

# Oyu Tolgoi: world-class asset, development optionality, significant cash flow potential



TURQUOISE HILL

# Forward-looking statements

This presentation includes certain “forward-looking information” within the meaning of applicable Canadian securities legislation and “forward-looking statements” within the meaning of the “safe harbour” provisions of the United States Private Securities Litigation Reform Act of 1995.

All statements and information, other than statements of historical fact, are forward-looking statements and information that involve various risks and uncertainties. There can be no assurances that such statements or information will prove accurate and actual results and future events could differ materially from those expressed or implied in such statements. Such statements and information contained herein, which include, but are not limited to, statements respecting anticipated business activities, planned expenditures, corporate strategies and other statements that are not historical facts, represent the Company’s best judgment as of the date hereof based on information currently available. The Company does not assume any obligation to update any forward-looking statements or information or to conform these forward-looking statements or information to actual results, except as required by law.

For a more detailed list of specific forward-looking statements and information applicable to the Company, refer to the *Forward-Looking Information* and *Forward-Looking Statements* sections of the Annual Information Form dated as of March 14, 2018 in respect to the year ended December 31, 2017.

All amounts are in U.S. dollars, unless otherwise stated.



# Turquoise Hill's investment thesis

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- World-class asset with long-term development optionality
- Significant free cash flow generation expected from underground
- Expected benefit from lower copper supply (~2020) and ongoing demand growth



# Robust long-term production profile

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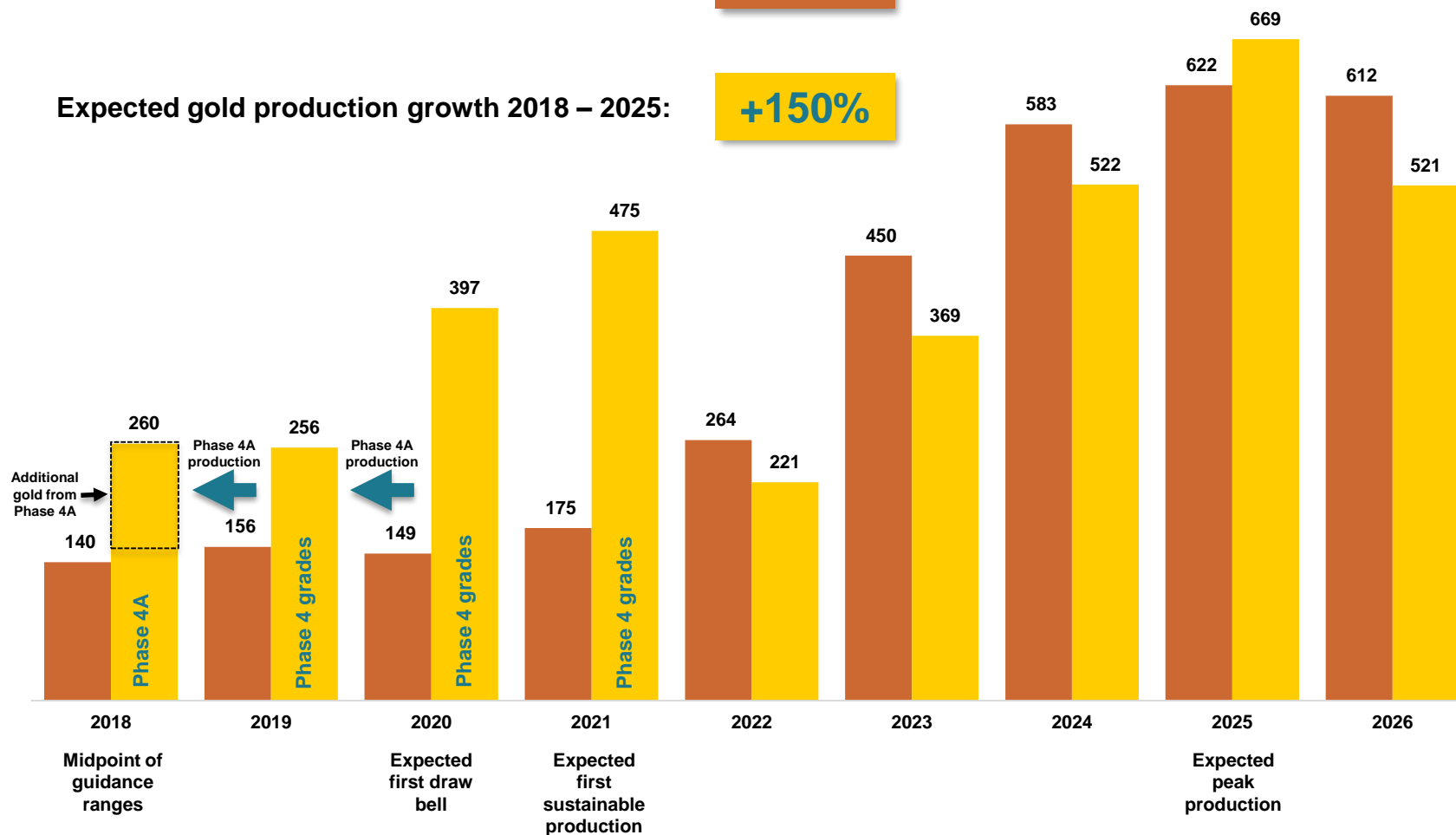
■ Copper ('000 tonnes) ■ Gold ('000 ounces)

Expected copper production growth 2018 – 2025:

**+340%**

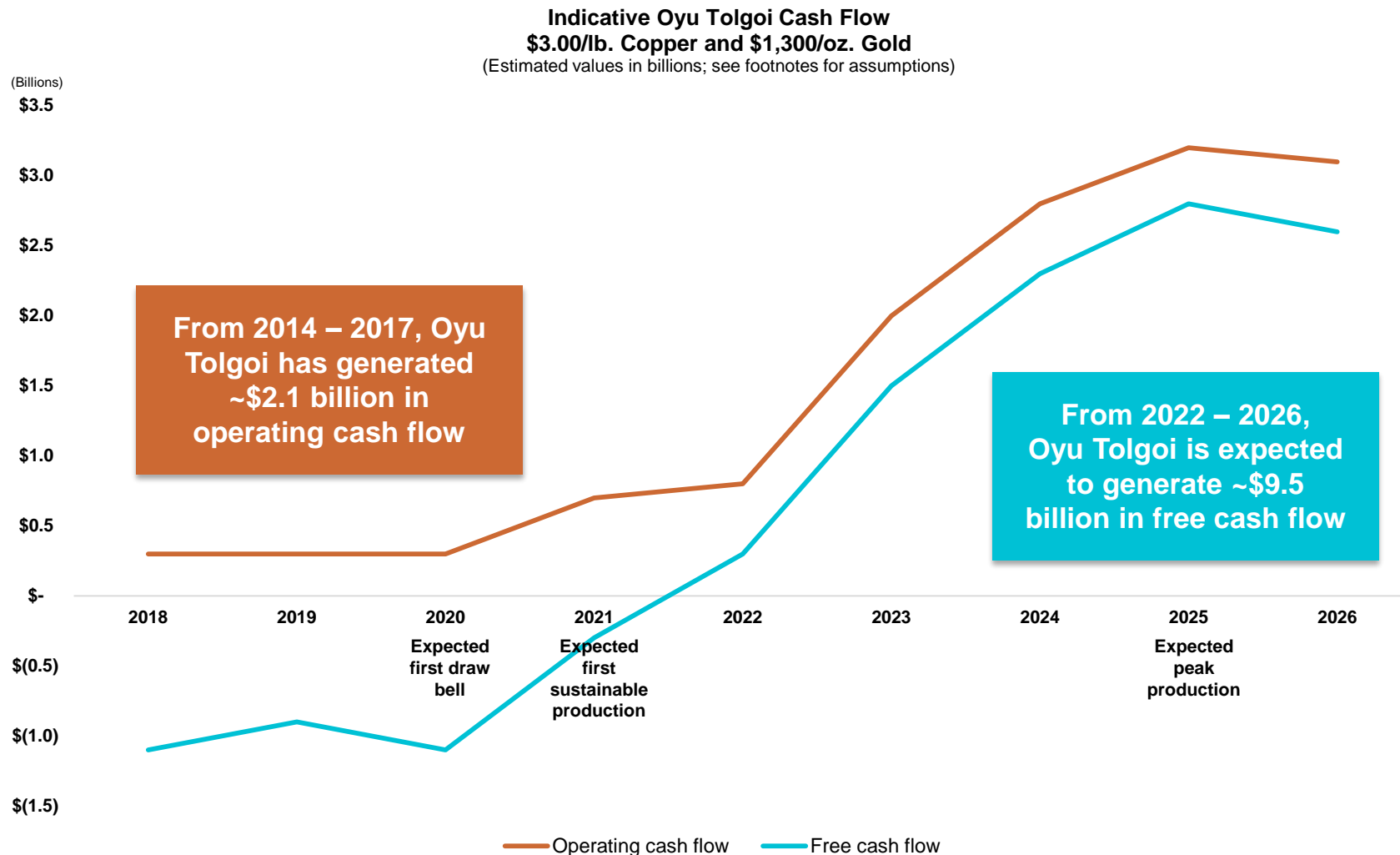
Expected gold production growth 2018 – 2025:

**+150%**



# Significant cash flow expected

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Source: 2016 Oyu Tolgoi Technical Report.

