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**CLEAN**  
**TEQ**

*Powering innovation*

# Battery Metals Webcast

**Sunrise Project Execution Plan**



**TSX** **CLQ**

# Cautionary statement

Certain statements in this news release constitute “forward-looking statements” or “forward-looking information” within the meaning of applicable securities laws. Such statements involve known and unknown risks, uncertainties and other factors, which may cause actual results, performance or achievements of the Company or industry results, to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements or information. Such statements can be identified by the use of words such as “may”, “would”, “could”, “will”, “intend”, “expect”, “believe”, “plan”, “anticipate”, “estimate”, “scheduled”, “forecast”, “predict” and other similar terminology, or state that certain actions, events or results “may”, “could”, “would”, “might” or “will” be taken, occur or be achieved. These statements reflect the Company’s current expectations regarding future events, performance and results, and speak only as of the date of this new release.

Statements in this news release that constitute forward-looking statements or information include, but are not limited to, statements regarding: financing of the Sunrise Project; the outlook for electric vehicle markets and demand for nickel and cobalt; completing final design and detailed engineering; making a Final Investment Decision; the timing of commencement and/or completion of construction, commissioning, first production and ramp up of the Project; the potential for a scandium market to develop and increase; metal price assumptions; cash flow forecasts; projected capital and operating costs; metal recoveries; mine life and production rates; and the financial results of the Project Execution Plan (PEP) announced on 28 September 2020 including statements regarding the Sunrise Project IRR, the Project’s NPV (as well as all other before and after taxation NPV calculations); life of mine revenue; capital cost; average operating costs before and after by-product credits; proposed mining plans and methods; the negotiation and execution of offtake agreements; a mine life estimate; the expected number of people to be employed at the Project during both construction and operations and the availability and development of water, electricity and other infrastructure for the Sunrise Project.

Readers are cautioned that actual results may vary from those presented.

All such forward-looking information and statements are based on certain assumptions and analyses made by Clean TeQ’s management in light of their experience and perception of historical trends, current conditions and expected future developments, as well as other factors management believe are appropriate in the circumstances. These statements, however, are subject to a variety of risks and uncertainties and other factors that could cause actual events or results to differ materially from those projected in the forward-looking information or statements including, but not limited to, unexpected changes in laws, rules or regulations, or their enforcement by applicable authorities; the failure of parties to contracts to perform as agreed; changes in commodity prices; unexpected failure or inadequacy of infrastructure, or delays in the development of infrastructure, and the failure of exploration programs or other studies to deliver anticipated results or results that would justify and support continued studies, development or operations. Other important factors that could cause actual results to differ from these forward-looking statements also include those described under the heading “Risk Factors” in the Company’s most recently filed Annual Information Form available under its profile on SEDAR at [www.sedar.com](http://www.sedar.com).

Readers are cautioned not to place undue reliance on forward-looking information or statements.

Although the forward-looking statements contained in this news release are based upon what management of the Company believes are reasonable assumptions, the Company cannot assure investors that actual results will be consistent with these forward-looking statements. These forward-looking statements are made as of the date of this news release and are expressly qualified in their entirety by this cautionary statement. Subject to applicable securities laws, the Company does not assume any obligation to update or revise the forward-looking statements contained herein to reflect events or circumstances occurring after the date of this news release.

Information relating to the Sunrise Project contained herein is based on the results of the recently concluded Project Execution Plan – for full details see the ASX announcement dated 28 September 2020.

This announcement is authorised for release to the market by the Board of Directors of Clean TeQ Holdings Limited.

# What is the Project Execution Plan?

- The Project Execution Plan (PEP) has been delivered by an integrated Clean TeQ / Fluor engineering team, providing a final scope and definitive estimates for capital and operating costs, an updated schedule and a strategy for project delivery
- The PEP incorporates a design philosophy based on feedback from the auto industry, seeking a significant reduction in risk in the raw material supply chain:
  - Consistent products at the lowest possible cost
  - Diversification of raw material supply to lower risk jurisdictions
  - A low carbon footprint and good environmental stewardship
  - Measurable and auditable social and community outcomes
  - Built-in recycling capability
  - Better engagement across the supply chain



# Sunrise design philosophy

# Building a new template for battery metal supply



## Cost

Clean-iX® is the simplest, lowest-cost and most direct route to battery-grade Ni/Co salts, by-passing intermediate products and third-party refining



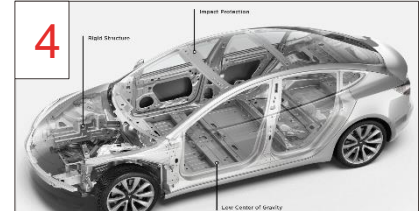
## Carbon

Sunrise will have a low carbon footprint and be located within one of Australia's largest renewable energy corridors



