Ounces discovered by region

Primary gold deposits found : 1950-2017

The relative importance of each Region changes over time

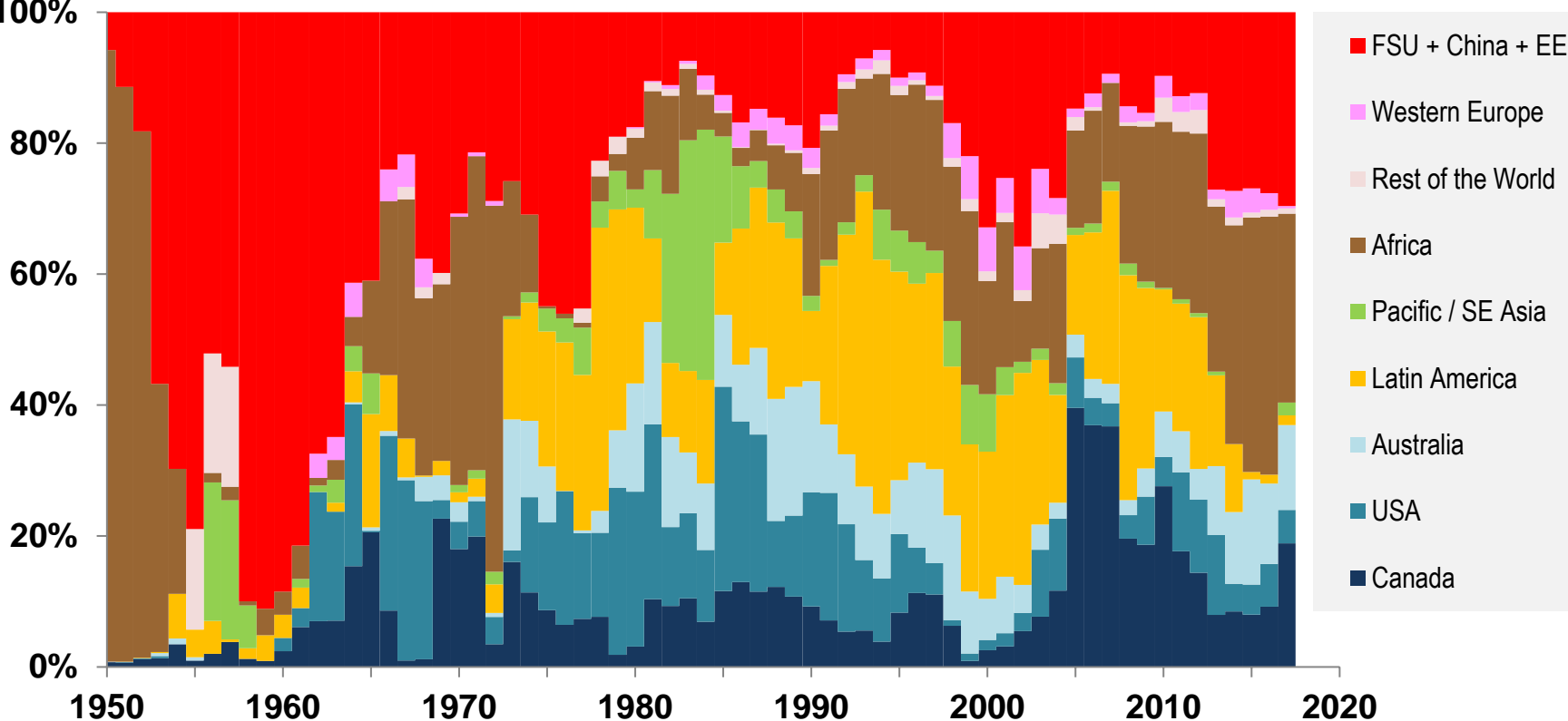
... is driven by geological maturity, technology, infrastructure and Country Risk

Percentage of Total  
100%

Strategic focus on gold exploration and production in USSR

Exploration efforts in Russia suspended following the collapse of the Soviet Union in 1991

Rise of China and the return of Africa



From 1960 onwards several big discoveries were made in USA and Canada

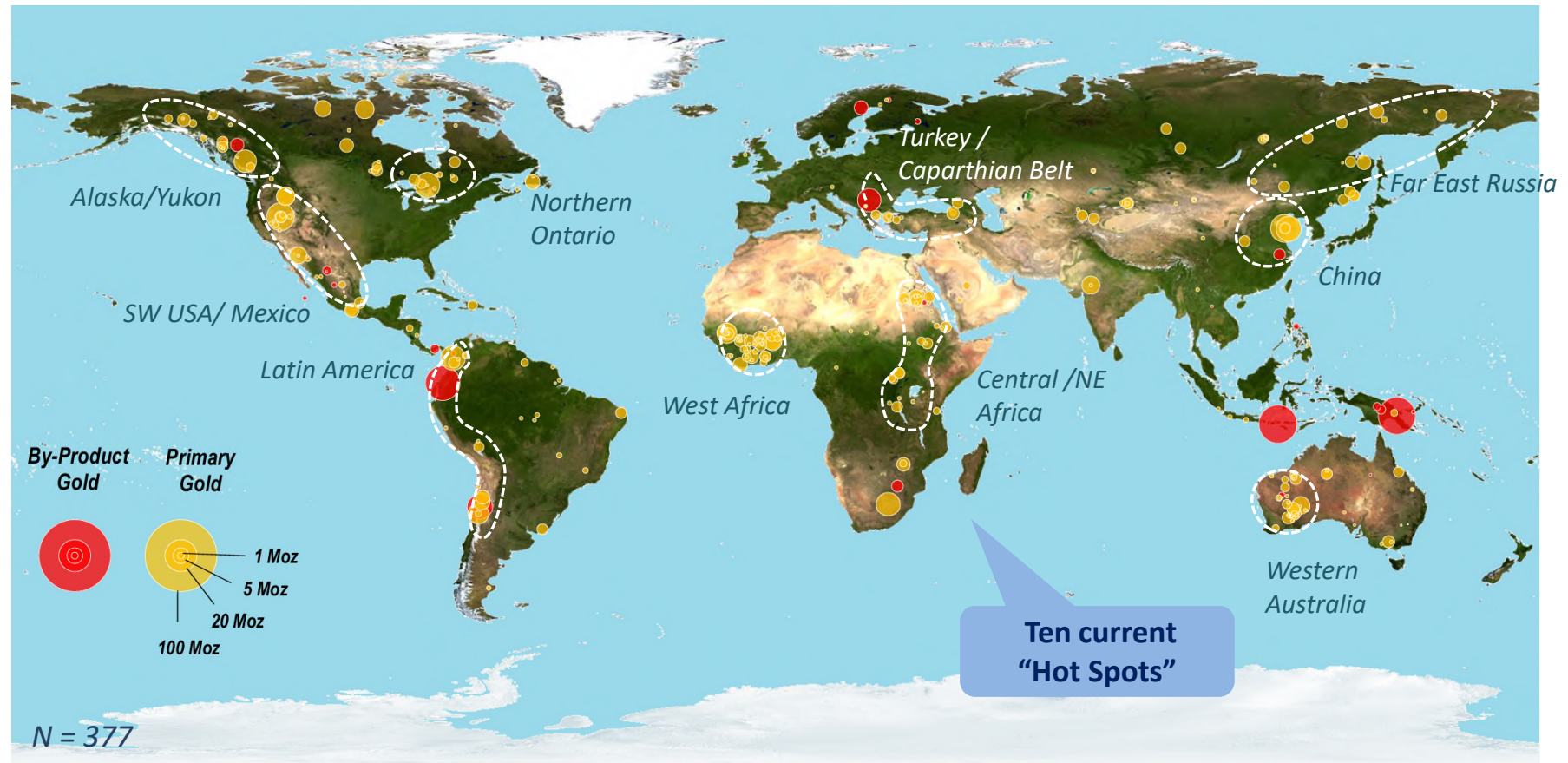
... followed by Australia in 1980s & 90s

Big jump in Canada in 2005 due to discovery of 106 Moz at KSM

In recent years very few primary gold discoveries in Latin Am and SE Asia

Source: MinEx Consulting © October 2019

# Gold discoveries in the world: 2009-Present



Note: Based on deposits containing >0.1 Moz of gold

Source: MinEx Consulting © October 2019

# Recent Tier 1 discoveries

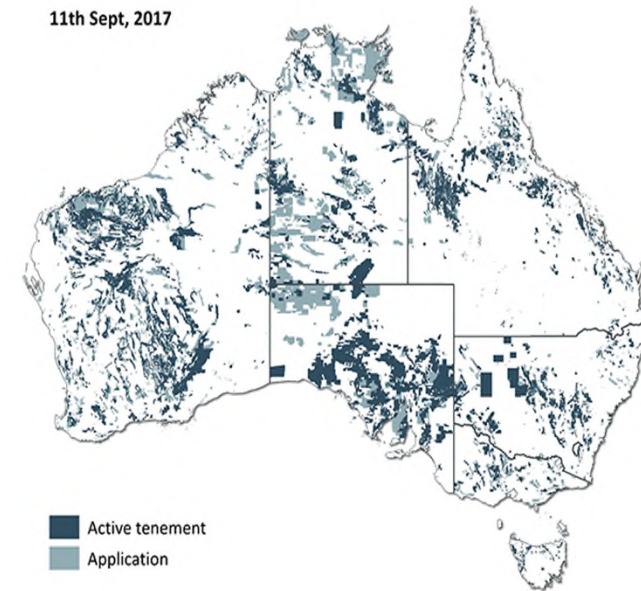
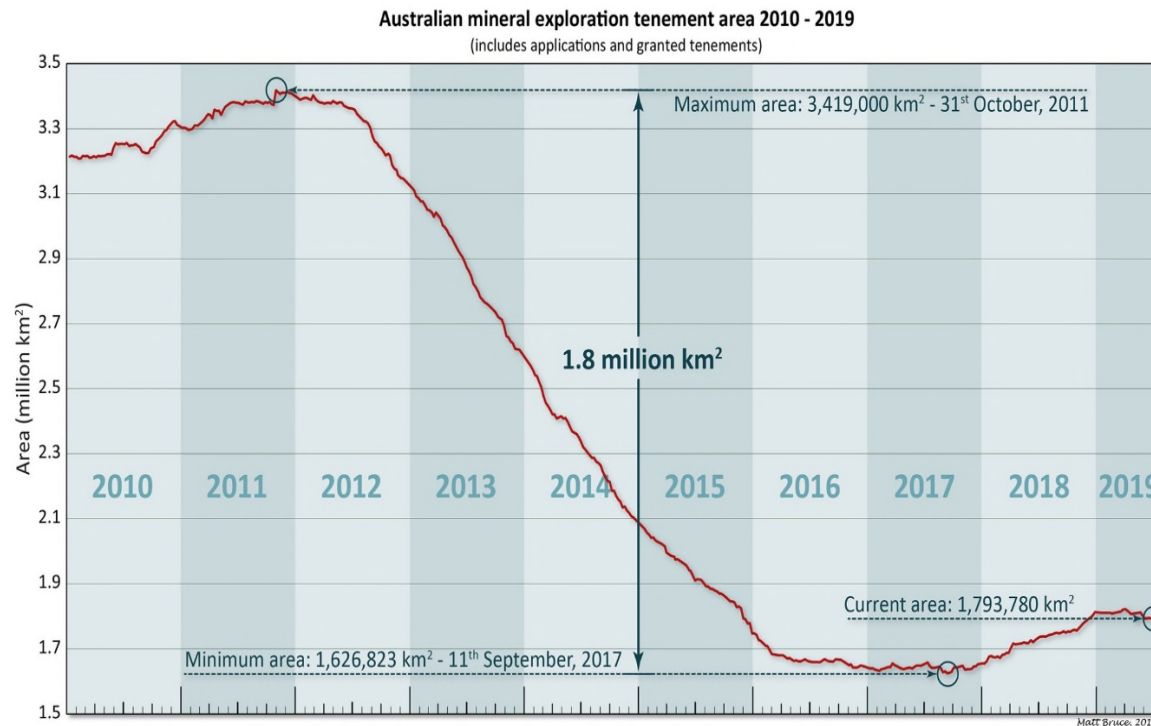
- **Cote** - Discovered in 2010 by Trelawney Mining & Exploration in Ontario. Current Resource is 468 Mt @ 0.82 g/t Au = 12.4 Moz
- **Red Hill/Goldrush** - Discovered in 2011 by Barrick next to its existing operation in Nevada. Current Resource is 67 Mt @ 7.0 g/t Au = 14.9 Moz
- **Haiyu** - Discovered in 2011 by Laizhou Ruihai in Shandong Province in China. Reported to contain 67 Mt @ 7.0 g/t = 15.1 Moz. Is under 1250m of cover
- **Xiling** - Discovered in 2016 by Shandong Gold Mining in Shandong Province in China. Contains 85 Mt @ 4.5 g/t = 12.3 Moz. Underground deposit
- **Swan** – Discovered by Kirkland Lake in 2016 at its existing Fosterville operation in Victoria. Contains 2.1 Mt @ 45 g/t = 3.0 Moz and growing
- **Cascabel** – Cu/Au deposit in Ecuador discovered by SolGold in 2013. Contains 2950 Mt @ 0.37% Cu + 0.25 g/t Au = 10.0 Mt Cu + 23.2 Moz Au
- **Hu'u** – Cu/Au deposit in Indonesia discovered by Vale in 2015. Is under 400m of cover. Unofficial resource is 1700 Mt @ 0.90% Cu + 0.52 g/t Au + 3.6 /t Ag = 15.3 Mt Cu + 28.4 Moz Au

## 3A. HOT SPOTS IN AUSTRALIA



# Tenement Coverage in Australia : All Commodities

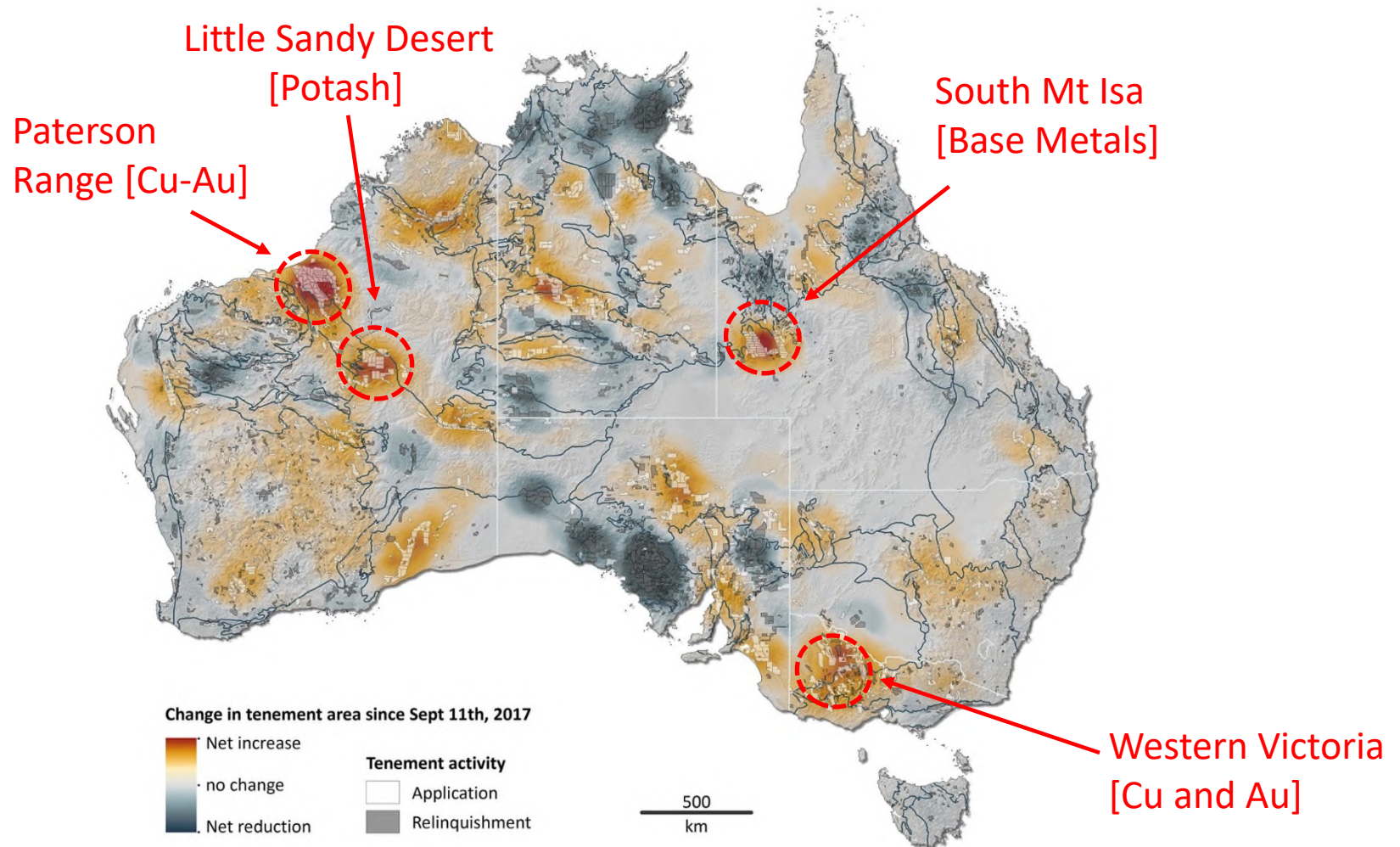
Coverage **halved**  
between 2011 and 2017



