# Sustaining our urbanizing planet. New roles for vital ‘green metals’.

*Imagine: 8 billion of us – in just 4 more years!*

Mines and Money London | November, 2019


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Group Manager, Resources


IVANHOE MINES
NEW HORIZONS

# Forward-looking statements & Qualified Person

Certain statements in presentation constitute “forward-looking statements” or “forward-looking information” within the meaning of applicable securities laws, including, without limitation, the timing and results of: (i) statements regarding the ongoing development and exploration work at the Kamoa-Kakula Project, including drilling, decline development, and feasibility, pre-feasibility (PFS) and preliminary economic assessment (PEA) studies; (ii) statements regarding the ongoing development work, including shaft sinking, and the feasibility study at the Platreef Project; and (iii) statements regarding ongoing upgrading and development work and the pre-feasibility study at the Kipushi Project. As well, the results of the PFS and PEA of the Kamoa-Kakula Project, the feasibility study of the Platreef Project and the PFS of the Kipushi Project constitute forward-looking information, and include future estimates of internal rates of return, net present value, future production, estimates of cash cost, proposed mining plans and methods, mine life estimates, cash flow forecasts, metal recoveries, and estimates of capital and operating costs.

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In making such statements, Ivanhoe has made assumptions regarding, among other things: the accuracy of the estimation of mineral resources; that exploration activities and studies will provide results that support anticipated development and extraction activities; that studies of estimated mine life and production rates at the Kamoa-Kakula, Kipushi and Platreef projects will provide results that support anticipated development and extraction activities; that Ivanhoe will be able to obtain additional financing on satisfactory terms; that infrastructure anticipated to be developed or operated by third parties, including electrical generation and transmission capacity, will be developed and/or operated as currently anticipated; that laws, rules and regulations are fairly and impartially observed and enforced; that the market prices for relevant commodities remain at levels that justify development and/or operation; that Ivanhoe will be able to successfully negotiate land access with holders of surface rights; and that war, civil strife and/or insurrection do not impact Ivanhoe’s exploration activities or development plans.

Although the forward-looking statements or information contained in this presentation are based upon what management of Ivanhoe believes are reasonable assumptions, Ivanhoe cannot assure investors that actual results will be consistent with these forward-looking statements. They should not be should not be read as guarantees of future performance or results. A number of factors could cause actual results to differ materially from the results discussed in the forward-looking statements, including, but not limited to, the factors discussed under "Risk Factors" in Ivanhoe’s most recent Annual Information Form.

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This presentation also contains references to estimates of Mineral Resources. The estimation of Mineral Resources is inherently uncertain and involves subjective judgments about many relevant factors. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. The accuracy of any such estimates is a function of the quantity and quality of available data, and of the assumptions made and judgments used in engineering and geological interpretation (including estimated future production from the company’s projects, the anticipated tonnages and grades that will be mined and the estimated level of recovery that will be realized), which may prove to be unreliable and depend, to a certain extent, upon the analysis of drilling results and statistical inferences that ultimately may prove to be inaccurate. Mineral Resource estimates may have to be re-estimated based on: (i) fluctuations in copper, nickel, platinum-group elements (PGE), gold or other mineral prices; (ii) results of drilling, (iii) metallurgical testing and other studies; (iv) proposed mining operations, including dilution; (v) the evaluation of mine plans subsequent to the date of any estimates; and (vi) the possible failure to receive required permits, approvals and licences.

Disclosures of a scientific or technical nature in this presentation have been reviewed and approved by Stephen Torr, who is considered, by virtue of his education, experience and professional association, a Qualified Person under the terms of NI 43-101. Ivanhoe has prepared a NI 43-101 technical report for each of the Kamoa-Kakula Project, the Platreef Project and the Kipushi Project, which are available under the company’s SEDAR profile at www.sedar.com. These technical reports include relevant information regarding the effective date and the assumptions, parameters and methods of the mineral resource estimates on the Kamoa-Kakula Project, Kipushi Project and Platreef Project cited in this presentation, as well as information regarding data verification, exploration procedures and other matters relevant to the scientific and technical disclosure contained in this presentation in respect of the Kamoa-Kakula Project, Platreef Project and Kipushi Project.


Source: AFP/JIJI

# Visualizing the auto industry's problem


Note: Size represents the global market value of the commodity. Source: CleanTeQ

# Year-to-date price change (Jan 1 to Nov 22, 2019)

| | |
|---|---|
| Ivanhoe Mines (IVN:TSX) | +54.85% |
| Rhodium (Rd spot) | +143.90% |
| Palladium (Pd NYM) | +45.76% |
| Nickel (Ni LME 3mth) | +35.50% |
| Gold (Au spot) | +14.02% |
| Platinum (Pt NYM) | +12.26% |
| Silver (Ag spot) | +9.70% |
| Copper (Cu CMX) | +0.51% |
| Zinc (Zn LME) | -7.04% |

*Source: Bloomberg*

# Félix Tshisekedi sworn in as the President of DR Congo on January 24

“ The whole world is watching the Democratic Republic of Congo. For our harmonious development, **we will pursue a policy of economic cooperation based on investment** and improving the image of our country.

**The strength and unity of a people is based on solidarity** and national reconciliation.

We intend to urge the government to **work for peace and tolerance** with a view to peaceful coexistence between our different communities. ”

**– Inauguration speech, Kinshasa, DRC**

# A culmination of more than 15 years of a long-lasting friendship with CITIC

"We are confident that the CITIC Metal Group has the experience, financial resources – and a shared commitment to our objectives – to greatly assist us as we advance our projects to production."


**In April 2003**, **Robert Friedland**, Chairman of Ivanhoe Mines, and **Wang Jun** (left), Chairman of CITIC Group, announced the formation of a strategic alliance in mineral exploration, development and production.

**September 19, 2018: Completion of a major strategic equity investment totalling C$723 million (approximately US$556 million) in Ivanhoe Mines by CITIC Metal to help advance three world-scale mine-development projects in Southern Africa.**


Ivanhoe Mines' Executive Co-Chairman **Robert Friedland** (above, middle right) and CITIC Metal Group President and Ivanhoe Co-Chairman **Yufeng "Miles" Sun** (above, middle left), signed the landmark agreement to complete CITIC's investment in Ivanhoe during a ceremony in Beijing on September 19, 2018.

# On August 16, CITIC Metal closed its second investment ~US$1 billion at a +35% premium to market.

Left to right: **Peter Zhou** (Vice President, Ivanhoe Mines), **Yufeng "Miles" Sun** (President, CITIC Metal Group, Co-Chairman, Ivanhoe Mines), **Robert Friedland** (Executive Co-Chairman, Ivanhoe Mines) and **Manfu Ma** (Vice President, CITIC Metal Group).

# Proforma top 10 shareholders hold ~73% of Ivanhoe

| Shareholder | Ownership stake in Ivanhoe Mines |
|---|---|
| CITIC | 26.4 |
| ZiJin | 13.88% |
| Robert Friedland | 13.20 |
| Fidelity INVESTMENTS | 9% |
| BlackRock | 2% |
| Invesco | 2% |
| Rothschild | 2% |
| SKAGEN | 2% |
| OppenheimerFunds | 2% |
| Vanguard | 1% |

Standstill at 26.4% until 2023

Standstill at 13.88% until 2026

# URBANIZATION:

Resources and technologies for one of the greatest social and economic transformations in human history.

**With an estimated 7.6 billion people *now*, our world is gaining another 82.5 million people *every year*.**

**8.5 billion people will call Earth home by 2030.**

**Shanghai's** population tripled to 23 million in only two decades.


*Source: United Nations*

Today, **4.2 billion people** (**55%** of the global population) live in cities.

By 2050, it will be **6.7 billion people in cities** (**68%** of the global population).

Tokyo, currently the world's largest urban area (pop. 38 million)

*Source: Oct 2018 United Nations report*

# In 2019, air pollution is considered by WHO as the greatest environmental risk to health

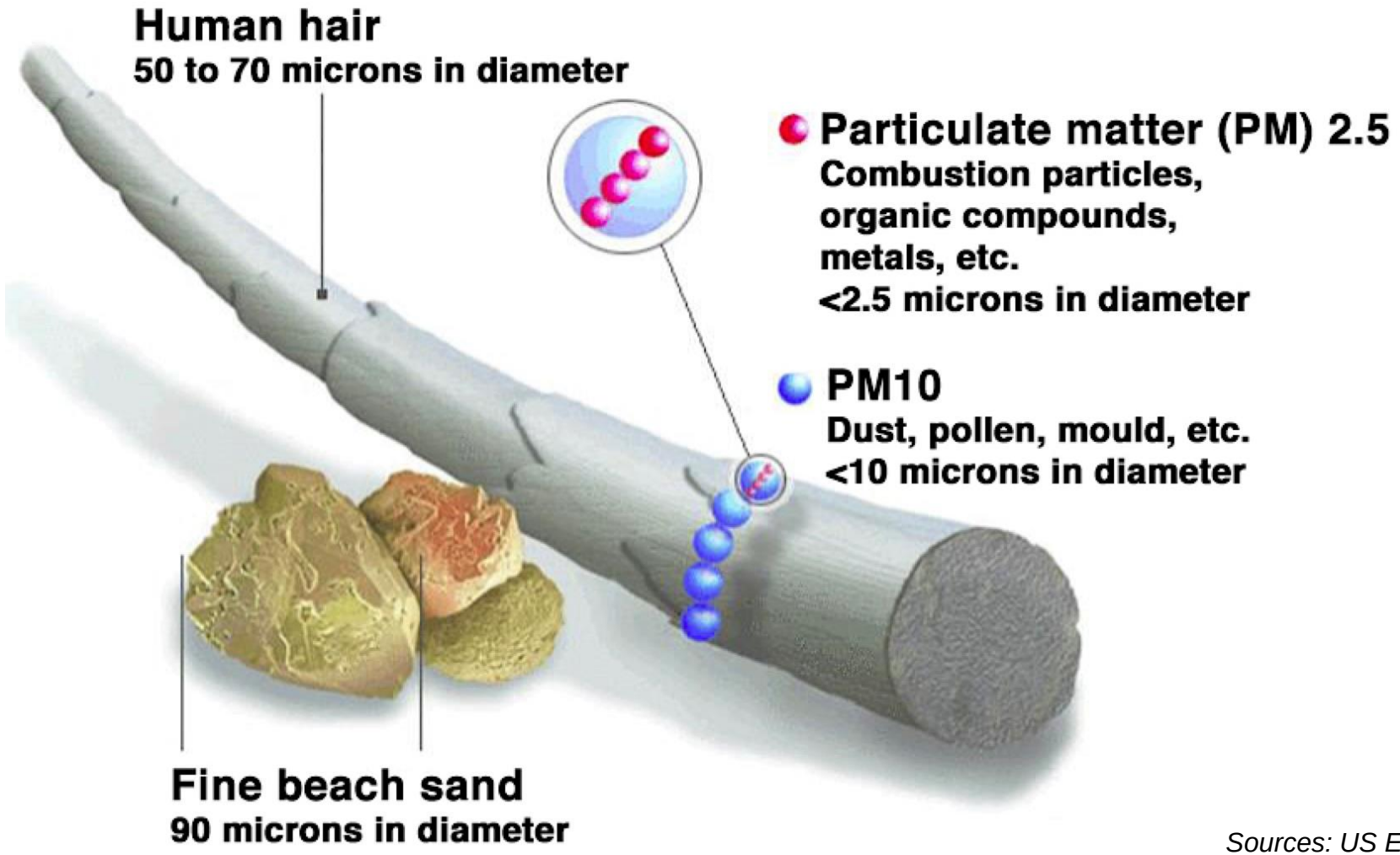
> “As the world continues to urbanize, sustainable development depends on the **successful management of urban growth**.”
>
> **– United Nations World Urbanization Report**

**Jakarta, Indonesia**

*Photo: MenaFN*

# Humans are vulnerable to air pollutants seeping into bloodstreams and brains

Miniscule airborne particles are less likely to be trapped by hairs and the mucus that line our noses – our body's natural barrier.




*Sources: US EPA, BBC*

# Toxic smog clouds future of urbanizing Earth

**Nine out of 10 people worldwide breathe polluted air.**
– UN World Health Organization, May 2018

**Air pollution deaths cost the global economy $5 trillion annually.**
– World Bank, August 2016

**Air pollution kills 7 million people a year.**
– UN World Health Organization, May 2018

**Air pollution deadlier than smoking, war and AIDS, reducing worldwide lifespan by 1.8 years.**
– University of Chicago, November 2018

From Asia…to the USA

# Studies reveal dangers of prolonged exposure to air pollution

**2.7 million premature births** a year linked to air pollution.

REUTERS

Air pollution tied to **chronic kidney disease.**

The New York Times

**Heart disease** linked to air pollution.

BBC

Possible **Alzheimer's** link cited by UK researchers.

BBC

Air pollution linked to 3.2 million new **diabetes** cases in one year.

THE LANCET

**Higher cancer death risk** linked to air particle pollution.

Newsweek

Young and old – air pollution affects the most vulnerable

# Babies in prams/strollers can be exposed to up to 60% more pollution than adults

BBC

- Infants in prams/strollers are exposed to dirtier air because they are lower to the ground and closer to vehicle exhaust pipes.
- Toxic air puts 17 million **babies' brains and lungs at risk**: UNICEF.

REUTERS

*Photo: Elizabeth Dalziel / Greenpeace*

# Almost every Londoner exposed to dangerous levels of toxic air pollution

**7.9 million Londoners – nearly 95% of the capital's population – live in areas that exceed WHO's limit of damaging PM2.5 particles, an October 2017 report showed.**

*Photo: AP/Alastair Grant*

# The world’s dirtiest air is in India

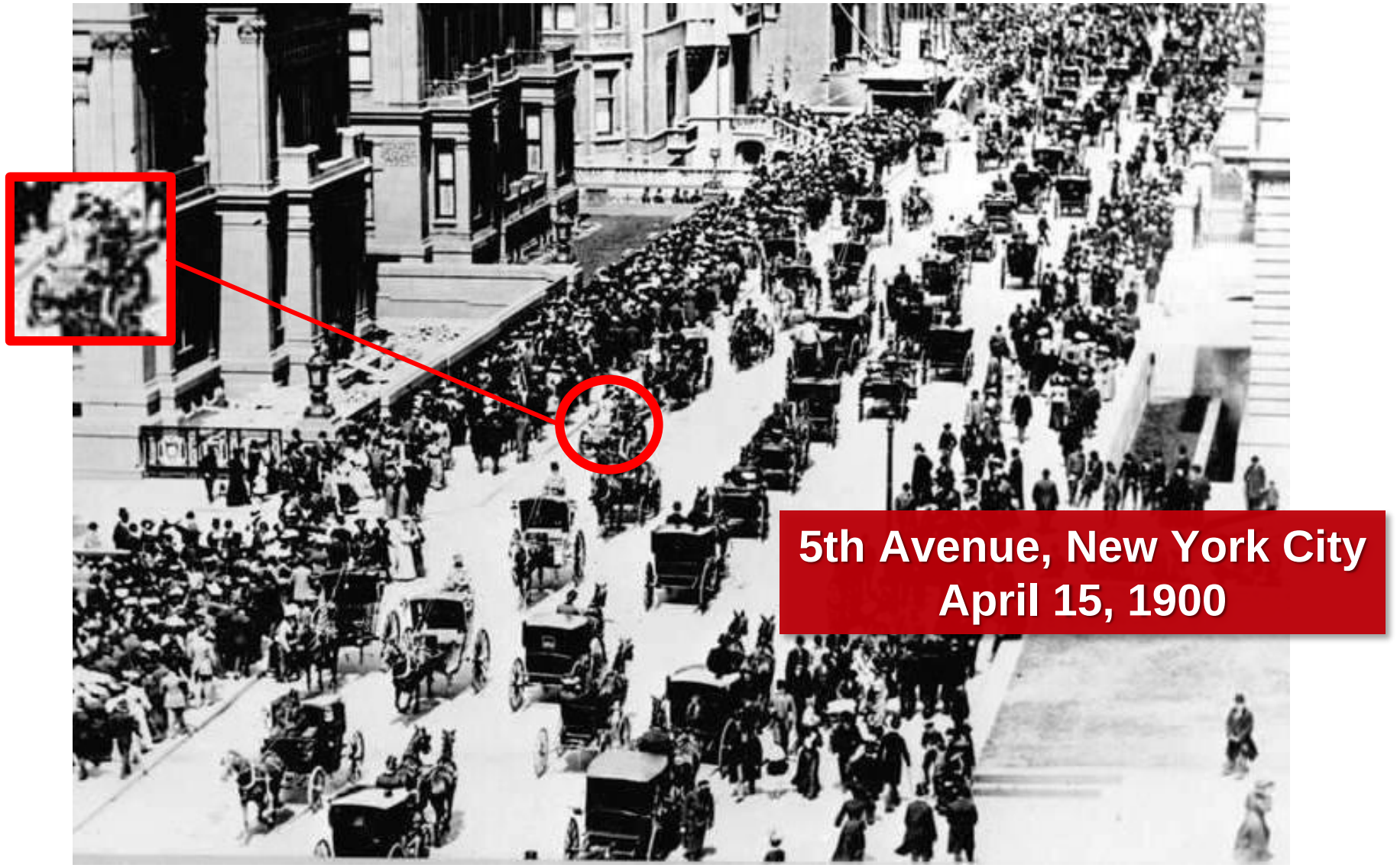
## Delhi air pollution surged to severe, emergency levels in 2019

- **Government’s five-year plan aimed at reducing air pollution in 102 cities by up to 30% from 2017 levels.**
- **March 2019: Delhi cabinet approved 1,000 electric buses to fight air pollution.**

*Photo: Raj K Raj/HT File Photo*

# Disruptions happen – sometimes quickly.

## It's 1900: Can you spot *the car*?




*Source: Tony Seba, U.S. National Archives*

# This disruption *did happen quickly.*
# Now it's 1913: Can you spot *the horse?*

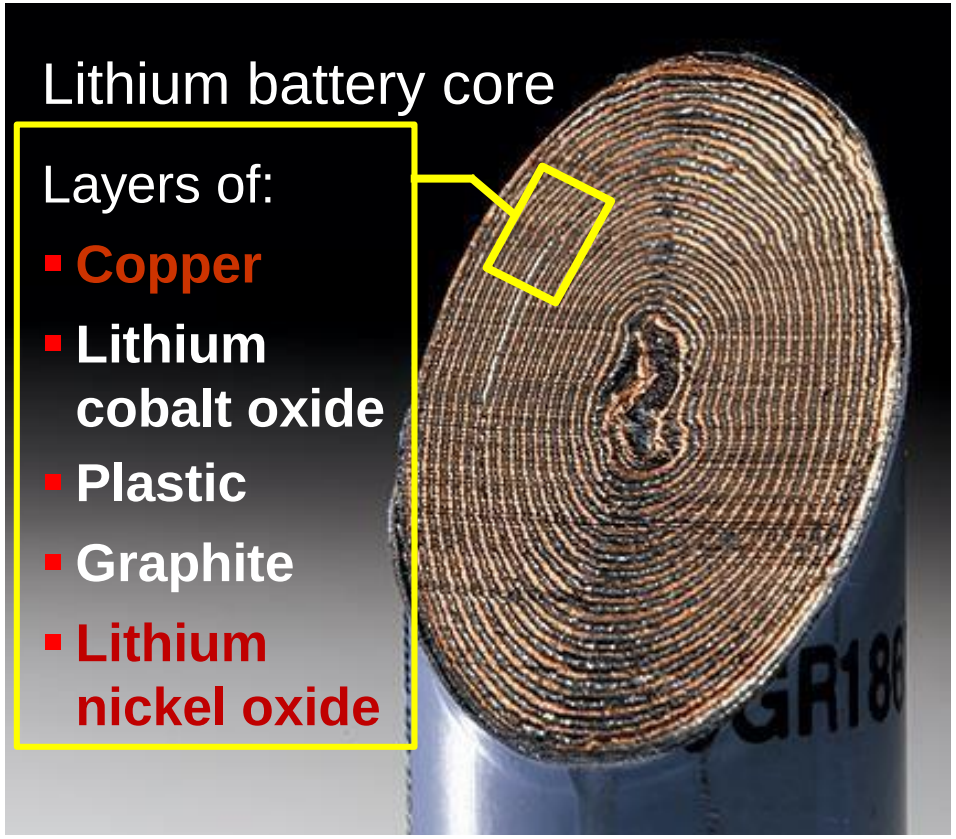
# Copper demand for electric cars to rise 900% by 2027

**– International Copper Association**

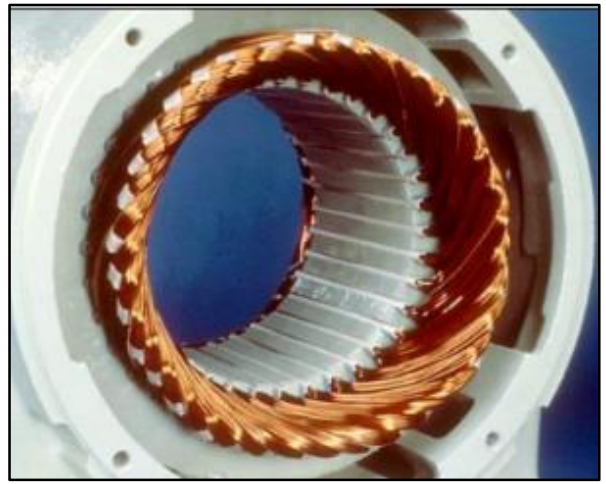
## Copper, a major commodity winner in growing EV market, is at the heart of lithium batteries and induction motors

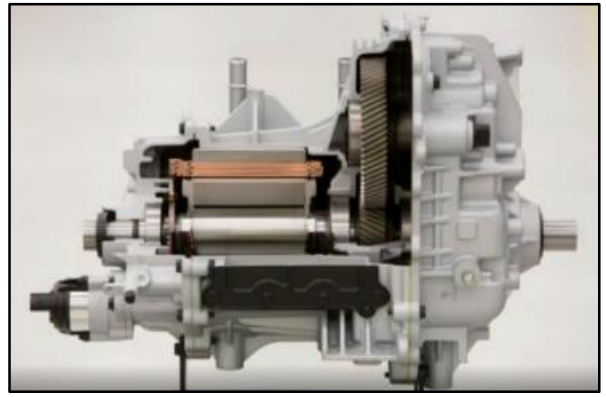
Motor windings contain approx. 40 kg (88 lbs.) of copper.