## Recycling

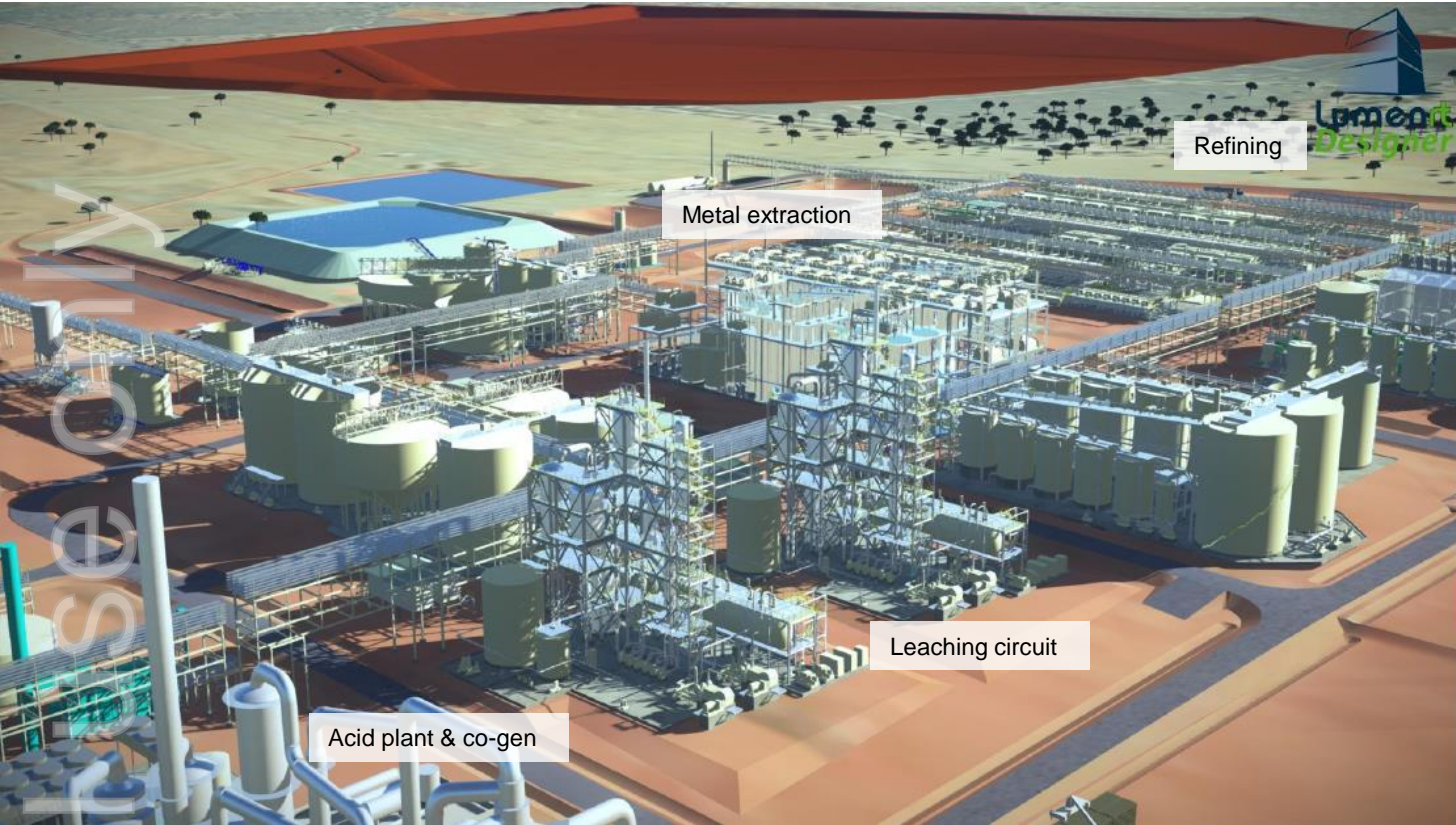
The Sunrise refinery is designed to 'take back' and recycle spent cathode to recover nickel, cobalt and other metals



## Lightweighting

Scandium can deliver lighter, corrosion resistant, formable and printable aluminum alloys for aerospace and automotive

# Sunrise Battery Materials Complex



## By the Numbers

**-US\$0.80**

Negative C1 cash cost per pound of nickel (after by-product credits) over first 25 years of operation

**1.3TWh**

Cathode capacity supported by Sunrise's contained nickel reserves<sup>1</sup>

**50+**

Years of operation based on current mineral resources and planned throughput

1. Assumes NMC811 chemistry

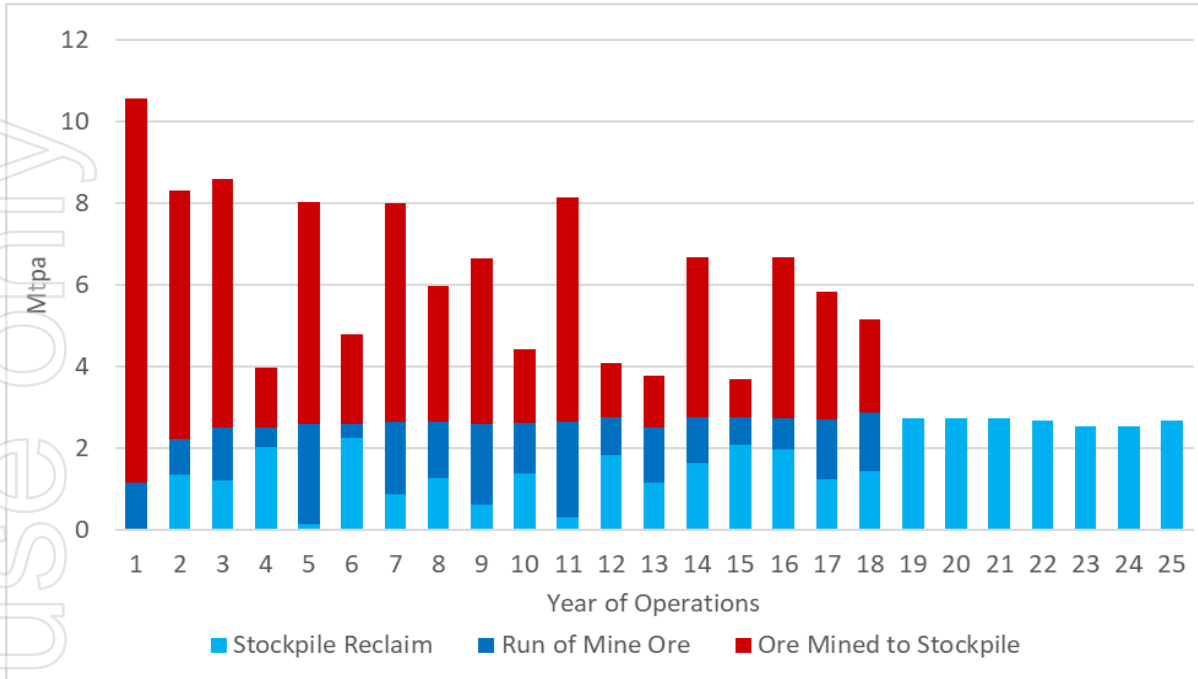
# Updated Ore Reserve<sup>1</sup>

Category	Tonnes (Mt)	Ni Grade (%)	Contained Ni (kt)	Co Grade (%)	Contained Co (kt)	Sc Grade (ppm)
Proven	65.4	0.67	438	0.11	72	55
Probable	77.9	0.52	405	0.09	70	41
<b>Proven and Probable</b>	<b>143.3</b>	<b>0.59</b>	<b>843</b>	<b>0.10</b>	<b>142</b>	<b>47</b>