Source: Matt Bruce September 2019

# “Heat Map” for new Tenements in Australia

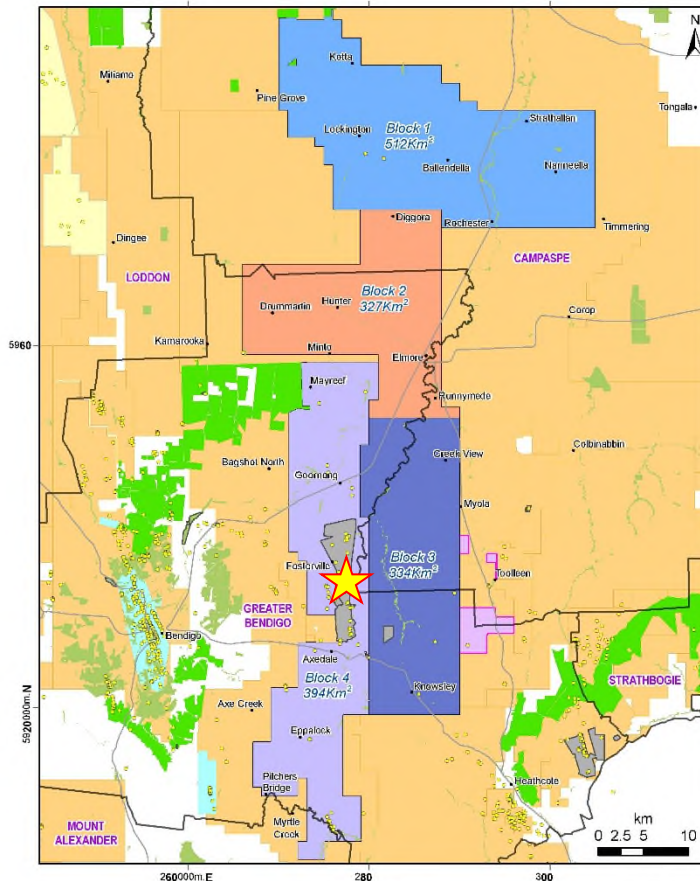
## Change between Sept 2017 and July 2019



Source: Matt Bruce September 2019

# Upcoming Hot Spot

## North Central Victorian Goldfields Ground Release



**Victorian Govt is putting 4 Exploration Blocks (surrounding the Fosterville Gold mine) up for tender.**

**Total Area = 1567 km<sup>2</sup>**

**Tender briefing 13<sup>th</sup> December 2019**

**Tenders close 31 Jan 2020**

**For more info go to ...**

<https://earthresources.vic.gov.au/projects/north-central-victorian-goldfields-ground-release/for-explorers>

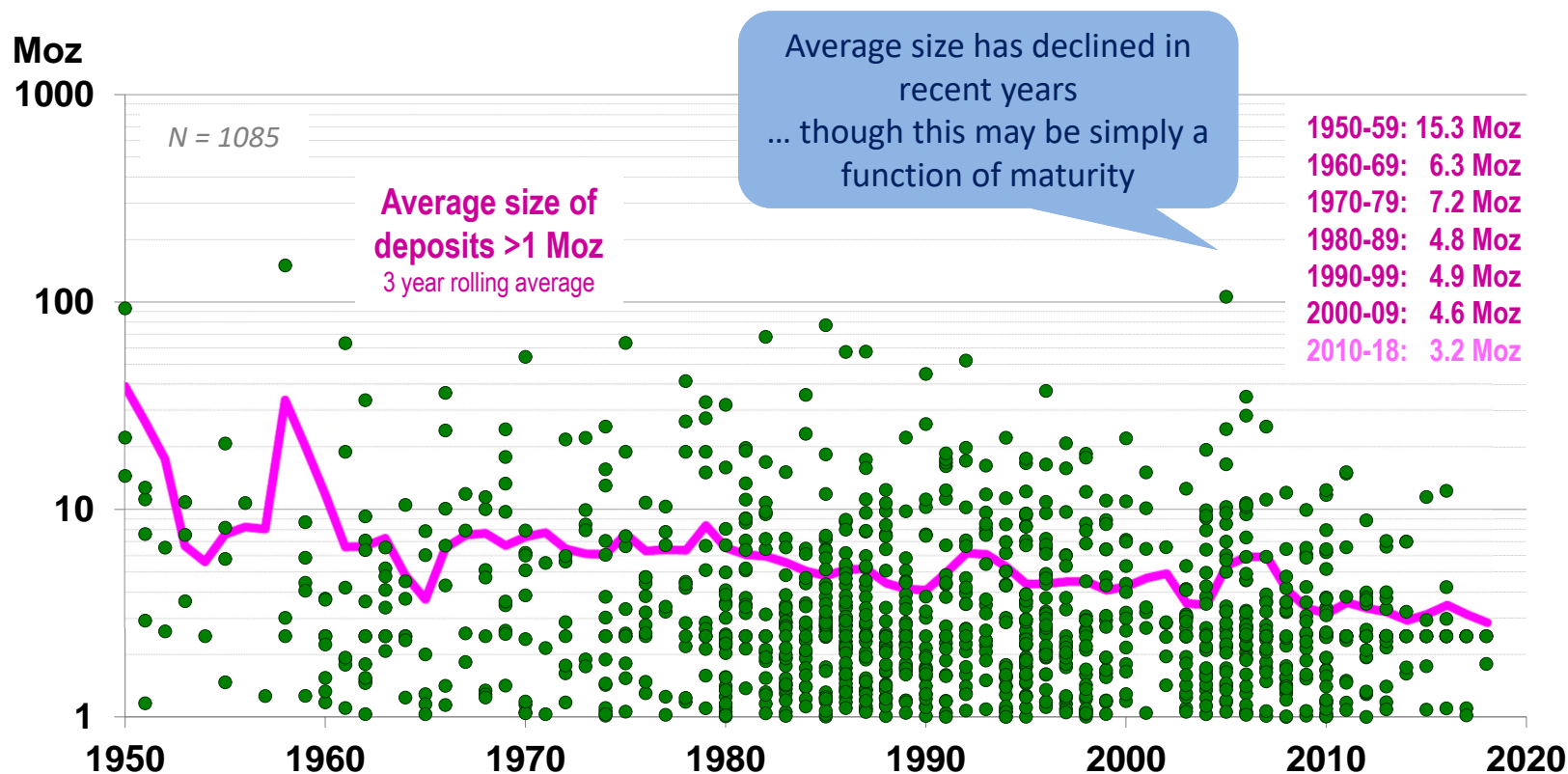
There has been a slow decline in the size of deposits found.  
Grades have remained fairly constant

## **4. TRENDS IN THE SIZE & GRADE OF GOLD DISCOVERIES**



# Trend in the average size of gold deposit discovered

All primary gold discoveries >1 Moz in the World: 1950-2018

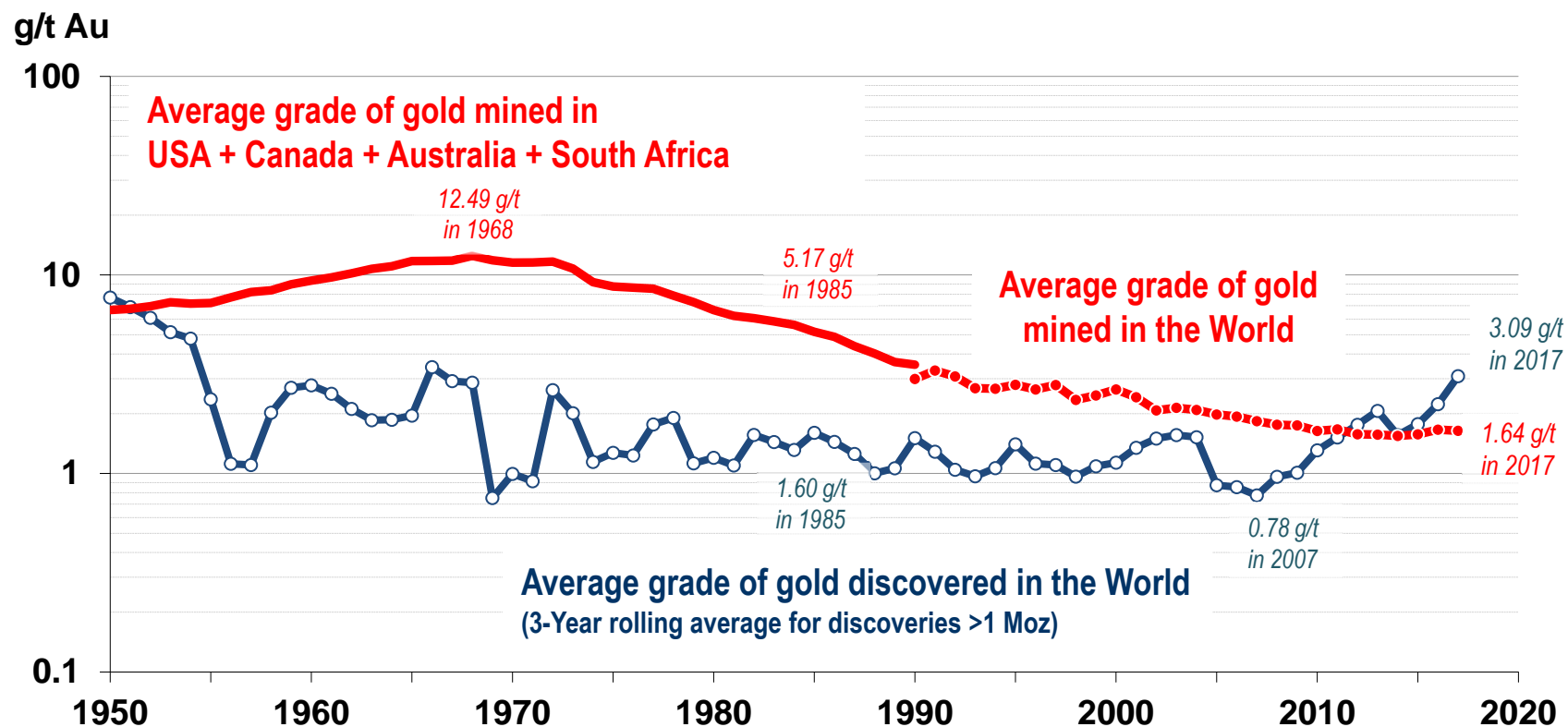


Note: Excludes deposits where gold is a by-product.  
No adjustment made for growth in recent discoveries

Source: MinEx Consulting © October 2019

# Trend in average ore grades

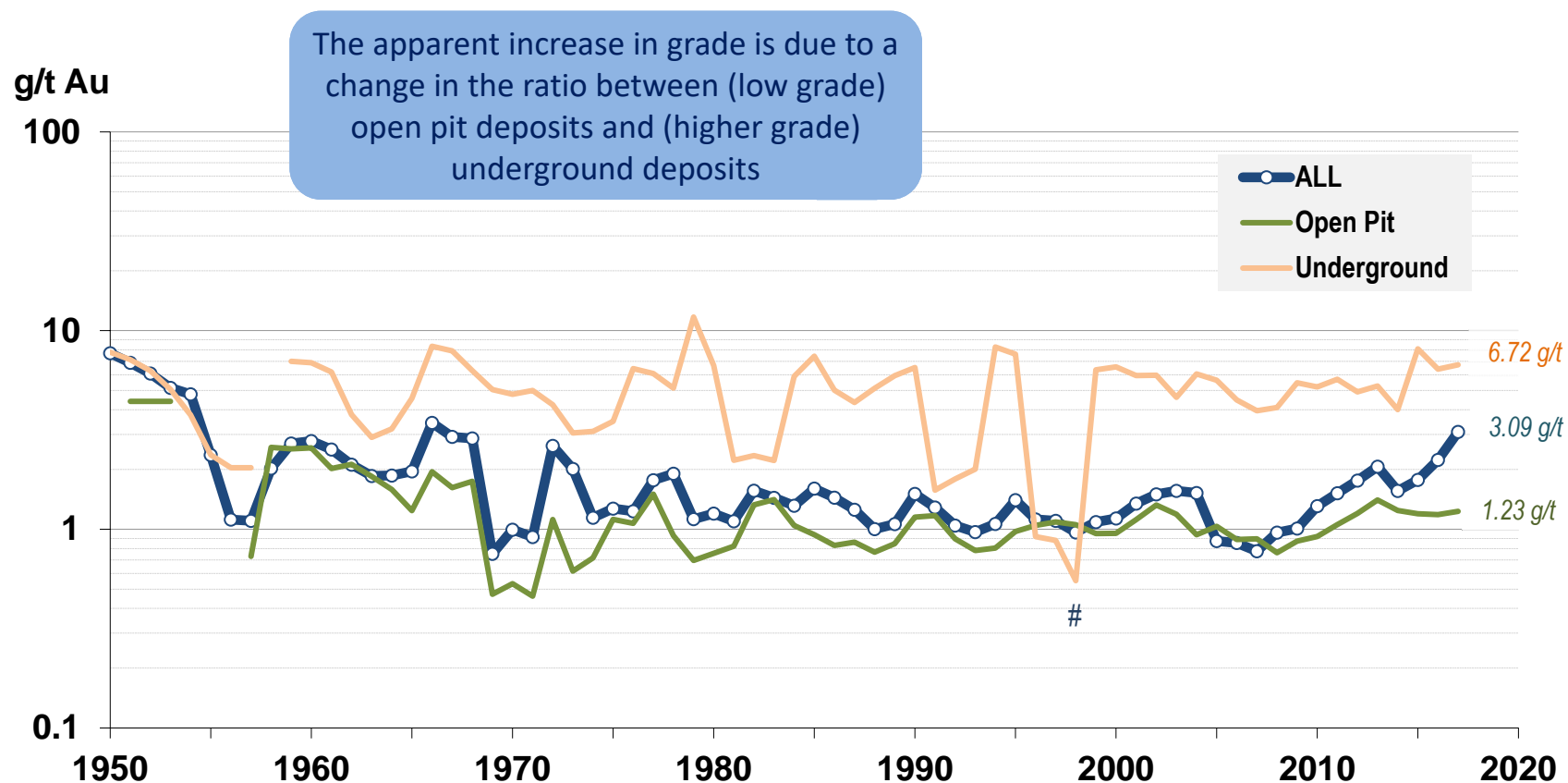
Average ore grade for all primary gold discoveries >1 Moz in the World  
versus average head grade of ore mined



Note: Excludes deposits where gold is a by-product.  
Also excludes artisanal mines and retreatment of waste dumps

Sources: MinEx Consulting © October 2019  
Mudd (2010) for production data 1950-1990  
MinEx Consulting for production data 1990-2017

# Average grade of gold discovered in the World (3-Year rolling average for discoveries >1 Moz)



Note: Excludes deposits where gold is a by-product.

Also excludes artisanal mines and retreatment of waste dumps

# The dip in underground grades in 1996-98 is associated with the discovery of the giant Ridgeway and Cadia East deposits (239 Mt @ 0.94 g/t Au and 2990 Mt @ 0.39 g/t Au respectively)

Source: MinEx Consulting © October 2019

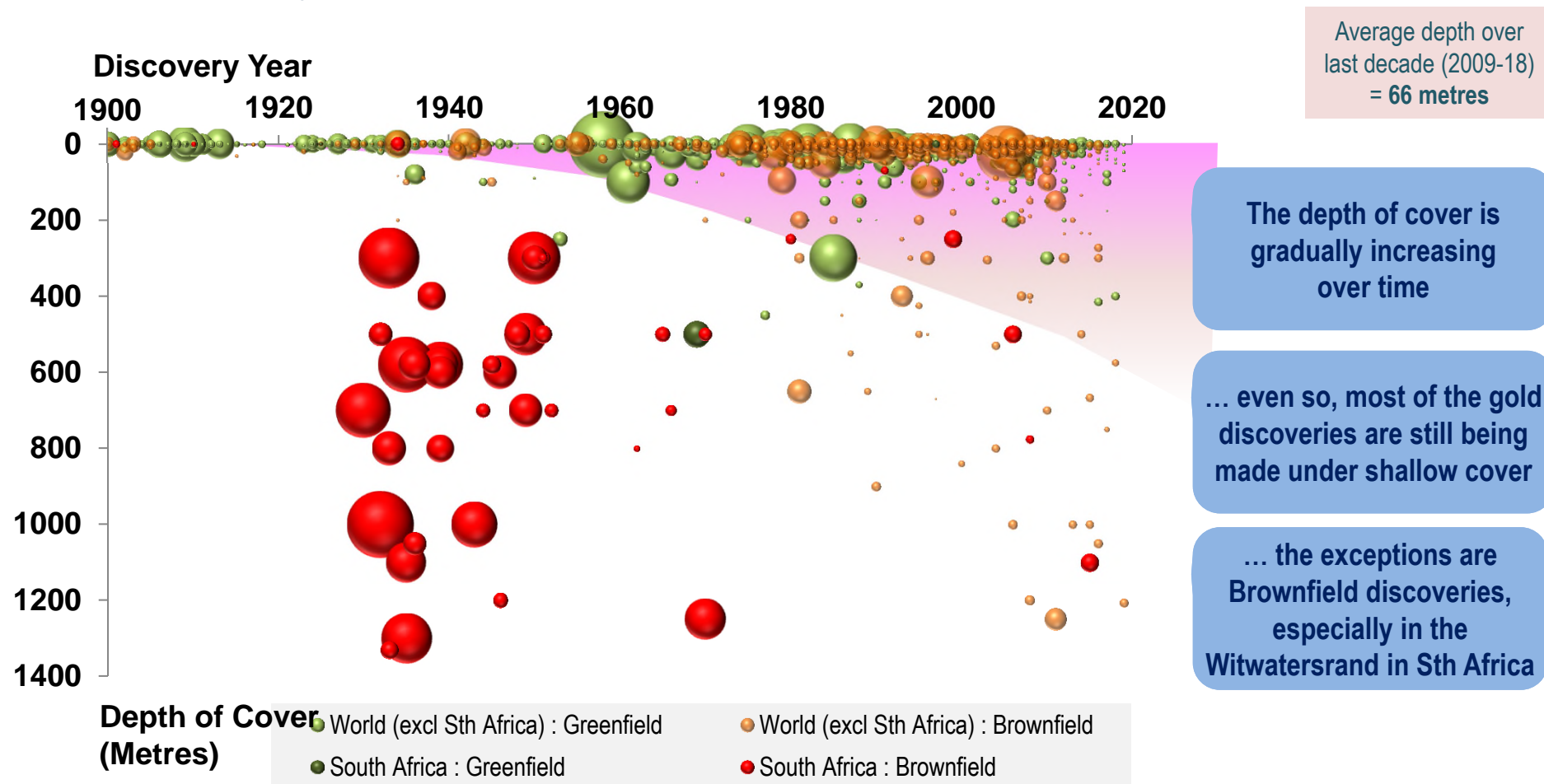
We are progressively looking under deeper cover