Free cash flow = operating cash flow – CAPEX; does not include financing costs or power plant CAPEX.

Assumes \$3.00/lb. copper and \$1,300/oz. gold beginning in 2018 and represents Oyu Tolgoi-level cash flow.

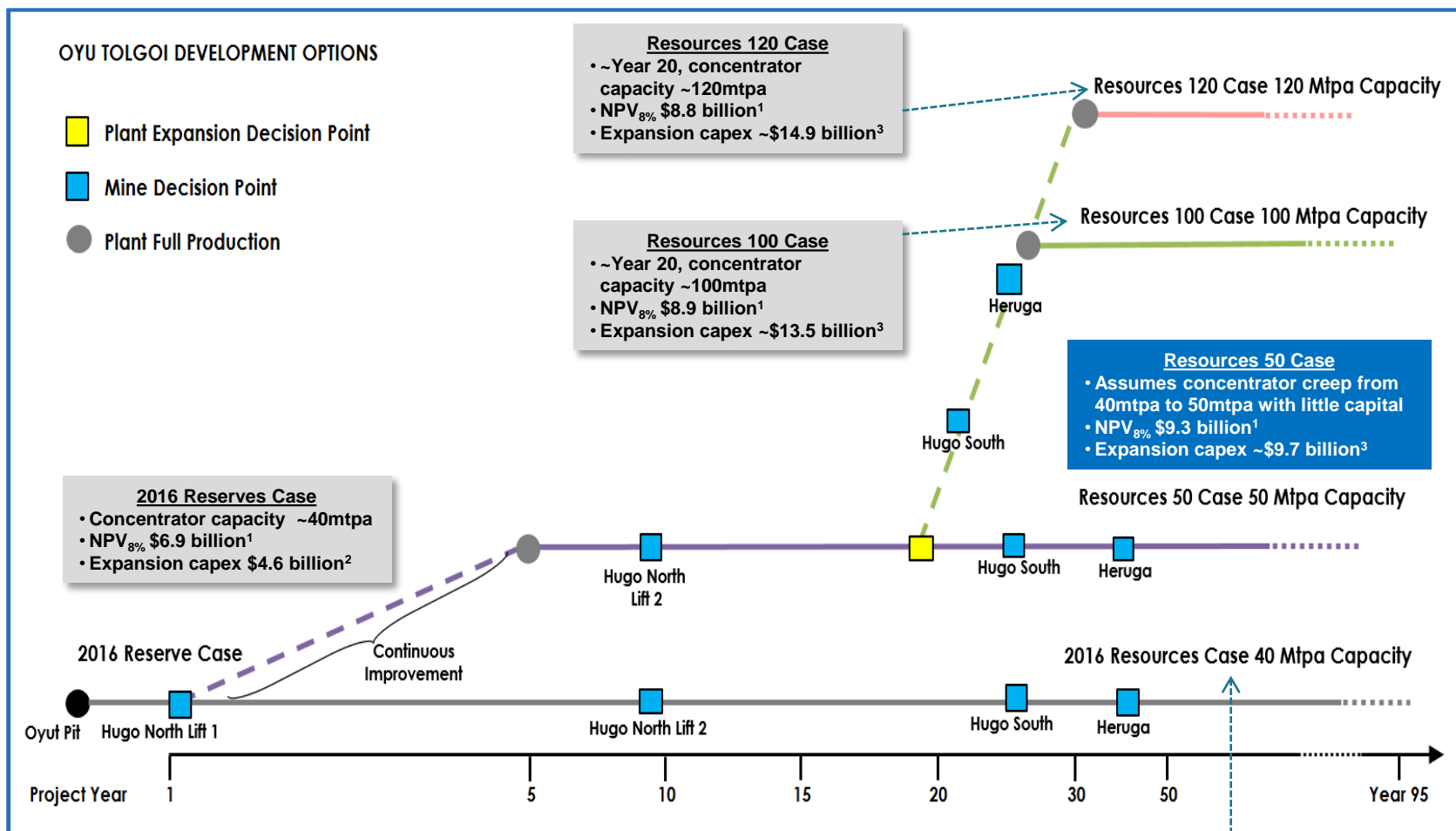
Production in 2018 assumes additional 100,000 ounces of gold from 2016 technical report projection and 50,000 less ounces from 2019 and 2020 technical report projections.

Operating cash flow for 2018 – 2020 incorporates operational improvements/cost savings implemented after publication of the 2016 technical report cash flow model (Table 22.11).



# Long-term development optionality

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1. NPV<sub>8%</sub> assumes \$3.00/lb copper and \$1,300/oz gold

2. Expansion capital costs include only direct project costs and exclude interest expense, capitalized interest, debt repayments, tax pre-payments and forex adjustments. In all cases, total capital cost excludes capital costs for the year 2016. Expansion capital for 2016 excluded is \$0.46 billion.

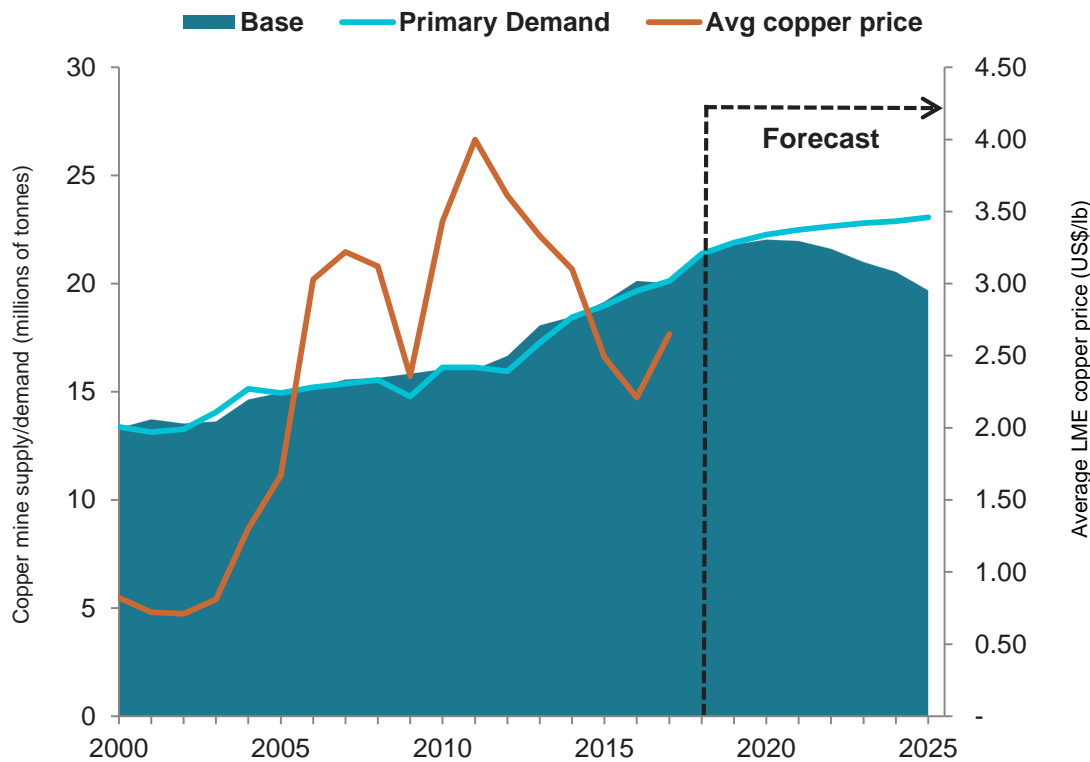
3. Expansion capital costs inclusive of 2016 Reserves Case expansion capital. Expansion capital costs include only direct project costs and exclude interest expense, capitalized interest, debt repayments, tax pre-payments and forex adjustments. In all cases, total capital cost excludes capital costs for the year 2016.