- Ore Reserves materially unchanged, supporting a mine life of 50+ years
- Contained nickel supports **1.3TWh** of NMC811 cathode capacity
- Contained cobalt supports **1.7TWh** of NMC811 cathode capacity
- Scandium resource sufficient for **8Mt** of aluminum alloy<sup>2</sup>
- Over **1Moz** of platinum also defined in the Sunrise mineral resource

1. For full details see the ASX announcement dated 28 September 2020. 2. Assumes average 0.2% scandium content in alloy.

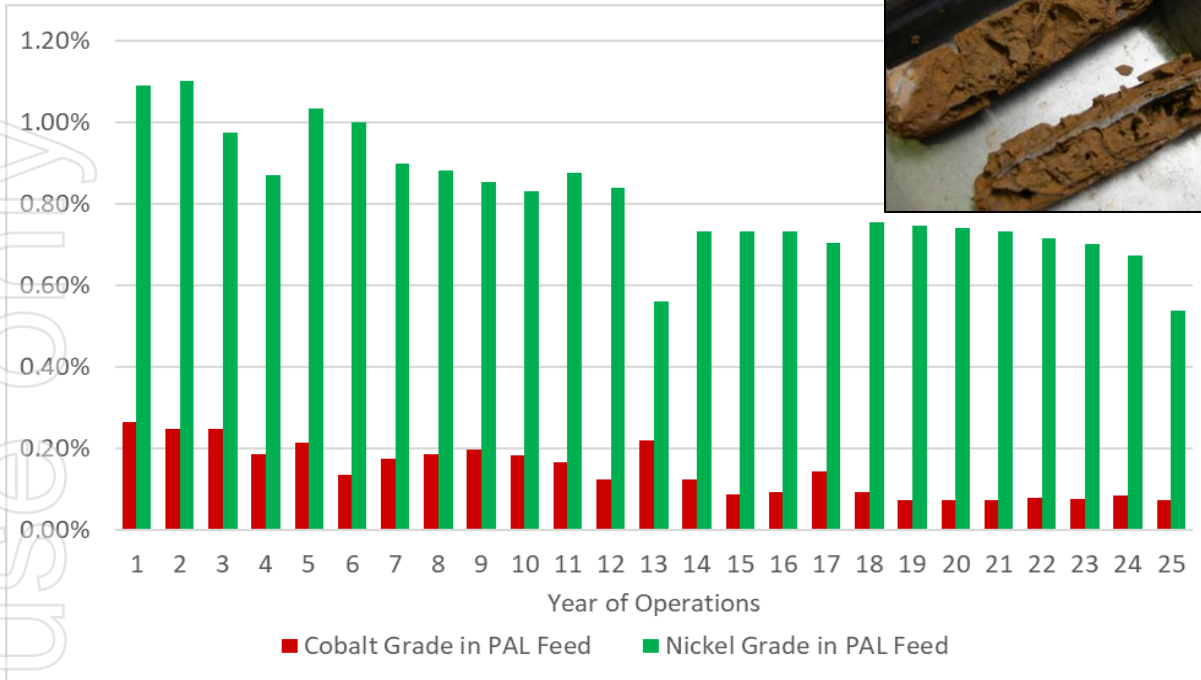
## Ore movement



- The mine plan has been updated to 'smooth' the production profile at 11Mtpa of total material moved
- This delivers a consistent 2.5Mtpa of ore to the leach circuit
- Mining ceases in Yr18 with ore reclaimed from stockpiles to Yr25
- The smoothed mine plan facilitates easier planning and contractor management