## **5. TRENDS IN THE DEPTH OF COVER**



# ... and we are exploring under deeper cover

## Depth of cover for discoveries in World: 1900-2018

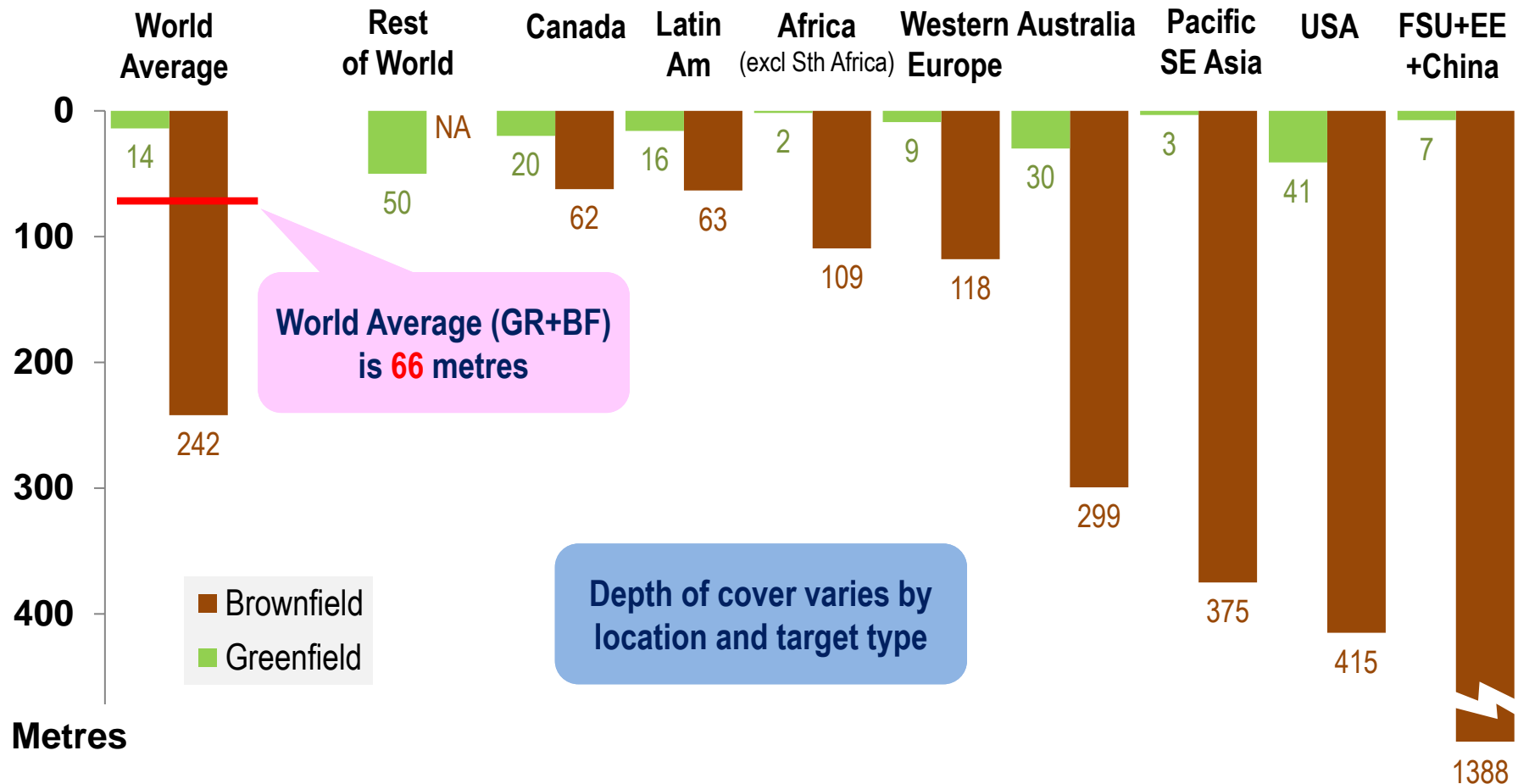


Note: Primary gold deposits > 0.1 Moz. Bubble size refers to Moz of pre-mined Resource  
Excludes satellite deposits within existing Camps.

Source: MinEx Consulting © October 2019

# Average depth of cover for gold discoveries

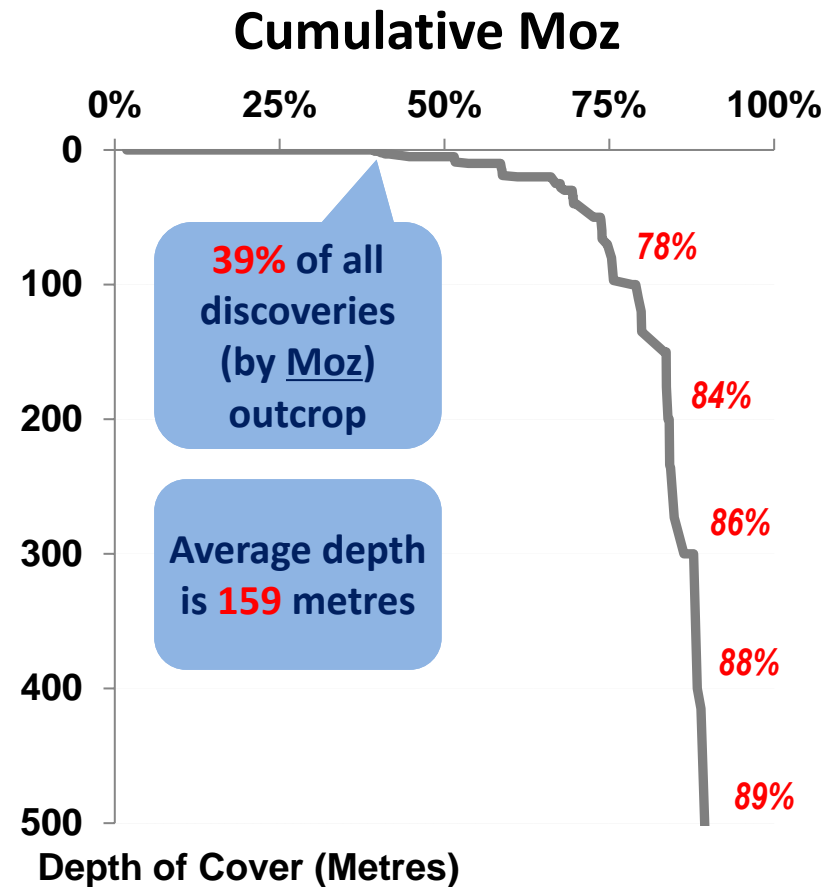
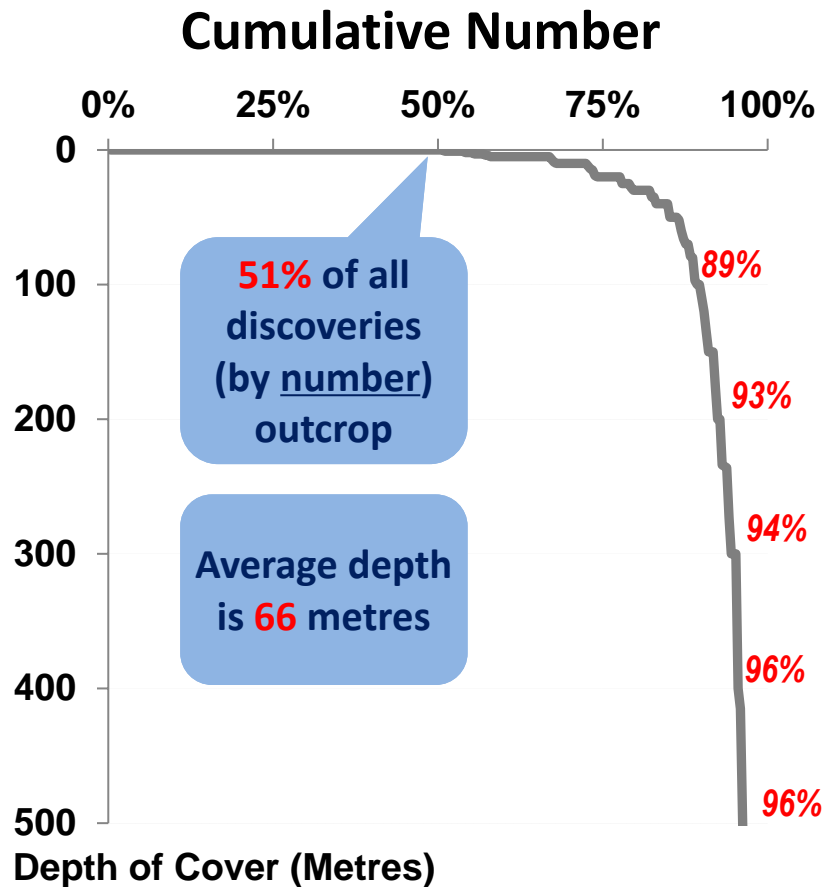
World: 2009-2018



Note: Based on 290 Primary gold deposits with reported depths and > 0.1 moz Au  
 Excludes satellite deposits within existing Camps

Source: MinEx Consulting © October 2019

# Cumulative distribution of depth for primary gold deposits > 0.1 Moz found in the World in 2009-2018



Note: Analysis based on 290 deposits with known depth data and >0.1 Moz.  
Includes both Greenfield and Brownfield discoveries

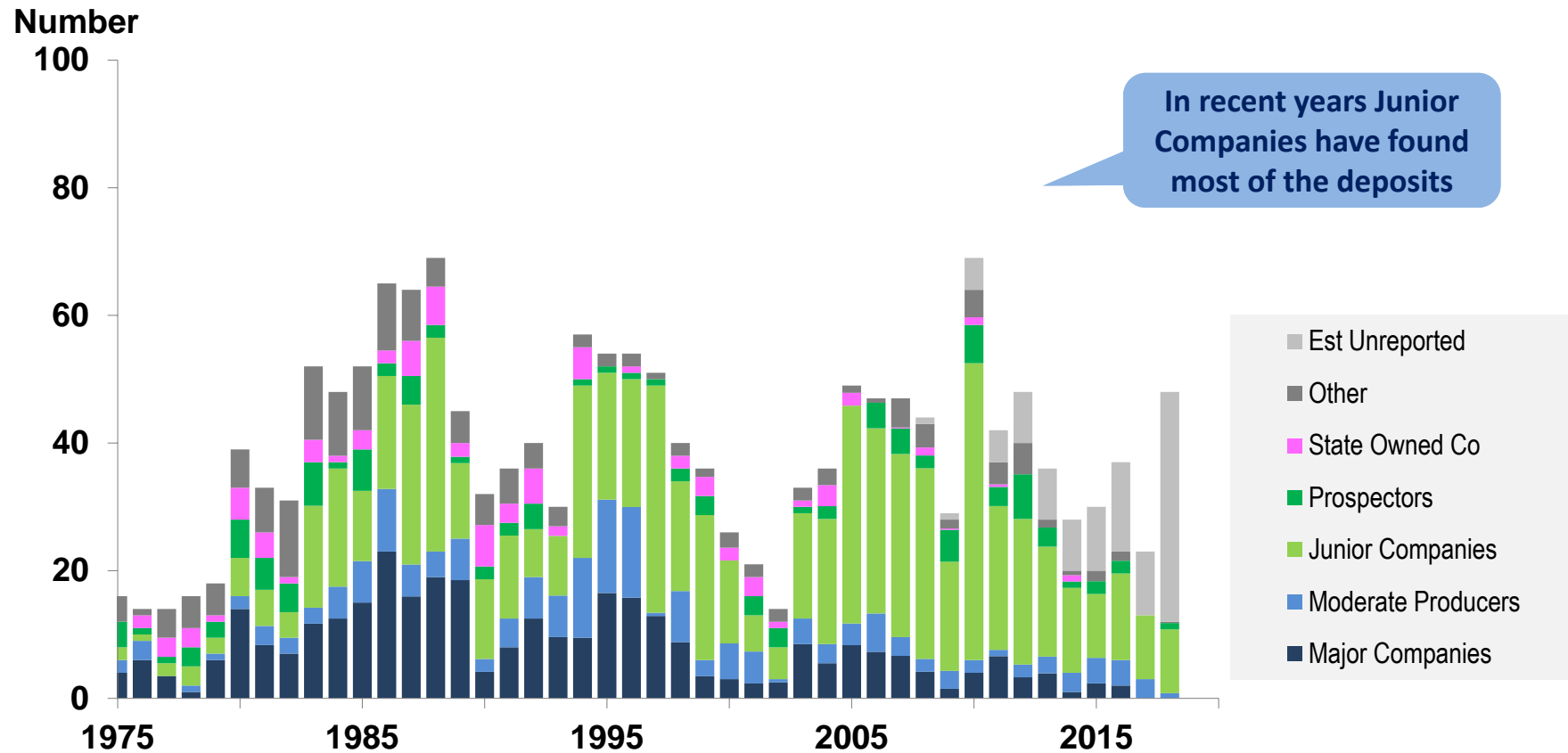
Source: MinEx Consulting © October 2019

Majors versus Juniors

## **6. WHO MADE THE DISCOVERIES ?**

# Number of discoveries made by Company Type

Moderate+Major+Giant primary gold discoveries in Western World: 1975-2018

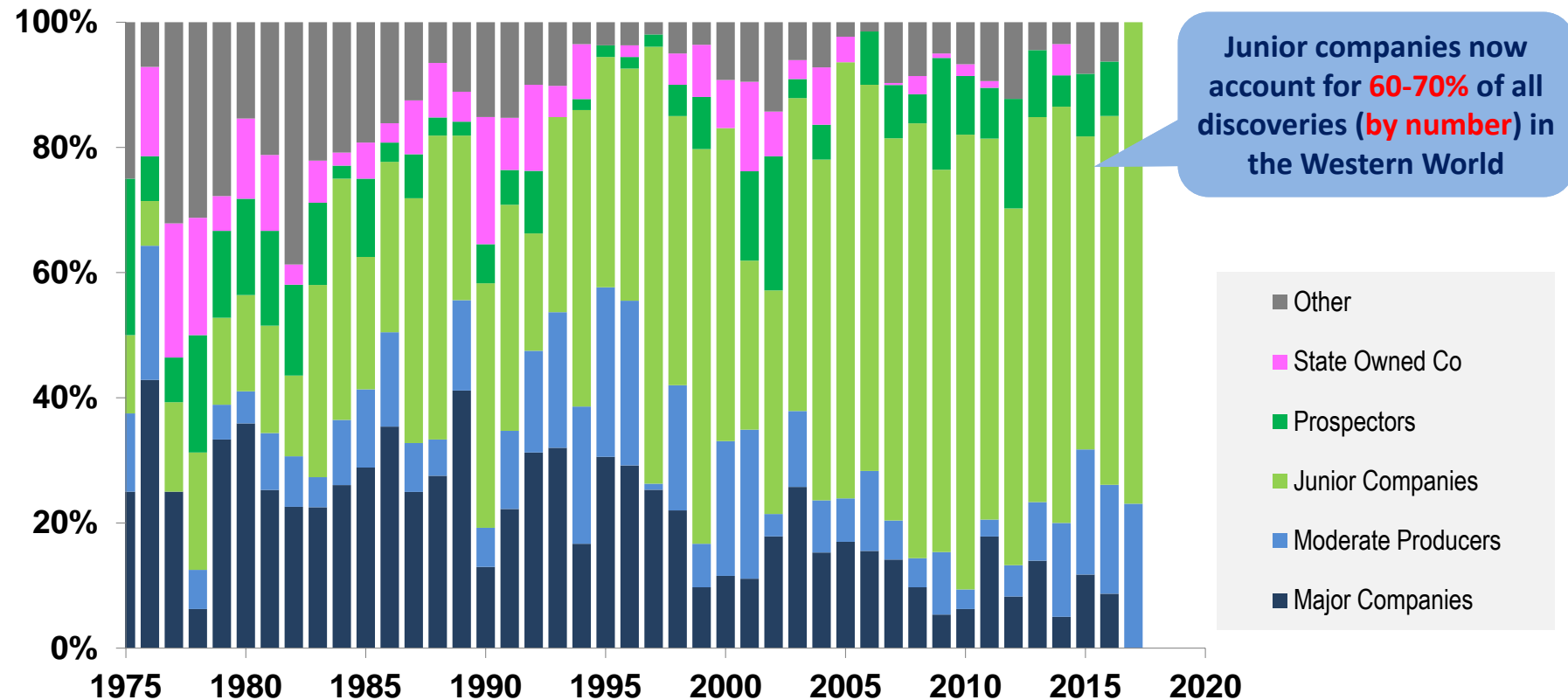


Note: Figures are adjusted for shared discoveries  
Excludes satellite deposits within existing Camps