Battery pack contains approx. 37.5 kg (83 lbs.) of copper.




Copper windings, rotor cages and coils in EV models, including the Chevy Bolt, BMW i3 and Tesla Model 3.
**Kilos of copper!**





*Sources: National Geographic; GM; Bernstein; Cleantechnica; Copper Alliance; BMO.*

All-electric cars now use **four times more copper** than conventional gasoline-powered autos. Future, larger electrics could use much more.

**FUTURE PLUG-IN ELECTRICS**

**(Bernstein projection for a generation of bigger, longer-range electrics)**

**360 lbs. / 163 kg**

**PLUG-IN ELECTRIC**

**240 lbs. / 109 kg**

*Tesla Model 3*

**HYBRID**

**88 lbs. / 40 kg**

*Hyundai Hybrid*

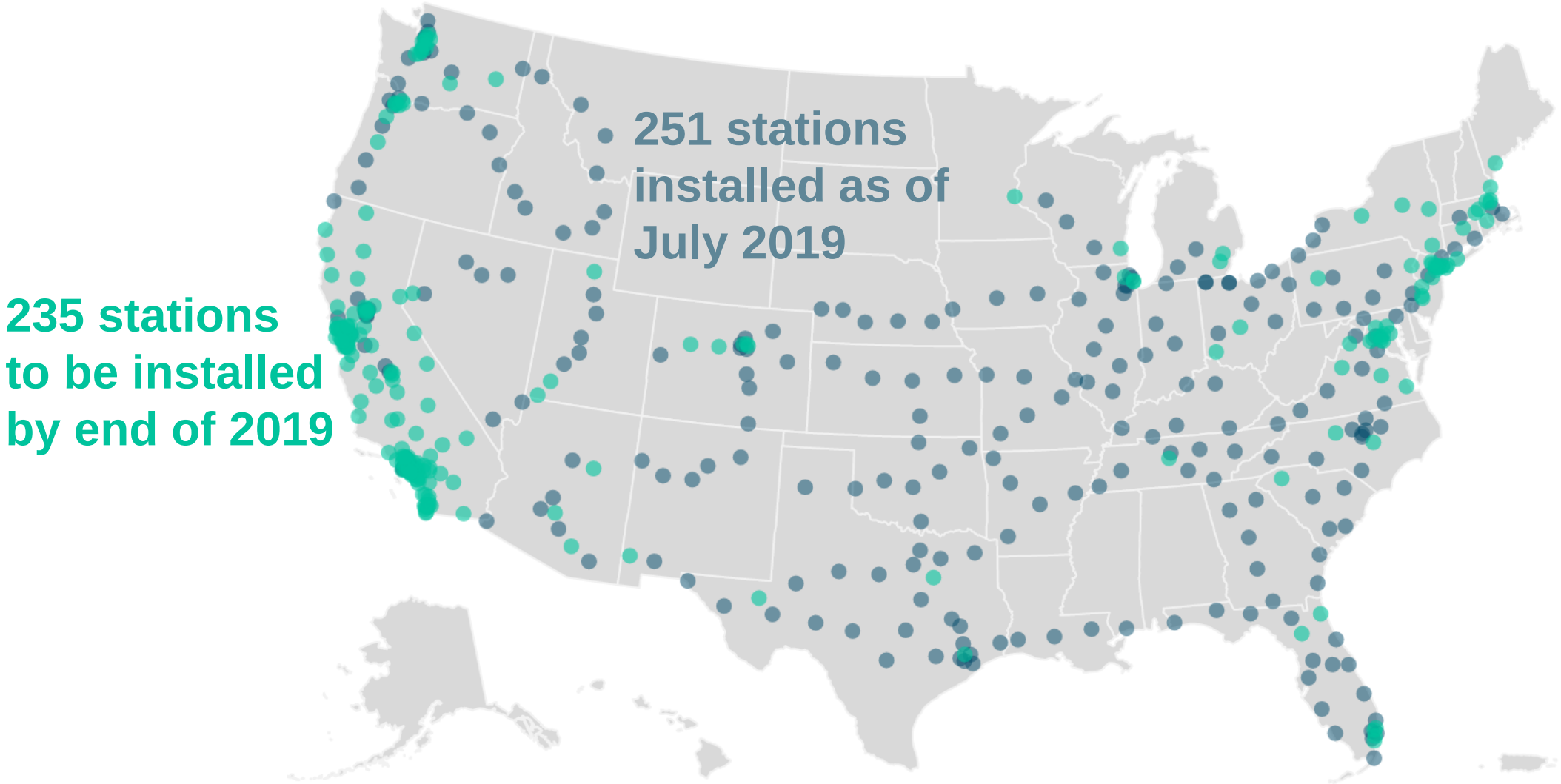
**GASOLINE**

**66 lbs. / 20 kg**

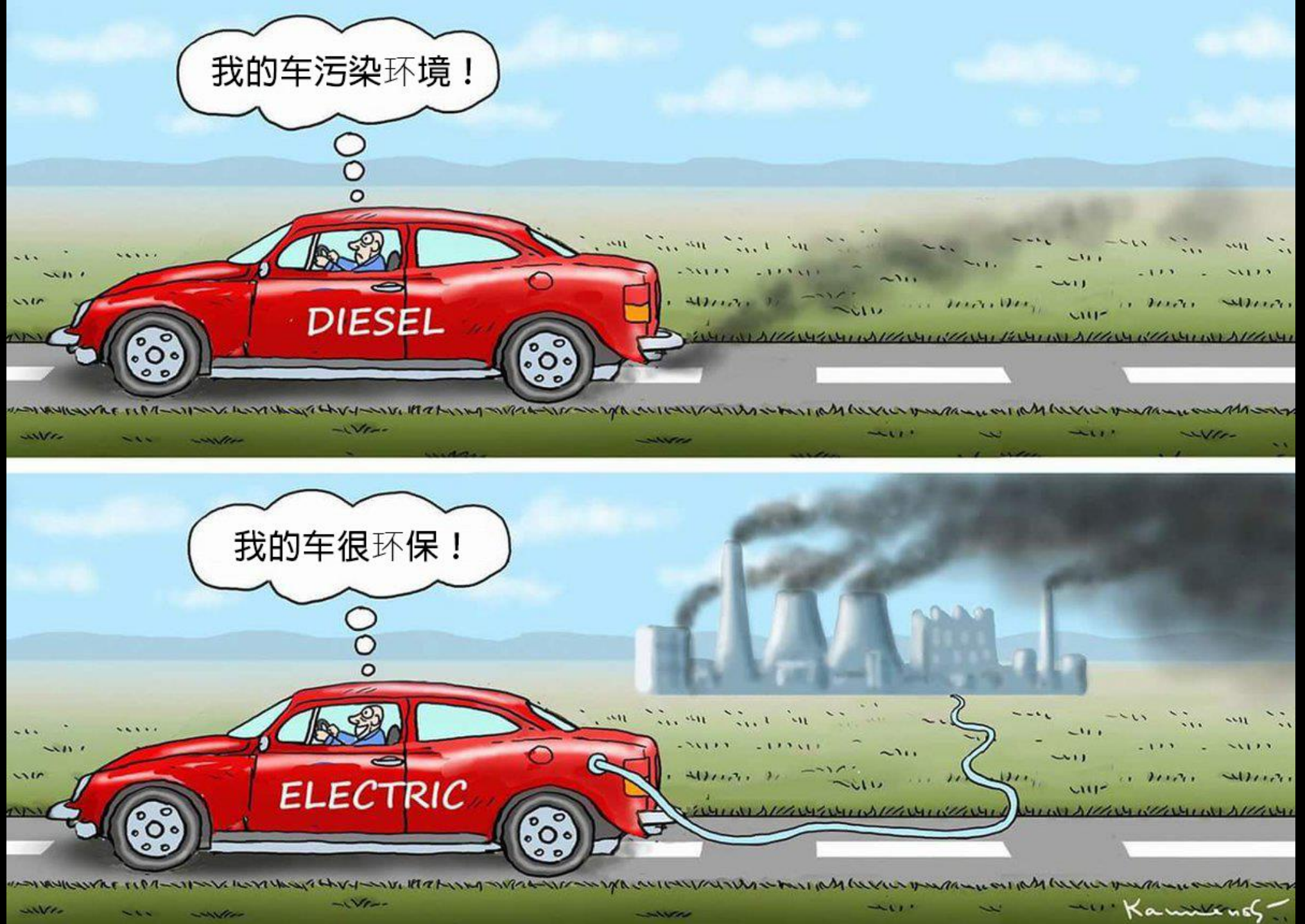
*Ford Mustang*

*Sources: BHP via ft.com (2016); Bernstein Research projection (2017)*

# Super-fast Electrify America electric-car charging network expanding in the U.S.

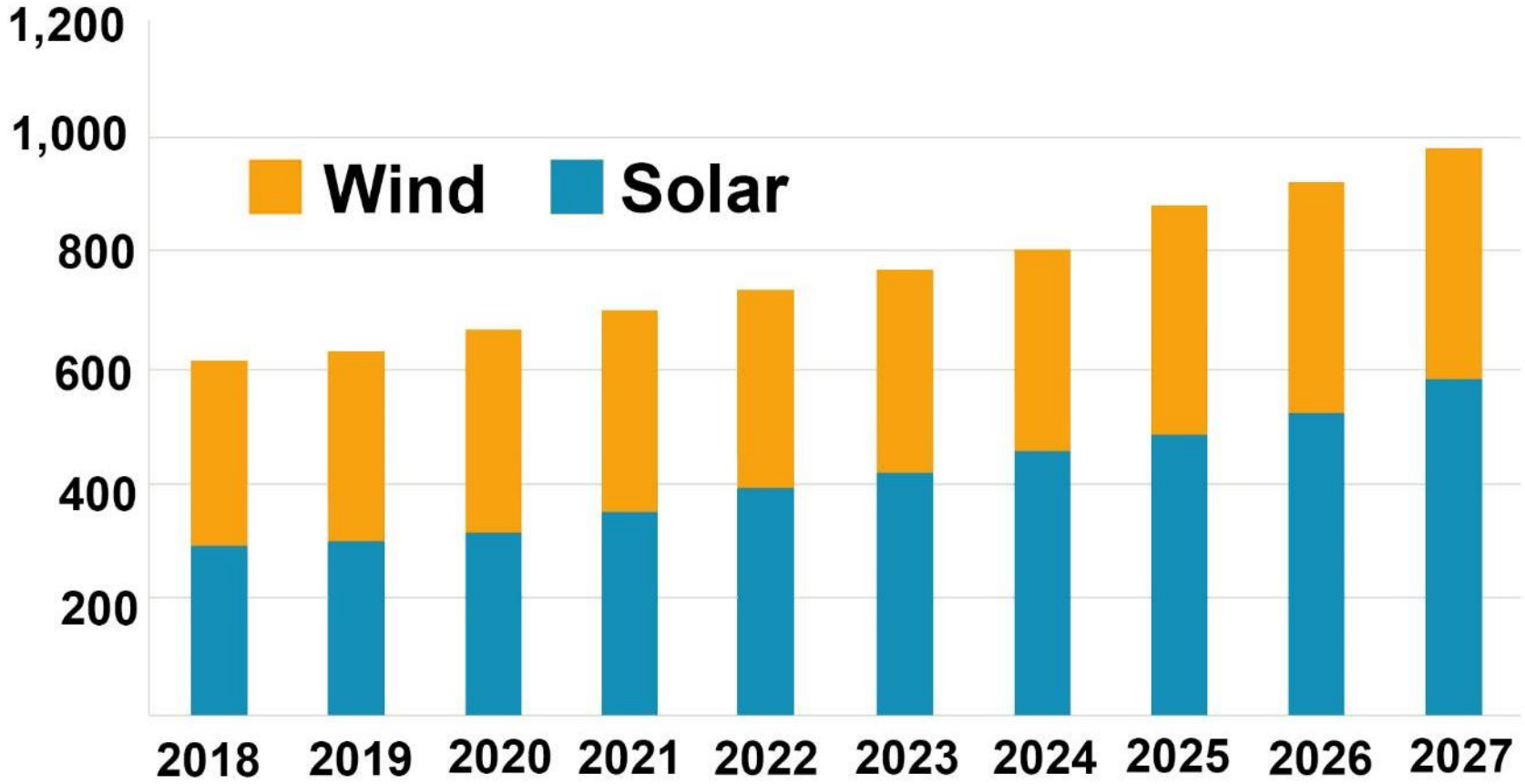



*Source: Electrify America. Graphic: Curt Merrill, CNN.*

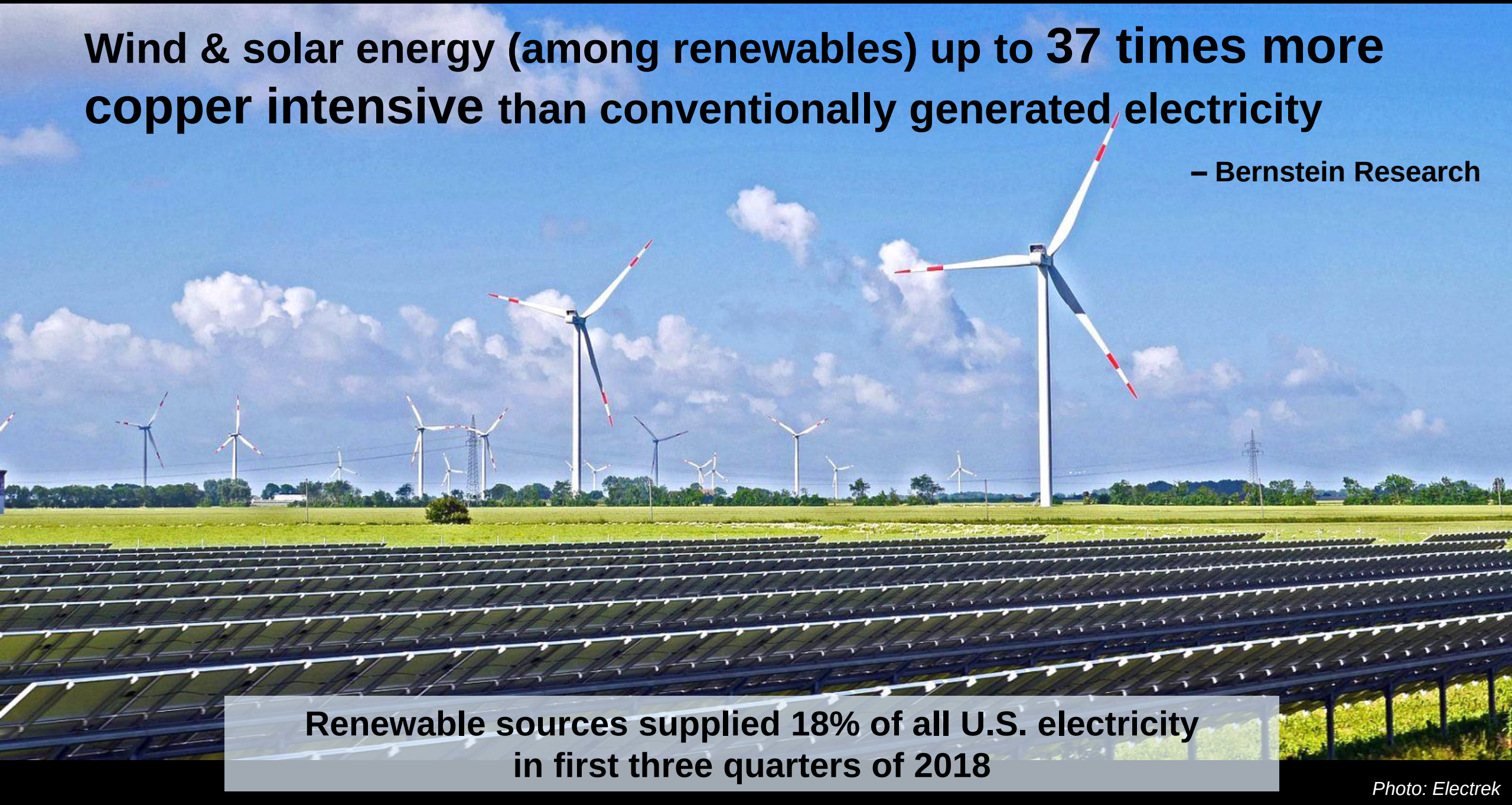

我的车污染环境！
DIESEL
我的车很环保！
ELECTRIC

# Growth in solar and wind energy projected to increase copper demand by 56% in 2027, over 2018 levels

**Copper annual capacity forecast (kt)**




*Sources: International Copper Association & Navigant Research*



**Wind & solar energy (among renewables) up to 37 times more copper intensive than conventionally generated electricity**

**– Bernstein Research**

**Renewable sources supplied 18% of all U.S. electricity in first three quarters of 2018**

*Photo: Electrek*

# Global wind turbine fleet to consume more than 5.5 million tonnes of copper by 2028 – Wood Mackenzie

Wind turbines installed in Denmark are 60 storeys high. *One blade* is 82 metres (270 feet) long – wider than the total wingspan of an Airbus A380, the world's largest passenger jet.


GE is planning an 85-storey-high offshore wind turbine to power up to 16,000 homes. **A wind farm of 62 turbines could power 1 million European households.**

88-metre (290-ft.) moulded blade being delivered for turbine assembly.

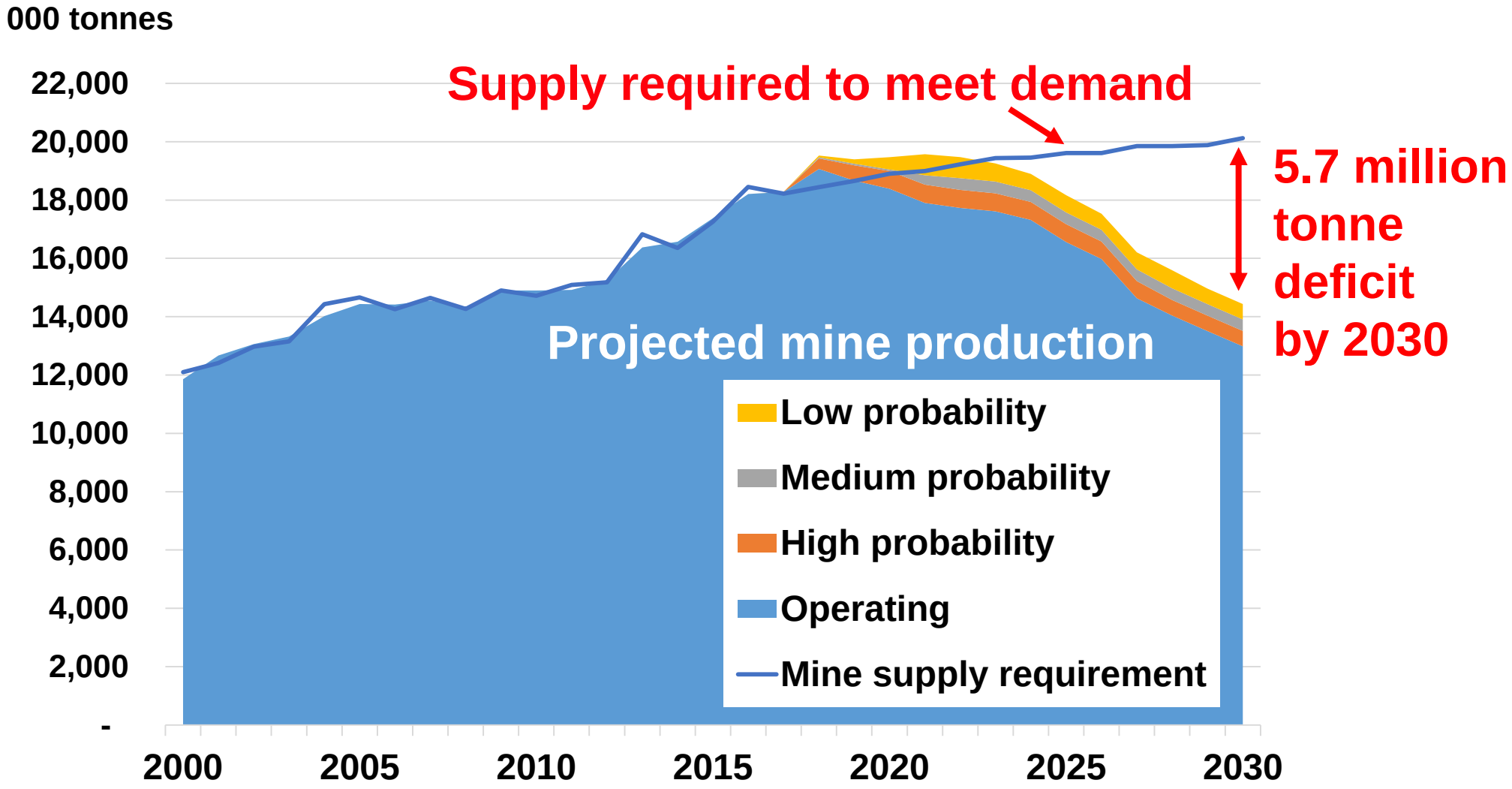
*Sources: LM Wind Power, New York Times, Wall Street Journal*

# **August 2018:** California takes historic step toward 100% carbon-free electricity generation by 2045

- Legislators voted to require that 100% of state's electricity comes from **carbon-free sources**.
- **World's fifth largest economy to fully commit to renewable energy** by 2045.
- Other U.S. states to mandate 100% renewable energy sources in coming decades: **New York, Hawaii, Nevada, New Mexico, Washington**.