# Long-term copper fundamentals strong

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## Copper mine supply/demand outlook



Source: Wood Mackenzie (Q4'17 Long-Term Outlook); base includes highly-probable projects.

- Small deficit/balanced market expected 2018-2019
- Ongoing attrition at existing mines driven by declining grade
- Continued demand growth requires new capacity in the medium-term
- Increasing deficit from 2020
- China now largest buyer of gold and continues to be largest consumer of copper





Underground  
development



# Q1'18 underground progress

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## Workforce

Over  
**6,600**  
workers

## Workforce Composition

Mongolian nationals  
**89%**  
of workforce

## Lateral Development

Since project restart  
**10.3 eq. km**  
completed

## Development Rates

Imminent completion of  
**Shaft 5**  
to increase capacity for  
underground activities

## Project Spend

Project spend and  
capital commitments  
totaled  
**\$2.6 billion**  
since project re-start

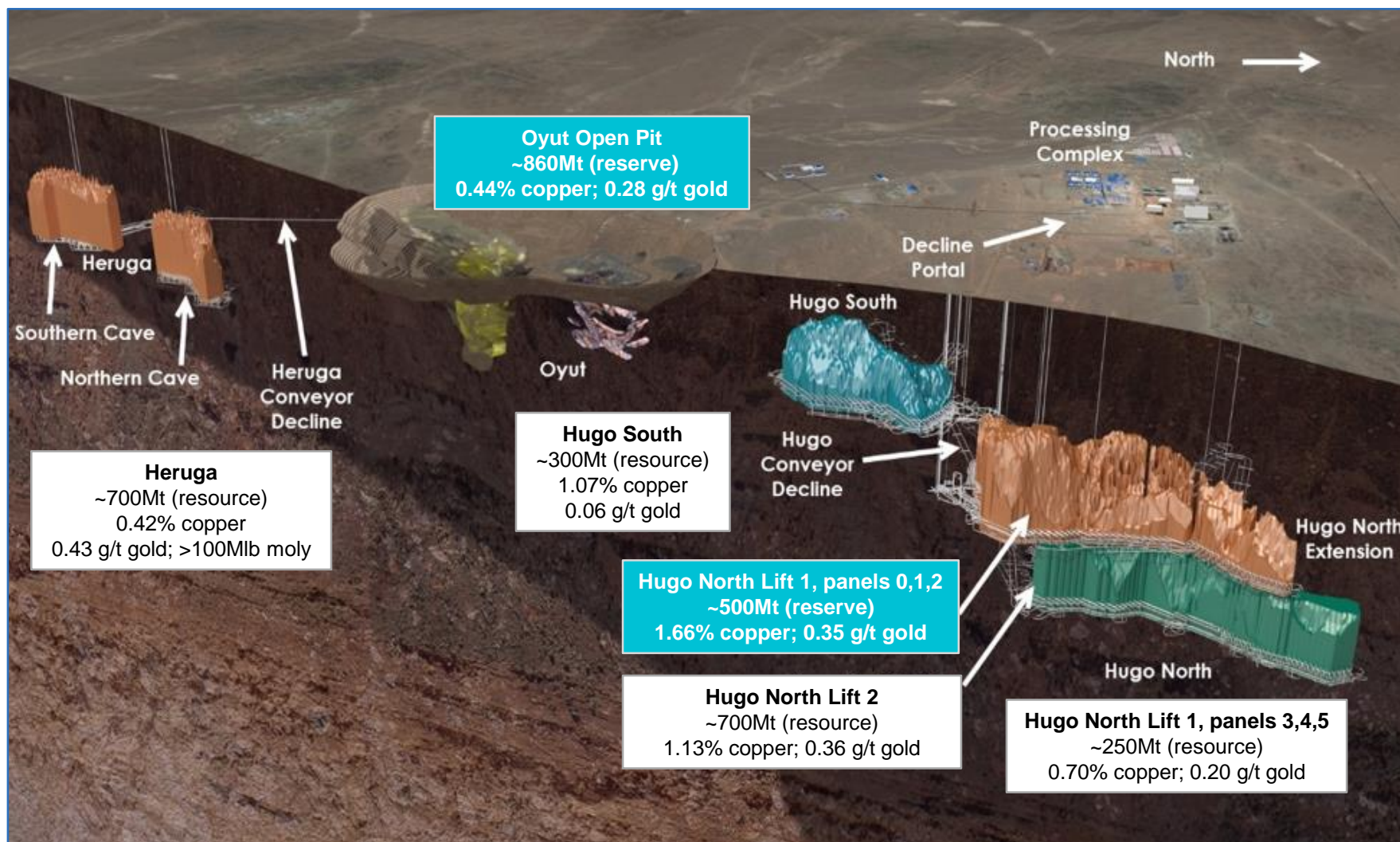
## Mongolian Spend

Almost  
**\$1.6 billion**  
awarded to Mongolian  
companies



# 2016 Resources Case: ~3.3 billion tonnes

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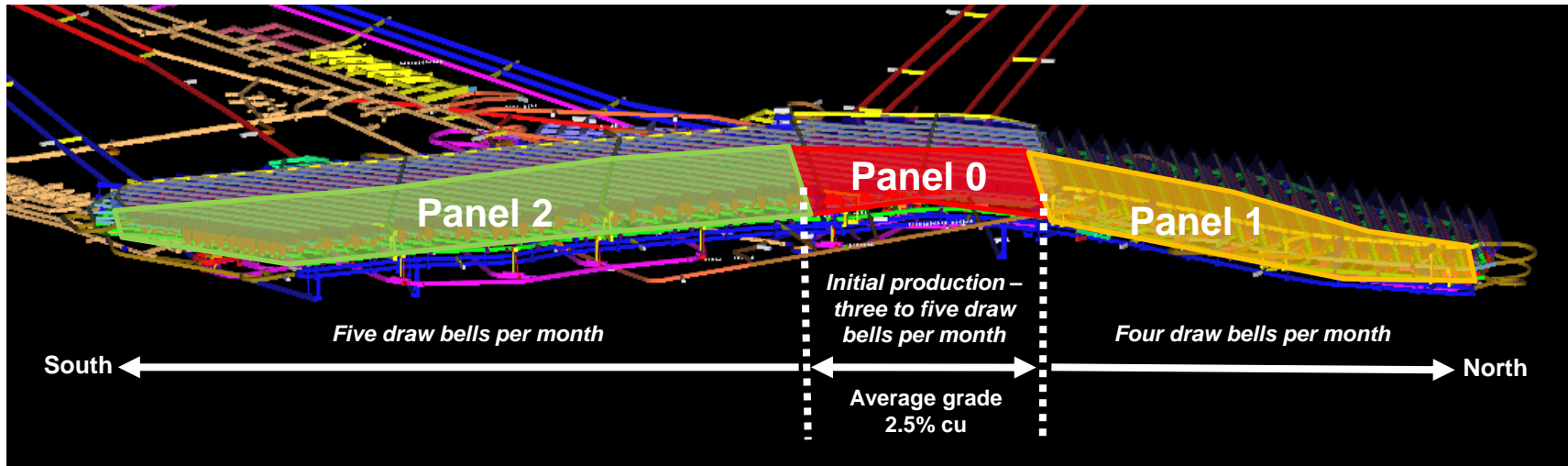


Note: Open-pit reserve as of December 31, 2017.