Source: MinEx Consulting © October 2019

# Percentage of discoveries made by **Company Type**

Moderate+Major+Giant primary gold discoveries in Western World: 1975-2017

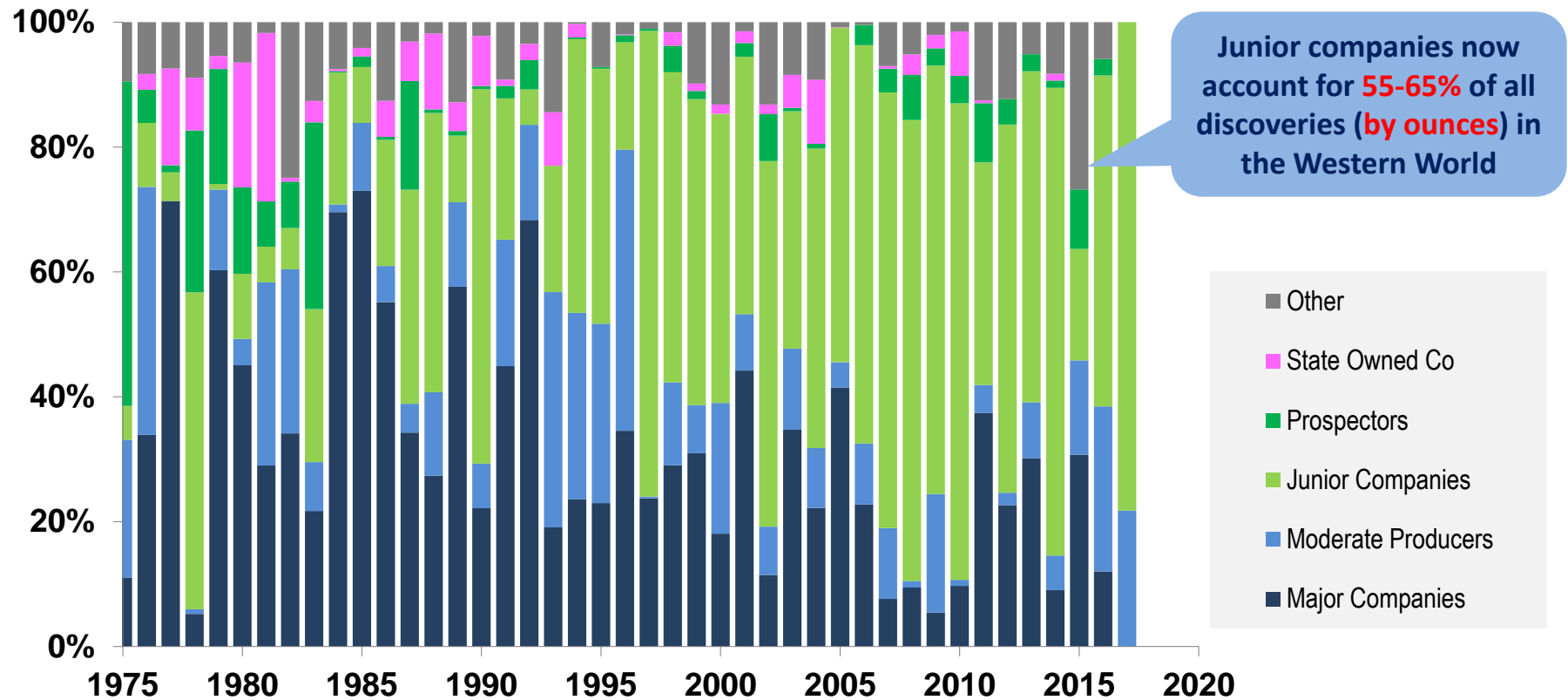


Note: Figures are adjusted for shared discoveries  
Excludes satellite deposits within existing Camps

Source: MinEx Consulting © October 2019

# Percentage of Ounces found by Company Type

Moderate+Major+Giant primary gold discoveries in Western World: 1975-2017

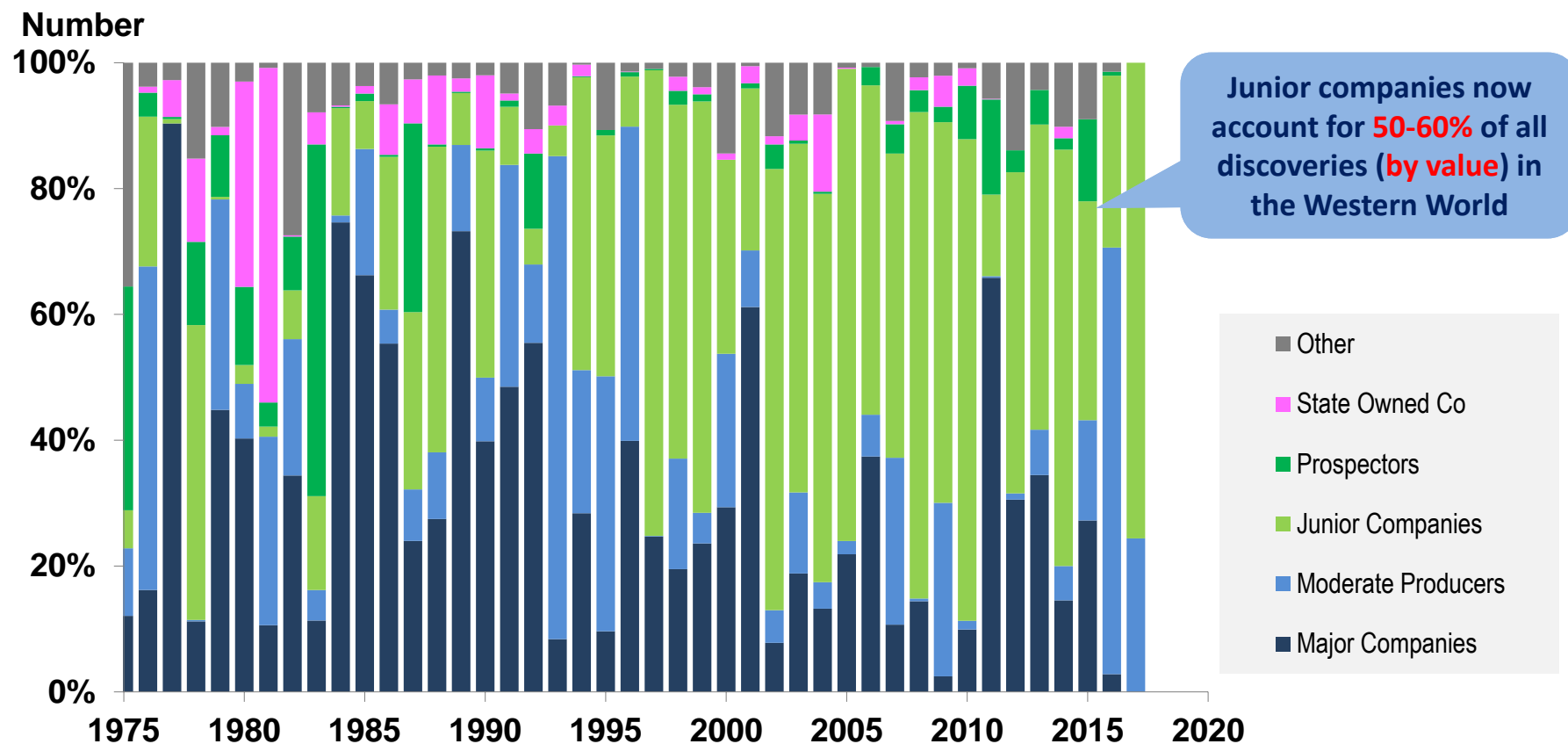


Note: Figures are adjusted for shared discoveries  
Excludes satellite deposits within existing Camps

Source: MinEx Consulting © October 2019

# Estimated Value created by Company Type

Moderate+Major+Giant primary gold discoveries in Western World: 1975-2017



Note: Figures are adjusted for shared discoveries  
Excludes satellite deposits within existing Camps

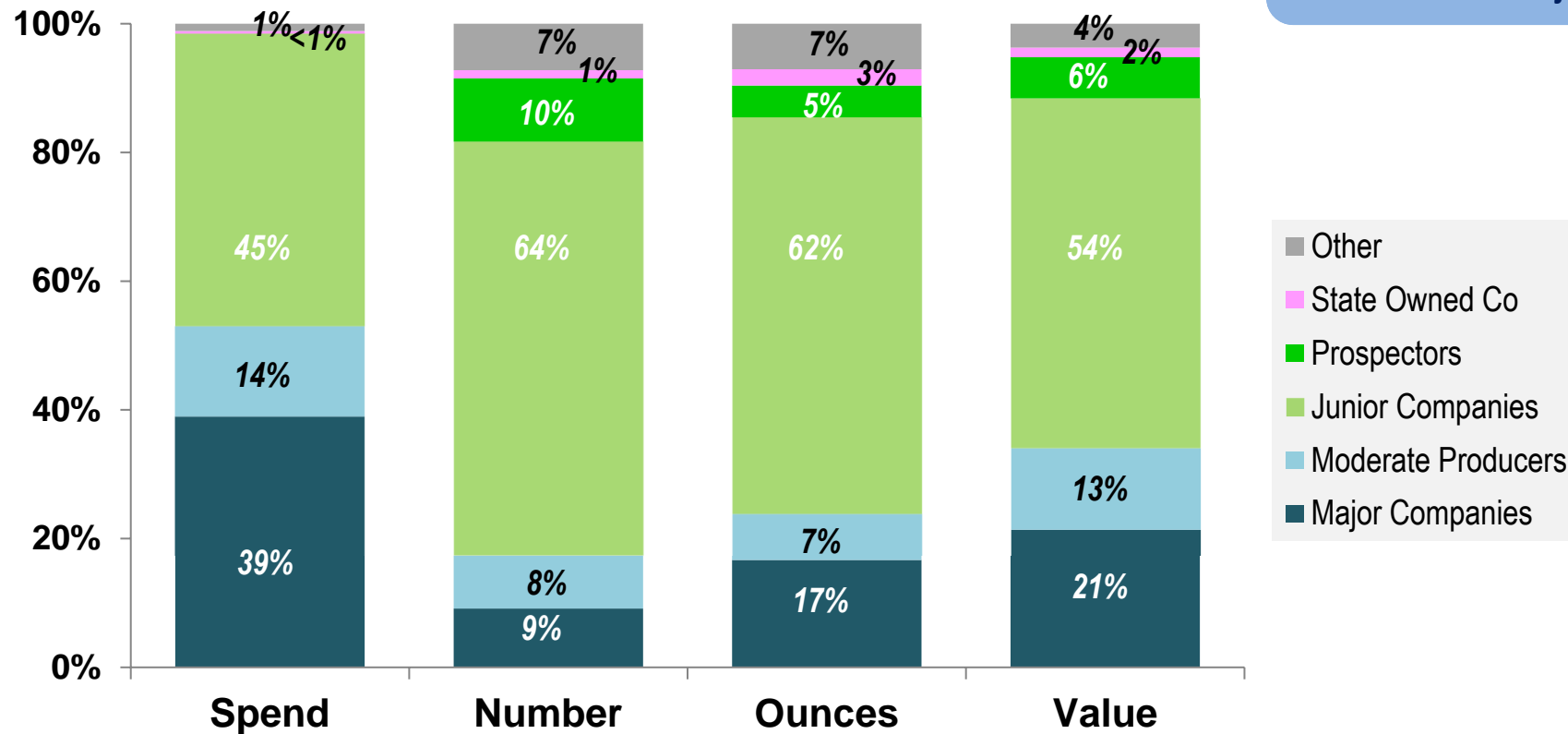
Source: MinEx Consulting © October 2019



# Majors versus Juniors

## Western World: 2008-2017

Over the last decade  
Juniors performed  
better than the Majors



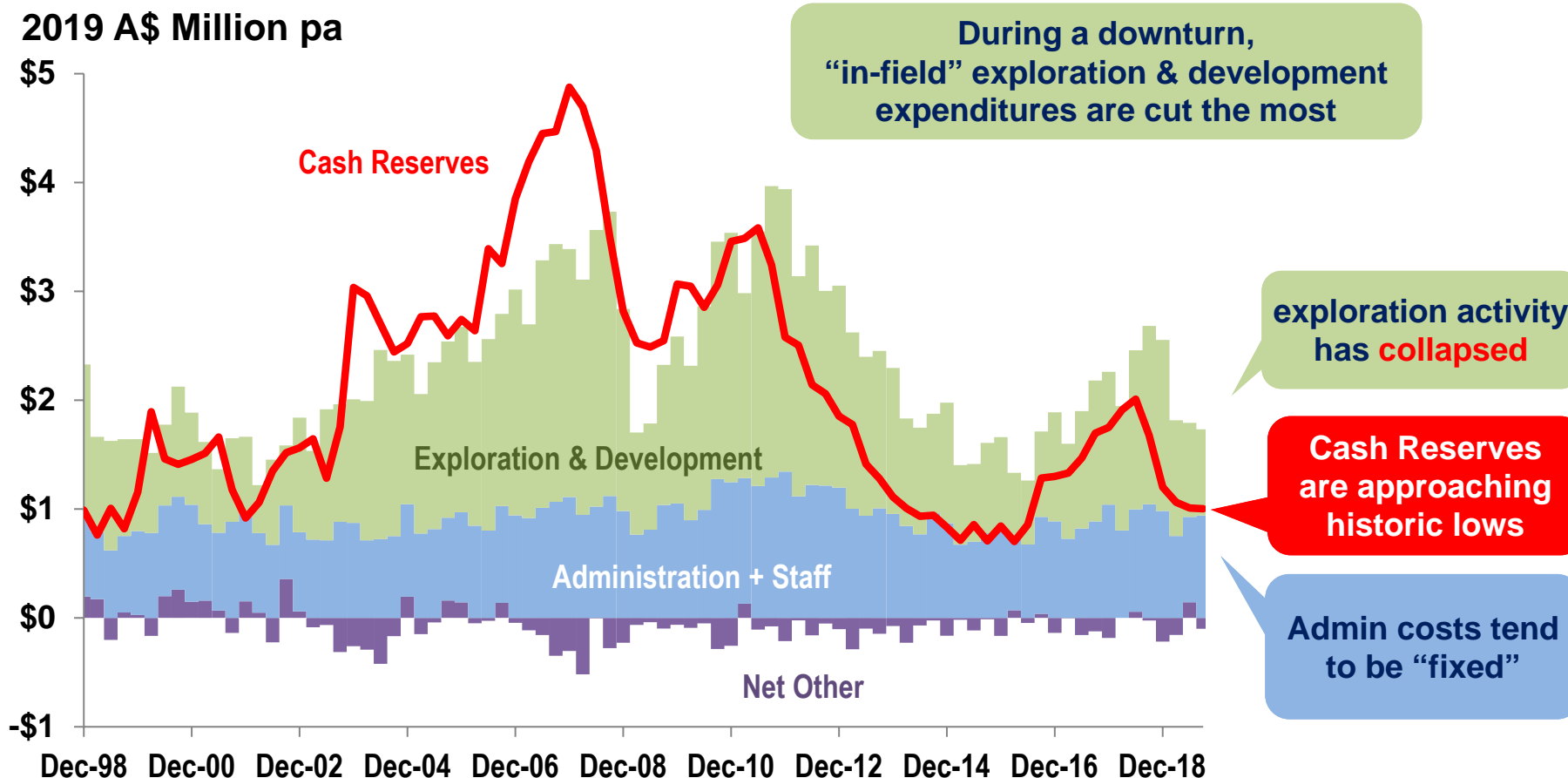
Note: Figures are adjusted for shared discoveries  
Excludes satellite deposits within existing Camps  
Exploration expenditures are approximate only

Source: MinEx Consulting © October 2019

Junior Companies account for half the exploration spend in Australia – but they are struggling to raise cash

## **6A. JUNIOR EXPLORERS IN AUSTRALIA**

# Cash Reserves and Expenditures for the MEDIAN Australian Junior Exploration Company : Dec 1998-Sept 2019



Note: Survey based on a sample of 360 junior exploration companies listed on the ASX between 1998-2019.  
“Net Other” includes production and other costs less interest income, mine revenue, asset sales  
Government Assistance and R&D tax credits.  
Quarterly spend data has been multiplied by 4x to produce an annualised spend rate.