*Photo: Daniel Hoover, Youtube*

# Not enough copper is being discovered to meet future projected demand




*Source: S&P Global Market Intelligence*

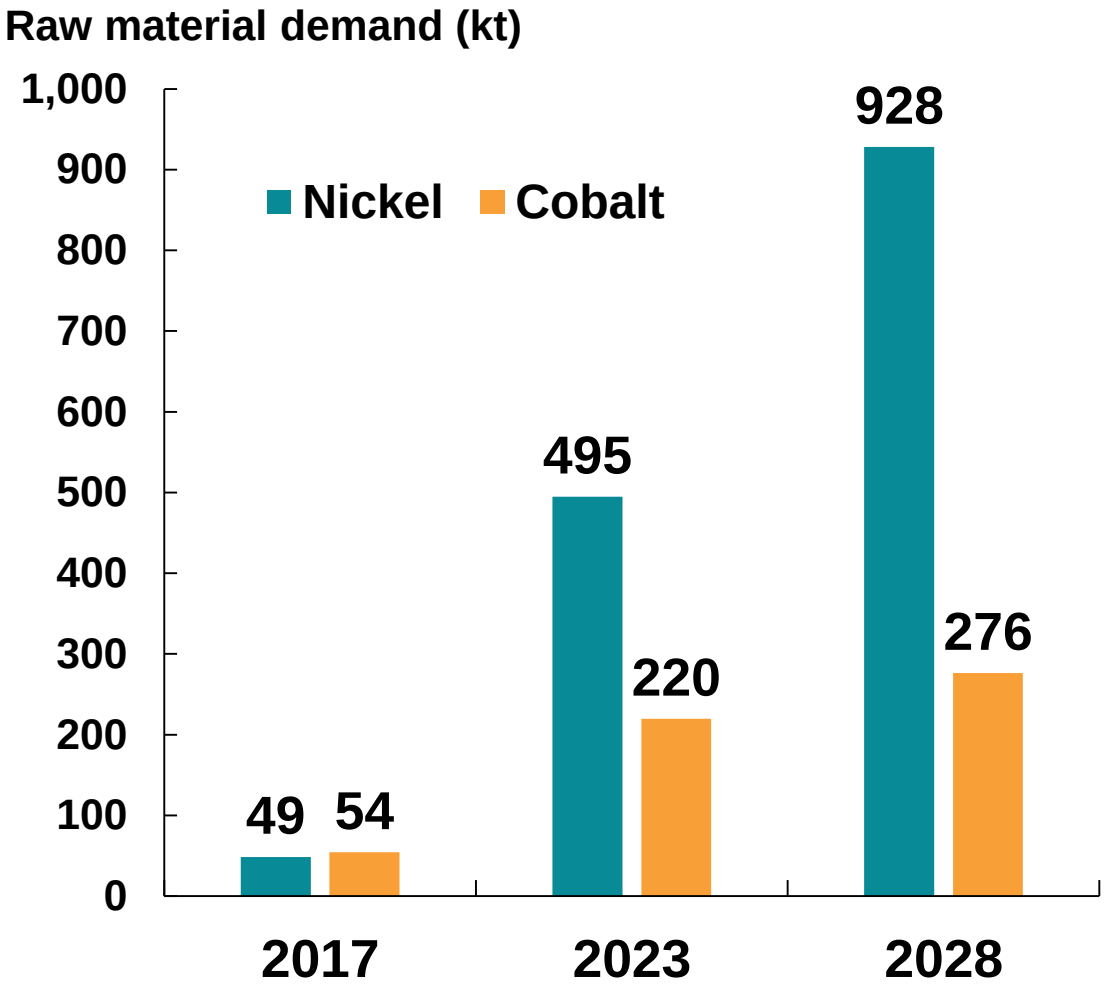

# Escondida

World's largest copper mine produced **6%** of global output in 2016.

However, it is facing the same problem as many large copper mines – **dropping grades**. In 2007, Escondida's copper grade was **1.72%**. Its remaining copper reserve grade is **0.52%**.

*Source: Visual Capitalist*

# Electric vehicles also driving huge growth in nickel and cobalt demand




- 95% of cobalt production comes as a **by-product of copper or nickel production.**
- **Less than 50%** of current global nickel production is suitable for battery applications (Class I nickel sulphate).
- Lack of new nickel sulphate developments are leading to a **sustained sulphate premium** over LME nickel price.

*Source: Benchmark Mineral Intelligence*

# Global automakers investing $300 billion (equivalent to Chile's GDP) in electric vehicles

**Large sums planned to develop and procure batteries and EVs over the next five to 10 years; ~45%, or $135 billion, will be spent in China.**

## Volkswagen

- **$91 billion** pledge is almost one-third of entire industry's EV spending.
- **$57 billion** just for batteries.
- **$45.5 billion** to be spent in China.

## Daimler

DAIMLER

- Daimler, maker of Mercedes-Benz cars, will buy battery cells worth >**$23 billion** by 2030 for mass production of hybrid and electric vehicles.

## General Motors

GM

- GM plans to build EV battery modules with its partner, SAIC, in China.
- GM will spend a total of **$8 billion** on electrification and automation over the next several years.

## Tesla

- Tesla will invest **$5 billion** in batteries.
- Its **$5 billion** Nevada Gigafactory is due to reach full output next year.

# New names, big names on EV horizon

**More than 230 electric-vehicle models will be released by 2021, compared with 179 at the end of 2018.**

**Tesla Model Y**

**Lucid Motors Air**

**Rivian R1T**

**Porsche Taycan**

**Jaguar I-Pace**

**Audi e-tron**

*Source: Bloomberg New Energy Finance*

# Toyota, world's #3 sales leader, plans to make *all vehicles* emissions-free by 2050


Toyota Prius hybrid

- Toyota will spend US$13 billion on new hybrids and electrics, including more than 10 new battery-electric models by the early 2020s.

TOYOTA BYD AUTO

- Toyota partnering with China's BYD Auto (world's largest EV maker) to develop batteries and bring EVs to market by 2020.

# Jaguar E-Type Zero – world's "most beautiful" electric car – to hit the road in 2020


*Photo: Jaguar*

# Ford to bring 16 EV models to market by 2022

In 2019, Ford showed off an electric prototype of its most important vehicle – the **F-150** pickup truck, towing a one-million-pound (453,592 kg) train over 1,000 feet (304 metres).
A hybrid version of the truck will go on sale in 2020.

# Big Rigs are going all-electric, too

**Tesla's** fully-electric, semi-autonomous Class 8 truck capable of sprinting from 0 to 97 km/hr (0 to 60 miles/hr) in just 5 seconds. Production set for 2019.

Range: 800 km (500 miles) on one charge with full 80,000-pound (36-tonne) load.

U.S. truck maker **Cummins**' new Class 7 electric truck can haul 44,090 pounds (20 tonnes) and recharge in an hour.

Range of initial **AEOS** model only 160 km (100 miles); longer-range models coming.

## Dawning of self-flying “air taxis”

# Boeing and Airbus developing electric, autonomous passenger drones



## Boeing PAV (passenger air vehicle)

- Prototype’s 1-minute first test flight January 2019, in Virginia, U.S.
- Range: 80 km (50 miles).
- 2023 U.S. target launch with Uber Air.

## Airbus Vahana

- Test flight completed: January 2018.
- Range: 50 km (30 miles).
- Target launch: 2020.

# HYDROGEN FUEL CELLS

## The 2nd disruptor in the electric-vehicle revolution.


**Hyundai's** second generation **Nexo** fuel-cell SUV

Range: 612 km (380 miles) – L.A. to San Fran

Refuelling: 5 minutes

# Platinum- and copper-intensive fuel-cell electric vehicles being backed by Japan


**In Japanese, Mirai (未来) means ‘the future’.**

# Fuel-cell electrics also being developed by Germany's leading automakers

**Mercedes-Benz's** GLC F-Cell, the world's first hydrogen fuel-cell electric vehicle combined with plug-in battery power, has started leasing in Germany and will go on sale in the U.S. in 2020.

Total range: **480 km (300 miles)**, including 50 km under battery power. Refuelling: **3 minutes.**

*Photo: autocar.co.uk*

# Toyota's fuel-cell-powered big rig to start operating in California's ports in the fourth quarter of 2019


- Toyota's Class 8 fuel-cell truck hauls **36-tonne loads over 483 km (300 miles).**
- Installed on a Kenworth chassis, two fuel-cell stacks from **Toyota's Mirai** sedan can **produce more than 670 hp**.
- Toyota and Shell are working together to standardize hydrogen-fuelling components that could get fuel-cell trucks on the road faster.

*Photo: Toyota; Electrive.com*

# Buses hitching up to fuel-cell revolution

Photo: Cleantechnica

- **London** Mayor Sadiq Khan unveiled the upgraded, hydrogen fuel-cell double-decker bus to be in operation next year.

  (Double-deckers have been a London icon for 170 years)

- Sales of **Toyota** fuel-cell buses in **Japan** started last year.
- Fleet of 100 to be operating for the 2020 Tokyo Olympics.

# Hydrogen-powered fuel cells have taken to the rails in Europe and China

- World's first two hydrogen trains began service in **Germany** in September 2018, replacing diesel trains. Another 14 will be running by 2021.
- Range of 1,000 km (620 miles); top speed 140 km/h (87 mph).


Photo: Alstom

- **China** streetcar driven by hydrogen fuel cells; emits only water.
- Refuels in 30 minutes.
- China to spend US$32 billion extending tracks.

# Historical average American's lifetime use of resources BEFORE the New Era of Electrification

## 1,515 tons of minerals, metals and fuels per person.
## Current U.S. population: 328 million.

971 lbs. copper

521 lbs. zinc

+54,336 lbs. other minerals & metals

1.76 troy oz. gold

5,708 lbs. bauxite (aluminium)

24,698 lbs. iron ore

459,784 lbs. coal

12,129 lbs. clays

45,060 lbs. cement

72,080 gallons petroleum

17,343 lbs. phosphate rock

27,442 lbs. salt

6.8 million cu. ft. natural gas

1.18 million lbs. stone, sand & gravel

889 lbs. lead

*Source: Mineral Information Institute*

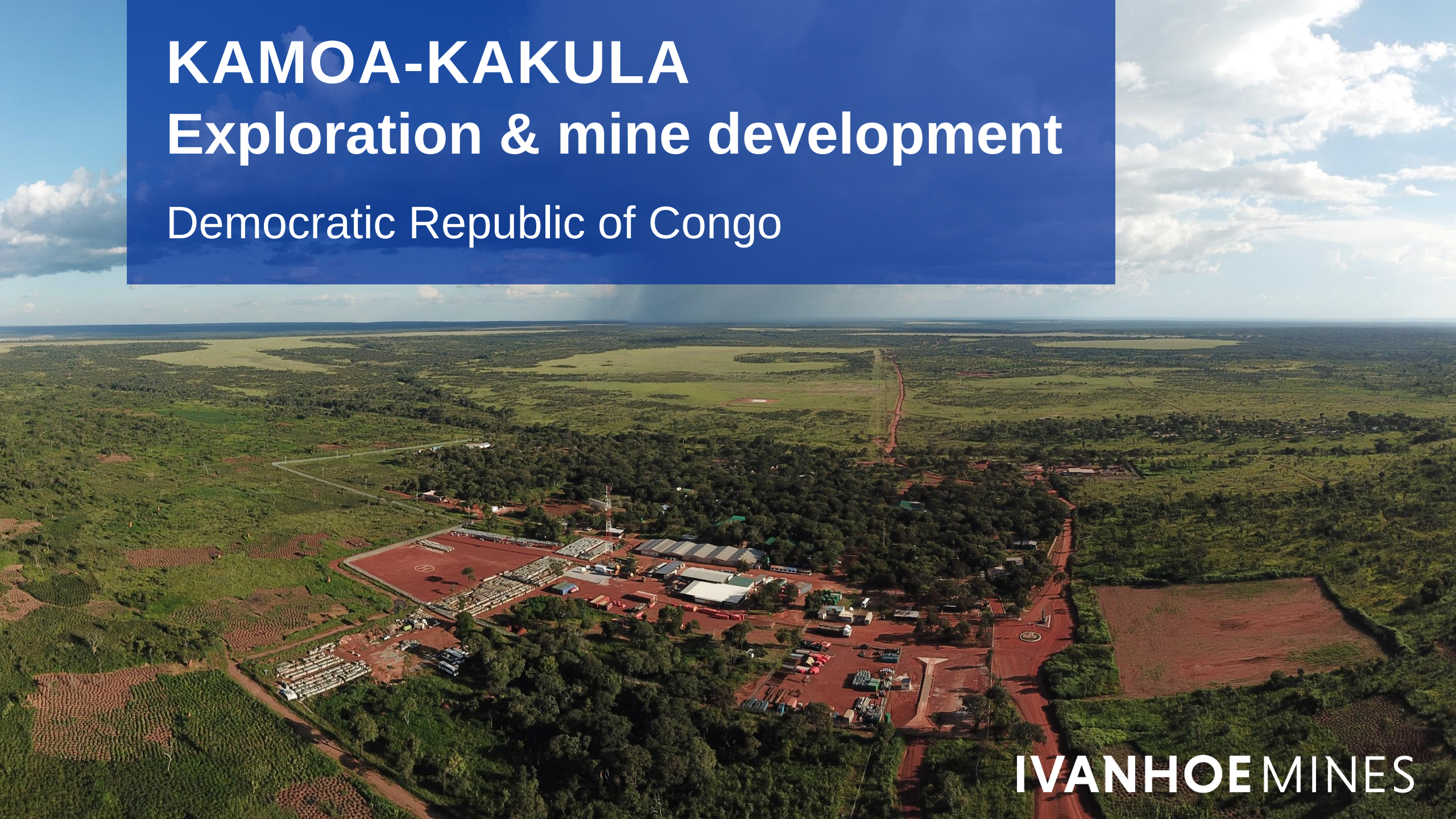
# IVANHOE MINES

NEW HORIZONS

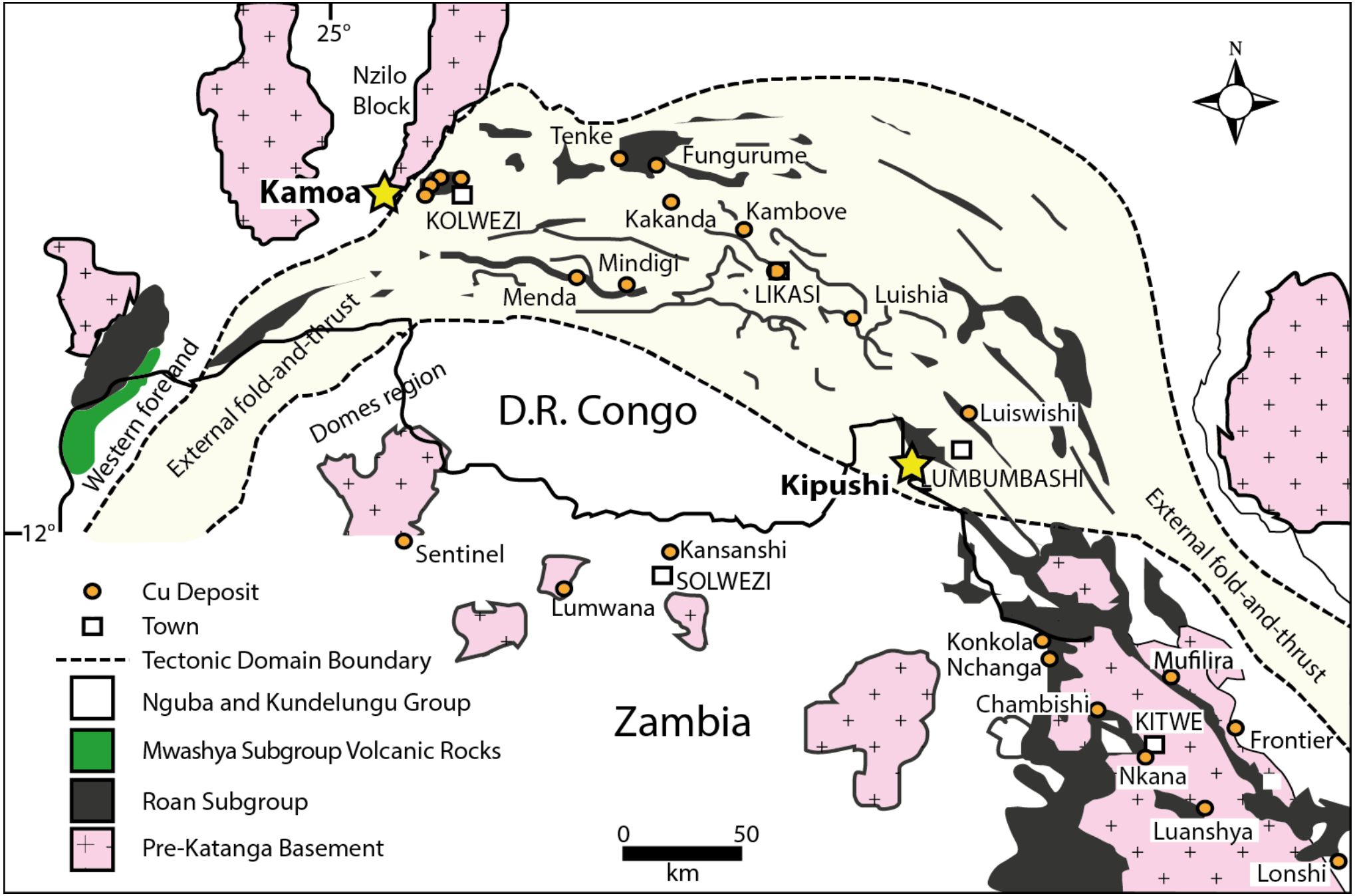
- **Over 20** years in Southern Africa.
- **3** advanced, unique projects.
- Positioned to realize urbanization's resource opportunities with minerals to help build a better world.

# KAMOA-KAKULA
# Exploration & mine development

Democratic Republic of Congo



IVANHOE MINES


25°
Nzilo
Block
Kamoa
KOLWEZI
Tenke
Fungurume
Kakanda
Kambove
Mindigi
Menda
LIKASI
Luishia
Western foreland
External fold-and-thrust
Domes region
D.R. Congo
Luiswishi
LUMBUMBASHI
Kipushi
12°
Sentinel
Kansanshi
SOLWEZI
Lumwana
Zambia
Konkola
Nchanga
Mufilira
Chambishi
KITWE
Frontier
Nkana
Luanshya
Lonshi
External fold-and-thrust
N
Cu Deposit
Town
Tectonic Domain Boundary
Nguba and Kundelungu Group
Mwashya Subgroup Volcanic Rocks
Roan Subgroup
Pre-Katanga Basement
0
50
km

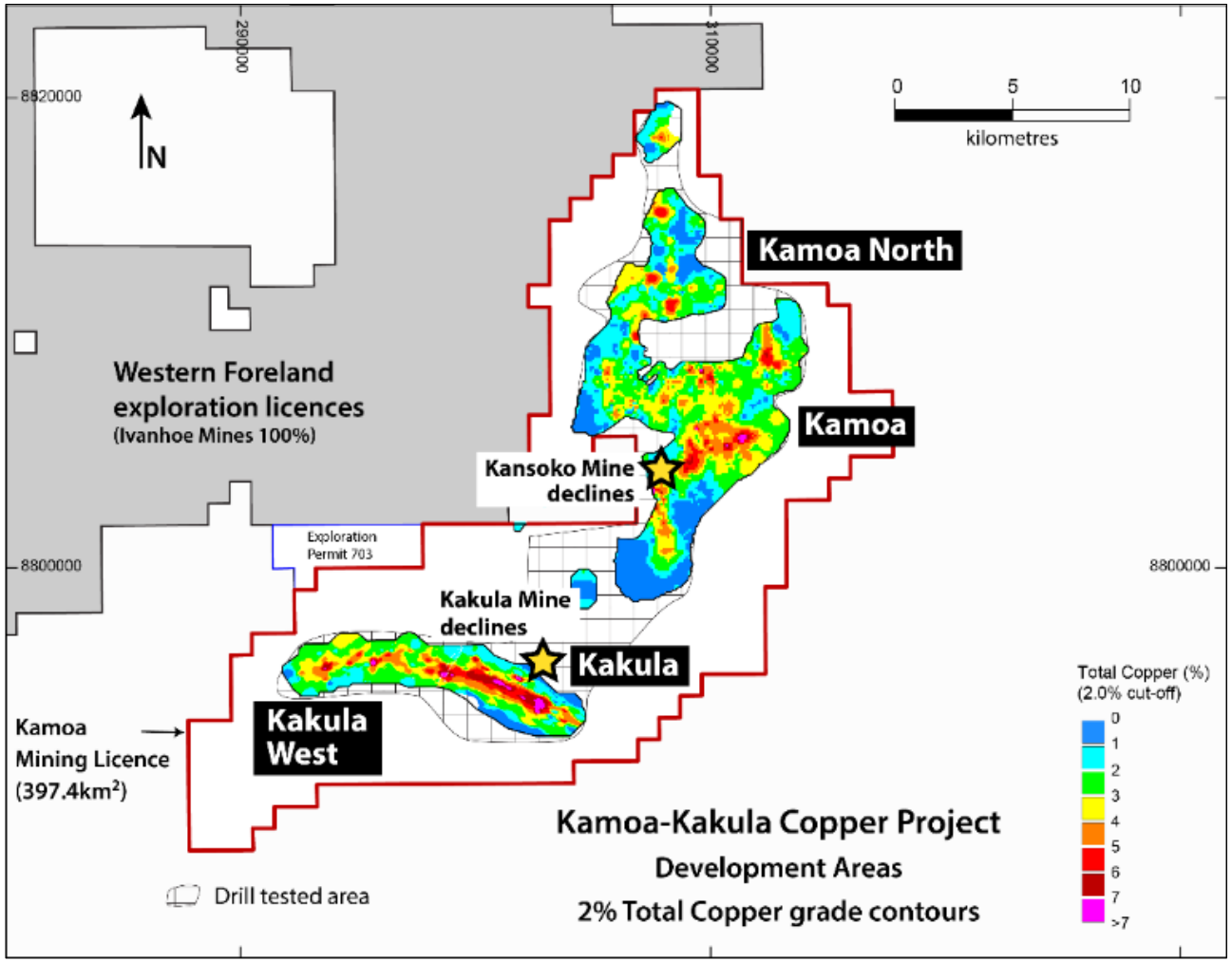
# Mineral Resources & Reserves

## Mineral Reserves & Resources

| Category | Mt | Cu % | Cu Bnlb | Cu Mt |
|---|---|---|---|---|
| Probable (Kakula) | 120 | 5.48 | 14.5 | 6.6 |
| Probable (Kamoa) | 125 | 3.81 | 10.5 | 4.7 |
| **Total Reserves** | **245** | **4.63** | **25.0** | **11.3** |
| Indicated (Kakula) | 628 | 2.72 | 37.6 | 17.1 |
| Indicated (Kamoa) | 759 | 2.57 | 43.0 | 19.5 |
| **M&I Resources*** | **1,387** | **2.64** | **80.6** | **36.6** |
| Inferred (Kakula) | 114 | 1.59 | 4.0 | 1.8 |
| Inferred (Kamoa) | 202 | 1.85 | 8.2 | 3.7 |
| **Inferred Resources*** | **316** | **1.76** | **12.2** | **5.6** |