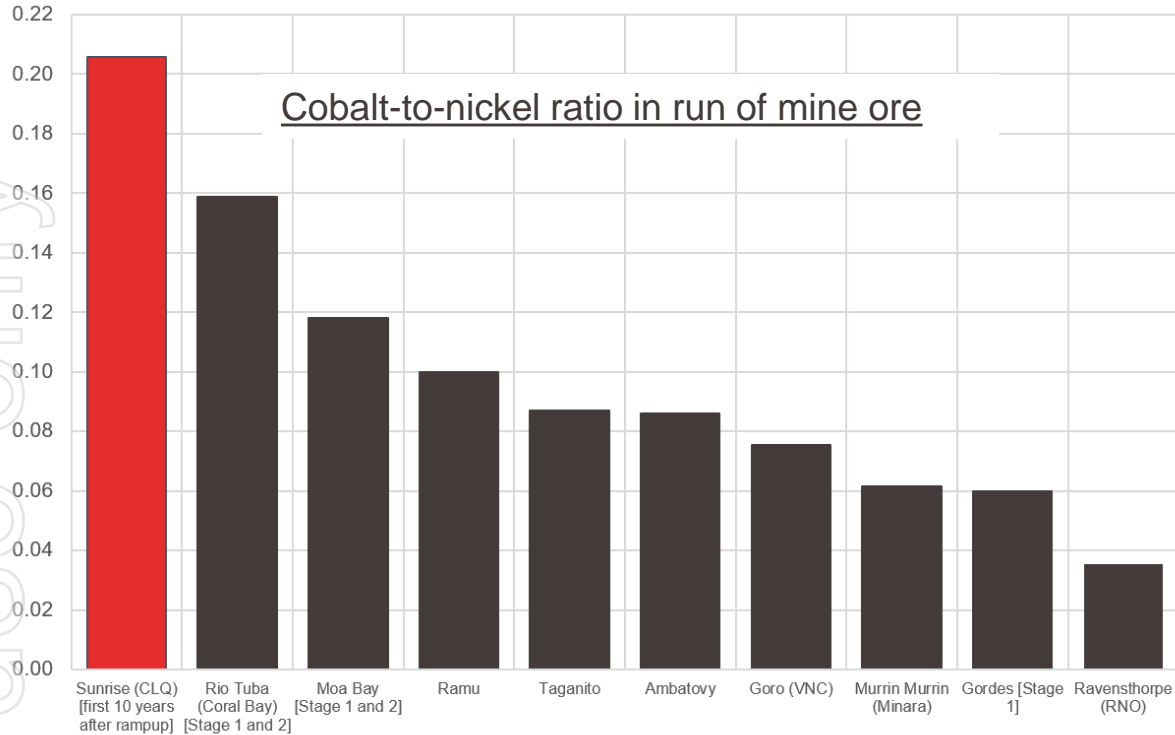


## PAL feed nickel and cobalt grades



- Ore is beneficiated to remove silica, resulting in higher head grade into the leach circuit
- Grade variability allows production to be flexed to accommodate metal price movements and, over the longer-term, changes in battery cathode chemistries

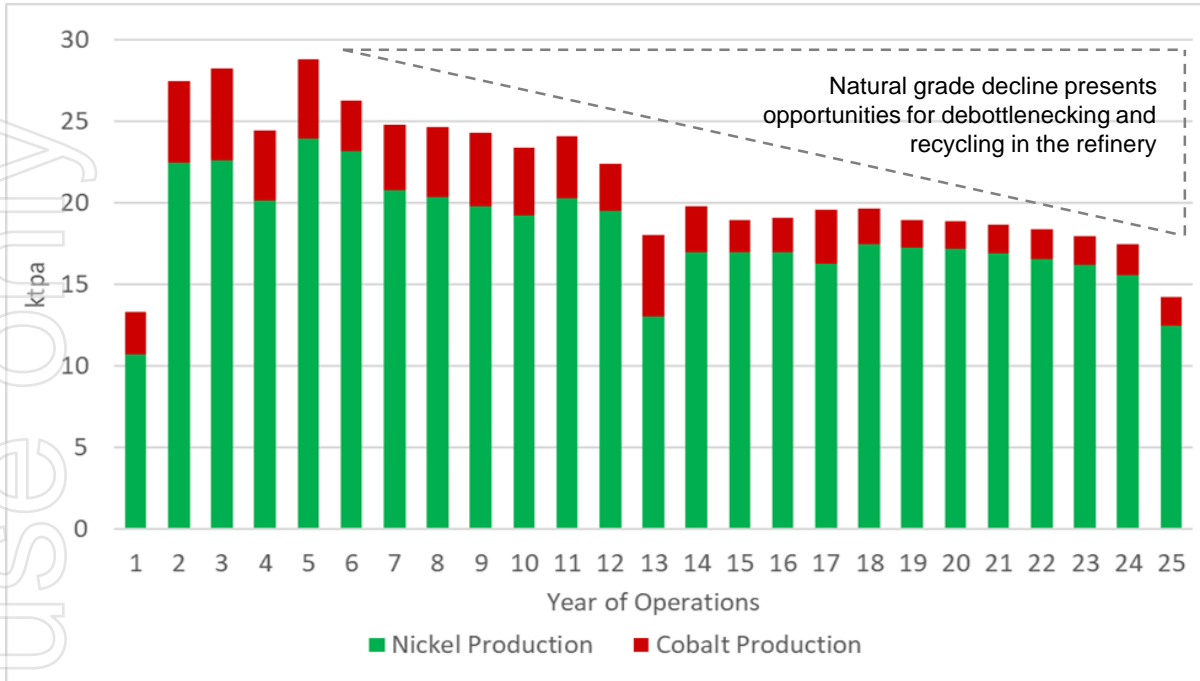
# The importance of by-products



- Sunrise's value is driven by its exceptional and unique geology, delivering:
  - excellent rheology
  - low acid consumption
  - high by-product credits, especially cobalt
- Sunrise will be one of the largest sources of cobalt in the world outside DRC
- Cobalt sales forecast to be approx. 30% of total revenue over life of operation

Source: Metal grades for operating assets are based on publicly available data, adjusted for payable metals and upgrade (beneficiation) factors where known.

## Nickel and cobalt production volumes



- All nickel and cobalt production is refined to battery-grade sulphate – no intermediate products
- Average annual (metal equivalent) production rates in first decade are 21,293tpa nickel and 4,366tpa cobalt
- Refinery nameplate capacity is 25ktpa Ni and 7ktpa Co
- Declining head grade beyond Yr5 opens significant capacity in the refinery to recycle secondary metal

# De-bottlenecking – Sunrise Phase 2

- Engineering anticipates a future de-bottlenecking to 3Mtpa – this does not form part of the current base case or financial evaluation
- Any increase in throughput beyond 2.5Mtpa is subject to regulatory approval
- As a guide, capital for de-bottlenecking in Yr4 is estimated at A\$95M to add a further A\$580M of NPV<sub>8</sub> at that time