# Underground mining sequence

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- Initial underground production begins with Panel 0
- Highest copper grades occur during ramp up exceeding 2.5% in several years
- 2024-2026: Oyu Tolgoi *peak* copper production during period expected to average > 600,000 tonnes annually due to high grades
- 2024-2036: Total mine copper production over period expected to average > 500,000 tonnes annually
- Following Panel 0, production will move outward with Panels 1 and 2



# Underground development status

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## Lateral development

- 10.3 equivalent kilometres completed (January 2016 – Q1'18)
- Highest development month to date in March 2018
- Expect ~10.0 kilometres of lateral development in 2018

## Shaft 2 (Production and ventilation)

- Shaft sinking complete in January 2018
- Shaft fit-out expected throughout 2018

## Shaft 5 (Ventilation)

- Shaft sinking complete in March 2018; fan installation expected to be complete in early Q2'18
- Increase in lateral development expected when completed

## Convey-to-Surface

- Surface excavation complete
- Underground decline commenced in Q1'17

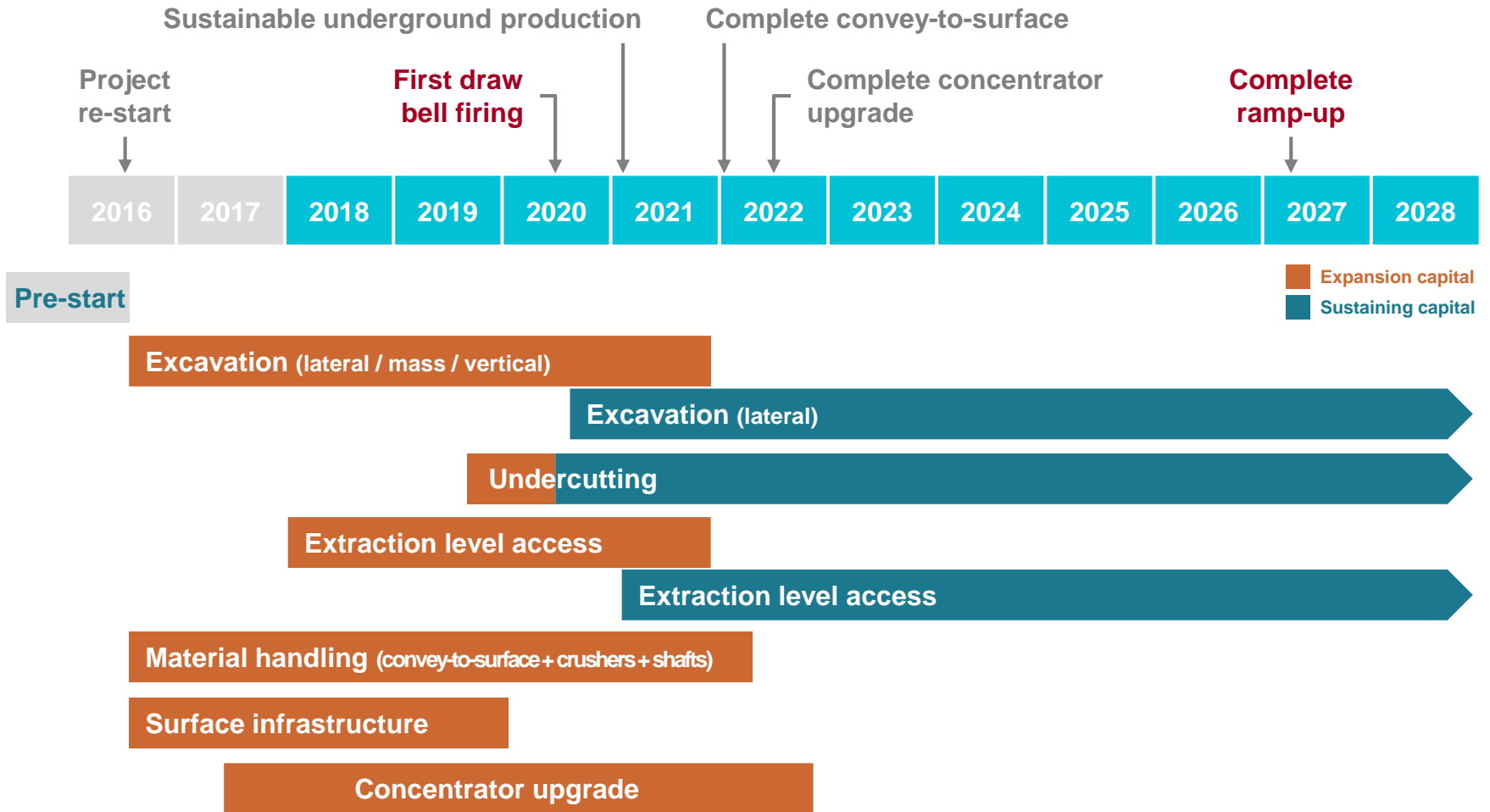
## Shafts 3 and 4 (Ventilation)

- Earthworks commenced during Q1'18
- Sinking award package expected to occur in Q2'18



# Complete ramp-up expected by 2027

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Timeline is illustrative only and subject to change.



# Hugo North Lift 1 production schedule

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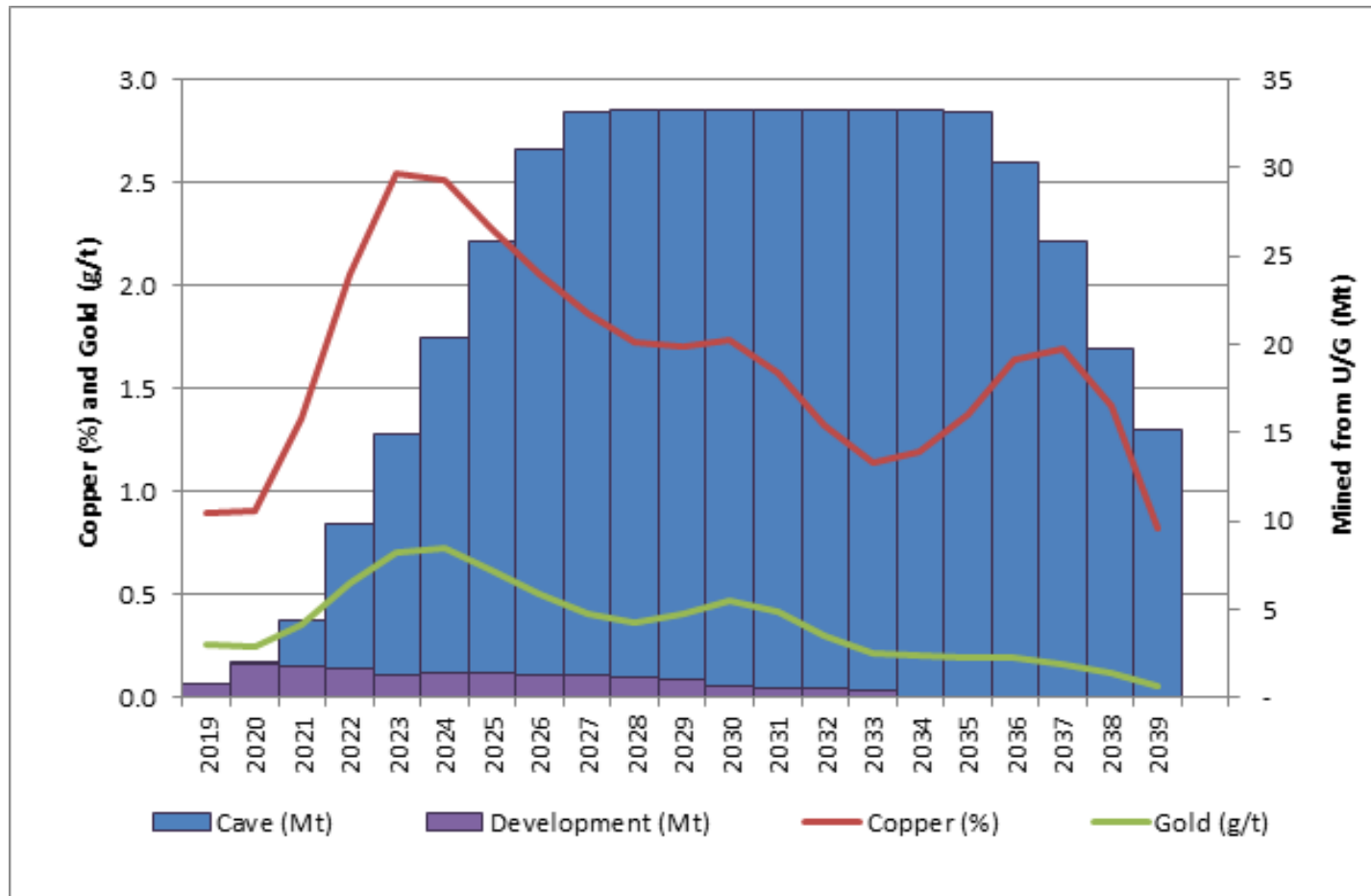
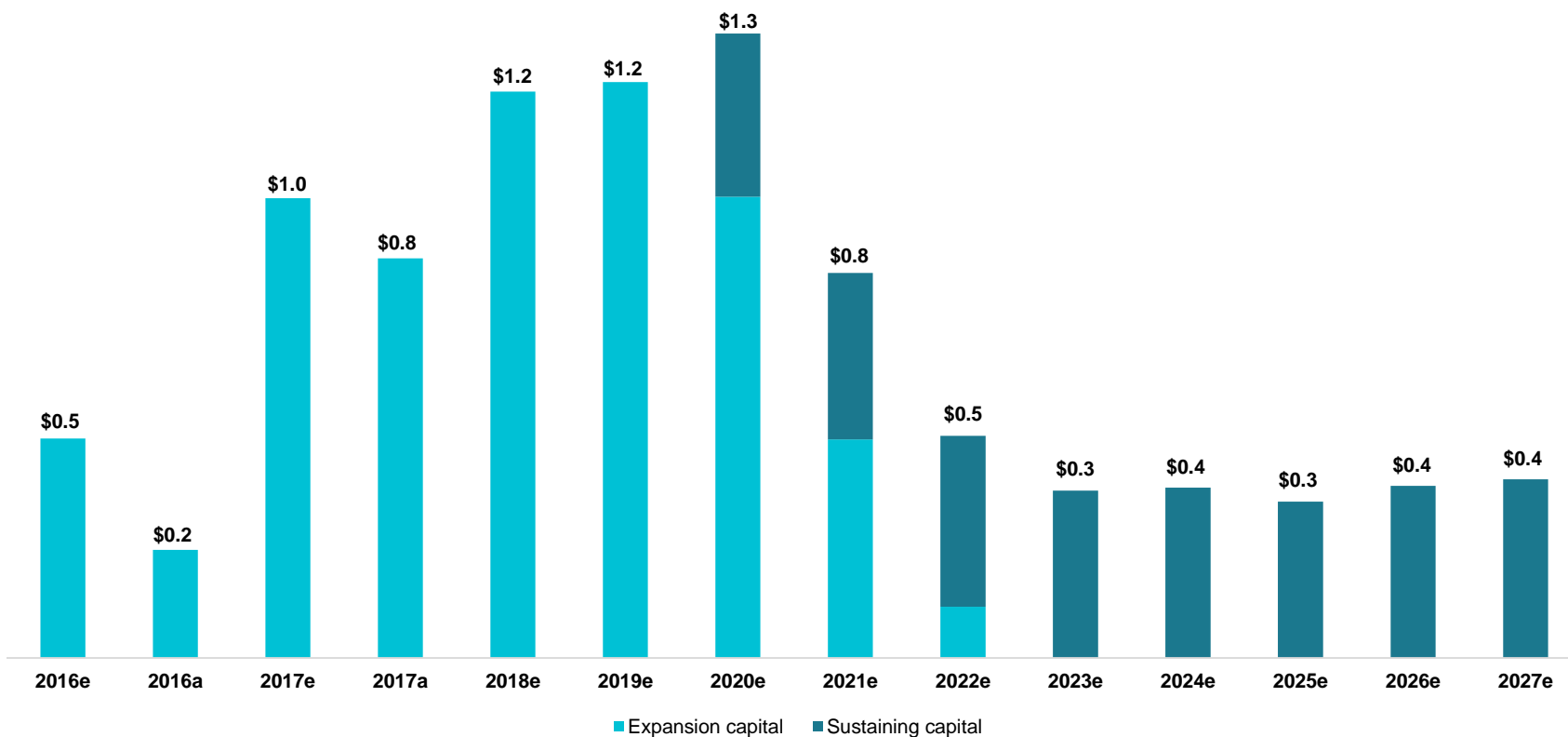