* 1% Cu cut-off grade; M&I Resources are inclusive of Mineral Reserves

**Well defined resource with prospective ultra high-grade zones, such as Kakula & Kamoa North**




Mineral Reserve of **120 Mt at 5.48% Cu**

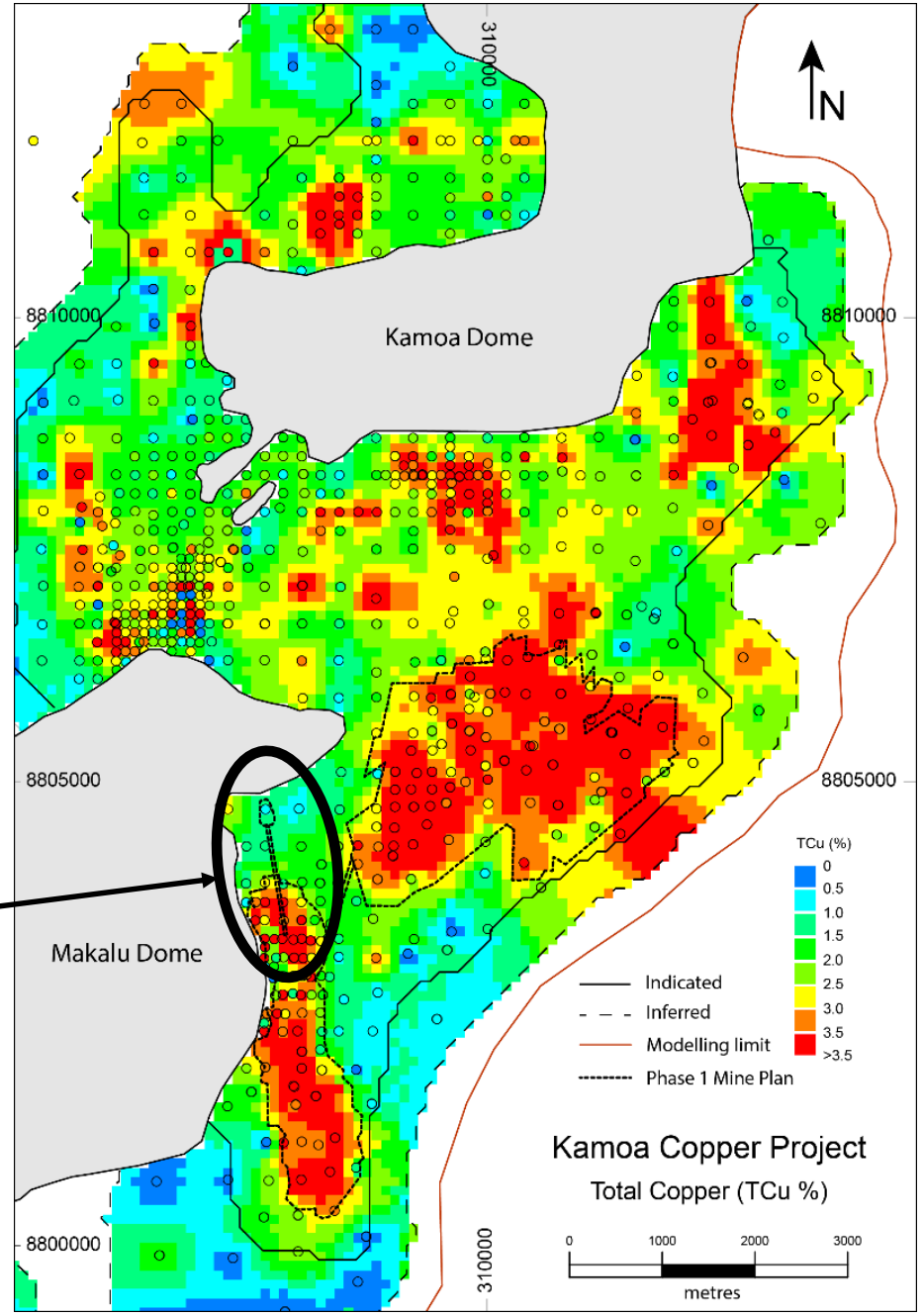
# Extent of the initial Kamoa Discovery

**Nearly 1,000 drillholes defining the resource area**

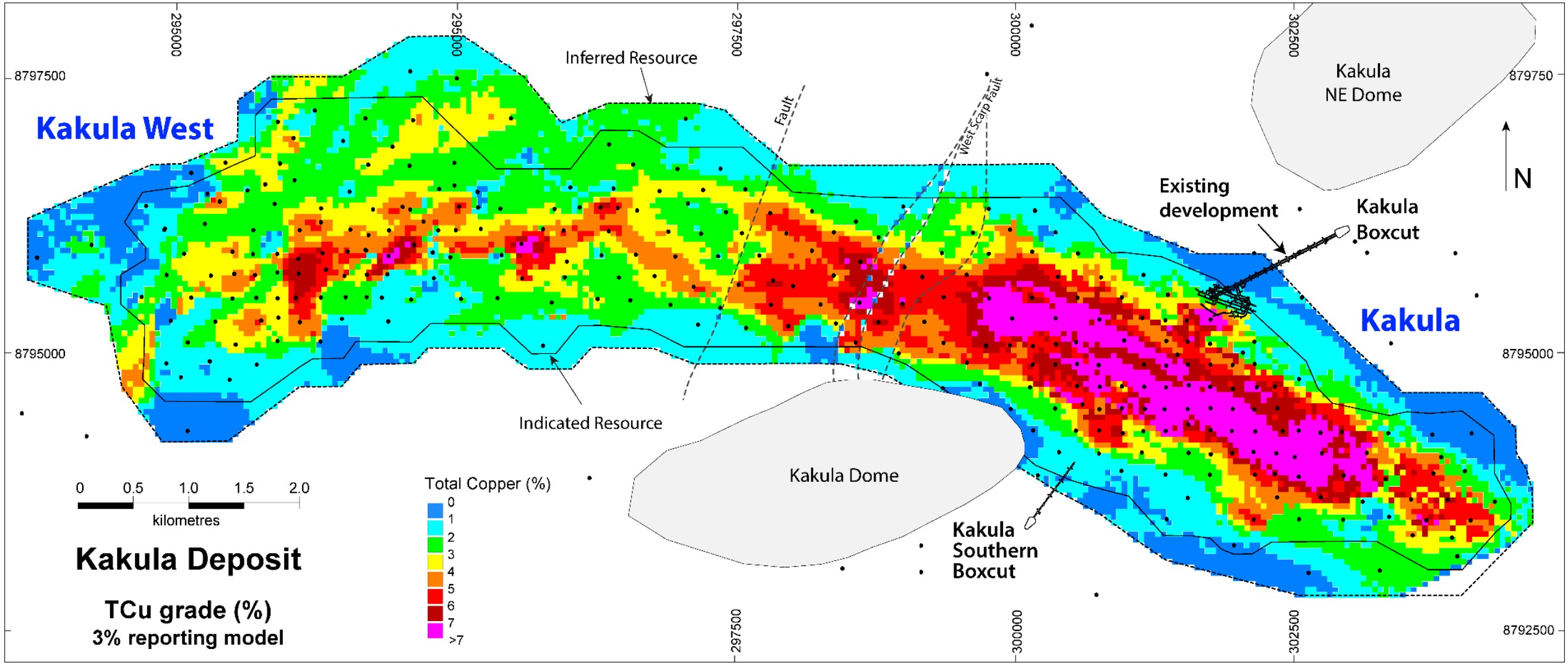
**Resource extents:**

**24km north-south**
**12km east-west**

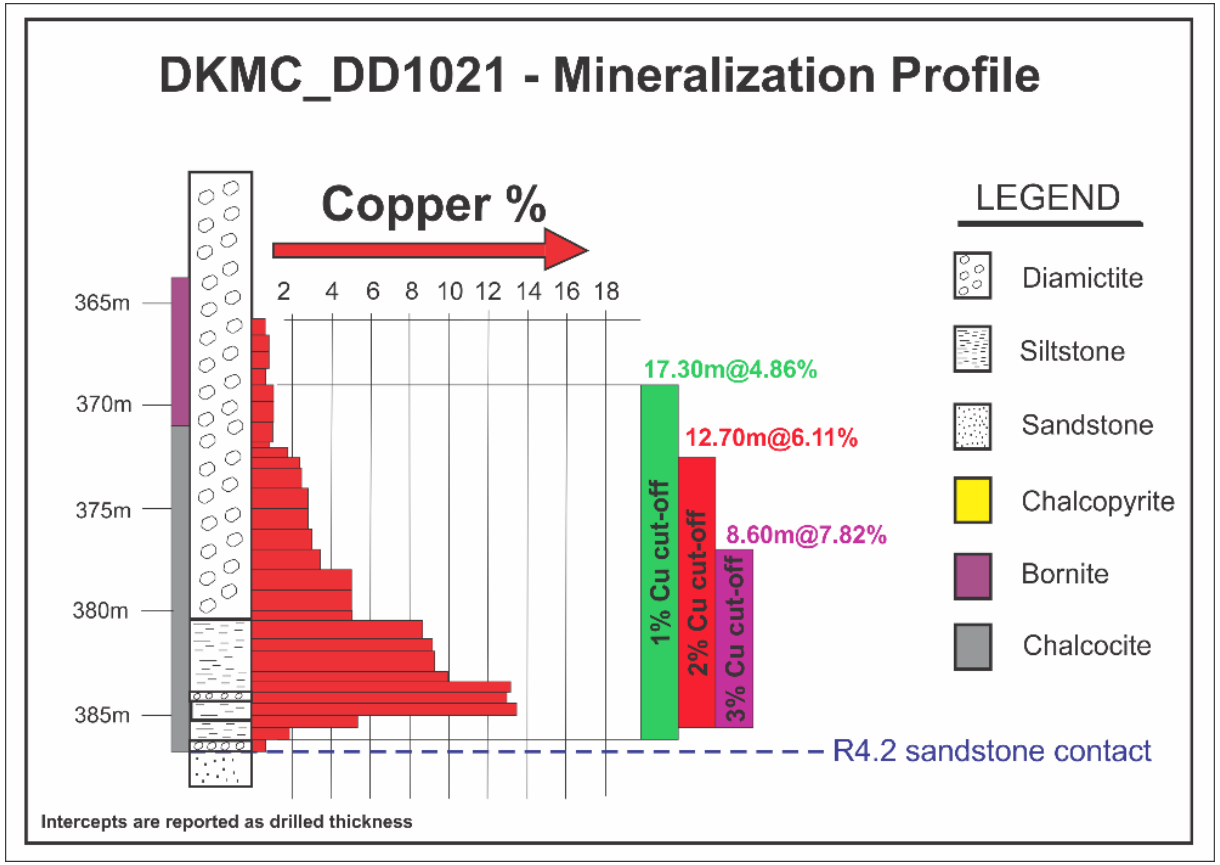
**Kansoko box cut and declines**

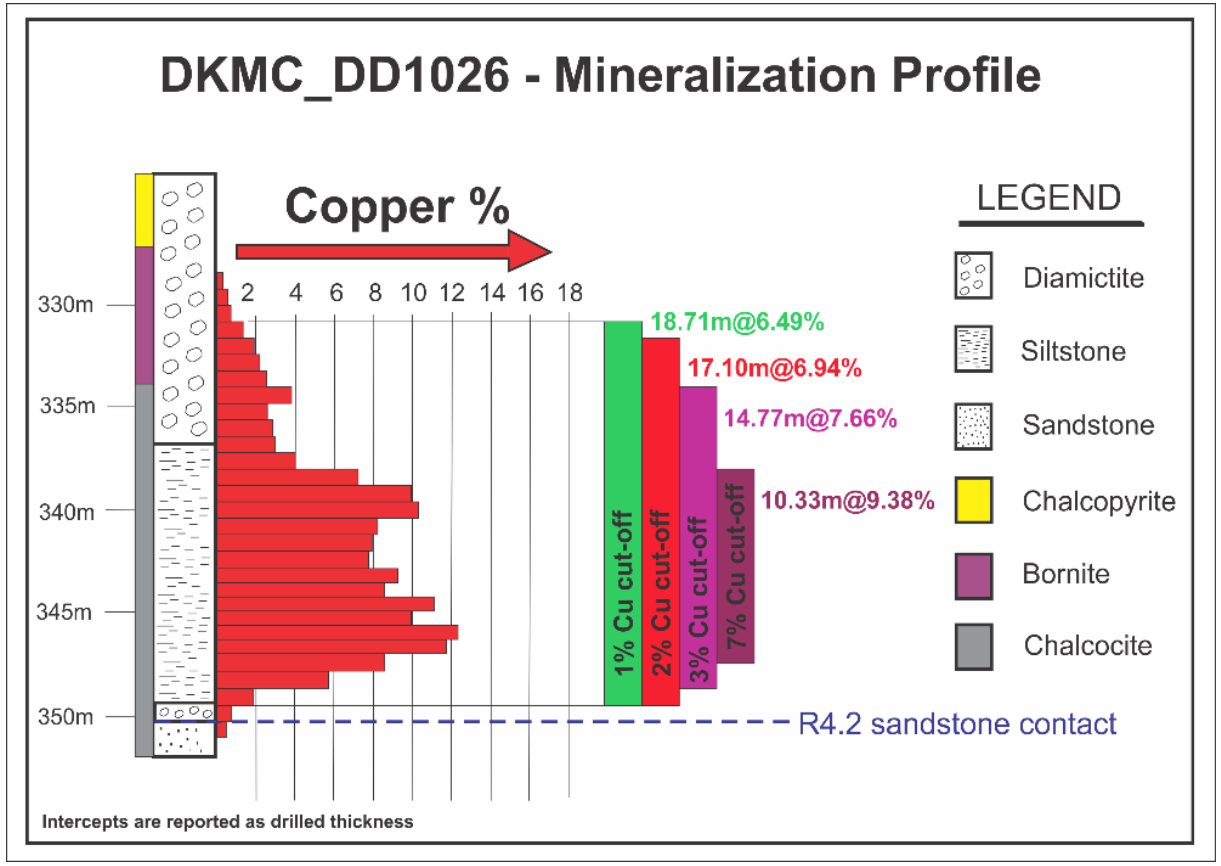


# Initial Kakula Deposit contains copper grades greater than 7% copper



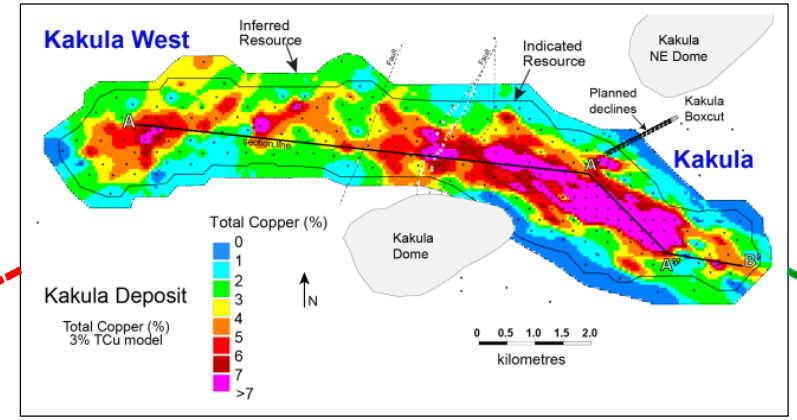
# Bottom-loaded, high-grade copper is consistent at higher cut-offs



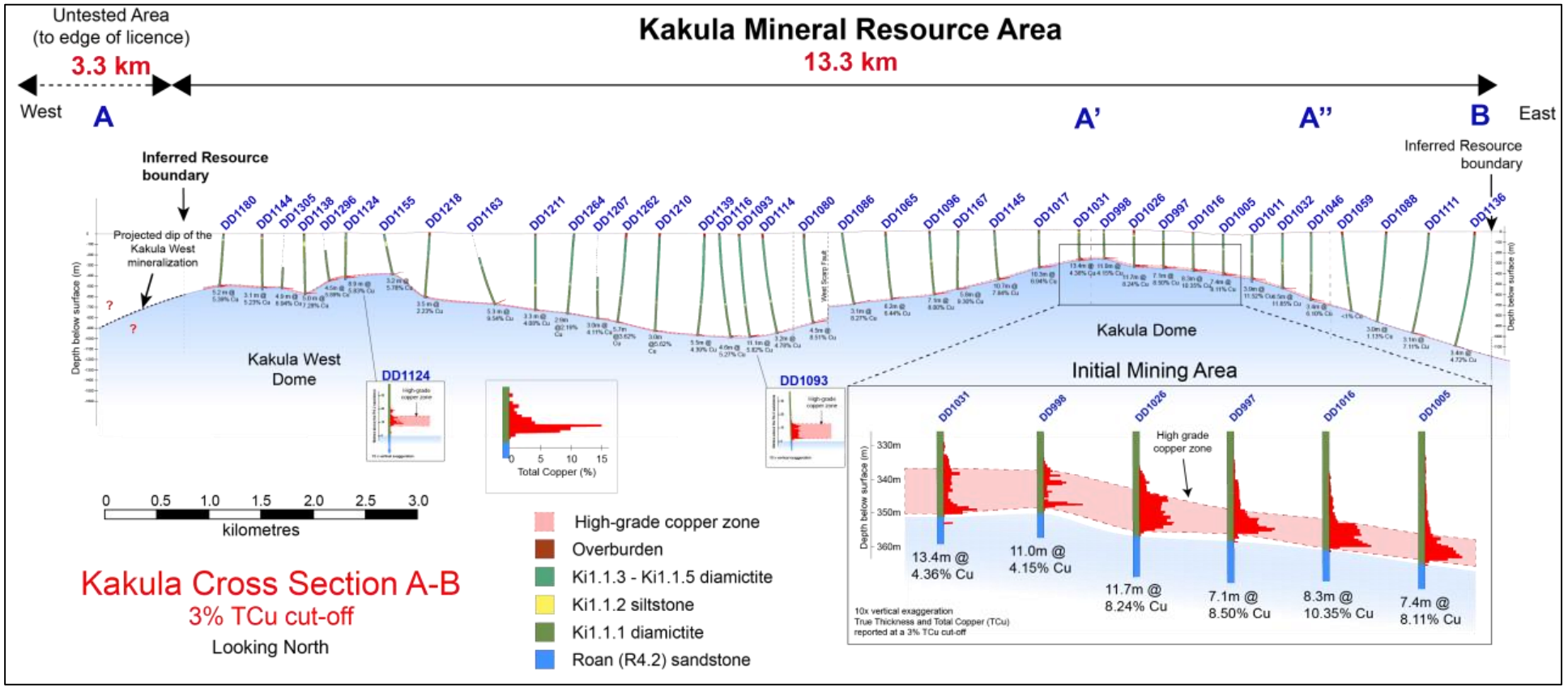




**Continuity and consistency of mineralisation provides great flexibility during mining**

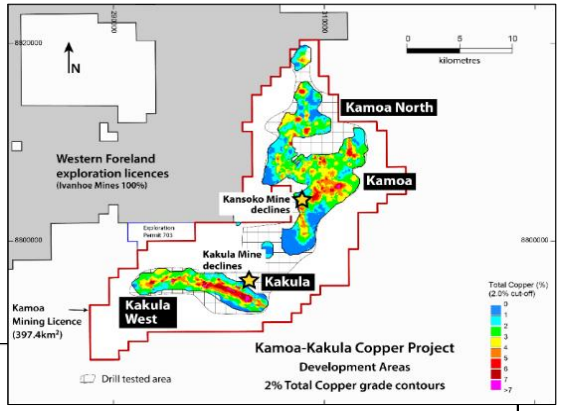
# Extent of Kakula / Kakula West Discovery