# Emissions – a carbon life cycle assessment

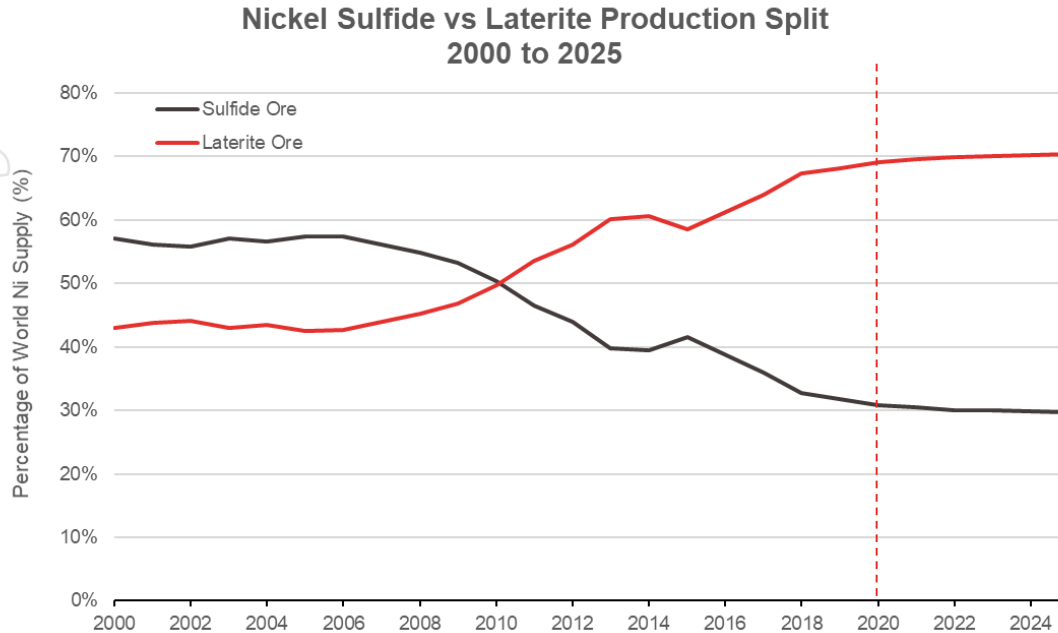


Norilsk nickel refinery, Russia

Ni product	Flowsheet	Kg CO2e / kg Ni in NiSO <sub>4</sub>
Sulphide / LME	Sulphide ore >> Conc >> Matte @ 75% Ni >> LME metal	9 – 19
Conventional PAL	Laterite ore >> PAL / CCD&SX >> MHP/MSP @ 40-55% Ni	19 – 24
Ferronickel	Laterite ore >> FeNi @ 25% Ni (RK electric furnace)	26 - 45
Nickel pig iron (BF)	Laterite ore >> NPI @ 8% Ni (blast furnace)	71
Nickel pig iron (EAF)	Laterite ore >> NPI @ 12% Ni (electric arc furnace)	99
<b>Sunrise PAL (grid)</b>	<b>Laterite ore &gt;&gt; PAL / cRIP &gt;&gt; NiSO<sub>4</sub> eluate @ 70% Ni, 18% Co</b>	<b>17</b>
<b>Sunrise PAL (renewables)</b>	<b>Laterite ore &gt;&gt; PAL / cRIP &gt;&gt; NiSO<sub>4</sub> eluate @ 70% Ni, 18% Co</b>	<b>11</b>

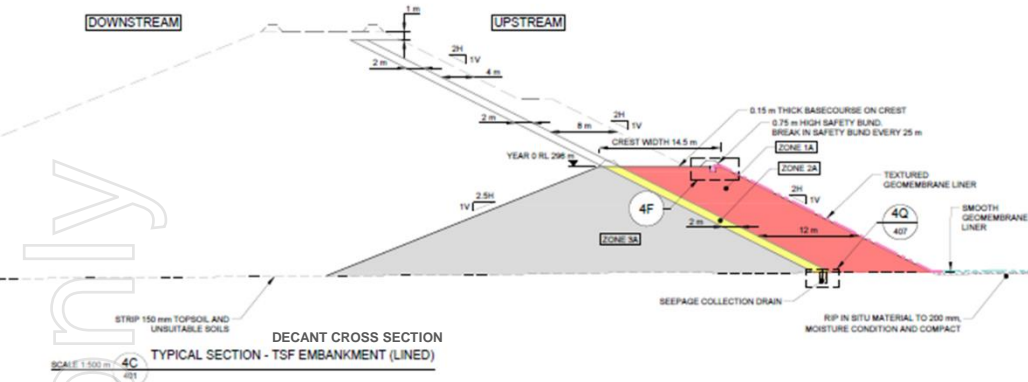
Source: Energetics, Life Cycle Assessment Report: greenhouse gas emission comparison for nickel production routes (Feb 2020). The GHG emission intensities of alternative processing routes are based on literature data that cannot be effectively harmonized. For comparison purposes the only harmonization that has occurred has been on end product (NiSO<sub>4</sub>) and using economic allocation to end products. Any comparison against Sunrise should be considered indicative only.

# Sulphide versus laterite ores



- Laterites will do most of the heavy lifting to meet EV demand for nickel and cobalt
- Accordingly, average capital intensity for nickel development will rise, as will incentive pricing
- The mining industry must develop better capability and consistency to deliver successful nickel hydromet plants

Source: CRU Nickel & Cobalt Market Study, October 2018.



- The Sunrise tailings storage facility (TSF) benefits from high local evaporation rates, utilizing HDPE liners and downstream construction
- TSF design adheres to NSW Dam Safety Committee and Australian National Committee on Large Dams Guidelines
- Golder retained to provide design and engineering support
- Contrast with deep sea tailings, which presents a real threat to the sustainability credentials of the nickel industry and the battery supply chain

# Stakeholder benefits



- 1,700 jobs during three-year construction period
- Approximately 500 skilled, site-based roles in operation
- Staff salaries of A\$1.2 billion over life of operation
- Community contributions of A\$17 million for local projects
- State royalties for NSW of A\$750 million
- Company tax payments of A\$3.5 billion



# Scandium – a new generation of alloys

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## Pistons

Higher strength scandium containing alloys with improved warm temperature performance

## Radiator

Scandium containing brazing alloys to allow for thinner sheets to be used reducing weight and increasing heat transfer coefficient.

## Bumper & Crash Structures

Higher strength 6xxx and 7xxx alloys with scandium means replacement of heavy steel bumpers with no compromise on safety

## Panels & Doors

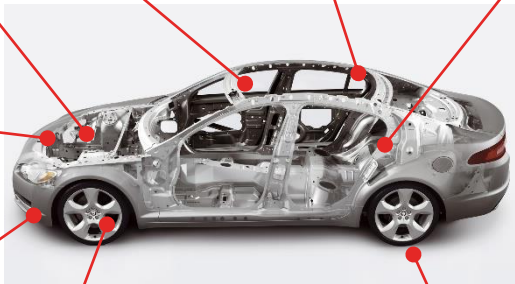
Scandium increases formability allowing more unique shapes to be used in car designs

## Main Body

Higher strength auto alloys with scandium means consolidation of alloy types for frames

## Body Nodes

Higher strength auto alloys with scandium means consolidation of alloy types for nodes.