Figure: 2016 Oyu Tolgoi Technical Report.



**Underground capital spend profile<sup>1</sup>**  
(\$ billion)



**Expansion capital of \$5.3 billion and sustaining capital of \$2.8 billion to full ramp-up expected in 2027**

Source: 2016 Oyu Tolgoi Technical Report | e = expected, a = actual

1. Expansion and sustaining capital includes VAT; general estimated escalation added to technical report numbers; does not include power plant CAPEX.



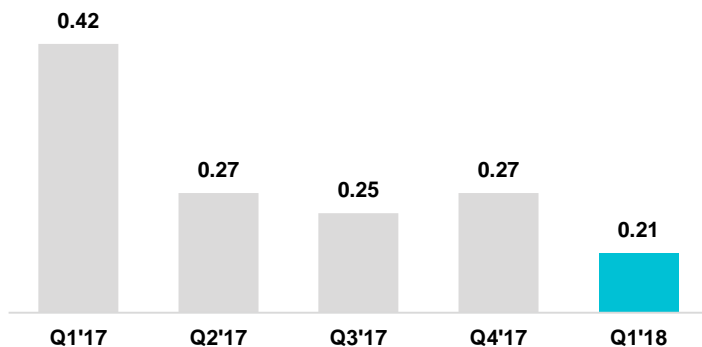
# Open-pit operations



# Production highlights

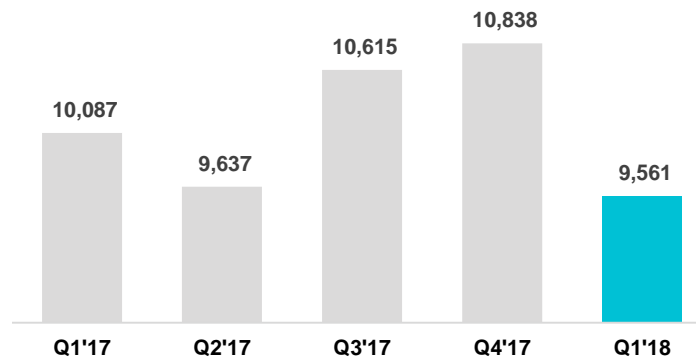
17

**All injury frequency rate**  
(Per 200,000 hours worked)



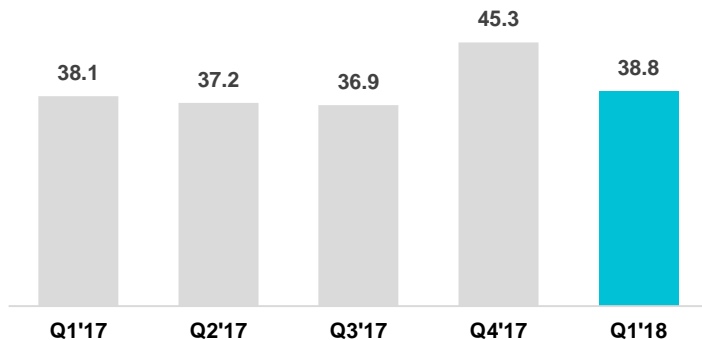
Industry-leading safety performance

**Concentrator throughput**  
('000 tonnes)



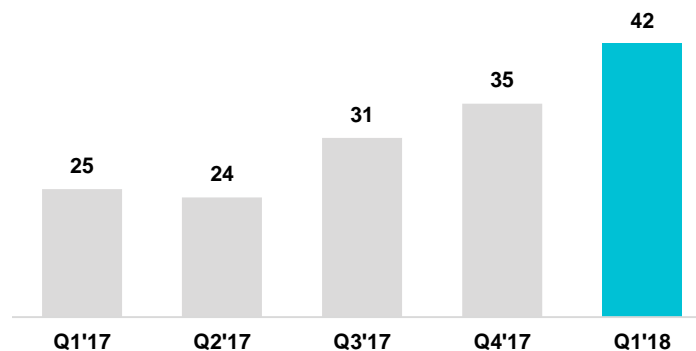
Q1'18 throughput impacted by scheduled maintenance

**Copper in concentrates**  
('000 tonnes)



Q1'18 copper production consistent with Q1'17 production

**Gold in concentrates**  
('000 ounces)



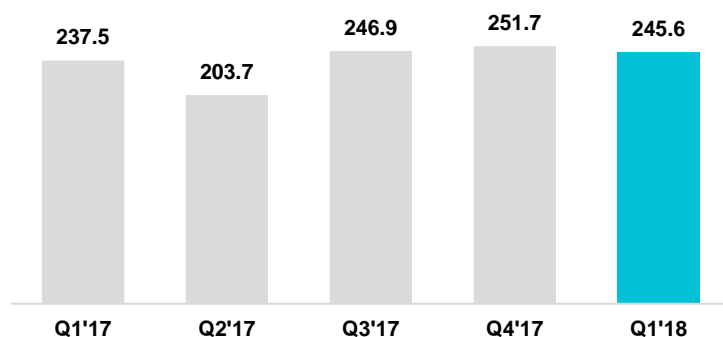
2018 gold production beginning to see impact of Phase 4 ore