**Kakula West discovery extends known mineralization to >13 km – and remains open.**

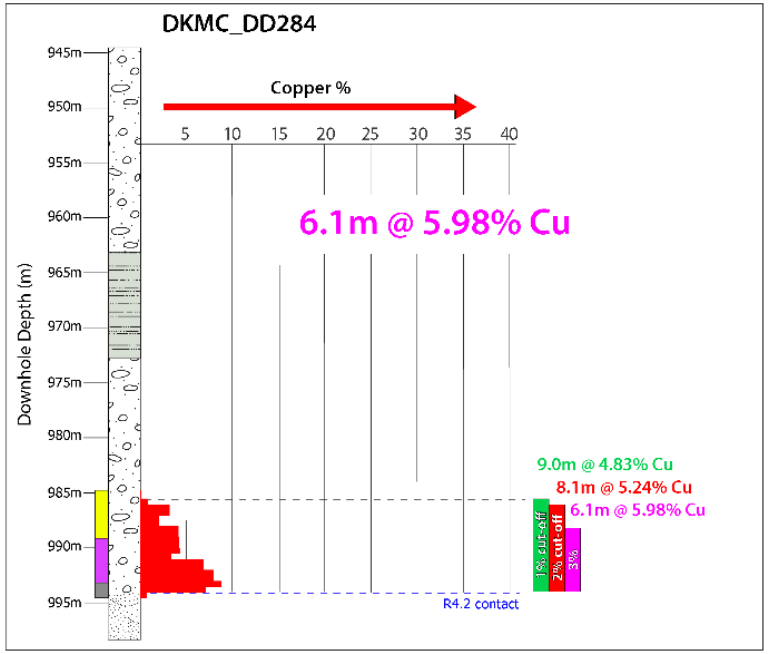


# The effect of persistence in exploration

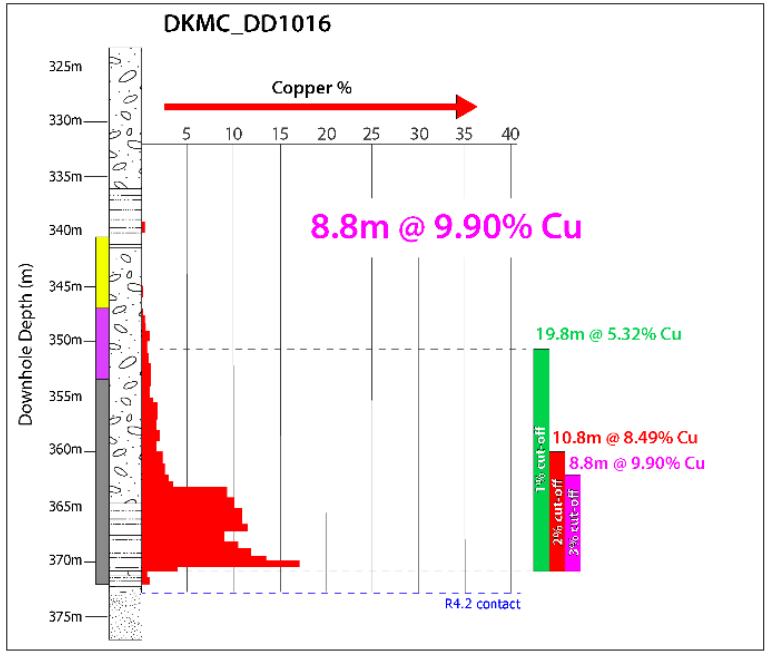



## Comparative Mineralization Profiles

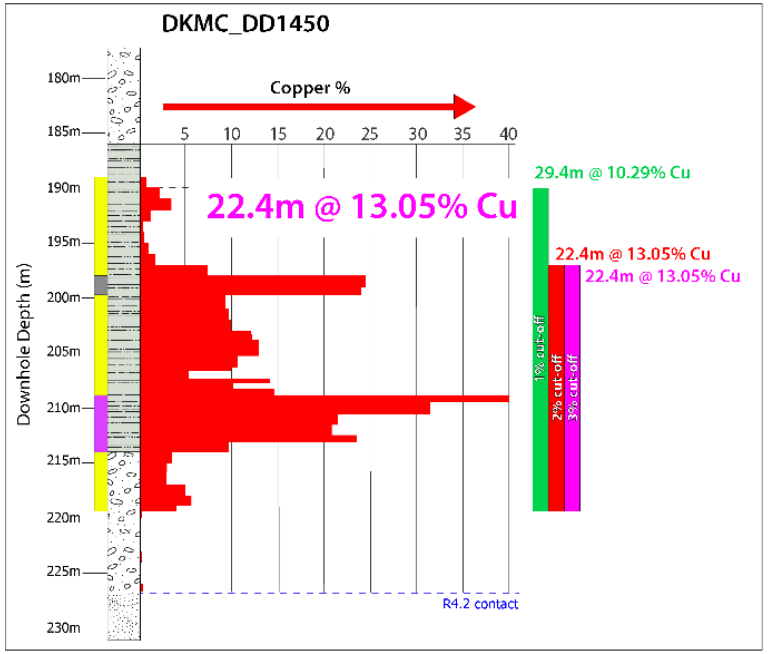
### Kansoko




### Kakula




### Kamoa North

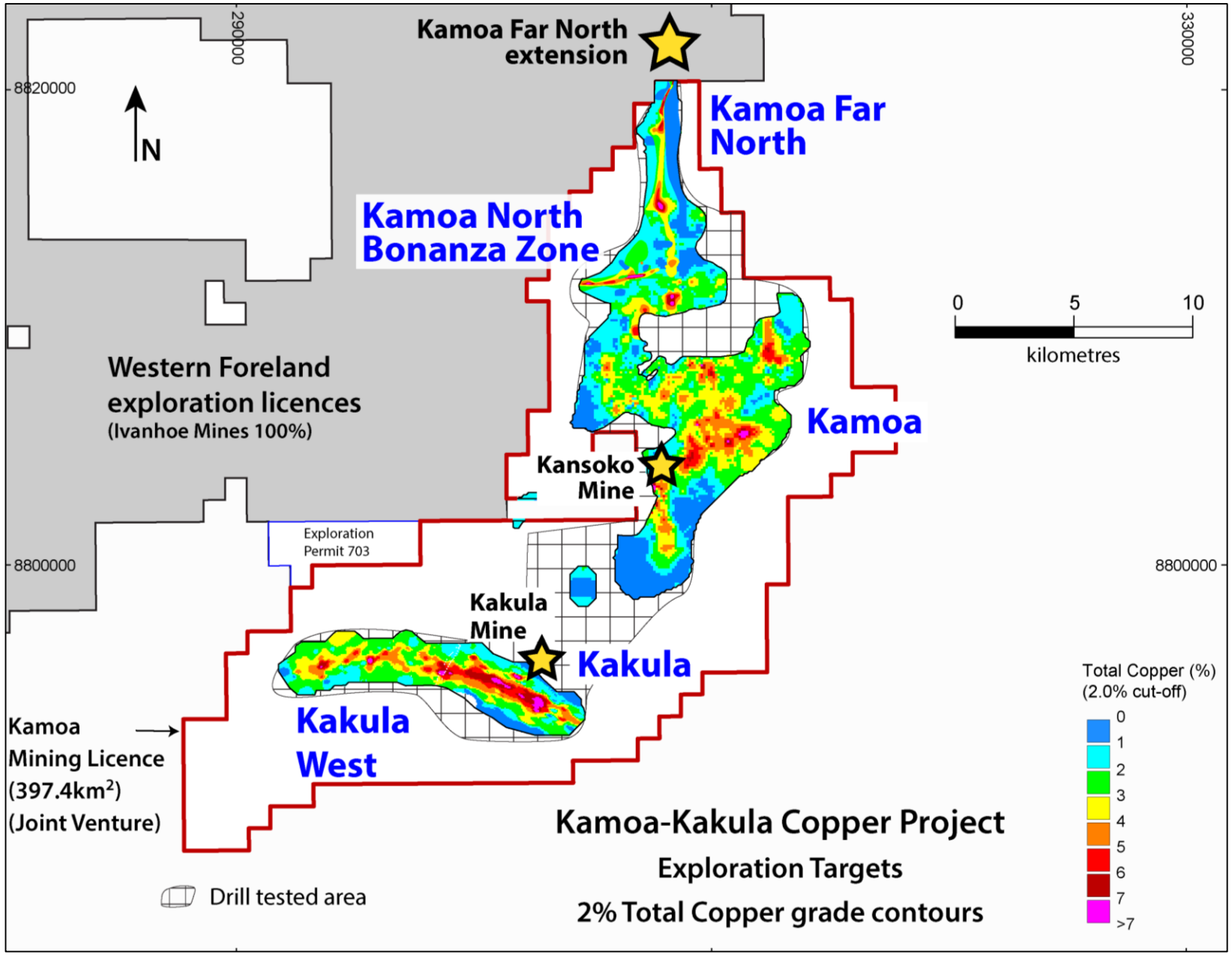


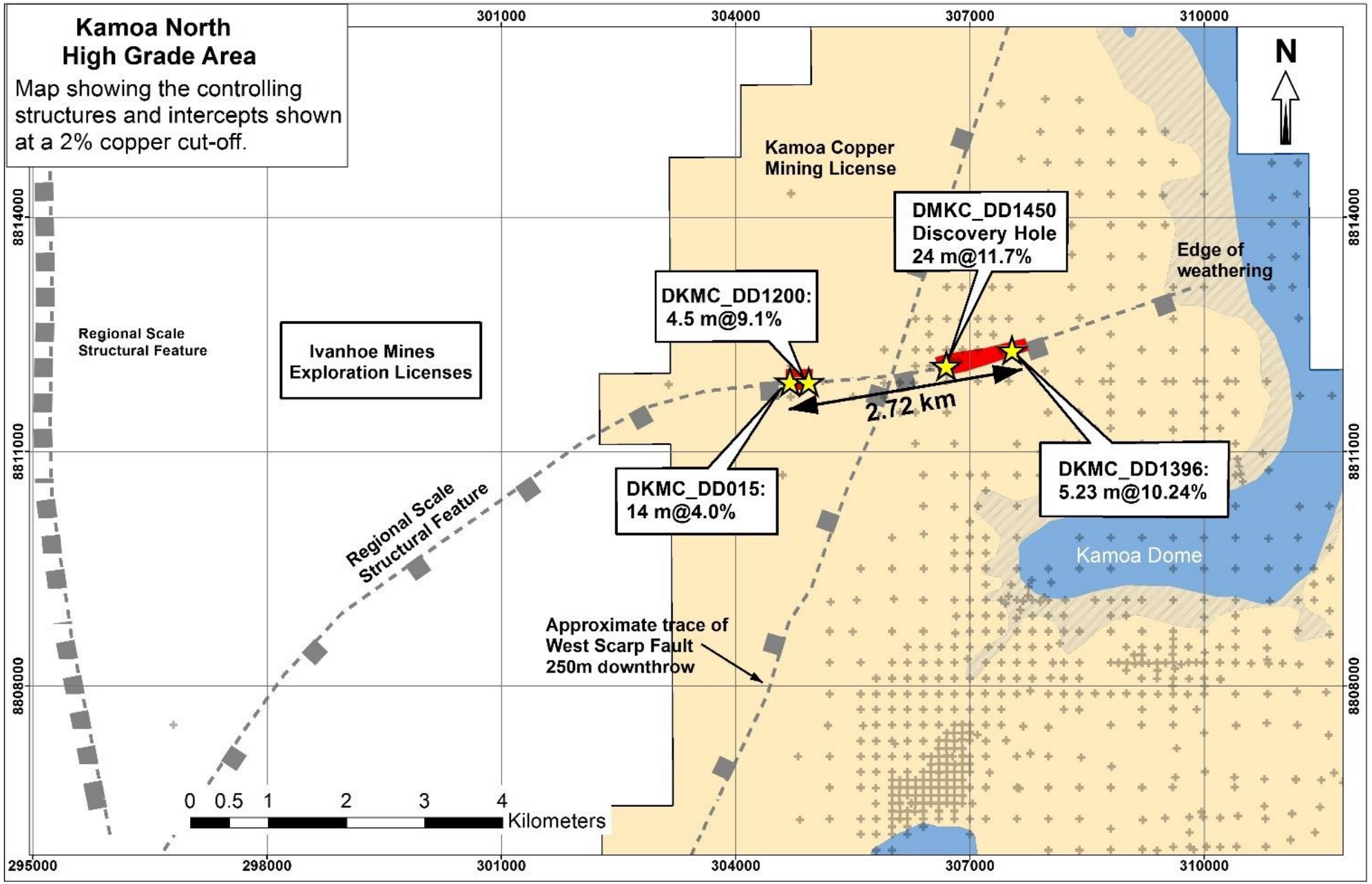

Legend

- Chalcopyrite
- Bornite
- Chalcocite
- Siltstone (Ki1.1.2)
- Diamictite (Ki1.1.1/Ki1.1.3)
- Sandstone (R4.2)
- Ki1.1.2 stratigraphy

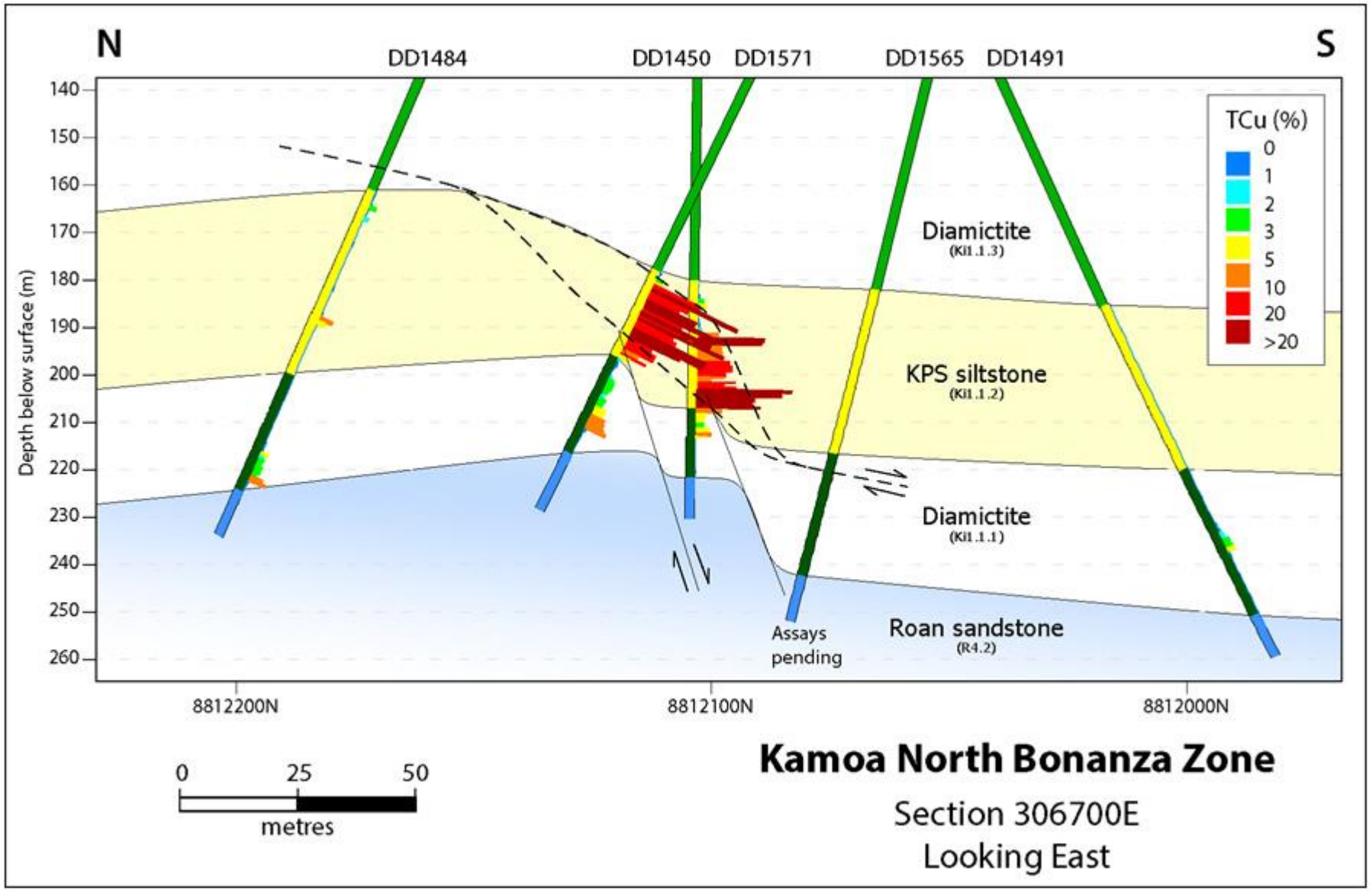
NOTE: Thickness reported as downhole thickness

# Kamoa North – two new high-grade corridors trending onto Ivanhoe's 100%-owned ground

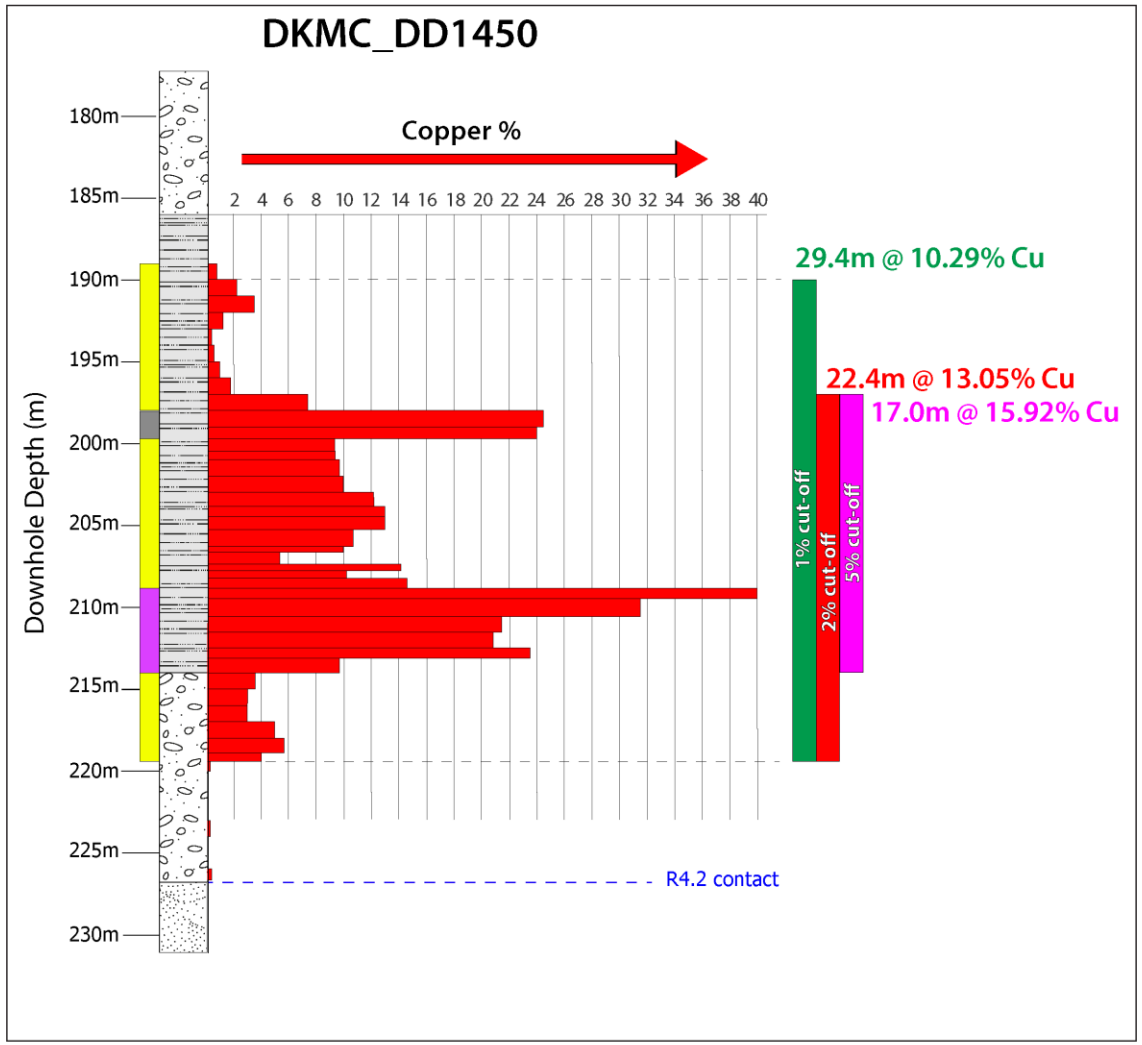


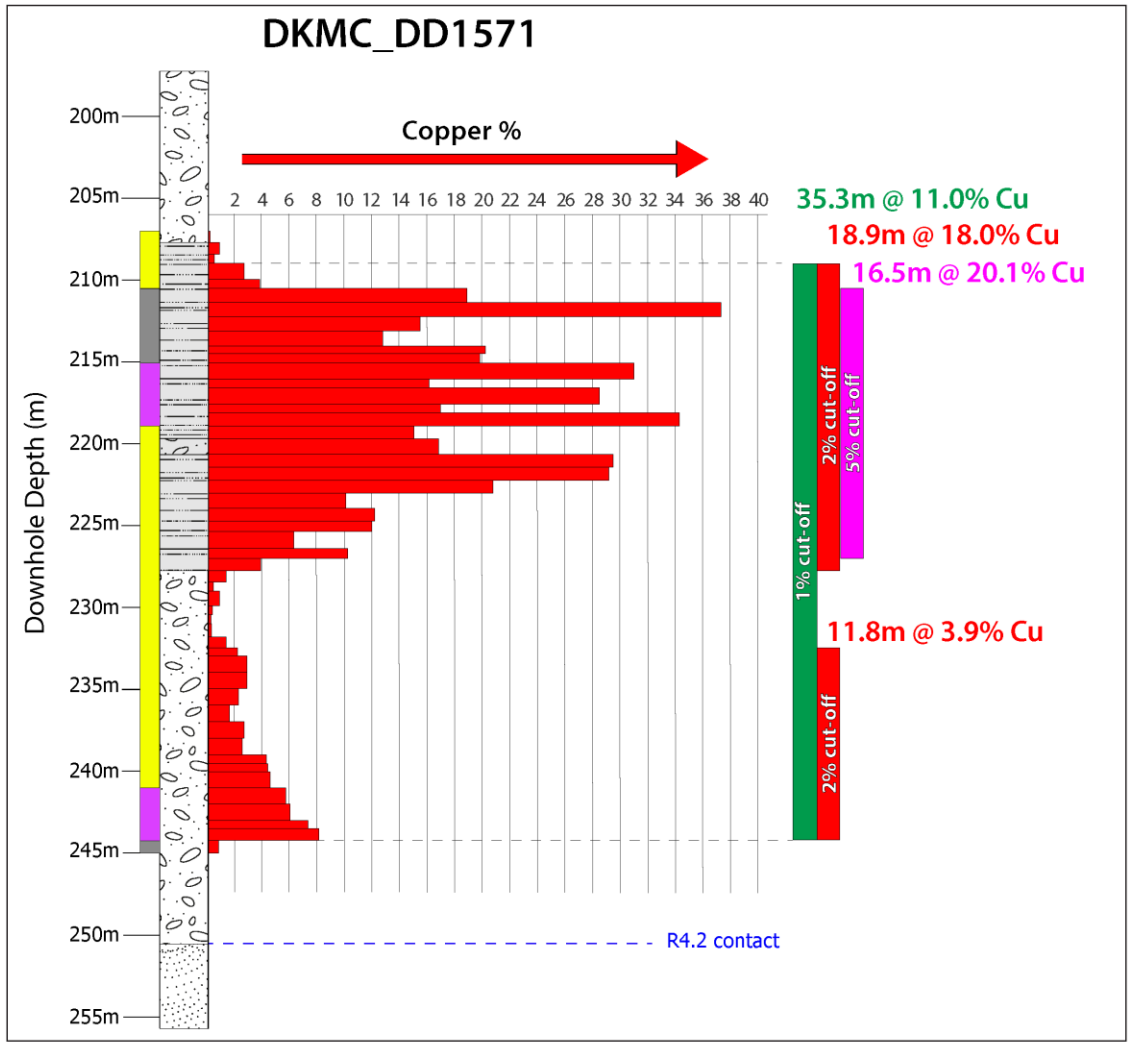

Kamoa North
High Grade Area
Map showing the controlling structures and intercepts shown at a 2% copper cut-off.
301000
304000
307000
310000
N
Kamoa Copper
Mining License
DMKC_DD1450
Discovery Hole
24 m@11.7%
Edge of
weathering
DKMC_DD1200:
4.5 m@9.1%
Regional Scale
Structural Feature
Ivanhoe Mines
Exploration Licenses
2.72 km
DKMC_DD015:
14 m@4.0%
DKMC_DD1396:
5.23 m@10.24%
Regional Scale
Structural Feature
Kamoa Dome
Approximate trace of
West Scarp Fault
250m downthrow
8814000
8811000
8808000
0 0.5 1 2 3 4
Kilometers
295000
298000
301000
304000
307000
310000
Mineralised KPS
Completed Drillholes