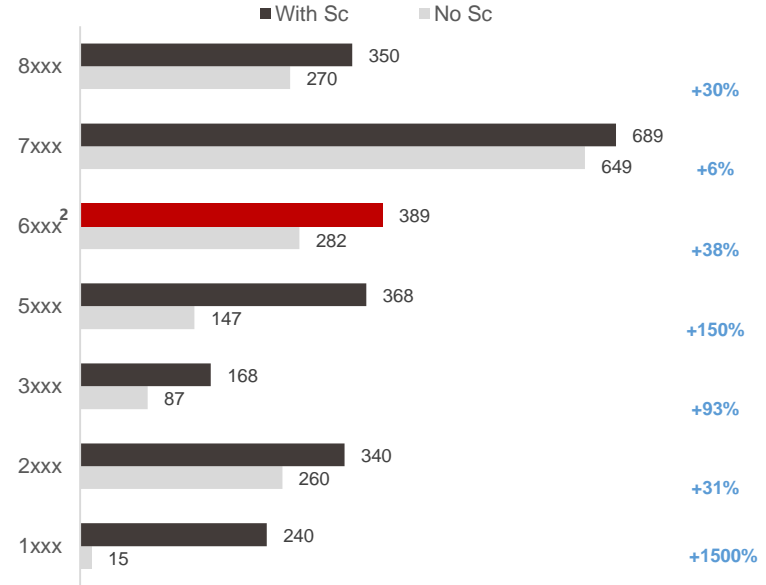
## Wheels

High strength scandium containing alloys allow for thinner, lighter wheels to be forged with the possibility of new forming technologies.

## Seat Frames & Tracks

Lighter and higher strength extrusions will allow for a significant weight reduction in seat assemblies.

Scandium Effect on Yield Strength (MPa)<sup>1</sup>



Notes: 1. Hydro Aluminium R&D Sunndal, 2012. 2. Work completed by Clean TeQ.



# Economic evaluation

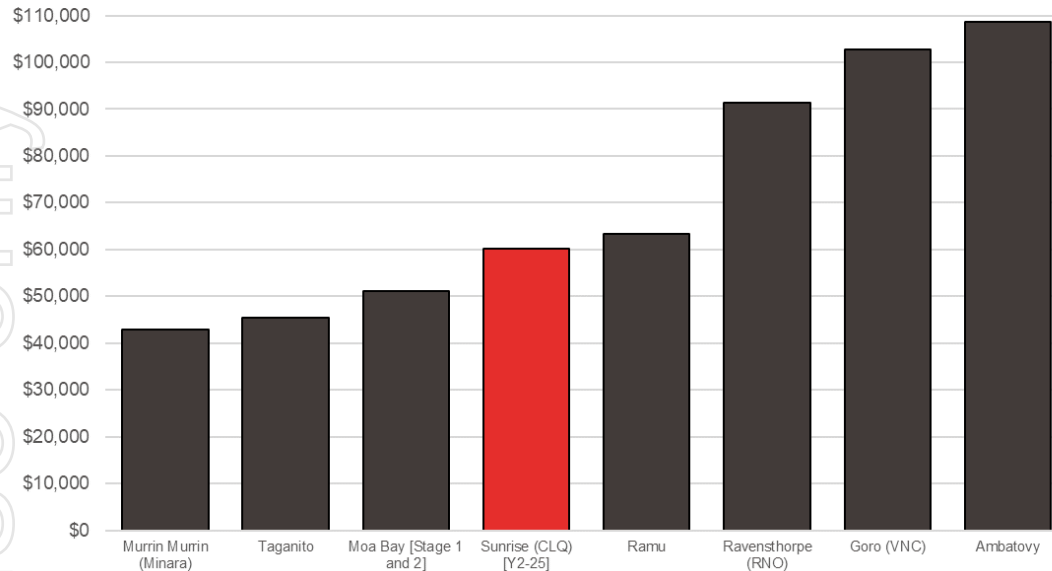
# Capital estimate

Capital Cost	US\$M
Site Development Costs	20
Mining Costs	25
Ore Leach Costs	289
Refinery Costs	190
Reagents Costs	176
Services and Infrastructure Costs	297
Offsite Operations Facilities	59
<b>Total Direct Costs</b>	<b>1,055</b>
EPCM	185
Owner's Costs	110
Other Indirect Costs	309
<b>Total Direct and Indirect Costs</b>	<b>1,658</b>
Contingency	168
<b>Total Including Contingency</b>	<b>1,826</b>

- Fluor has signed-off on a AACE Class 3 capital estimate at a p50 (-10%/+15%), with 80% of all equipment and material costs in the estimate supported by vendor quotations
- Schedule is three years from EPCM signing to first production, plus a two-year ramp-up
- Capital estimate looks reasonable and realistic when benchmarked against delivered projects of similar scale

# Benchmarking capital intensity

Capital Intensity<sup>1</sup> (US\$/t NiEq actual production)



- Expect new nickel laterite costs to be circa US\$50-60k/t Ni-eq capacity
- Significant execution risk on mega-projects (>40ktpa Ni)
- Some assets have operated reliably for many decades
- Sunrise will be a fourth-generation PAL circuit and incorporate the learnings from earlier projects