# Financial highlights

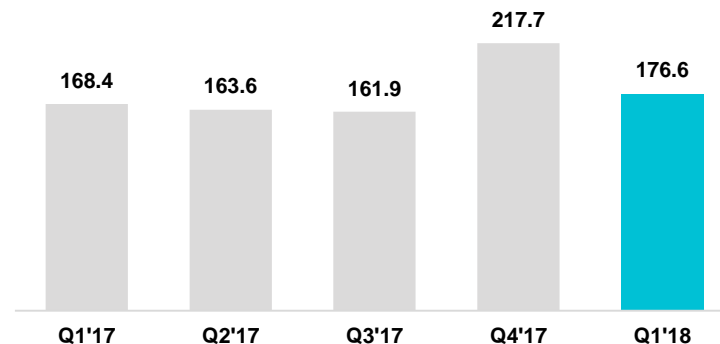
18

**Revenue**  
(\$'000,000)



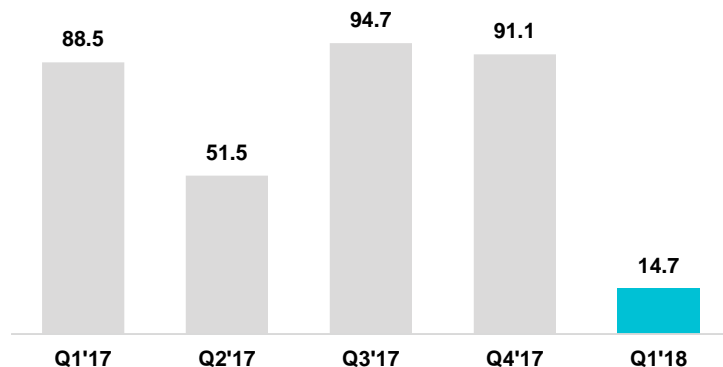
Q1'18 revenue reflects higher copper and gold prices partly offset by lower concentrate sales volumes

**Operating cash costs**  
(\$'000,000)



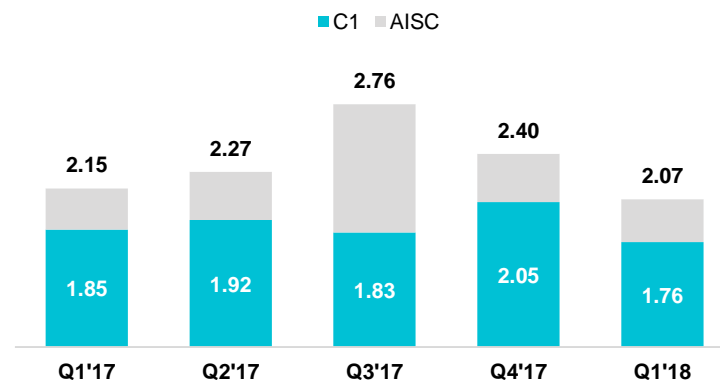
Q1'18 operating cash costs impacted by higher open pit and concentrator maintenance costs

**Operating cash flow**  
(\$'000,000)



~ \$2.1 billion of operating cash flow generated since 2014

**C1 and All-in sustaining costs (AISC)**



Q1'18 unit costs impacted by lower realization costs and higher gold sales



# Production and financial guidance

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	2018
Copper in concentrates	125,000 – 155,000 tonnes
Gold in concentrates	240,000 – 280,000 ounces
Operating cash costs	\$700M
Capital expenditures	\$150M (open pit) \$1.1B - \$1.2B (underground)

- For 2018, open-pit capital mainly comprised of deferred stripping, equipment purchases, tailings storage facility construction and maintenance componentization.
- Main drivers of 2018 open-pit capital estimate increase compared to 2017 forecast are equipment purchases and maintenance componentization.
- Underground lateral development is expected to advance approximately 10.0 kilometres during 2018.



# Reserves case concentrator performance

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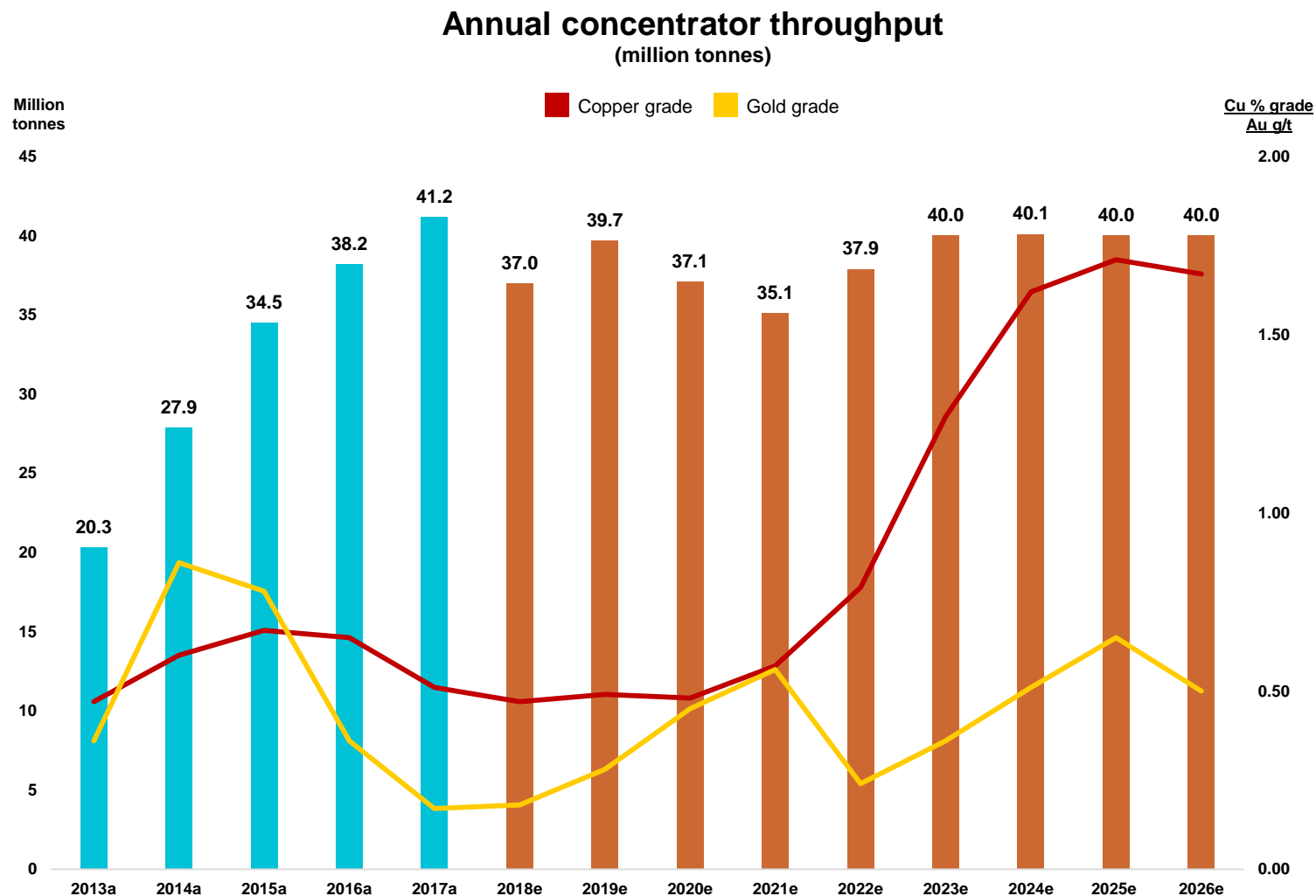
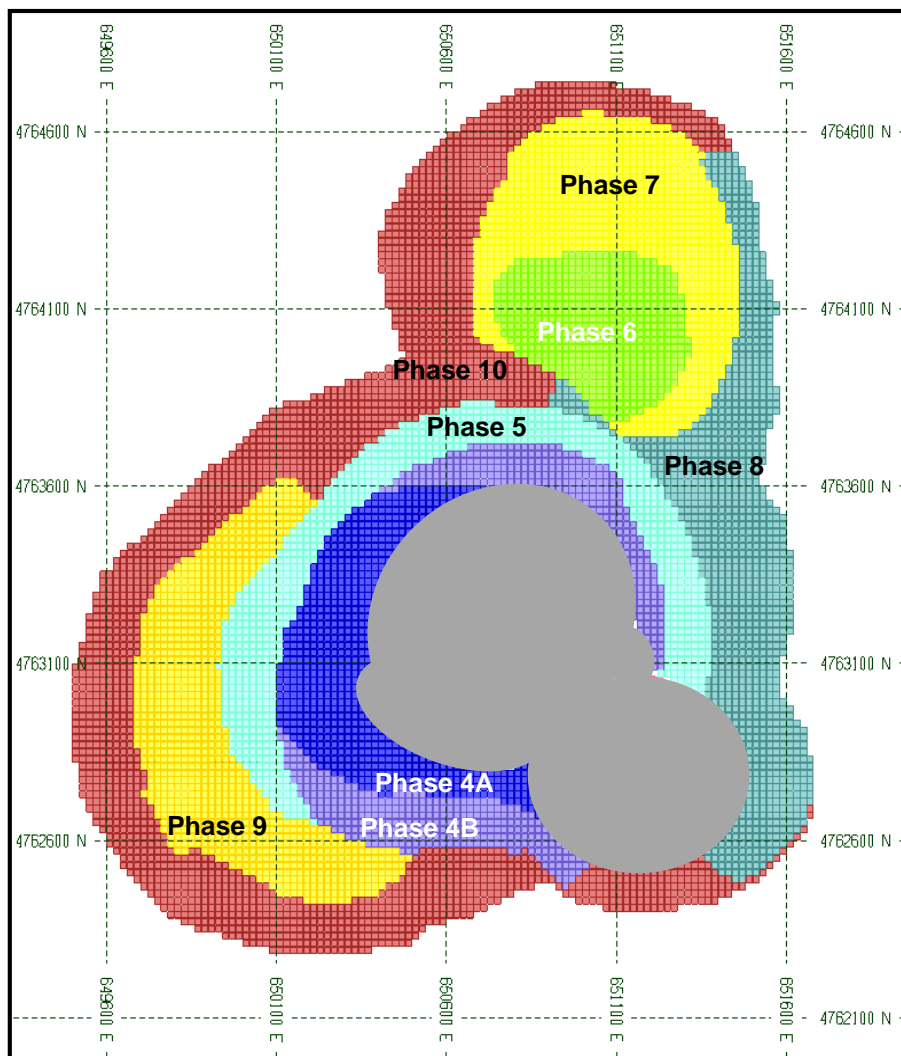