# North-south section view through the Kamoa North Bonanza Zone



# Mineralization Profiles

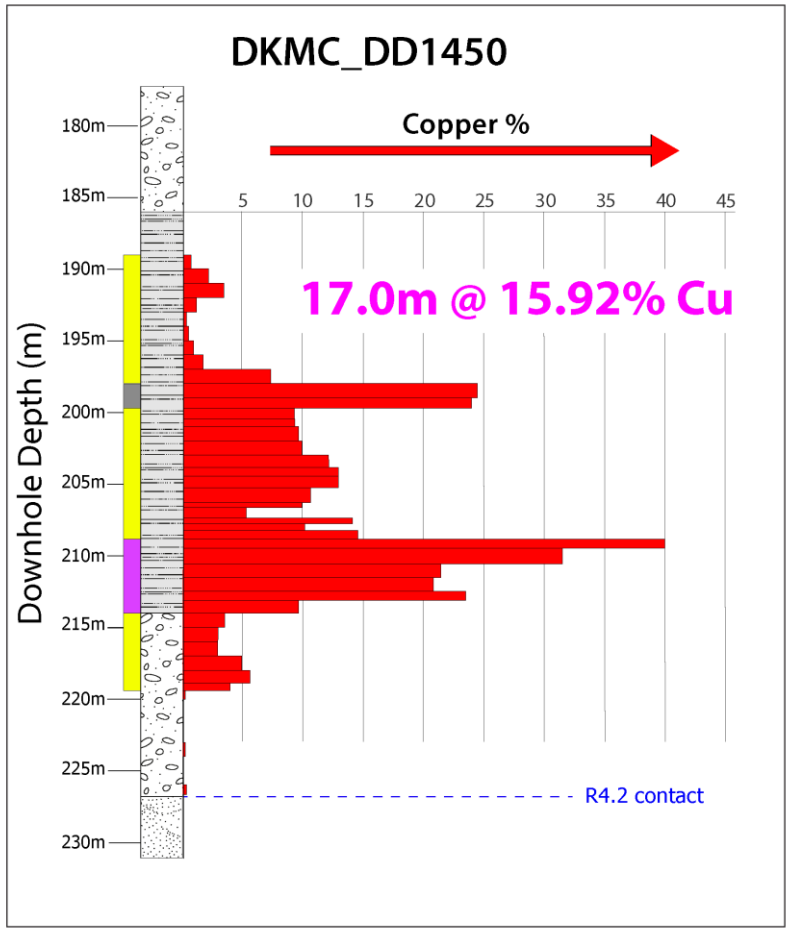


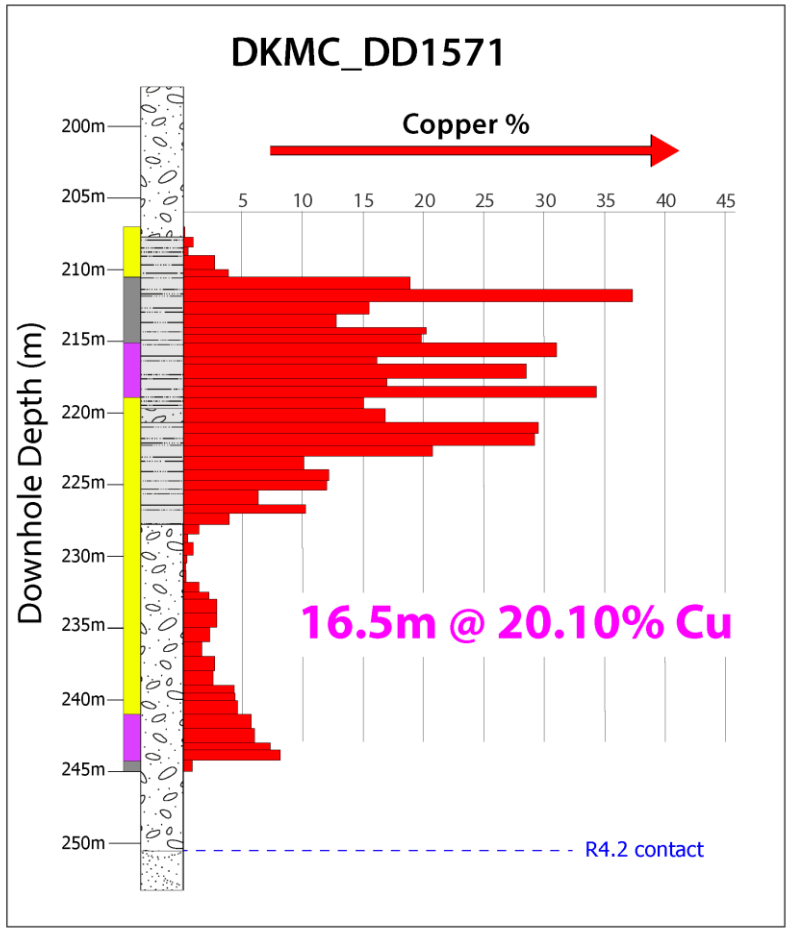



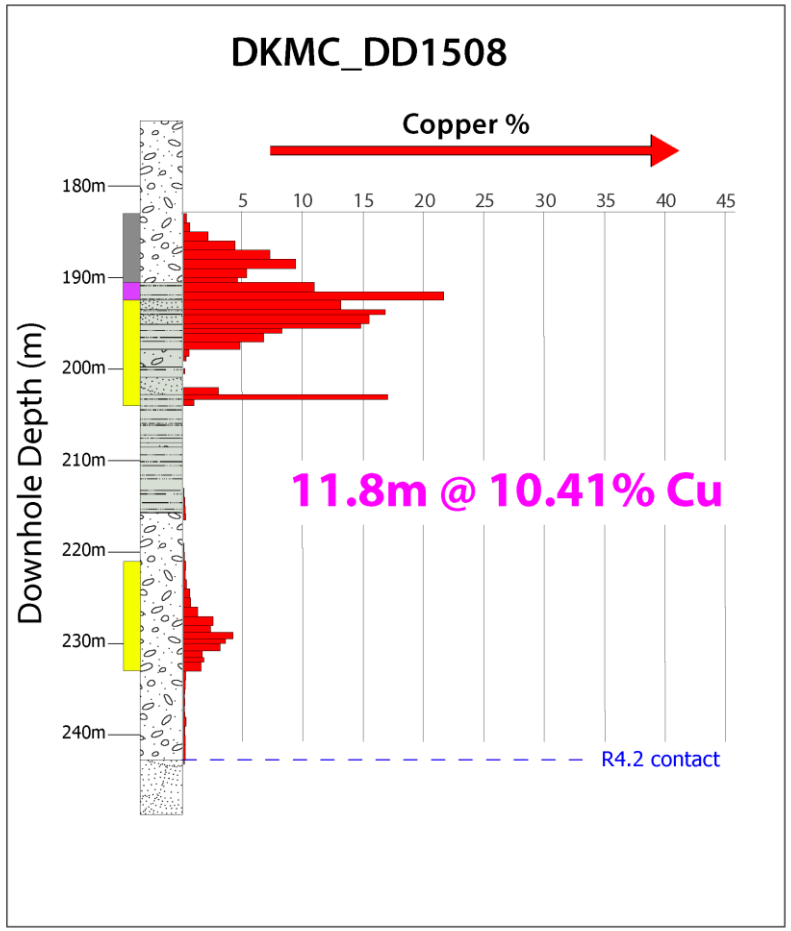

Legend

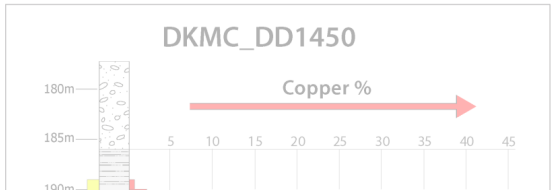
- Chalcopyrite
- Bornite
- Chalcocite
- Siltstone (Ki1.1.2)
- Diamictite (Ki1.1.1/Ki1.1.3)
- Sandstone (R4.2)
- Ki1.1.2 (KPS stratigraphy

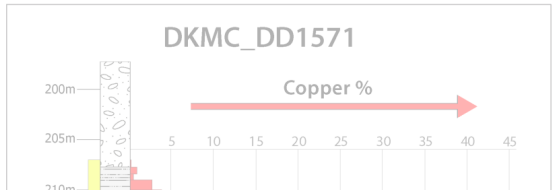
NOTE:
DD1571 results based on portable XRF (Niton)
Thickness reported as downhole thickness

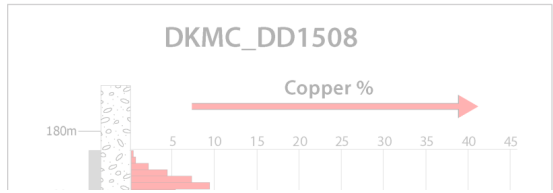

DKMC_DD1450
Copper %
5 10 15 20 25 30 35 40 45
Downhole Depth (m)
180m
185m
190m
195m
200m
205m
210m
215m
220m
225m
230m
17.0m @ 15.92% Cu
R4.2 contact

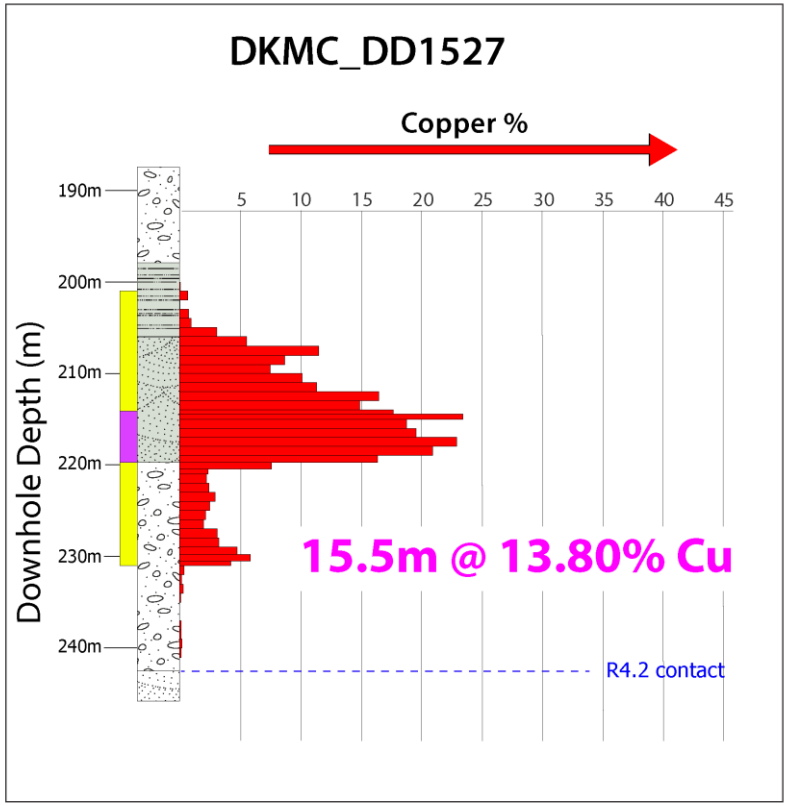

DKMC_DD1571
Copper %
5 10 15 20 25 30 35 40 45
Downhole Depth (m)
200m
205m
210m
215m
220m
225m
230m
235m
240m
245m
250m
16.5m @ 20.10% Cu
R4.2 contact

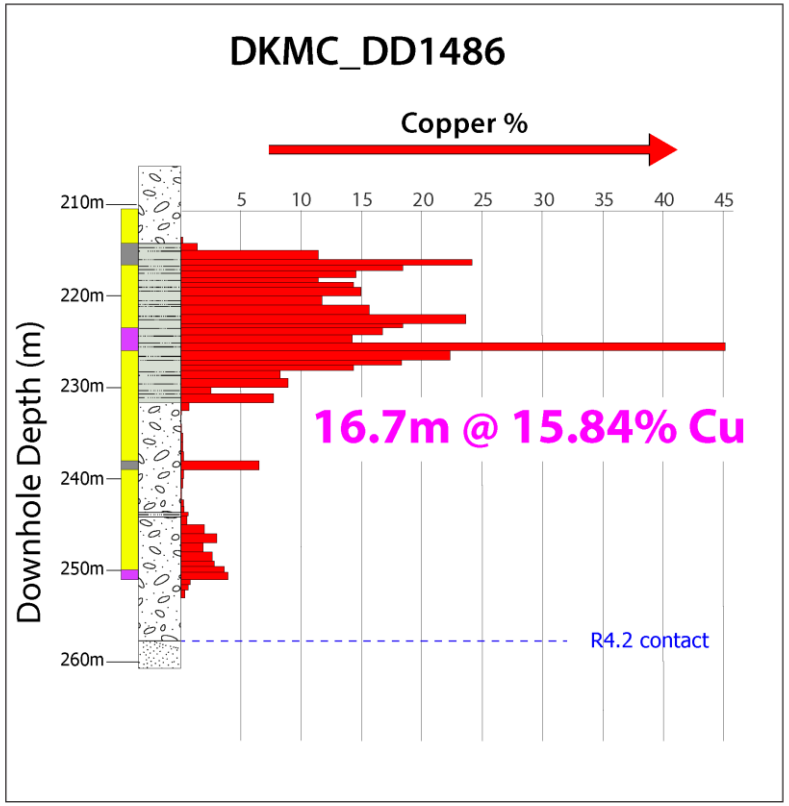

DKMC_DD1508
Copper %
5 10 15 20 25 30 35 40 45
Downhole Depth (m)
180m
190m
200m
210m
220m
230m
240m
11.8m @ 10.41% Cu
R4.2 contact

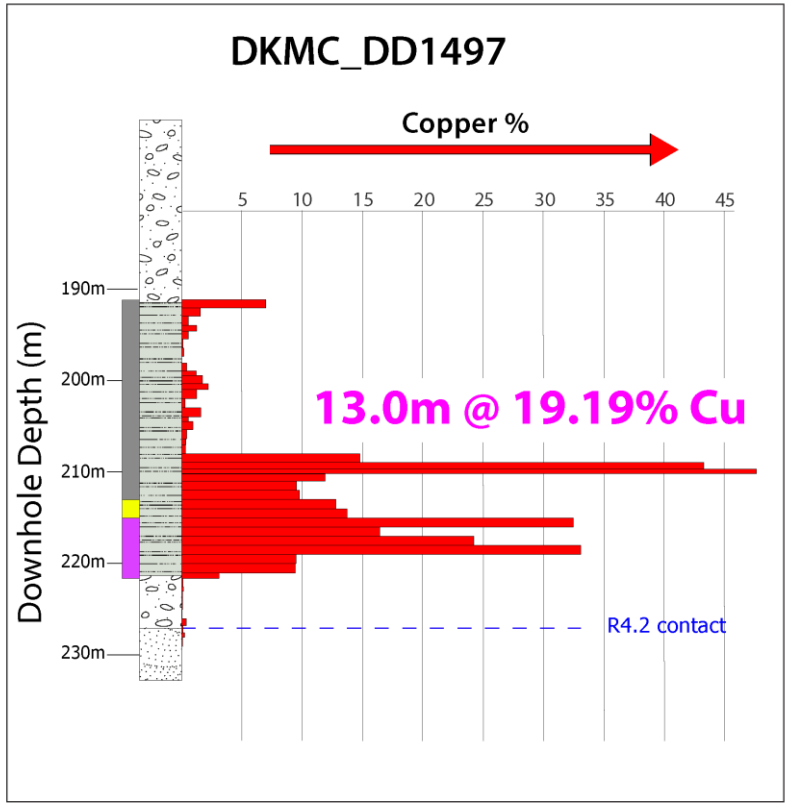

DKMC_DD1450
Copper %
180m
185m
190m
5 10 15 20 25 30 35 40 45

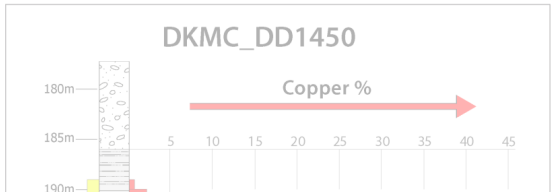

DKMC_DD1571
Copper %
200m
205m
210m
5 10 15 20 25 30 35 40 45

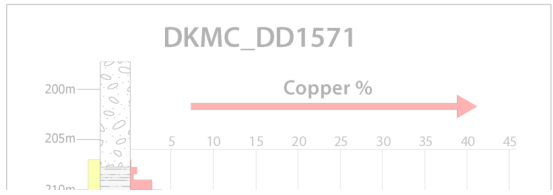

DKMC_DD1508
Copper %
180m
5 10 15 20 25 30 35 40 45

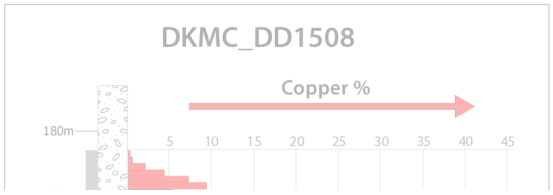

DKMC_DD1527
Copper %
Downhole Depth (m)
190m
200m
210m
220m
230m
240m
5 10 15 20 25 30 35 40 45
15.5m @ 13.80% Cu
R4.2 contact

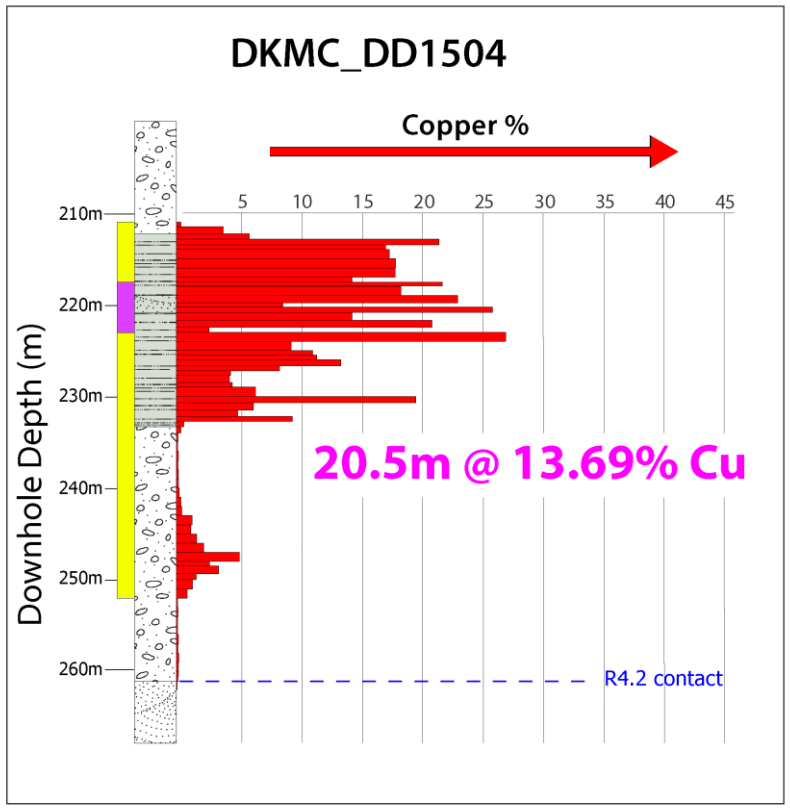

DKMC_DD1486
Copper %
Downhole Depth (m)
210m
220m
230m
240m
250m
260m
5 10 15 20 25 30 35 40 45
16.7m @ 15.84% Cu
R4.2 contact

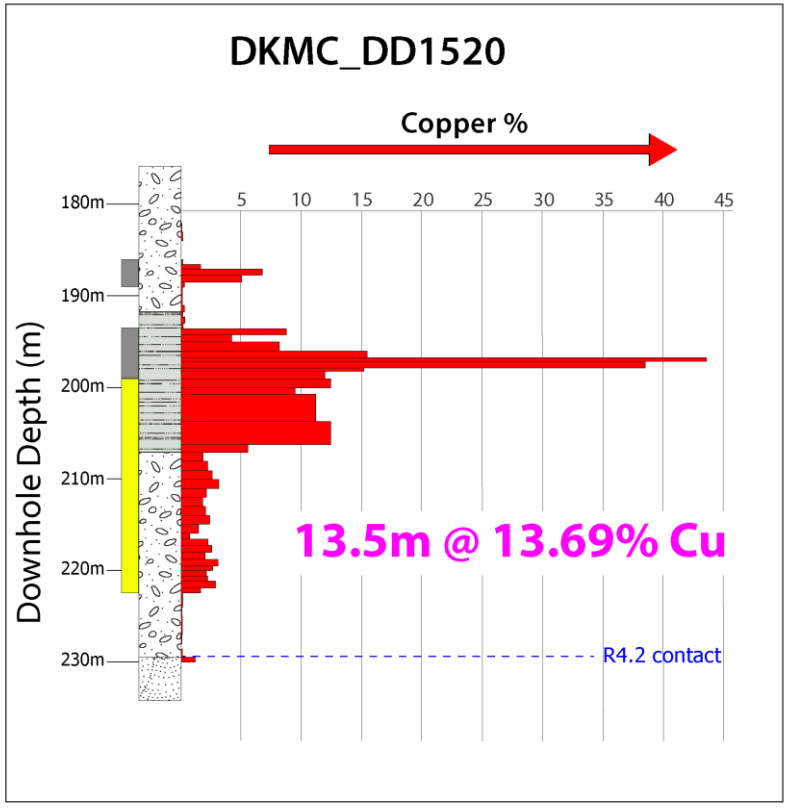

DKMC_DD1497
Copper %
Downhole Depth (m)
190m
200m
210m
220m
230m
5 10 15 20 25 30 35 40 45
13.0m @ 19.19% Cu
R4.2 contact