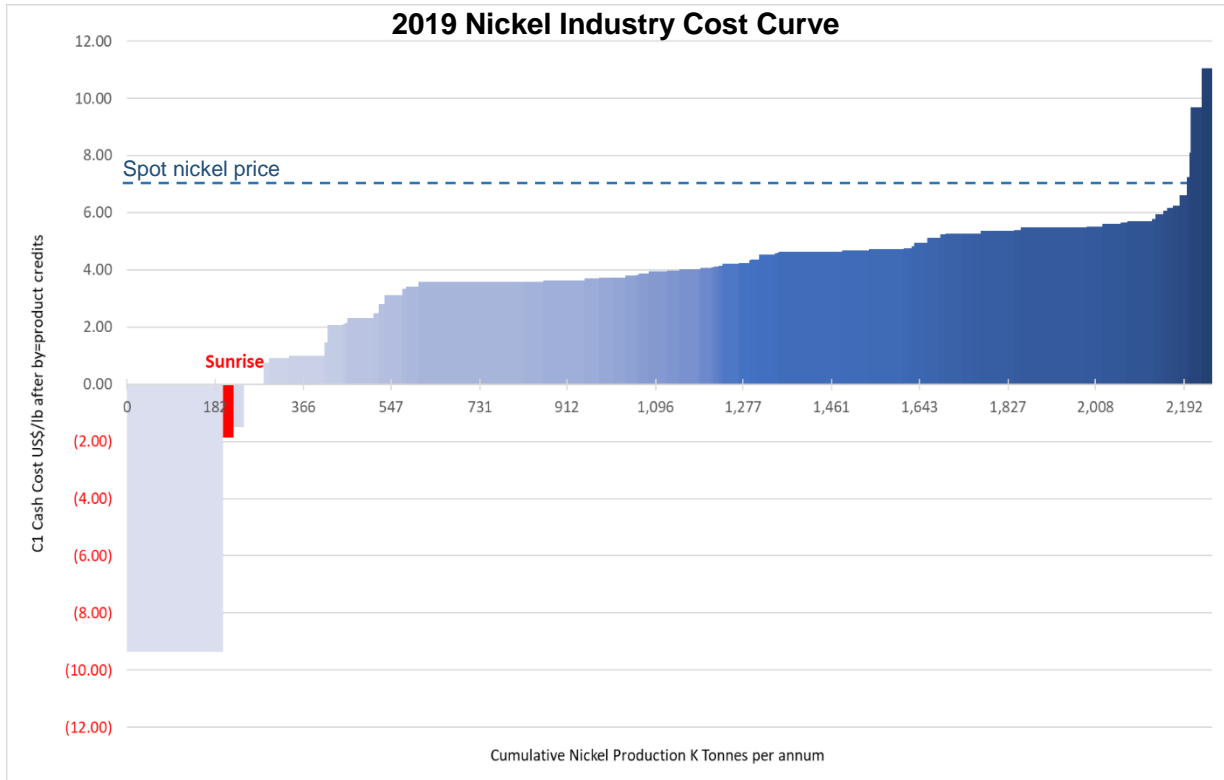
<sup>1</sup> Source: Company estimates based on publicly available data. Production numbers for operating assets use actual maximum production rates achieved at the operation. Sunrise production is set at the average output for life of the operation, which is equivalent to 77% of design capacity. The nickel-equivalent production value assumes a nickel price of US\$9.96/lb and a cobalt price of US\$26.87/lb; adjustments are made for payables depending on the final products manufactured (MHP/MSP/oxides/sulphate); and Sunrise includes ammonium sulphate and scandium credits. Historic capital costs on existing plants have been escalated to 2020 real dollars using the CE Plant Cost Index (<https://www.chemengonline.com/pci-home>) and expansion and/or remediation capital has also been included where known. Rio Tuba was excluded as comparisons were difficult, given no mining operation was included in capital. Gordes was excluded due to a lack of current information.

# Operating cost

Operating Costs (US\$/lb Ni)	Yr2-11	Yr2-25
Mining costs	0.84	0.76
Processing costs	3.14	3.47
General, Admin & Other Site Overheads	0.18	0.21
Haulage & Port	0.15	0.14
<b>C1 Costs (before by-products)</b>	<b>4.31</b>	<b>4.76</b>
<b>By-product credits</b>		
Cobalt Credits	(5.81)	(4.64)
Scandium Credits	(0.31)	(0.58)
Ammonium Sulphate Credits	(0.17)	(0.16)
<b>Total by-product credits</b>	<b>(6.28)</b>	<b>(5.38)</b>
<b>Total C1 cost</b>	<b>(1.97)</b>	<b>(0.80)</b>
Depreciation	2.22	2.33
<b>Total C2 cost</b>	<b>0.24</b>	<b>1.53</b>
Royalties, interest and other costs	0.88	0.75
<b>Total C3 cost</b>	<b>1.17</b>	<b>2.41</b>
<b>Total cash cost FOB</b>	<b>(1.04)</b>	<b>0.08</b>

- Opex includes an allowance of US\$32Mpa for maintenance and sustaining capital
- Opex includes closure and decommissioning costs in Yr26
- Headcount of approximately 500 people in operations

# Nickel C1 cost curve



Source: Wood Mackenzie

# Integrating metal supply

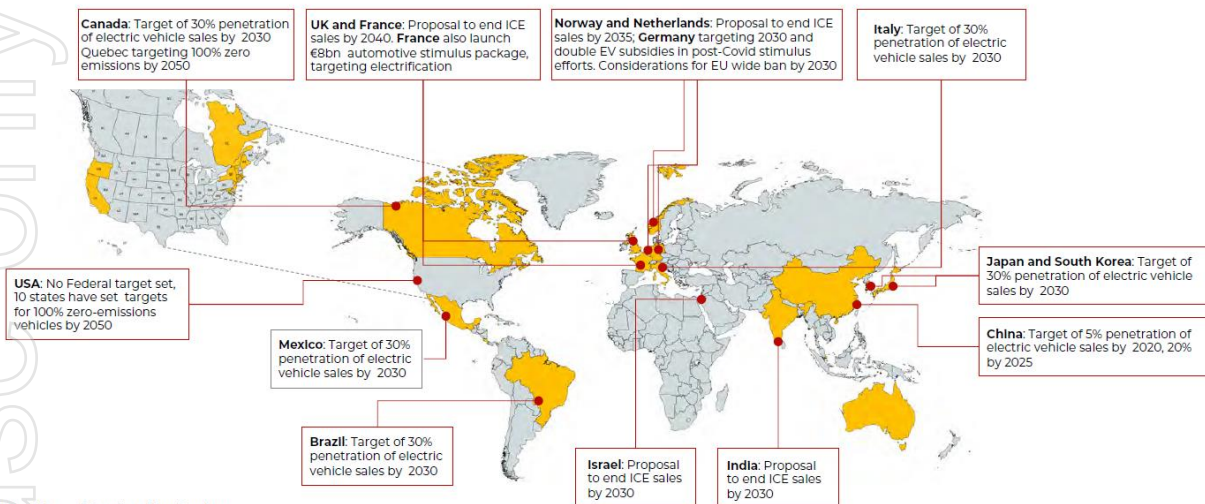
	Spot Ni+Co Prices	Incentive Ni+Co Prices	Historic High Ni+Co Prices
Procurement savings (US\$Mpa)	<b>219</b>	<b>480</b>	<b>1,409</b>
Battery pack savings (\$/kWh)	<b>6.34</b>	<b>13.86</b>	<b>40.70</b>
Cost impact (\$/EV)	<b>317</b>	<b>693</b>	<b>2,035</b>