Figure: 2016 Oyu Tolgoi Technical Report; 2018 reflects annual guidance expectations.  
Note: a = actual, e = expected; 2018 throughput results from processing harder ore from Phase 4A.



# Managing near-term ore grade challenges

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- Phase 4A higher gold grades in second half of 2018
- Phase 6 continues to be mined in early 2018 and Phase 4 will be mined throughout the year
- Phase 4B stripping continues in 2018



# Oyu Tolgoi – a long-term growth opportunity

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- **Advancing** underground development
- **Creating** long-term development options
- **Demonstrated** productivity and cost improvements
- **Best copper asset** in development



# Appendix



# Helping expand the Mongolian economy

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## Mongolian Workforce

**>14,000**

At the end of Q1'18, the Oyu Tolgoi's workforce was 14,000+ strong and 94% Mongolian

## Taxes and Fees

**~\$1.8B**

2010 – Q1'18, Oyu Tolgoi had paid ~ \$1.8 billion in taxes and royalties to the Mongolian Government

## In-country Spend

**~\$7.5B**

Between 2010 and Q1'18, Oyu Tolgoi has spent ~\$7.5 billion in Mongolia<sup>1</sup>

## Taxpayer Rank

**#2**

Oyu Tolgoi was the second-highest corporate taxpayer in Mongolia for 2017

## National Procurement

**~\$2.4B**

2010 – Q1'18, Oyu Tolgoi has spent almost \$2.4 billion on Mongolian procurement

## Community Investment

**>\$28M**

2014 – Q1'18, Oyu Tolgoi has invested >\$28 million in sustainable long-term projects in the South Gobi community

1. In-country spend includes salaries, payments to Mongolian suppliers, taxes and other payments to the Government of Mongolia.



# Reserves Case cash-flow model

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Cash Flow Statement (US\$M)	Year													Total
Year Number	1	2	3	4	5	6	7	8	9	10	11	21	31	
Year To	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	20	30	40	
Gross Revenue	954	923	1,189	1,402	1,735	1,993	3,380	4,434	4,879	4,622	35,422	13,698	8,175	82,806
Realization Costs	263	237	222	212	246	311	513	664	728	709	5,955	2,502	1,206	13,770
<b>Net Sales Revenue</b>	<b>691</b>	<b>686</b>	<b>967</b>	<b>1,190</b>	<b>1,489</b>	<b>1,682</b>	<b>2,867</b>	<b>3,770</b>	<b>4,151</b>	<b>3,912</b>	<b>29,467</b>	<b>11,196</b>	<b>6,969</b>	<b>69,036</b>
<b>Site Operating Costs</b>														
Mining	191	182	177	188	188	221	220	250	287	254	3,072	2,158	1,038	8,427
Processing and Tailings	285	295	297	279	266	292	326	328	329	327	3,248	3,193	2,445	11,911
G&A and Operations Support	100	93	94	96	97	96	96	96	92	88	851	586	387	2,771
Infrastructure and Other	65	84	91	41	69	57	69	83	69	30	373	359	371	1,761
<b>Total Site Operating Costs</b>	<b>641</b>	<b>655</b>	<b>659</b>	<b>604</b>	<b>620</b>	<b>665</b>	<b>710</b>	<b>756</b>	<b>776</b>	<b>700</b>	<b>7,544</b>	<b>6,297</b>	<b>4,241</b>	<b>24,869</b>
<b>Operating Surplus / (Deficit)</b>	<b>51</b>	<b>31</b>	<b>307</b>	<b>585</b>	<b>869</b>	<b>1,016</b>	<b>2,157</b>	<b>3,013</b>	<b>3,375</b>	<b>3,213</b>	<b>21,923</b>	<b>4,899</b>	<b>2,728</b>	<b>44,167</b>
Indirect Costs	171	182	180	187	182	178	182	188	178	164	1,746	1,190	848	5,576
<b>Net Profit Before Income Tax</b>	<b>-121</b>	<b>-151</b>	<b>128</b>	<b>398</b>	<b>688</b>	<b>838</b>	<b>1,974</b>	<b>2,825</b>	<b>3,197</b>	<b>3,049</b>	<b>20,177</b>	<b>3,708</b>	<b>1,880</b>	<b>38,591</b>
Income Tax	-	-	-	-	-	-	-	-	-	-	1,496	557	254	2,307
<b>Net Profit After Income Tax</b>	<b>-121</b>	<b>-151</b>	<b>128</b>	<b>398</b>	<b>688</b>	<b>838</b>	<b>1,974</b>	<b>2,825</b>	<b>3,197</b>	<b>3,049</b>	<b>18,681</b>	<b>3,151</b>	<b>1,627</b>	<b>36,284</b>
<b>Capital Expenditure</b>														
Expansion Capital	874	1,071	1,080	831	387	92	-	-	-	-	-	-	-	4,336
Sustaining Capital	82	101	58	351	424	373	397	430	320	350	1,912	866	424	6,088
VAT & Duties	79	82	66	102	75	44	43	47	35	38	209	99	47	967
<b>Subtotal</b>	<b>1,035</b>	<b>1,254</b>	<b>1,205</b>	<b>1,285</b>	<b>886</b>	<b>509</b>	<b>440</b>	<b>477</b>	<b>354</b>	<b>388</b>	<b>2,121</b>	<b>964</b>	<b>472</b>	<b>11,391</b>
Working Capital, Capitalized Operating Costs and Closure	-47	-34	-2	80	87	76	37	6	18	49	411	187	937	1,805
VAT & Duties (Capex)	3	1	-	5	2	3	1	-	1	5	44	21	-	86
<b>Total Capital Expenditure</b>	<b>992</b>	<b>1,221</b>	<b>1,203</b>	<b>1,369</b>	<b>975</b>	<b>588</b>	<b>479</b>	<b>483</b>	<b>374</b>	<b>442</b>	<b>2,576</b>	<b>1,172</b>	<b>1,408</b>	<b>13,282</b>
<b>Net Cash Flow After Tax</b>	<b>-1,112</b>	<b>-1,372</b>	<b>-1,075</b>	<b>-971</b>	<b>-287</b>	<b>250</b>	<b>1,496</b>	<b>2,342</b>	<b>2,823</b>	<b>2,607</b>	<b>16,105</b>	<b>1,979</b>	<b>218</b>	<b>23,003</b>

## Metal Price Assumptions

	Unit	2017	2018	2019	2020	2021 Onwards
Copper	\$/lb	2.15	2.36	2.58	2.79	3.00
Gold	\$/oz	1,300	1,300	1,300	1,300	1,300
Silver	\$/oz	19.00	19.00	19.00	19.00	19.00

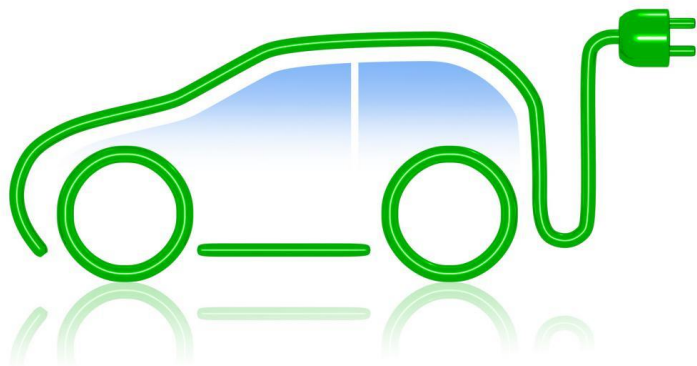
Source: Oyu Tolgoi 2016 Technical Report.