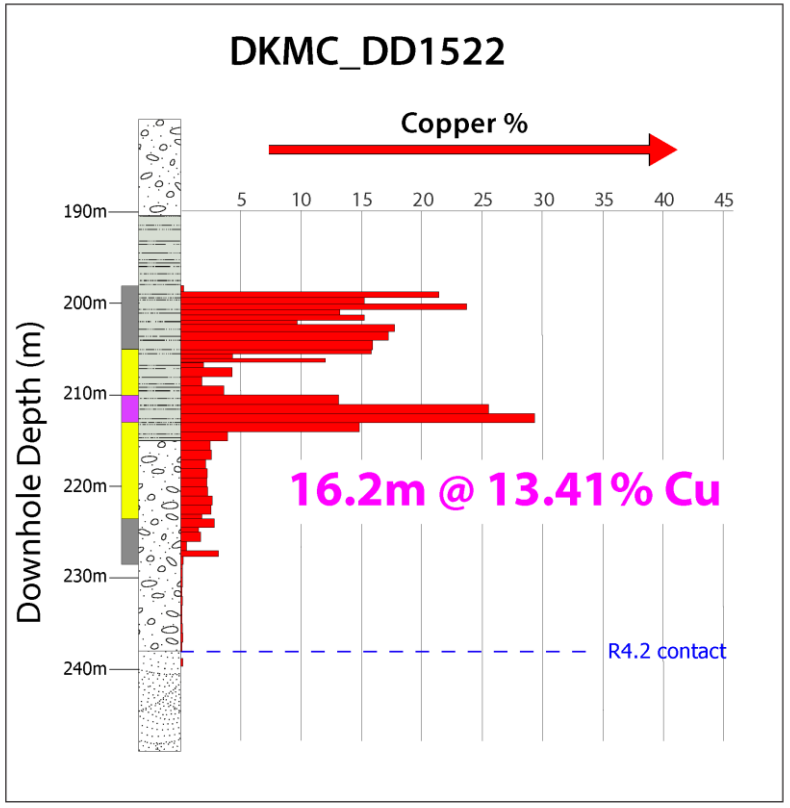

DKMC_DD1450
Copper %
180m
185m
190m
5 10 15 20 25 30 35 40 45

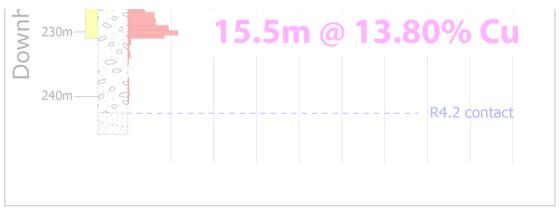

DKMC_DD1571
Copper %
200m
205m
210m
5 10 15 20 25 30 35 40 45

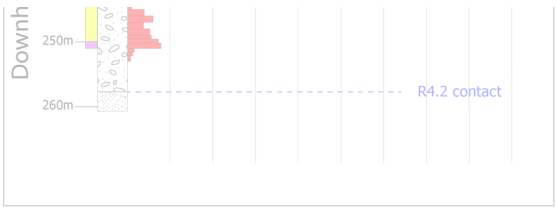

DKMC_DD1508
Copper %
180m
5 10 15 20 25 30 35 40 45

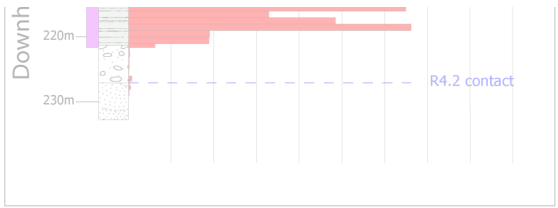

DKMC_DD1504
Copper %
Downhole Depth (m)
210m
220m
230m
240m
250m
260m
5 10 15 20 25 30 35 40 45
20.5m @ 13.69% Cu
R4.2 contact


DKMC_DD1520
Copper %
Downhole Depth (m)
180m
190m
200m
210m
220m
230m
5 10 15 20 25 30 35 40 45
13.5m @ 13.69% Cu
R4.2 contact

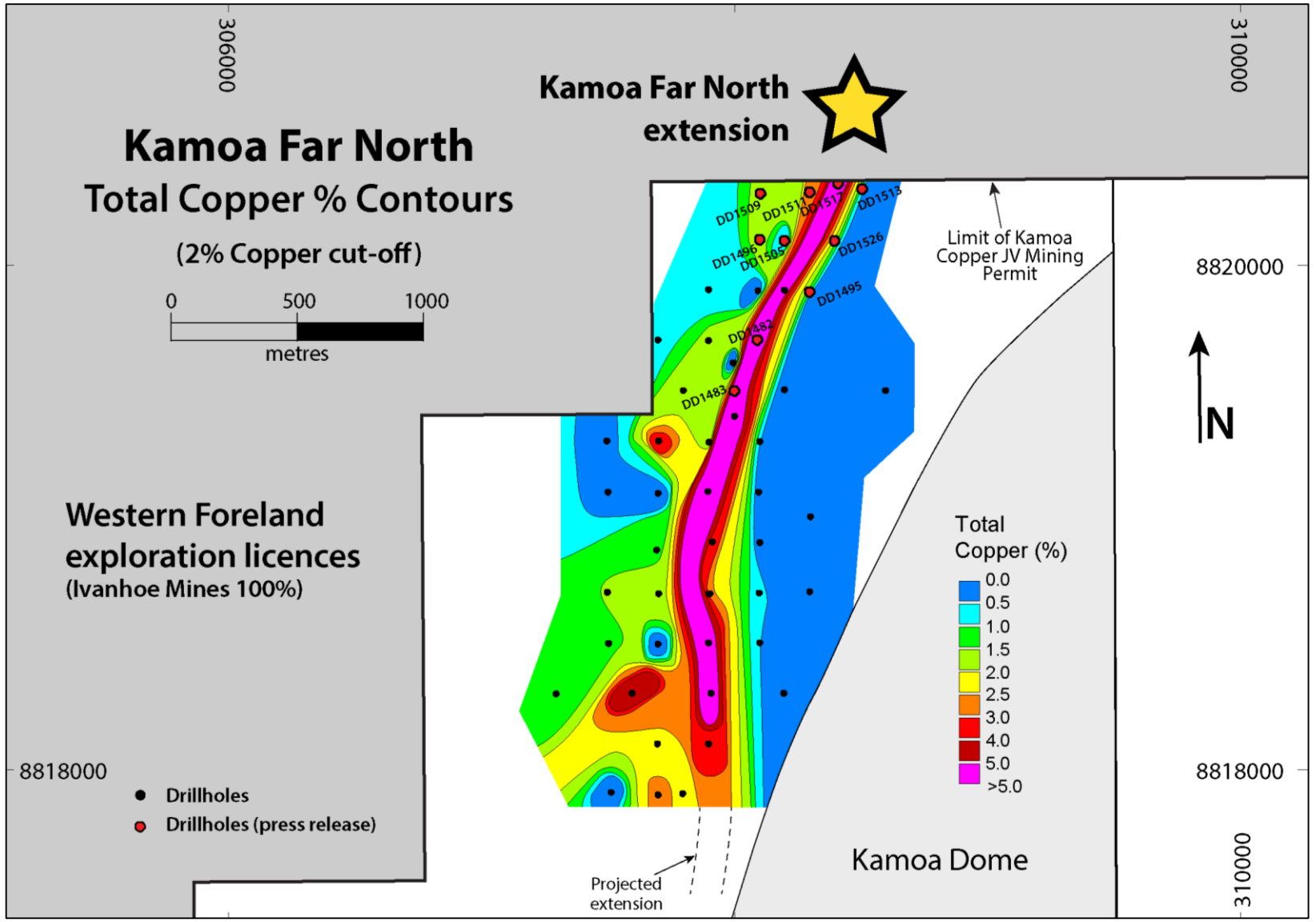

DKMC_DD1522
Copper %
Downhole Depth (m)
190m
200m
210m
220m
230m
240m
5 10 15 20 25 30 35 40 45
16.2m @ 13.41% Cu
R4.2 contact


Downh
230m
240m
15.5m @ 13.80% Cu
R4.2 contact

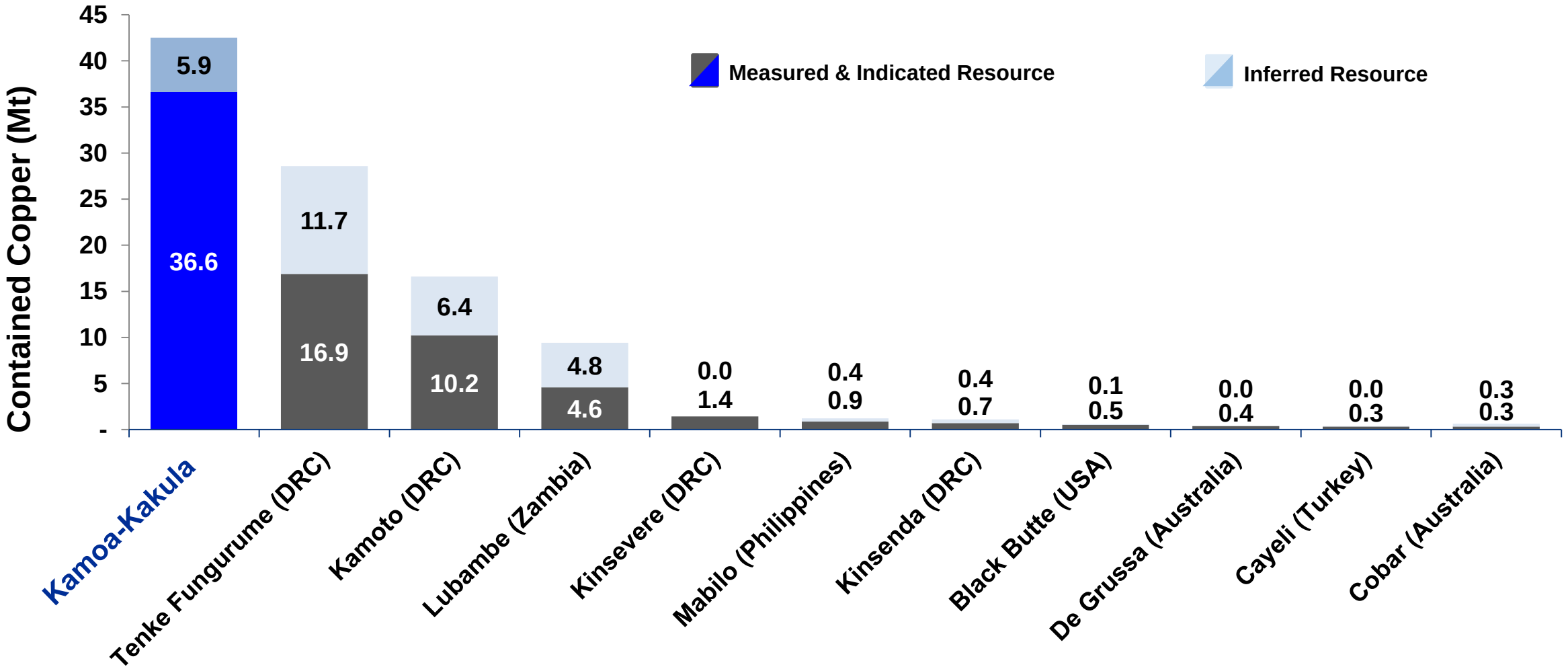

Downh
250m
260m
R4.2 contact


Downh
220m
230m
R4.2 contact

# Drilling extends 10-km Kamoa Far North discovery on to Ivanhoe's 100%-owned Western Foreland exploration licences



# Kamoa-Kakula is the largest high-grade copper deposit in the world




Source: Wood Mackenzie

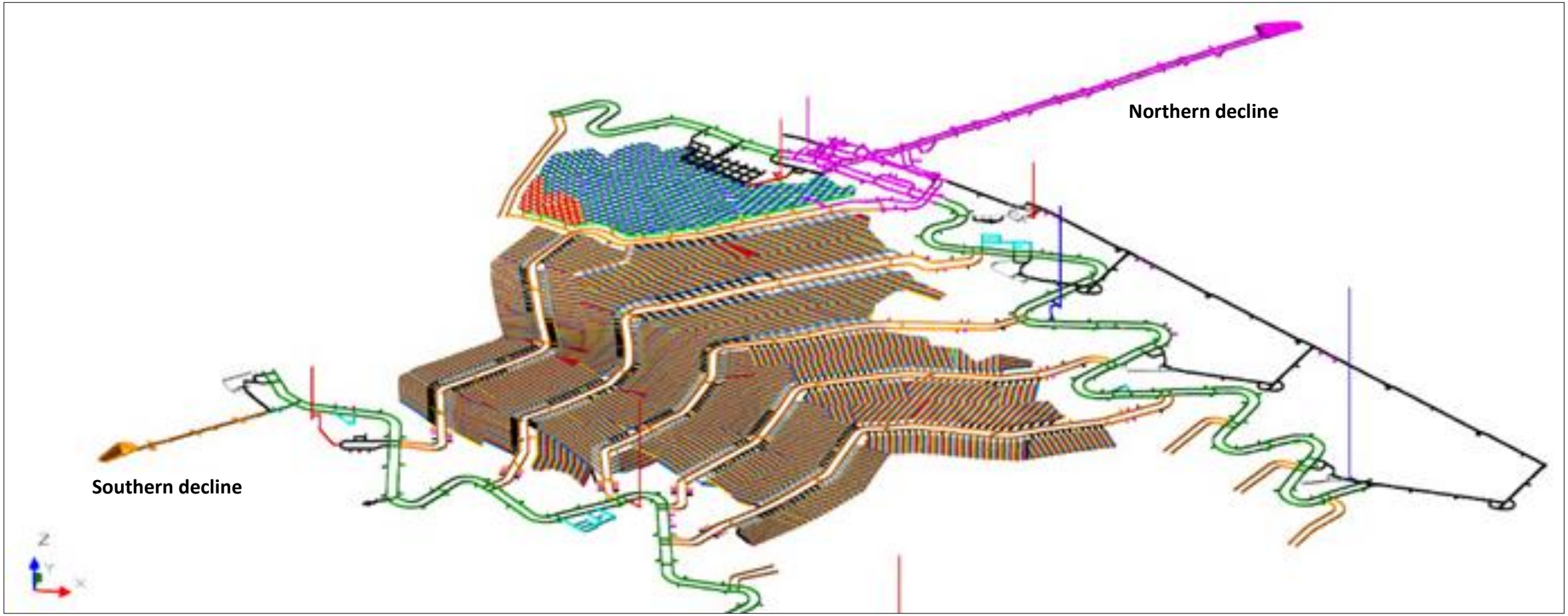
*Note: Contained copper in high-grade deposits (Measured & Indicated Resources, inclusive of Mineral Reserves, and Inferred Resources), with grades above 2.5% copper.

# The Kakula Mine's first stage will average 6.8% copper over the first 5 years, with mine-site cash costs of US$0.43/lb copper

Phase 1, 6 Mtpa operation at Kakula, yields an after-tax $NPV_{8\%}$ of **US$5.4 billion** and an **IRR of 47%** over a 25-year mine life, with an initial capital cost of **US$1.1 billion**

# The PEA envisions the staged mine expansions and smelter will be funded from internal cash flows and yields an after-tax NPV8% of US$10.0 billion and an IRR of 41%

# Kakula's underground development and production five-year plan

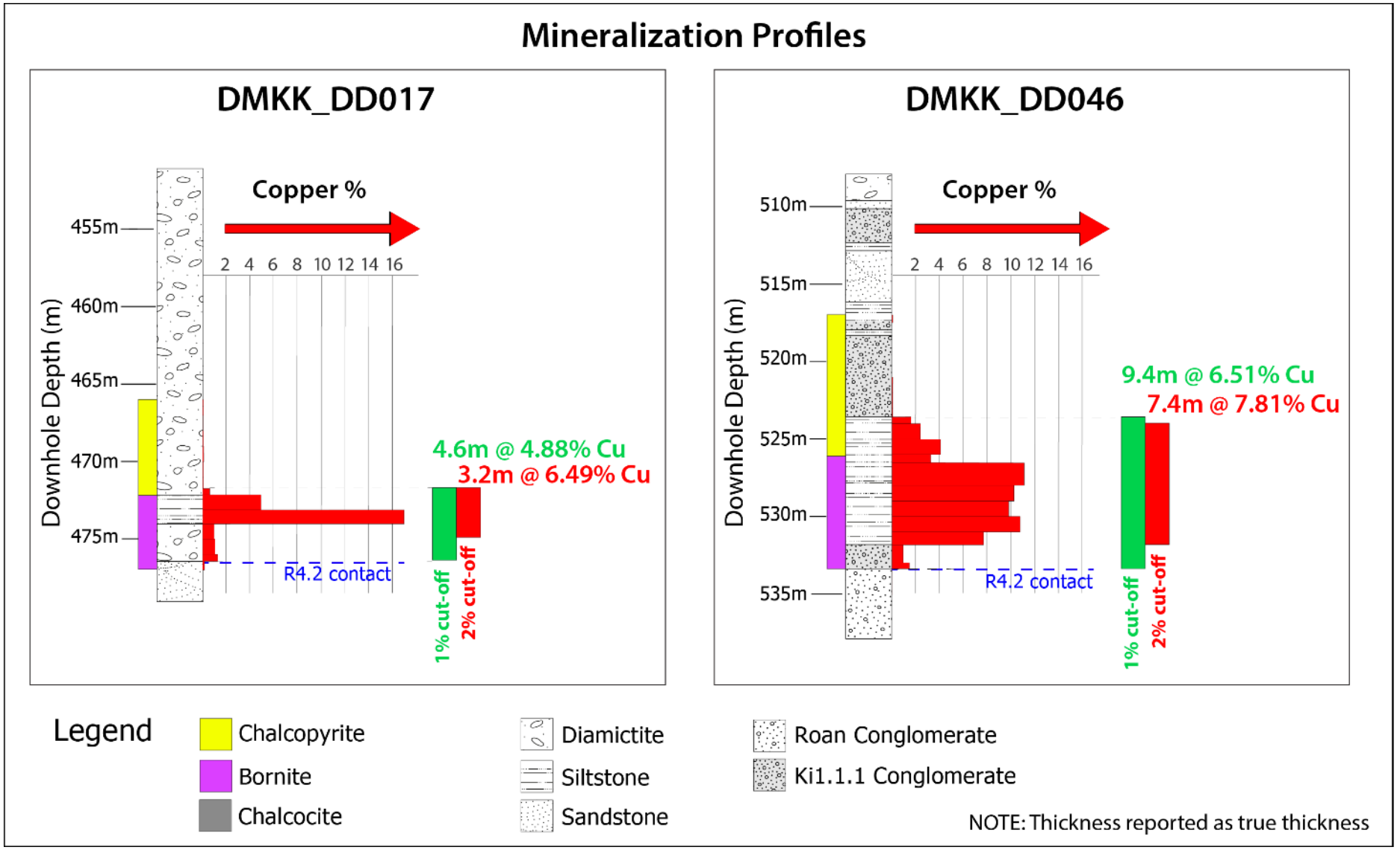



More than **five kilometres** of development work completed to date

## Western Foreland

**A drill rig in action on the Makoko exploration area on a portion of Ivanhoe's 100%-owned Western Foreland licences.**

# Makoko high-grade copper shows characteristics identical to tier-one Kamoa-Kakula Discoveries



# Mwadingusha hydroelectric plant upgrade

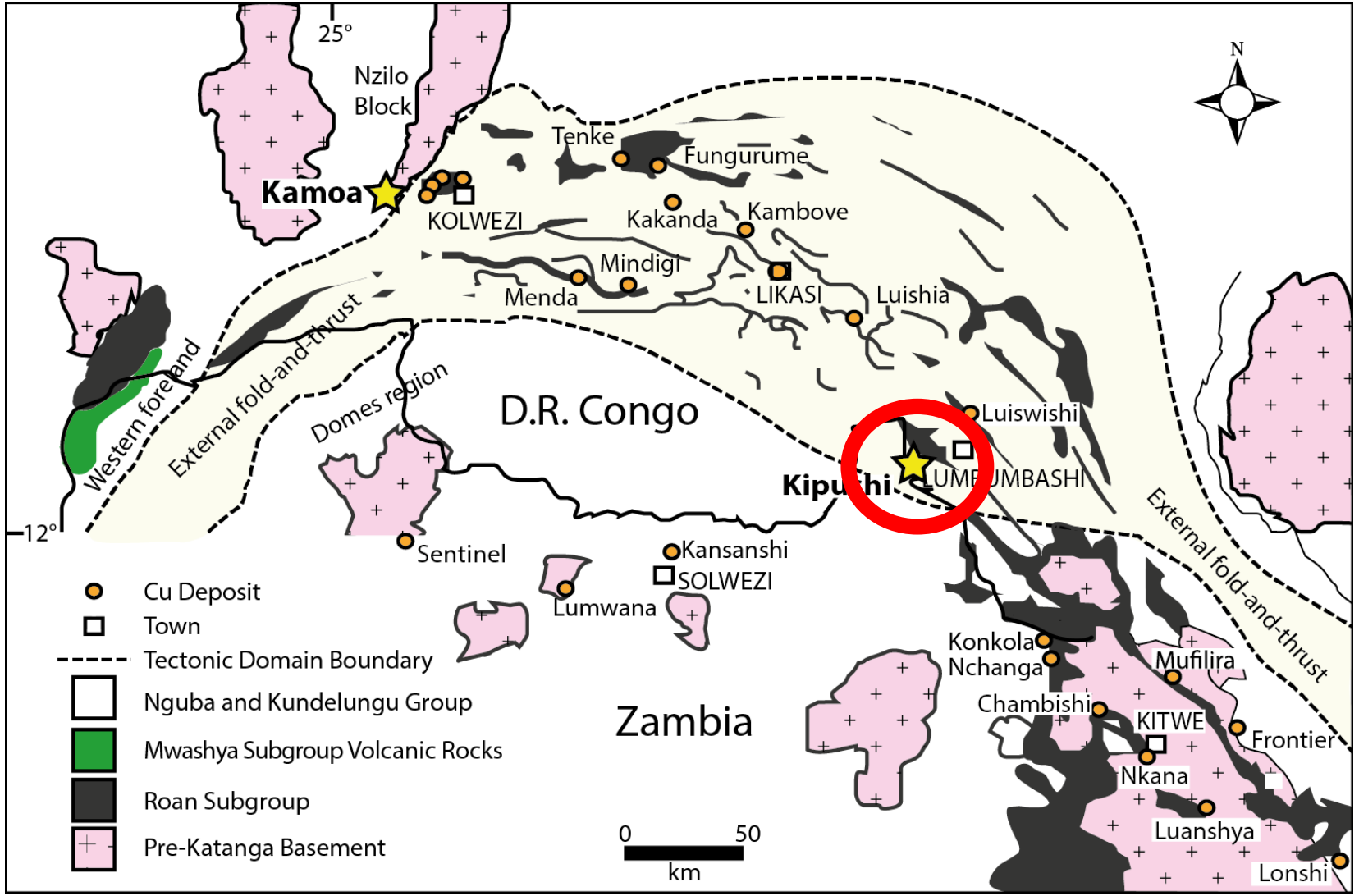
- Mwadingusha is the first of three hydroelectric power plants in the DRC being upgraded by Ivanhoe, Zijin and SNEL to secure a supply of **clean, sustainable electricity for the development of Kamoa-Kakula**.
- The Mwadingusha, Koni and Nzilo 1 plants will have combined, installed capacity of approximately **200 MW** for the national grid.