Source: MinEx Consulting © Nov 2019  
based on Quarterly Reports to the ASX

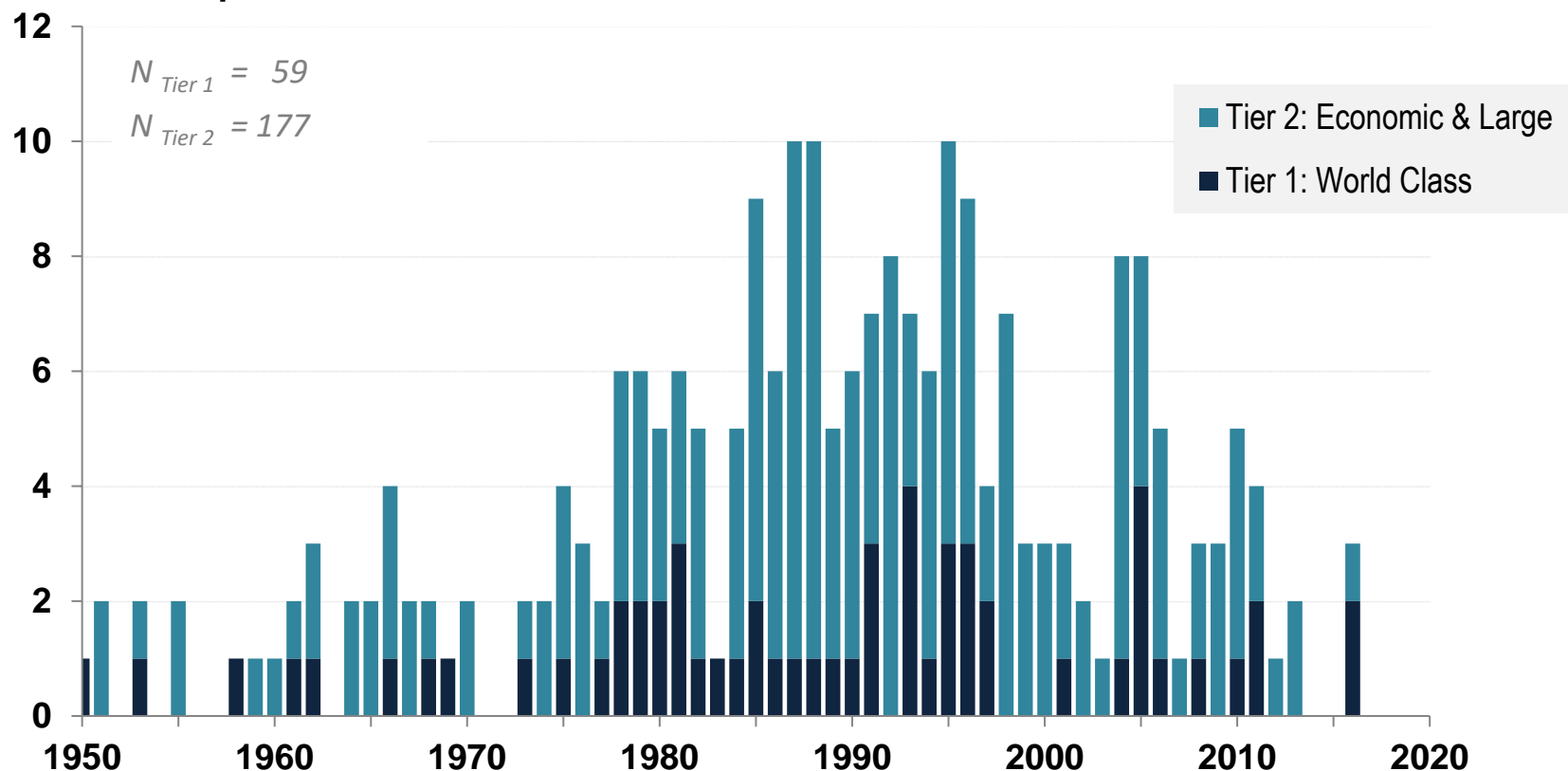
Tier 1 discoveries are rare but valuable

## **7. TRENDS IN THE QUALITY OF DISCOVERIES**

# Number of Tier 1 & 2 Gold Discoveries: World

## Primary Gold Deposits: 1950-2014

Number of Deposits



Note: Primary gold deposits only

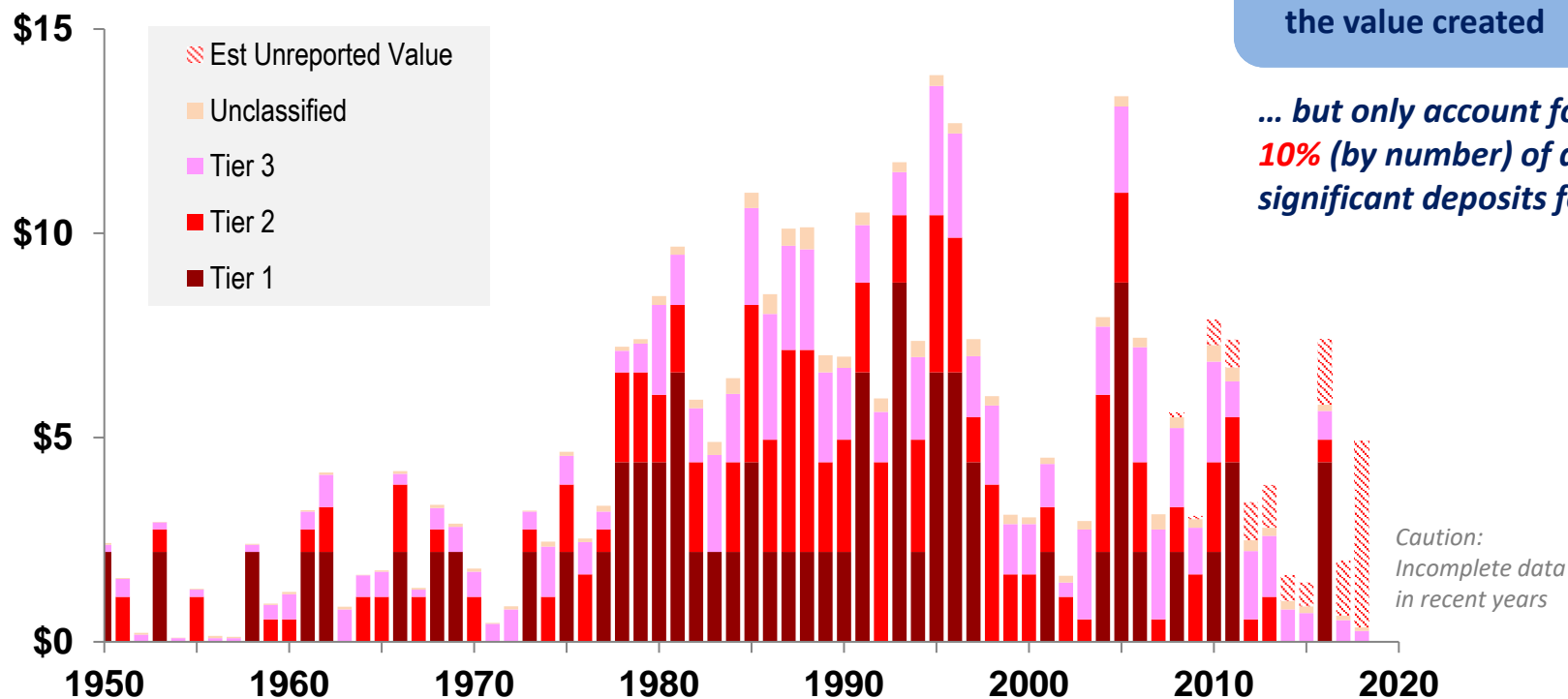
Caution: No adjustment made for unreported discoveries

Source: MinEx Consulting © October 2019

# Estimated value of gold Discoveries: World

## Primary Gold Deposits: 1950-2018

2019 US\$ billion



**Caution: Values are indicative / approximate-only**

Assumes that the average value of a Tier1/Tier2/Tier3/Unclassified discovery is \$2000m / \$500m / \$80m / \$10m in 2013 Dollars

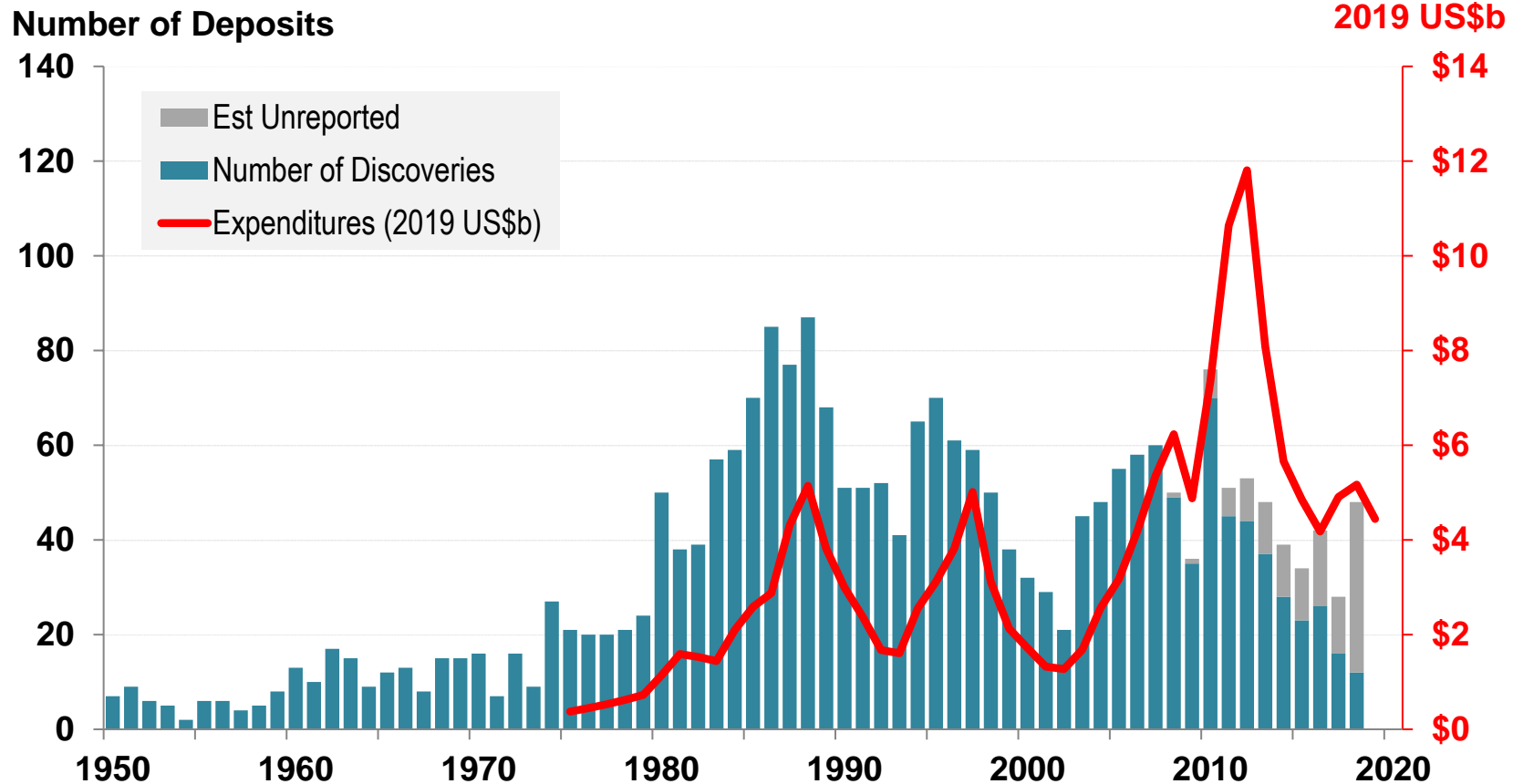
Source: MinEx Consulting © October 2019

Getting progressively more expensive over time

## **8. TRENDS IN UNIT DISCOVERY COSTS**

# Exploration Expenditures and Number of Gold Deposits found: World

Primary Gold deposits only (>0.1 Moz) plus associated By-Product Credits : 1950-2018



Note: Discoveries are for Primary gold deposits >0.1 Moz Au  
Excludes satellite deposits within existing camps  
Data from 2008 onwards have been adjusted for unreported discoveries

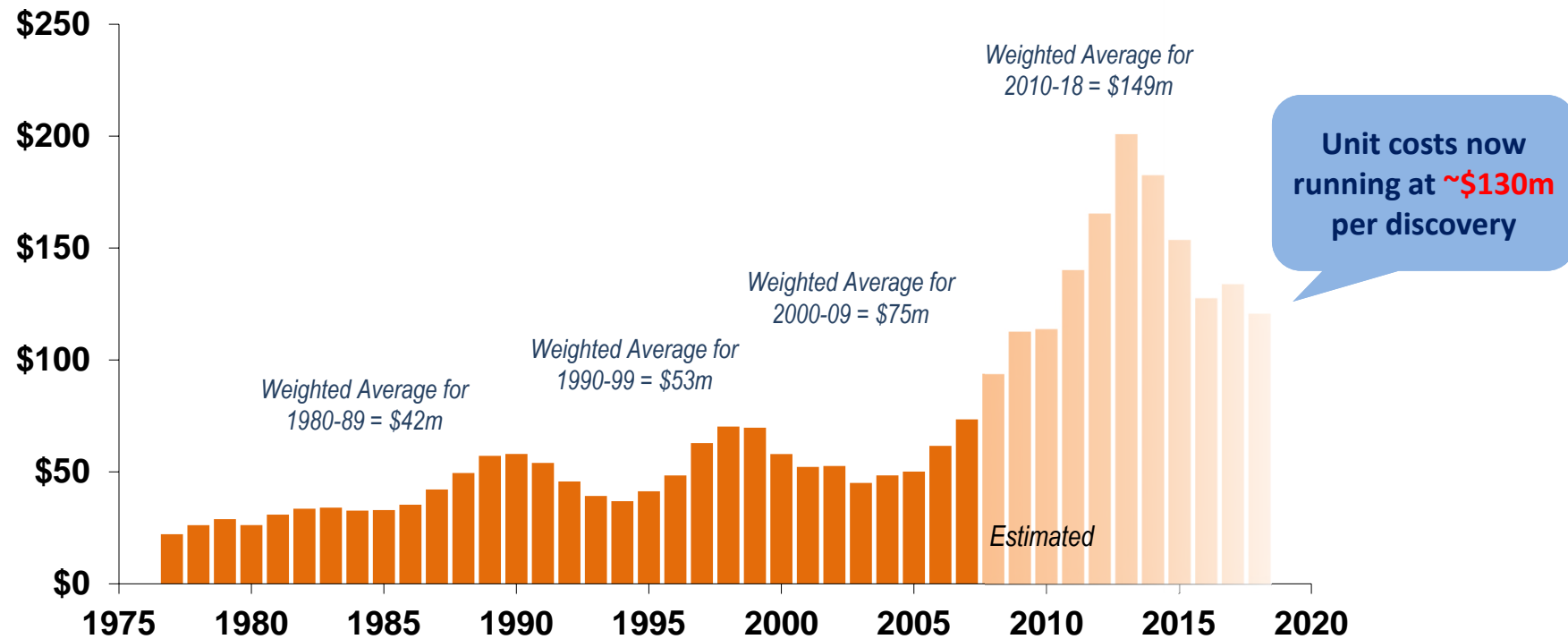
Source: MinEx Consulting © October 2019



# Trend in Unit Discovery costs: 1975-2018

World Primary Gold Deposits > 0.1 Moz

## Average Cost per Discovery (2019 US\$m)

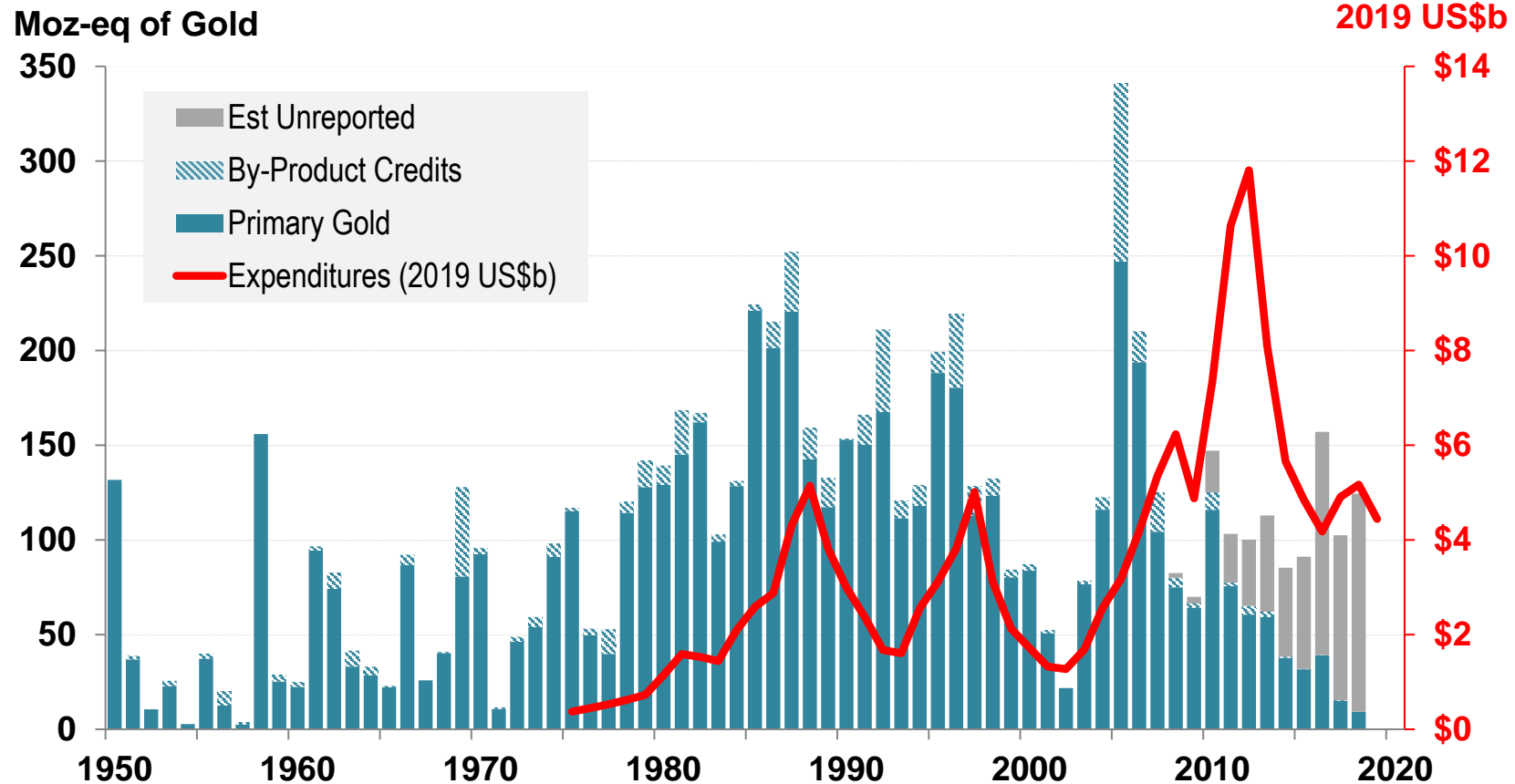


Note: Discoveries are for Primary gold deposits >0.1 Moz Au  
Data from 2008 onwards have been adjusted for unreported discoveries