# Increasing copper demand from electric vehicles

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Vehicle Type	Contained copper
Conventional car	18 – 49 lbs. copper
Hybrid electric vehicles	85 lbs. copper
Plug-in hybrid electric vehicles	132 lbs. copper
Battery electric vehicles	183 lbs. copper
Hybrid electric bus	196 lbs. copper
Battery electric bus	814 lbs. copper



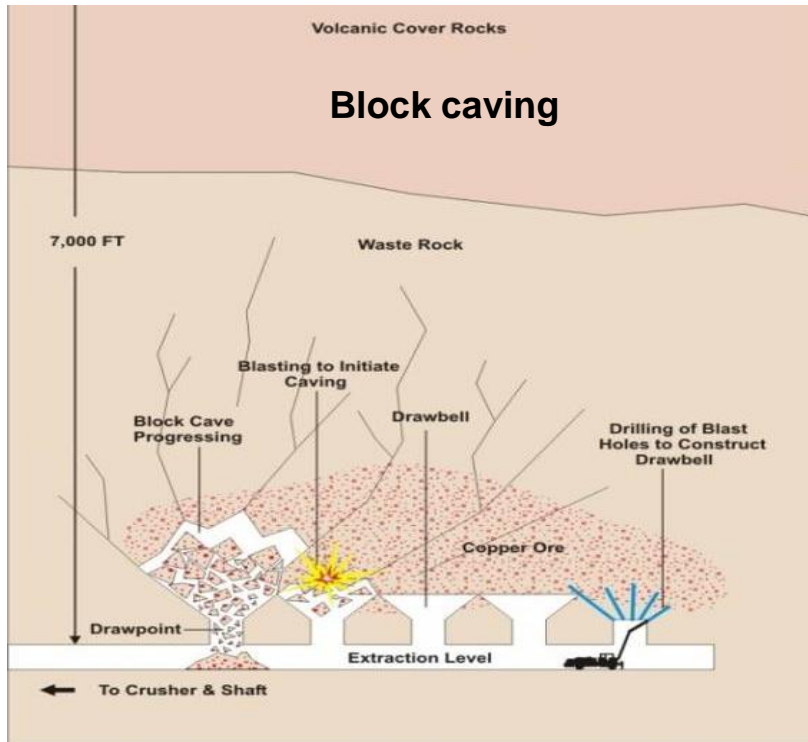
## From 2017 to 2025

- Copper demand from electric vehicles is expected to grow roughly six times from ~0.2 million to ~1.2 million tons.
- In U.S., electric vehicles expected to grow ten times from ~0.6 million to 7.0 million.
- By 2025, 27 million projected electric vehicles worldwide.
- Every charging station adds 0.7 – 8.0 kg of further copper demand; number of charging ports need to increase by 3,700% in U.S. alone by 2025.

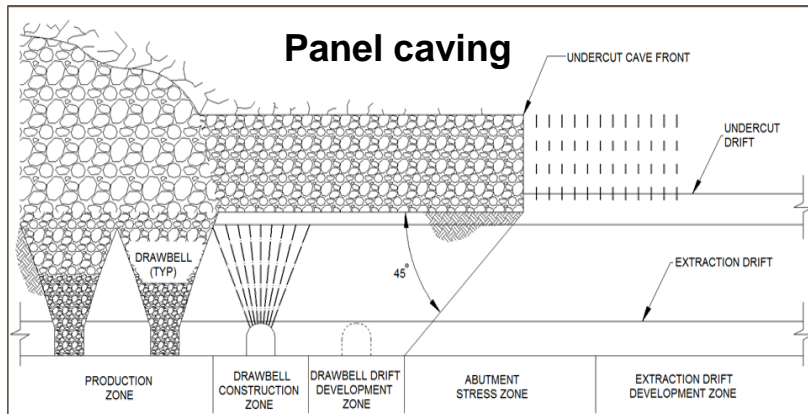


# Block cave concept

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- Gravity used to exploit deep ore body
- Cave propagation (caveability) depends on in situ stresses and host rock's ability to fracture
- Initial drill, blast and extraction focused on bottom section of ore body via drawpoint to create void
- Broken ore removal from undercut area causes ore above it to collapse (vertical propagation) and void forms drawpoint
- In traditional block cave, whole ore body extracted through static set of drawpoints at base of ore body
- Once undercutting complete, no on-going construction; only production until end of cave life



- Ore body progressively and systematically mined through moving *cave front* via series of panels
- Draw rates carefully managed to avoid riling and premature dilution
- Rate of undercut advance matched to both draw column height and production capacity



# Oyu Tolgoi at China's doorstep

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# Project finance flow of funds

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## Shareholder loan



### TURQUOISE HILL

#### Payable to Turquoise Hill\*

Shareholder loan Q1'16: \$7.0 billion

Drawdown Q2'16: \$4.3 billion

Shareholder loan Q1'18: \$4.1 billion

#### Receivable from Oyu Tolgoi\*

Shareholder loan Q1'18: \$4.1 billion

1. In accordance with the ARSHA, Turquoise Hill funded the common share investments in Oyu Tolgoi on behalf of Erdenes Oyu Tolgoi LLC; at June 3, 2017 the balance was approximately \$1.1 billion

\* Interest rate LIBOR + 6.5%

## At project finance drawdown



### TURQUOISE HILL

### Rio Tinto

Proceeds: \$4.3 billion<sup>2</sup>

\$4.3 billion<sup>3</sup>

\$4.2 billion

#### Payable to Turquoise Hill\*

Shareholder loan: \$4.1 billion

#### Receivable from Oyu Tolgoi\*

Shareholder loan: \$4.1 billion

#### Deposit from Turquoise Hill

Deposit: \$2.9 billion  
Waive 2.5%\*\* guarantee fee with amount on deposit

2. Project finance facility made directly with Oyu Tolgoi

3. Amount received net of bank fees

\* Interest rate LIBOR + 6.5%

\*\* When guarantee fee paid, Oyu Tolgoi pays 1.9% and Turquoise Hill pays 0.6%

## Priority of funding used for development

#1 Oyu Tolgoi operating cash flow

#2 Project finance funds

#3 Turquoise Hill cash

## Oyu Tolgoi cash call



### TURQUOISE HILL

### Rio Tinto

Funding

Funding

Funding

Payable to Turquoise Hill  
(2.5%\*\* guarantee fee on funds used)

#### Receivable from Oyu Tolgoi\*

Shareholder loan: ↑  
Equity loan: ↑

Shareholder loan: ↑  
Equity loan: ↑

\* Indicative, does not show the withholding tax implications | original shareholder loan interest rate LIBOR + 6.5% | Oyu Tolgoi's all-in project finance interest rate, including upfront and ongoing fees as well as the guarantee fee, is LIBOR + 6.0%

\*\* Guarantee fee - Oyu Tolgoi pays 1.9% and Turquoise Hill pays 0.6%



# Committed to sustainability

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- Strong safety performance
- Significant water conservation results – regularly exceed recycling target
- Robust biodiversity program
- Comprehensive climate change strategy
- Landmark Cooperation Agreement in 2015 with local communities
- Environmental and social impact assessments beginning in 2012



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# turquoisehill.com

Turquoise Hill Resources Ltd.  
Suite 354 - 200 Granville Street  
Vancouver, BC, Canada V6C 1S4

TRQ: TSX, NYSE & NASDAQ

Turquoise Hill is an international mining company focused on the operation and development of the Oyu Tolgoi copper-gold mine in southern Mongolia.