# KIPUSHI
# Mine development & upgrading for a new era

Democratic Republic of Congo

IVANHOE MINES

# Kipushi: world's highest grade zinc-copper-silver-germanium mine in southeast DRC on the Zambian border

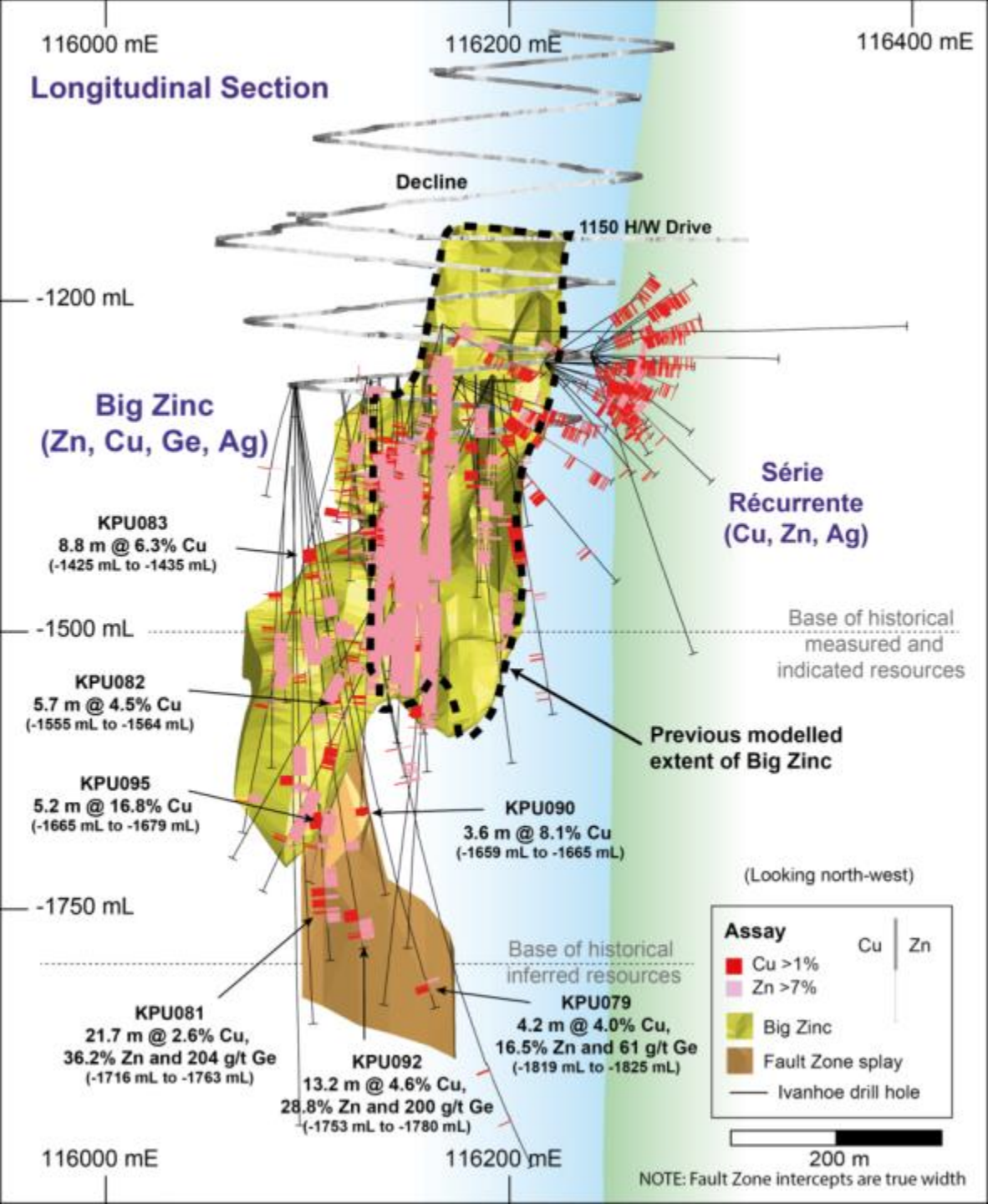


# **December 13, 2017:** Ivanhoe announced a pre-feasibility study for the rebirth of the historic Kipushi zinc-copper-silver-germanium mine

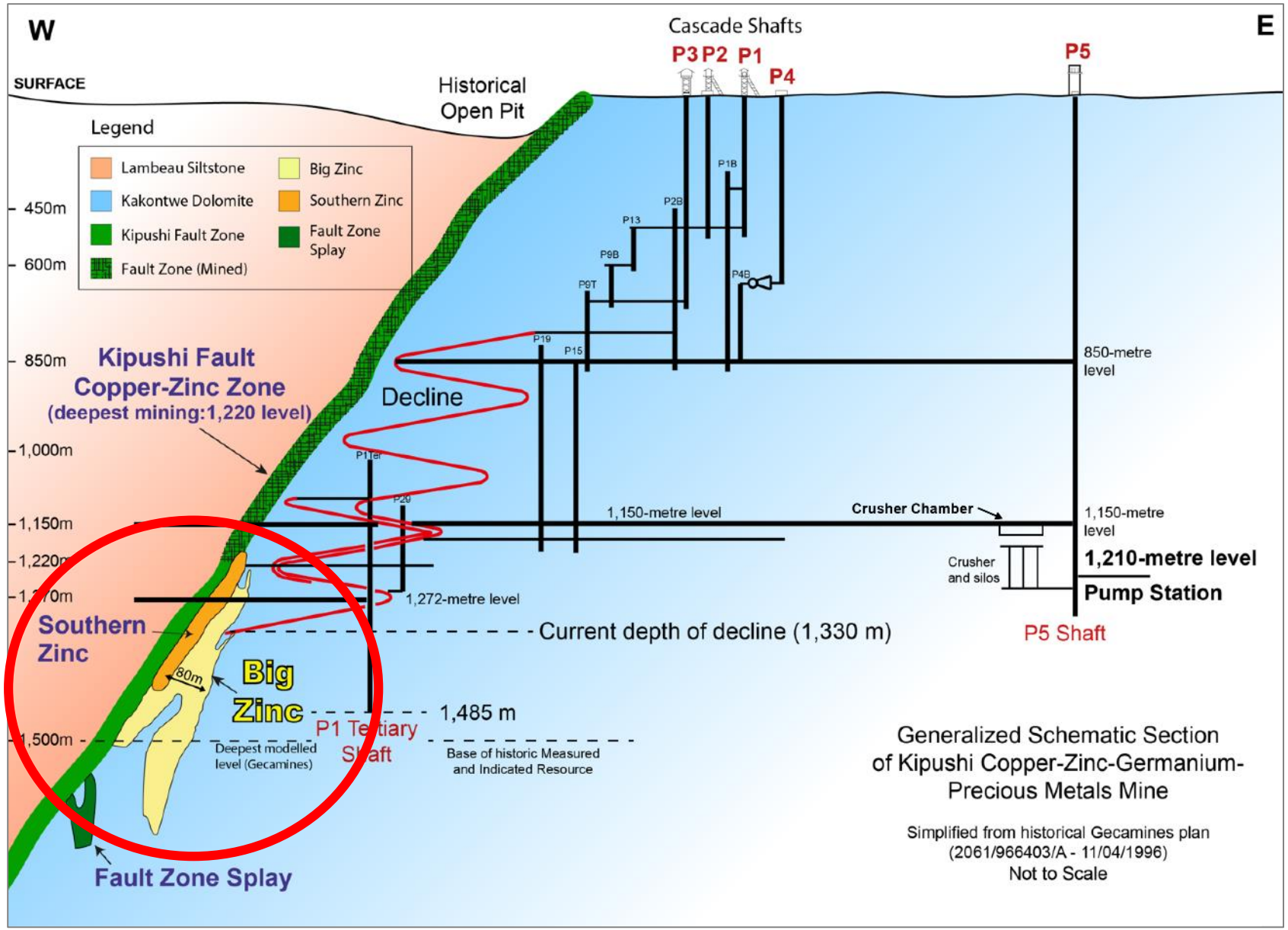
**After tax $NPV_{8\%}$ of $683 million and IRR of 35.3%**

# World’s best drill hole?

## Our geology team holding hands and showing Big Zinc intersection of 44.8% zinc over 340 metres

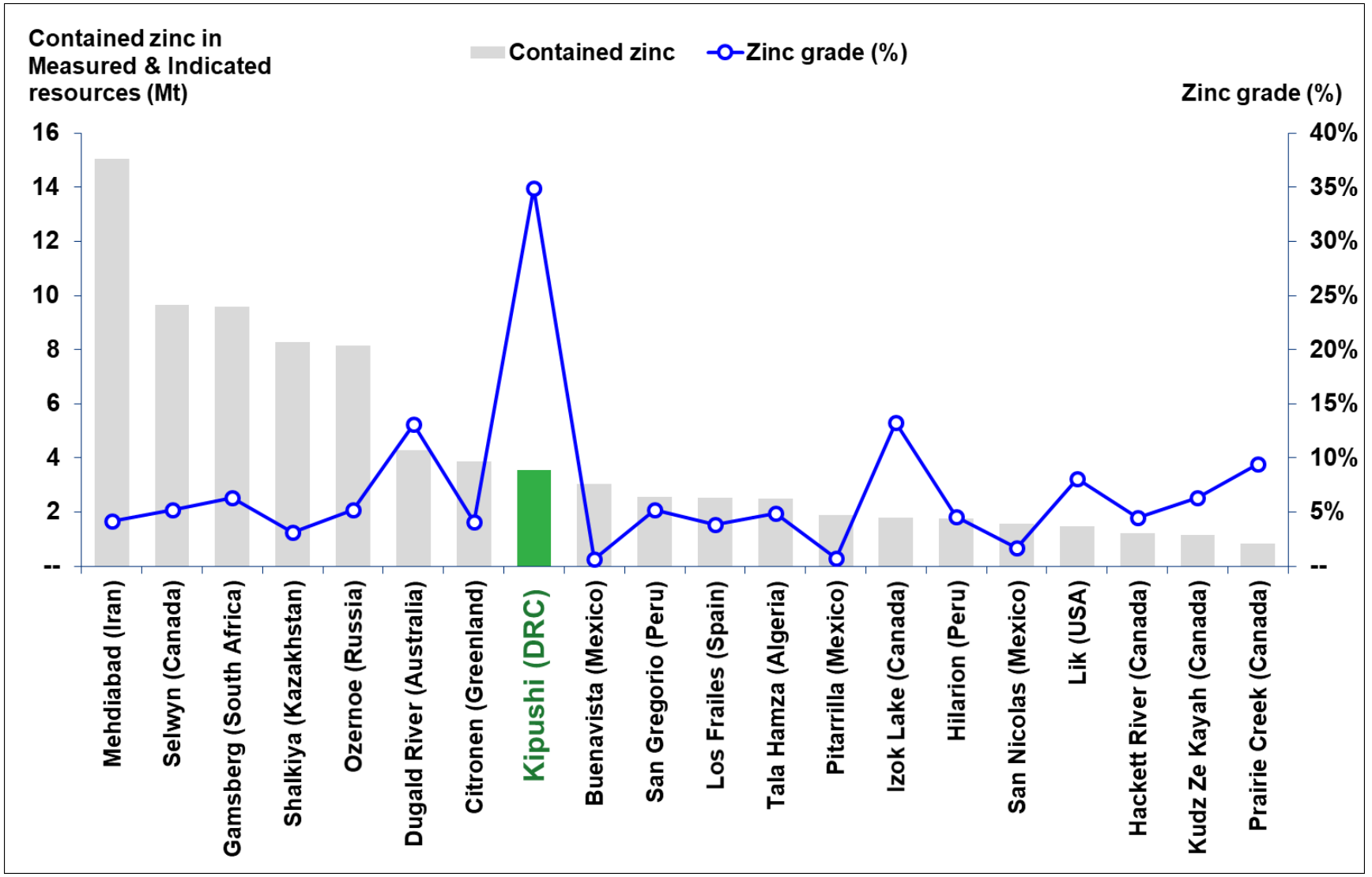



# Big Zinc Mineral Resource outline and Fault Zone and Fault Zone Splay copper intercepts in Ivanhoe drill holes




- **+35% Big Zinc (circled in red): READY TO MINE…**

# Top 20 zinc projects by contained zinc




Source: Wood Mackenzie. Note: All tonnes and zinc grades of the above-mentioned projects (except for Kipushi) are based on public disclosure and have been compiled by Wood Mackenzie.

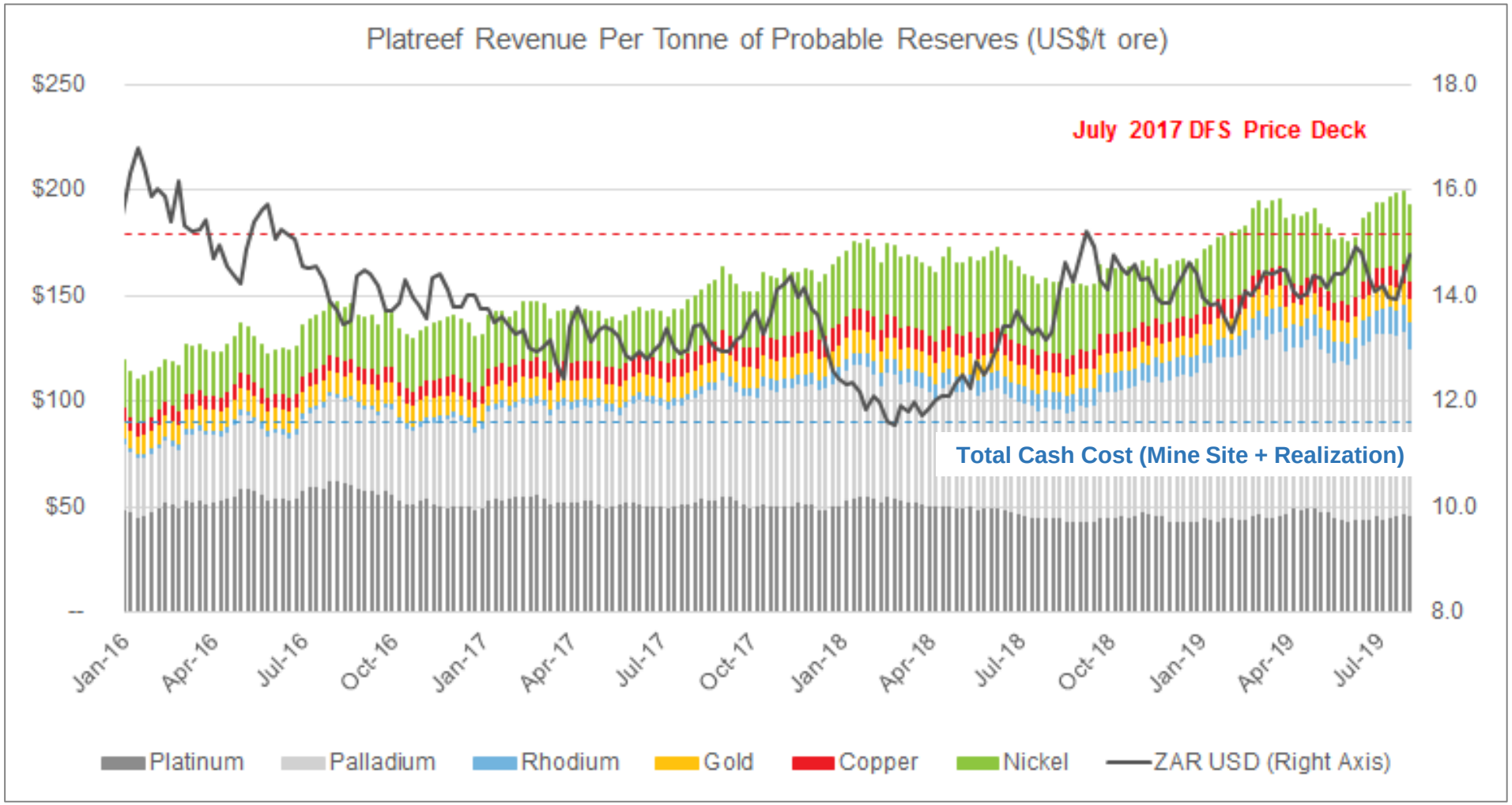
# PLATREEF

## Discovery & mine development

South Africa

IVANHOE MINES

# Revenue per tonne of ore at the Platreef Project now at 3-year high




Source: Bloomberg. Based on historical weekly commodity prices at the end of each week.

# 750-metre, 850-metre and 950-metre stations on Shaft 1 will provide access to the high-grade Flatreef orebody

# September 26, 2018: First underground mining intersection of the Platreef mineralized belt on the Northern Limb of South Africa's Bushveld Complex

The first ore from the underground mine development was delivered to a surface stockpile for metallurgical sampling.

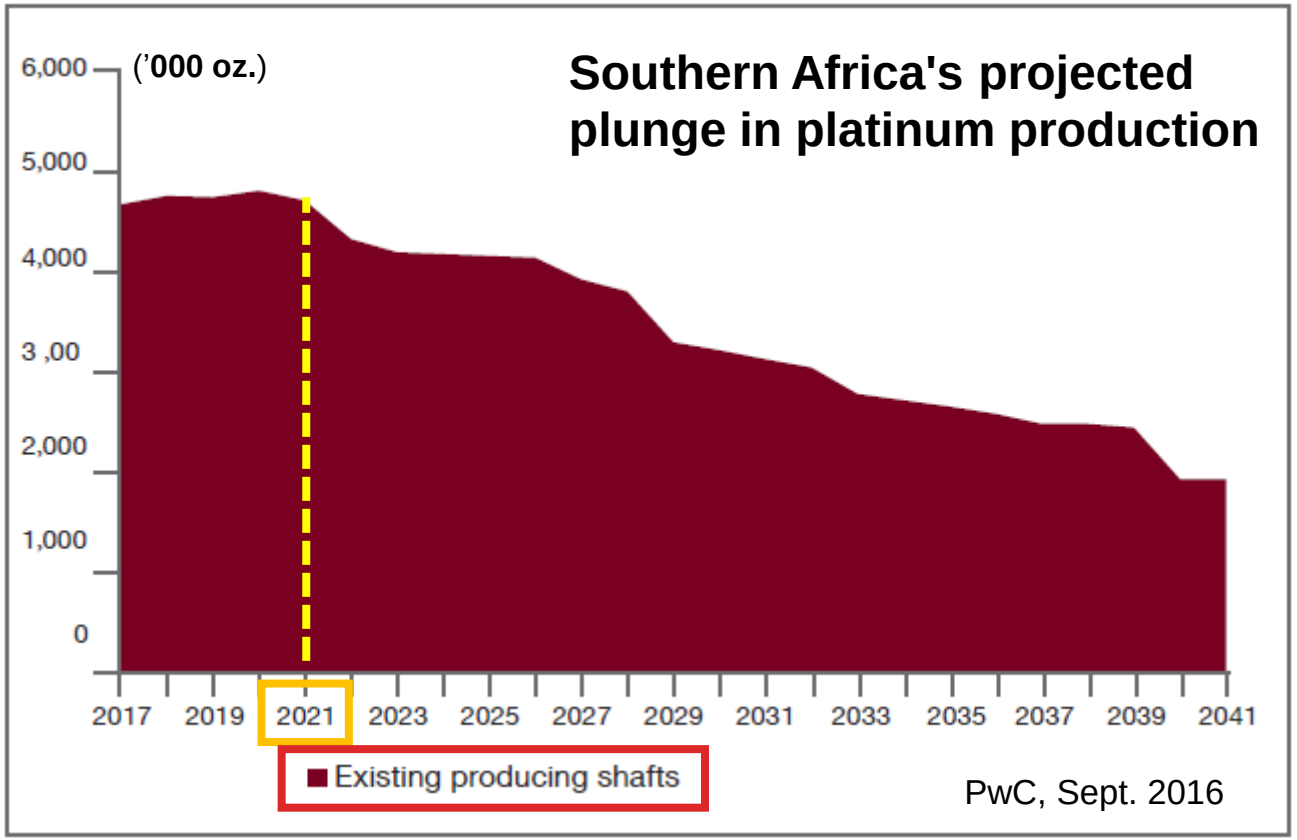
# Platreef's Shaft 2 box cut, with the 11.5-metre shaft ring set-up for the 10-metre internal diameter shaft

# July 31, 2017: Definitive feasibility study issued for Platreef Project

- First phase envisages annual throughput rate of four million tonnes of ore per year, producing 476,000 ounces of platinum, palladium, rhodium and gold (3PE+Au), plus 33 million pounds of nickel and copper.

- Projected to be Africa's lowest-cost producer of 3PE+Au, with a cash cost of US$351 per ounce of 3PE+Au.

# The looming platinum “supply cliff” for Southern Africa’s existing producing mines




- Existing shafts alone will barely maintain current production to 2021.
- Then, closures of mined-out shafts will help trigger a long production decline – and higher prices.
- **Filling such a supply-demand gap holds challenges and opportunities.**

# Thank You

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