Source: MinEx Consulting © October 2019

# Exploration Expenditures and Amount of Gold Discovered: World

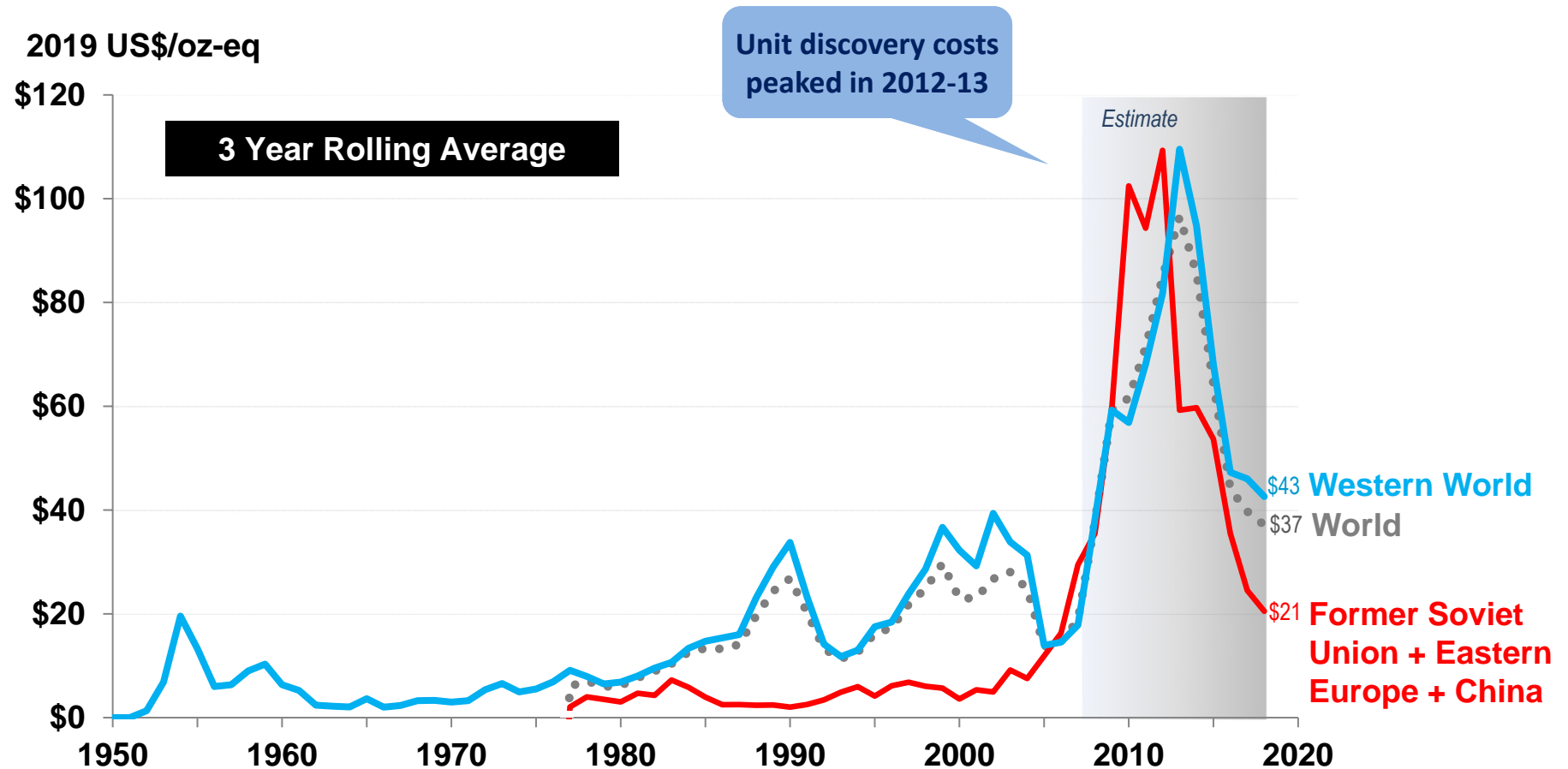
Primary Gold deposits only plus associated By-Product Credits : 1950-2018



Note: Excludes by-product gold associated with base metal and other discoveries  
Includes gold –equivalent value of base metal and other credits associated with the primary gold deposit  
Data from 2008 onwards have been adjusted for unreported discoveries

Source: MinEx Consulting © October 2019

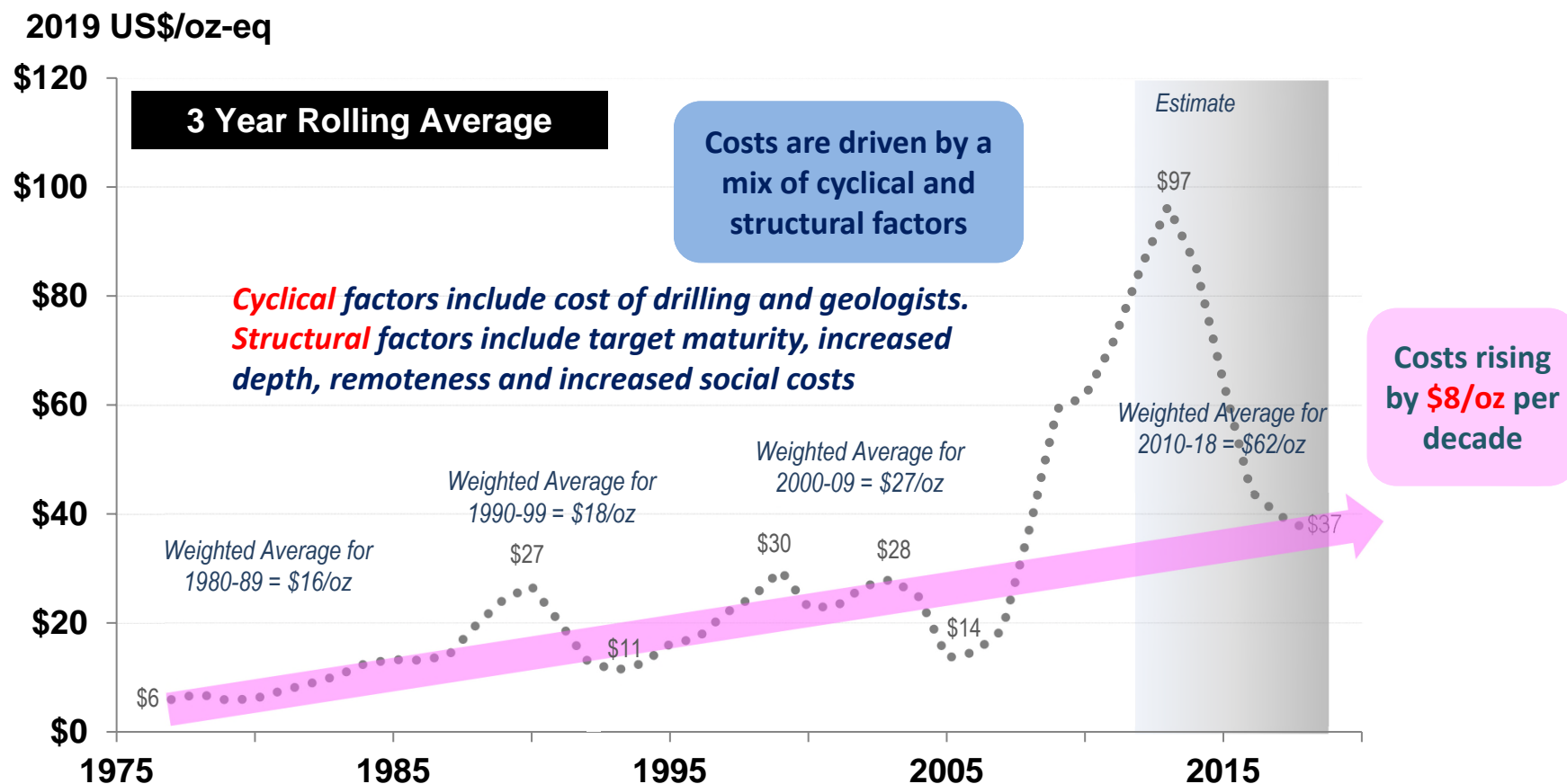
# Unit Discovery Costs for Gold : 1950-2018



Note Includes the value of by-product credits from other metals associated with the primary gold deposit  
Data from 2008 onwards have been adjusted for unreported discoveries

Source: MinEx Consulting © October 2019

# Unit Discovery Costs for Gold : World 1977-2018

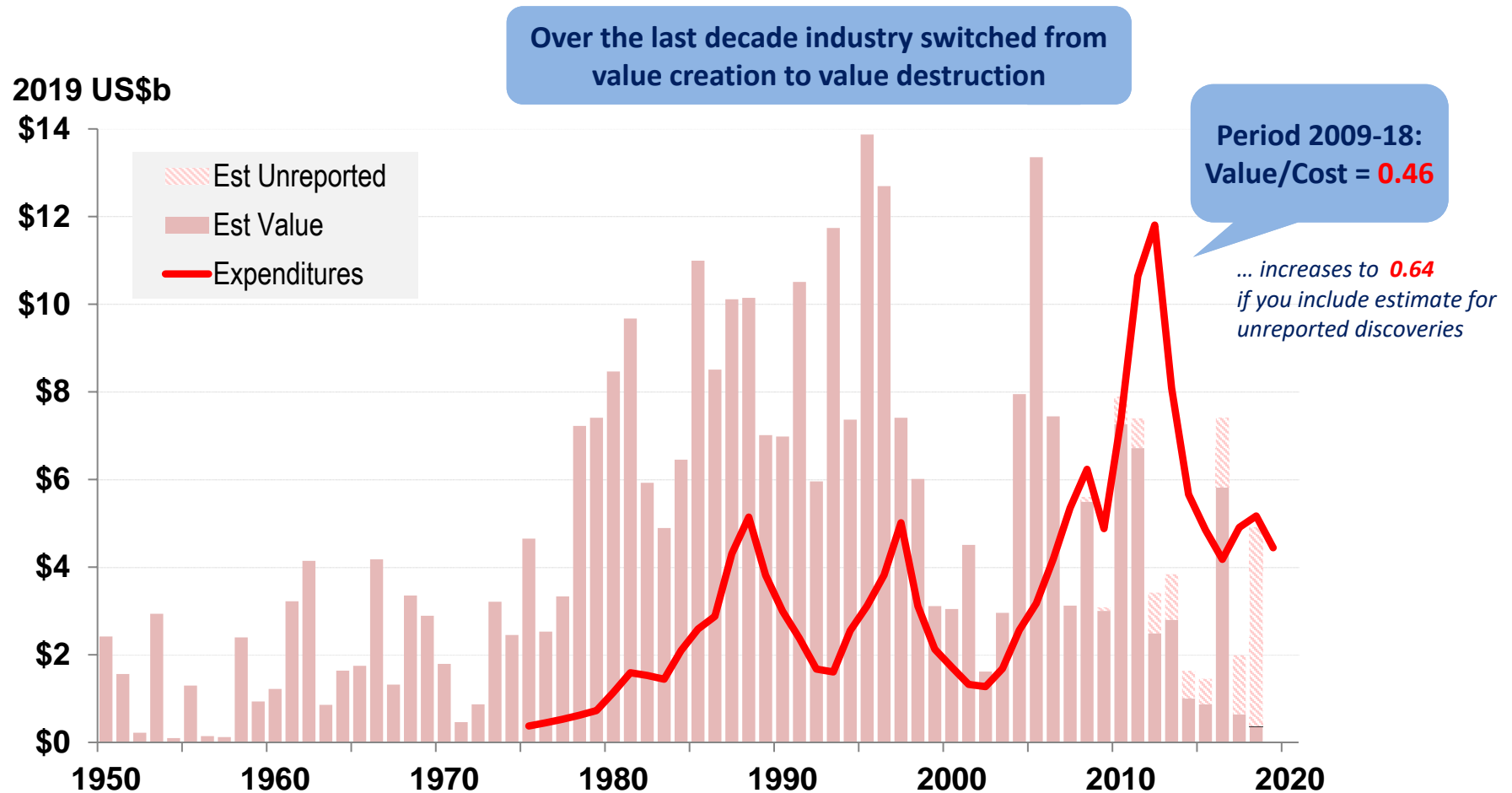


Note Includes the value of by-product credits from other metals associated with the primary gold deposit  
Data from 2008 onwards have been adjusted for unreported discoveries

Source: MinEx Consulting © October 2019

# Exploration Expenditures and Estimated Value Created: World

## Primary Gold deposits : 1950-2018



Note: Discoveries are for Primary gold deposits >0.1 Moz Au  
Excludes satellite deposits within existing camps  
Data from 2008 onwards have been adjusted for unreported discoveries

Source: MinEx Consulting © October 2019

# Discovery performance by Region: 2009-2018

Africa & ROW had lowest discovery costs, PAC/SEA was highest

Region	Explorn Spend (2019 \$b)		Adjusted No of Discoveries		Adjusted Moz found				Avg Size Moz-eq	Cost US\$/oz-eq
					Au	BP Credits	Moz-eq			
Australia	\$5.9	9%	76	17%	153	2	155	14%	2.0	\$38
Canada	\$12.5	19%	53	12%	152	3	155	14%	2.9	\$81
USA	\$5.9	9%	19	4%	66	1	68	6%	3.6	\$87
Latin America	\$15.6	23%	56	12%	103	16	119	11%	2.1	\$132
Pacific/SE Asia	\$4.0	6%	6	1%	9	1	10	1%	1.6	\$406
Africa	\$10.1	15%	152	32%	323	1	324	30%	2.1	\$31
W Europe	\$1.6	2%	16	4%	20	6	26	2%	1.7	\$60
FSU+EE+China	\$11.5	17%	65	14%	220	0	220	20%	3.4	\$52
Rest of World	\$0.5	1%	12	3%	15	2	17	2%	1.4	\$30
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TOTAL	\$67.5	100%	455	100%	1061	33	1094	100%	2.4	\$62

Note: Includes adjustment for unreported discoveries

Source: MinEx Consulting © November 2019

# Discovery performance by Region: Spend & performance by Region: 2009-2018

PAC/SEA was **well below average**. Africa & Australia performed best

i.e. “Bang-per-Buck”

Region	Exploration Spend (2019 \$b)		No of Discoveries		Tier 1+2 Discoveries		Estimated Value (2015 \$b)		Value / Spend
Australia	\$5.9	9%	76	17%	4	22%	\$5.4	17%	0.91
Canada	\$12.5	19%	53	12%	4	22%	\$5.4	17%	0.43
USA	\$5.9	9%	19	4%	1	6%	\$2.8	9%	0.48
Latin America	\$15.6	23%	56	12%	3	17%	\$3.1	10%	0.20
Pacific/SE Asia	\$4.0	6%	6	1%	0	0%	\$0.1	0%	0.03
Africa	\$10.1	15%	152	33%	3	17%	\$5.8	19%	0.57
W Europe	\$1.6	2%	16	4%	0	0%	\$0.6	2%	0.38
FSU+EE+China	\$11.5	17%	65	14%	3	17%	\$7.4	24%	0.64
Rest of World	\$0.5	1%	12	3%	0	0%	\$0.4	1%	0.78
	-----	-----	-----	-----	-----	-----	-----	-----	-----
TOTAL	\$67.5	100%	455	100%	18	100%	\$30.9	100%	0.46

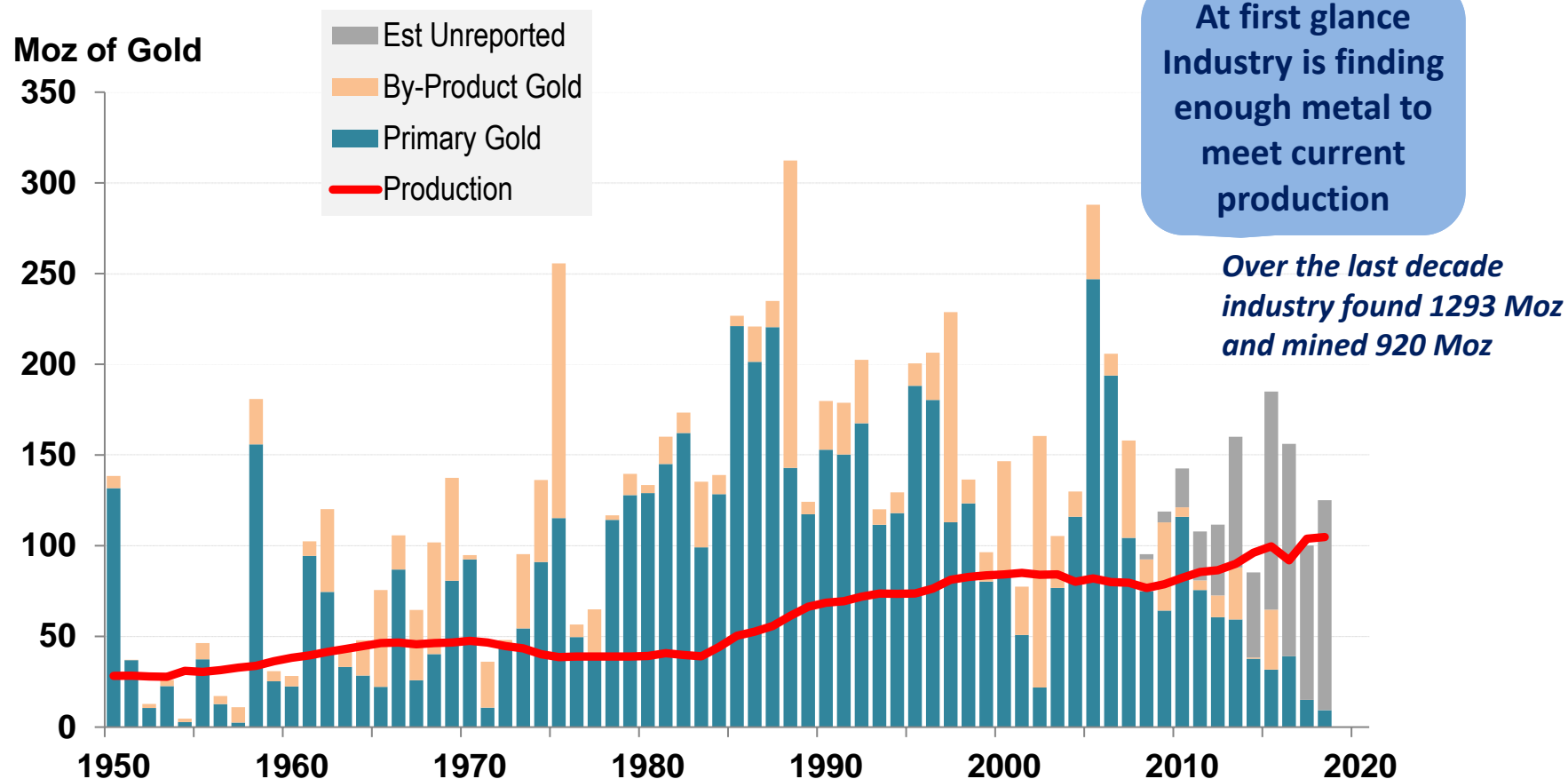
Note: Estimated values are **indicative** only and excludes unreported discoveries

## 9. ARE WE FINDING ENOUGH GOLD ?



# Amount of Gold Discovered and Mined : World

All deposits (i.e. Primary & By-Product Gold) : 1950-2018

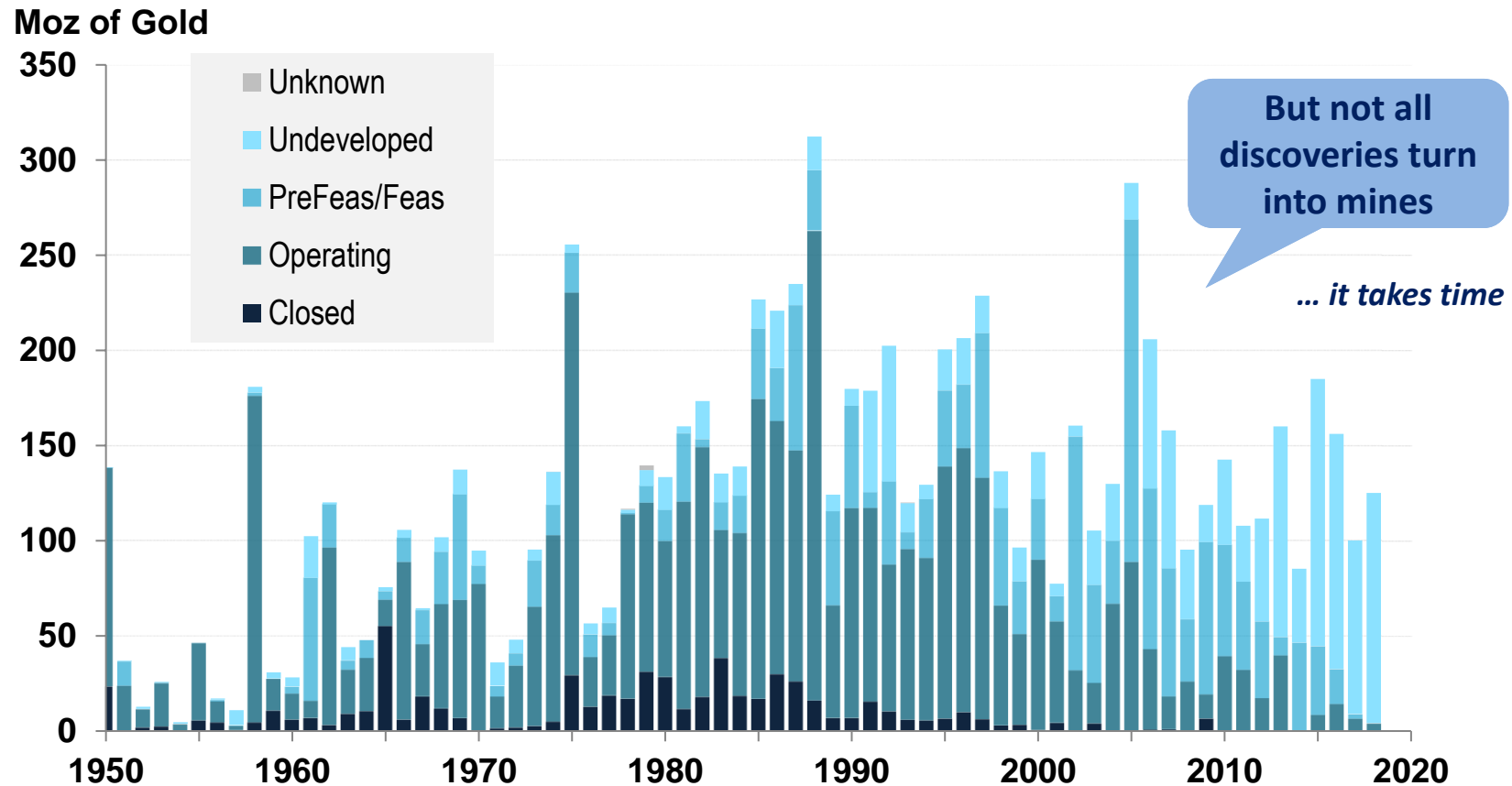


Note: Excludes satellite deposits within existing camps  
Data from 2008 onwards includes estimates for unreported discoveries

Source: MinEx Consulting © October 2019

# Amount of Gold Mined vs Discovered: World

## Primary & By-Product Gold : 1950-2018

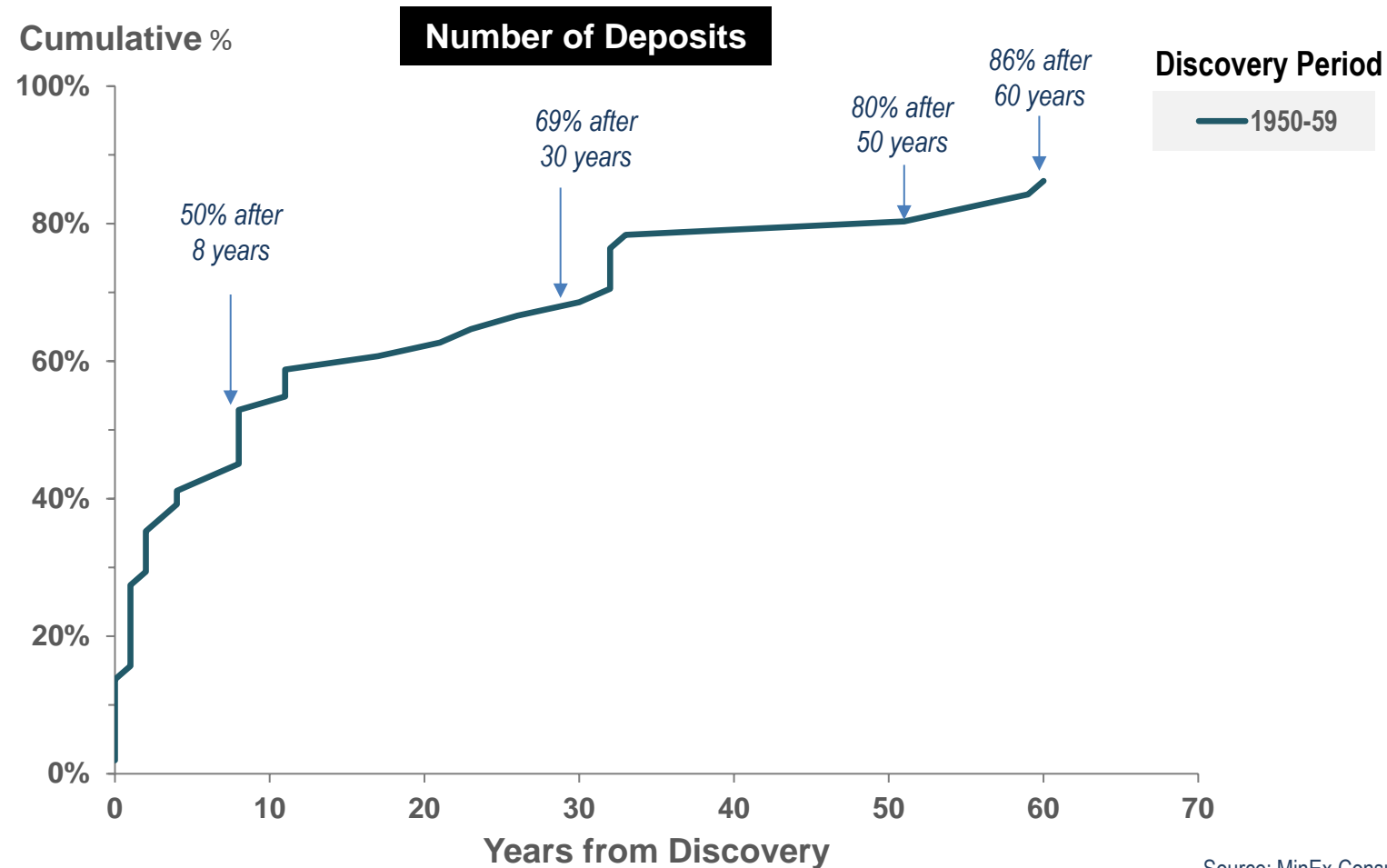


Note: Includes by-product gold associated with base metal and other discoveries  
Data from 2008 onwards have been adjusted for unreported discoveries  
Have ignored mining and processing losses

Sources: MinEx Consulting © October 2019  
USGS (for production data)

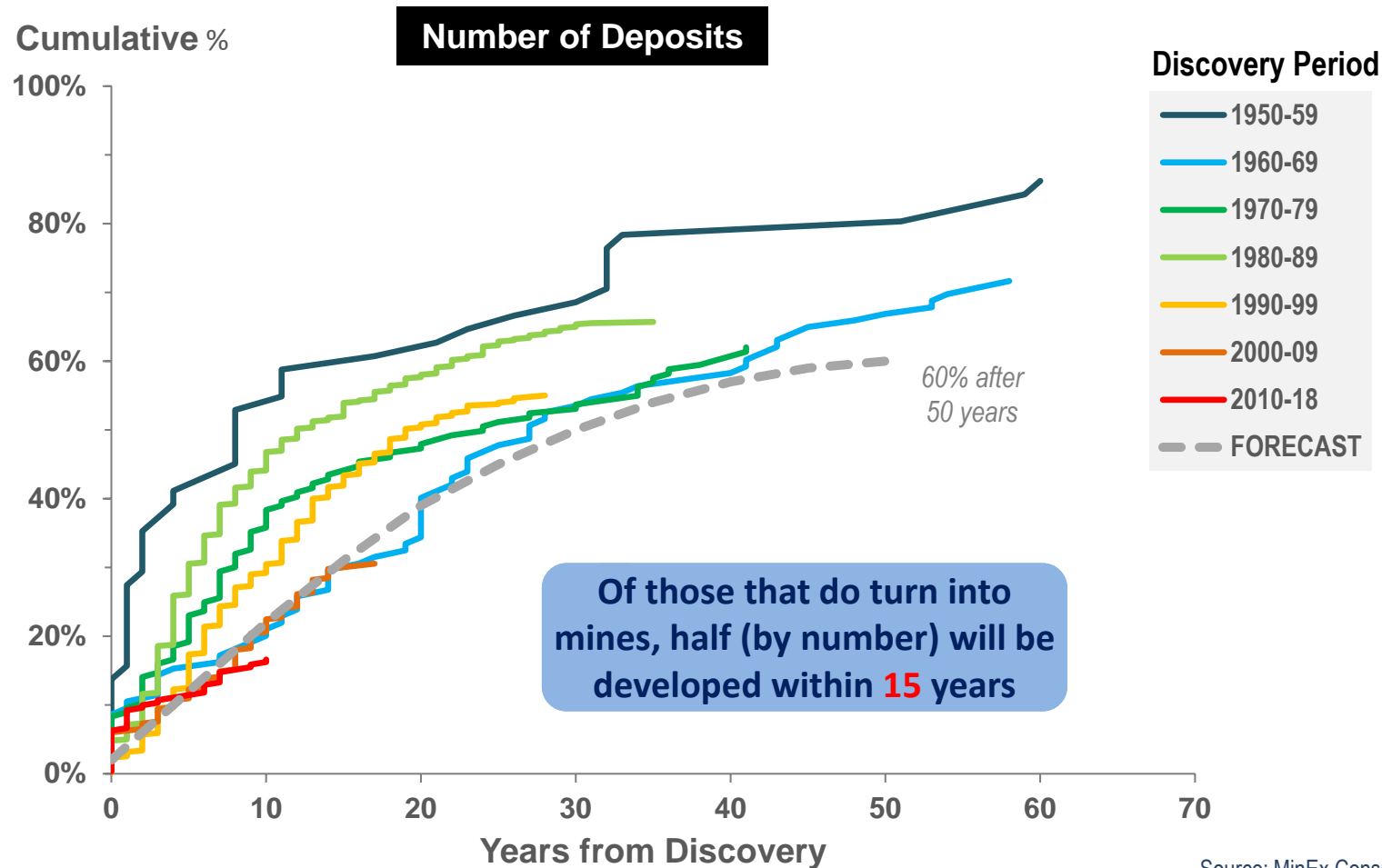
# Cumulative **Number** of Discoveries that become mines

All Primary Gold Discoveries in the World >0.1 Moz



# Cumulative **Number** of Discoveries that become mines

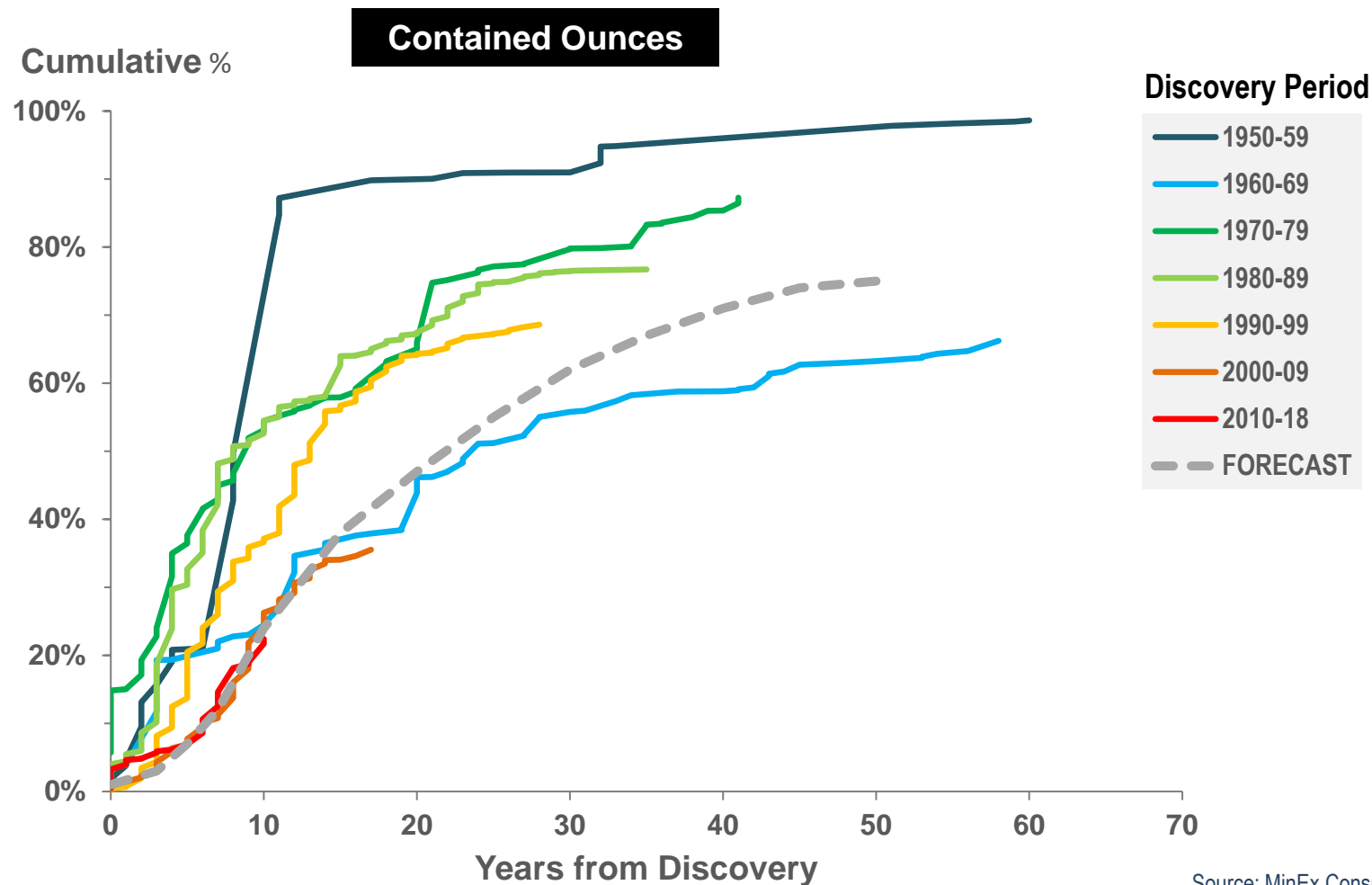
All Primary Gold Discoveries in the World >0.1 Moz



Source: MinEx Consulting © October 2019

# Cumulative **Ounces** in Discoveries that become mines

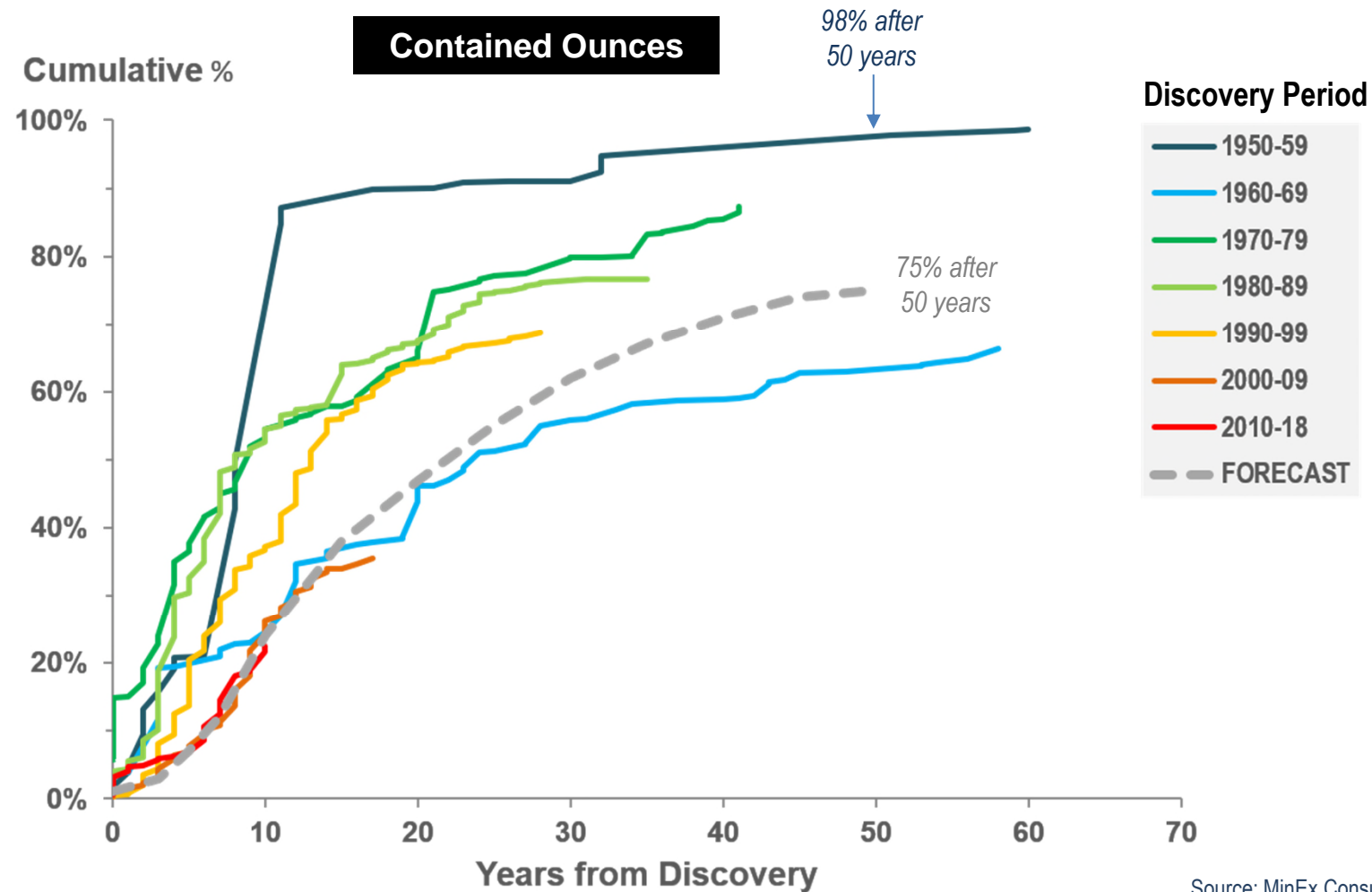
All Primary Gold Discoveries in the World >0.1 Moz



Source: MinEx Consulting © October 2019

# Cumulative **Ounces** in Discoveries that become mines

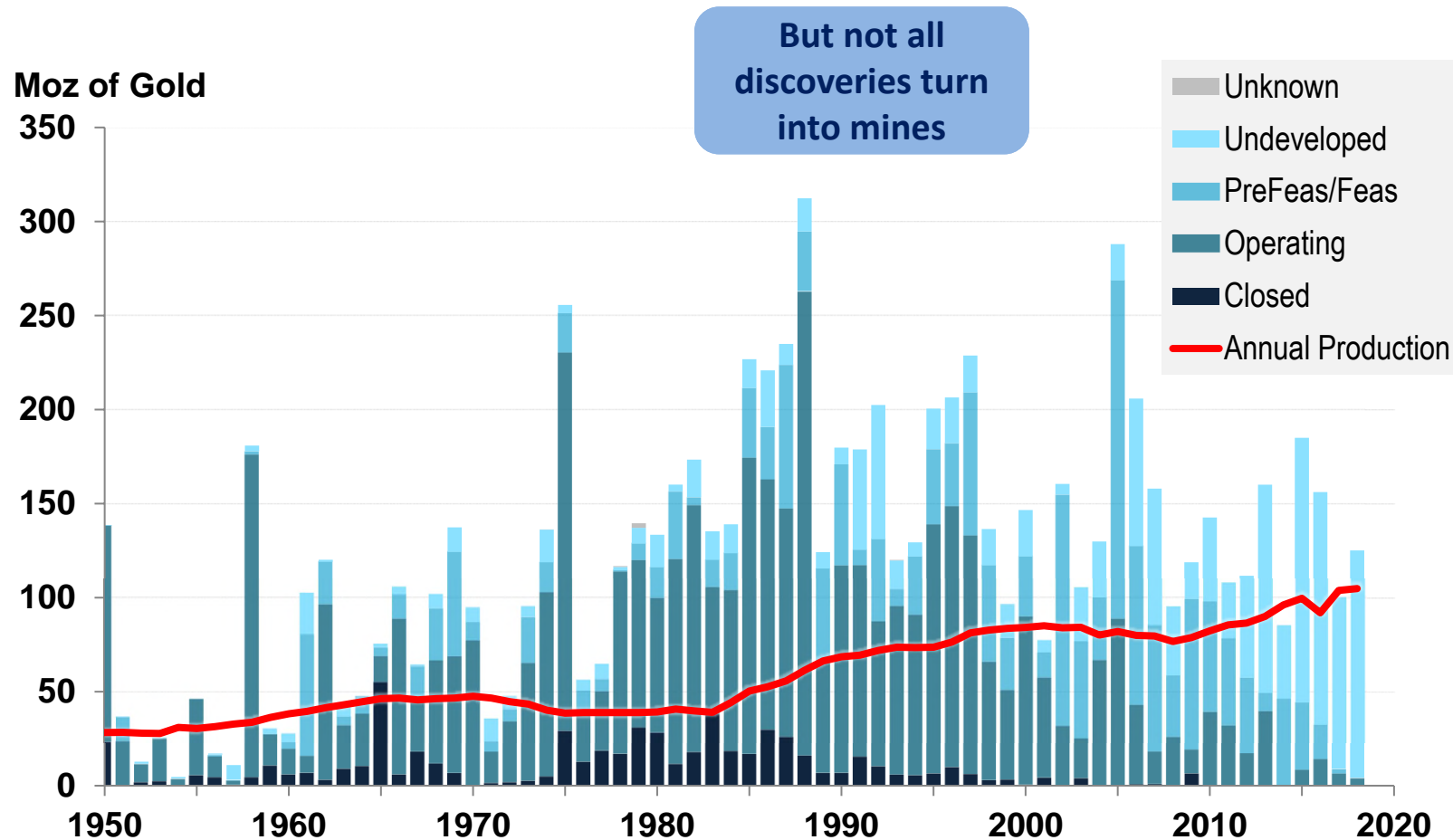
All Primary Gold Discoveries in the World >0.1 Moz



Source: MinEx Consulting © October 2019

# Amount of Gold Mined vs Discovered: World

## Primary & By-Product Gold : 1950-2018

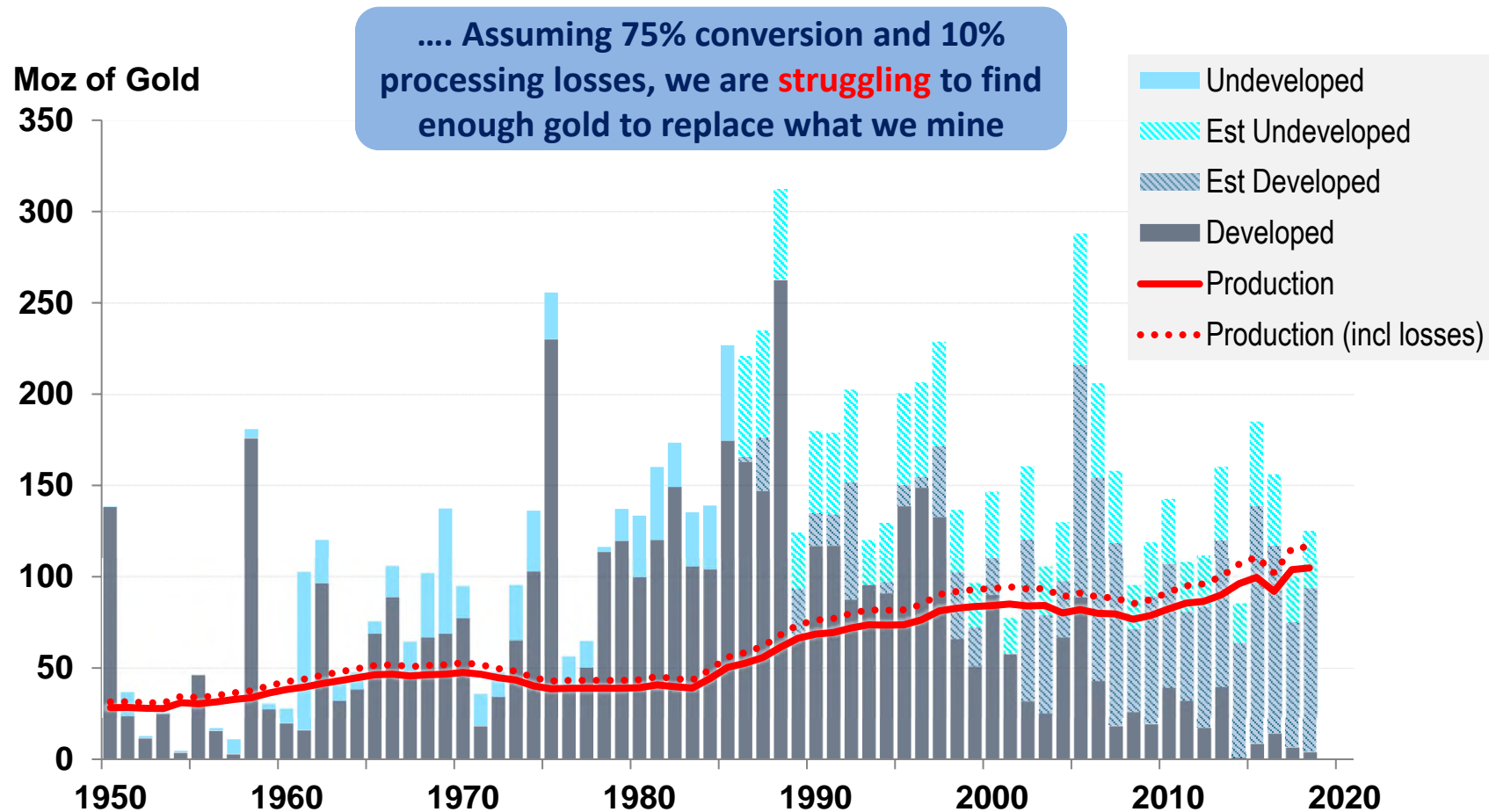


Note: Includes by-product gold associated with base metal and other discoveries  
Data from 2008 onwards have been adjusted for unreported discoveries  
Have ignored mining and processing losses

Sources: MinEx Consulting © October 2019  
USGS (for production data)

# Amount of Gold Mined vs Discovered: World

## Primary & By-Product Gold : 1950-2018



Note: Data from 2008 onwards have been adjusted for unreported discoveries  
 From 1986 onwards have assumed 75% of gold discovered is (eventually) developed  
 Assumes 10% loss for mining and processing

Sources: MinEx Consulting © October 2019  
 USGS (for production data)



## 10. SUMMARY / CONCLUSIONS

# Summary / Conclusions : 1/4

## 1. Trends in exploration expenditures

- Gold exploration expenditures are extremely cyclical
- Global spend was US\$4.4 b in 2019 , down 62% from its peak in 2012 ( of \$11.8b)
- Australia doing OK, but other countries impacted by savage cuts

## 2. Trends in the number of discoveries and ounces

- Discovery rates have plateaued at 35-45 deposits per year
- Over the last decade 1060 Moz was found in 455 primary gold deposits (>0.1 Moz) plus additional 233 Moz in base metal deposits. This includes an adjustment for unreported discoveries
- 32% of the ounces found were in deposits >6Moz, but these only accounted for 5% by number
- 23% of gold found is tied up in base metal and other deposits (as by-product gold)
- Primary gold deposits can have their own by-product credits (such as Ag and Cu). Converting these into gold-equivalent increases the effective size of the (average) discovery by 9%

## 3. Trends in the location of discoveries

- Over the last decade Australia and Africa did well (at the expense of Latin America)
- By number, 17% of the discoveries were in Australia, 32% in Africa and 12% in Canada
- In terms of contained gold, 14% was found in Australia, 30% in Africa and 14% in Canada
- Top 10 “Hot Spots” are Alaska/Yukon, SW USA/Mexico, Northern Ontario, Latin America, West Africa, NE/Central Africa, Turkey / Carpathian Belt, China, Far East Russia and Western Australia

# Summary / Conclusions : 2/4

## 4. Size and grade of discoveries

- Slow decline in the average size, Was ~5 Moz in 1980s and 1990s). Currently 3.2 Moz ... but this is likely to grow over time as the deposits are fully drilled out
- Average grade has tripled in the last decade (from 0.8 g/t to 3.1 g/t) .... Driven by several large high grade underground discoveries. Looking at open pit and underground deposits separately shows that grades have remained steady over the last 50 years at 0.8-1.2 g/t and 4-6 g/t

Suggests that (at a global level) the residual endowment is still good

## 5. Depth of cover for discoveries

- Depth is gradually increasing over time ...5-10 metres per decade
- Over the last decade the average depth of cover was 66 metres , made up of 14m for greenfield and 242m for brownfield.
- Half of the deposits (mainly GF) found were outcropping (and most of these were in Africa).

## 6. Who made the discoveries?

Juniors performed better than the Majors !!

- Over the last decade Junior companies accounted for 45% of the exploration spend, 64% of gold discoveries (by number), 62% of the ounces and 54% of the value created
- Major companies were mainly focused on finding giant deposits. Over the last decade, they accounted for 39% of the spend, 9% of the discoveries, 17% of the ounces and 21% of the value

# Summary / Conclusions : 3/4

## 7. Quality of the discoveries

- 72% of the value created was tied-up in Tier-1 and -2 discoveries (10% by number). These are rare – only 3-4 being found each year in the World.

## 8. Trends in unit discovery costs

- Currently costs ~\$130m per discovery
- Costs driven by (short term) cyclical and (long term) structural factors
- Due to cyclical factors (high cost for geologists and drill rigs) unit discovery costs blew out in the last decade ... peaking at \$97/oz in 2013. Has since dropped back to \$37/oz
- Over the long term costs are rising by \$8/oz per ... driven by remoteness, increased dept of cover, additional social and environmental issues
- Average cost over the last decade was \$62/oz. Costs vary widely by Region – the lowest was Africa (\$31/oz), Australia (\$38/oz), Canada (\$81/oz). The highest was Pacific SE Asia (>\$400/oz)
- In terms of Value/Cost (i.e. “Bang-per Buck”) over the last decade the industry created \$0.46 worth of value per each Dollar spent on Exploration. Australia (\$0.91) was the best performer.

*Hopefully this will improve over time – as costs come down and recent discoveries grow in size and quality*

# Summary / Conclusions : 4/4

## 10. Are we finding enough gold to replace what we mine?

- Over the last decade, industry found 1.4 oz of gold resource for every ounce mined. However, not all discoveries turn into mines (50% by number, 75% by metal) and not all resource ounces are turned into reserves. For those deposits that do get developed, the average delay between discovery and startup is now 15 years (and rising).

After factoring in processing losses, it is clear that the industry isn't finding enough (economic and socially acceptable) gold to replace what it mines.

*On this basis, the industry is currently struggling to sustain itself.*

*As a consequence the gold price has to rise (to stimulate more exploration and make more projects economic) or we have to either to be smarter/more efficient at exploration*

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