## Nickel and cobalt price volatility is a significant risk to EV industry margins

Note: Indicative notional cash procurement savings that may be achieved by an EV supply chain participant as owner of the Sunrise Project and sole offtaker vs the cost of procuring the equivalent metal units in the open market. Uses PEP average production rates and real cash costs (including royalties but excluding depreciation and tax) for Sunrise over Years 2-11 of operations. Battery pack cost savings assumes that all nickel and cobalt production from Sunrise is used for LiB production (even if production molar ratios do not match LiB molar ratio). Price decks are: Spot \$6.76/lb Ni and \$15.41/lb Co; Incentive \$9.96/lb Ni and \$26.87/lb Co; and Historic High \$25/lb Ni and \$50/lb Co. No sulphate premia is included for nickel or cobalt. Battery pack savings and cost impacts assumes NMC811 chemistry and an average 50kWh battery pack.

## EV sales forecast to reach 3.1% of global sales in 2020

Global policy statements supporting EV adoption:



Note: ICE - Internal Combustion Engine

Source: Benchmark Mineral Intelligence. Prices quoted in 2020 real terms.

- Adopted nickel and cobalt price forecasts from Benchmark Mineral Intelligence
- Weighted average forecast (metal equivalent) sulphate prices over life of mine are:
  - Nickel: US\$24,200/t (including sulphate premium)
  - Cobalt: US\$59,200/t
- Global battery plant capacity to increase from 486GWh in 2019 to 2,656GWh in 2029 (19% CAGR)



# Financial evaluation

## Financial assumptions

Mine life	25 years
Discount rate (real, ungeared)	8%
Corporate tax rate	30%
NSW state royalty	4%
Ni price	US\$24,200/t
Co price	US\$59,200/t
Scandium oxide price	US\$1,500/kg
Ammonium sulphate price	US\$130/t
USD/AUD rate	0.70

## Valuation outputs (Yr1-25)

Net present value	<b>US\$1.21B</b>
Post-tax IRR	<b>15.4%</b>
Payback period	<b>5.1 years</b>
Total revenue	<b>US\$16.3B</b>
Total EBITDA	<b>US\$10.8B</b>
Avg. annual post-tax FCF	<b>US\$308M</b>



**Tim Kindred**

Sunrise Project & Start-Up Director

**Peter Voigt**

Founder and Chief Technology Officer

**Ben Stockdale**

Chief Financial Officer

**Luke Cox**

Manager of Mining and Geology

**Simon Donegan**

Manager of Sunrise Process Design

**Tim Langan**

Manager of Scandium Alloy Programs



# Q&A

# Appendix – Sunrise Project Physicals

Year		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Ore	MT		10.57	6.94	7.36	1.95	7.87	2.52	7.12	4.70	6.02	3.03	7.83	2.25	2.61	5.06	1.61	4.71	4.59	3.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste	MT	2.00	9.43	4.06	3.64	9.05	3.13	8.47	3.88	6.30	4.98	7.97	3.17	8.75	8.39	5.94	9.39	6.29	6.41	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ore to Stockpile	MT		9.41	6.08	6.08	1.47	5.44	2.20	5.35	3.31	4.04	1.78	5.49	1.32	1.26	3.90	0.93	3.94	3.11	2.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROM Ore	MT		1.16	0.86	1.28	0.48	2.43	0.32	1.77	1.39	1.97	1.25	2.34	0.92	1.35	1.15	0.68	0.76	1.47	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stockpile Reclaim	MT		0.00	1.37	1.22	2.02	0.15	2.26	0.87	1.26	0.63	1.38	0.30	1.84	1.16	1.62	2.09	1.98	1.24	1.44	2.74	2.73	2.72	2.69	2.54	2.54	2.68	
Mill Feed	MT		1.16	2.23	2.50	2.50	2.58	2.58	2.64	2.65	2.61	2.63	2.64	2.76	2.51	2.78	2.77	2.74	2.71	2.87	2.74	2.73	2.72	2.69	2.54	2.54	2.68	
PAL Feed	MT		1.16	2.23	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
PAL Feed Grade Ni	%		1.09%	1.10%	0.98%	0.87%	1.03%	1.00%	0.90%	0.88%	0.85%	0.83%	0.88%	0.84%	0.56%	0.73%	0.73%	0.73%	0.70%	0.76%	0.75%	0.74%	0.73%	0.72%	0.70%	0.67%	0.54%	
PAL Feed Grade Co	%		0.27%	0.25%	0.25%	0.19%	0.22%	0.14%	0.17%	0.19%	0.20%	0.18%	0.17%	0.13%	0.22%	0.13%	0.09%	0.09%	0.15%	0.09%	0.07%	0.07%	0.08%	0.08%	0.08%	0.08%	0.08%	
PAL Nickel Recovery	%		84.84%	91.66%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.84%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%	92.60%
PAL Cobalt Recovery	%		83.56%	90.27%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.44%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	
Nickel Production (metal eq.)	T		10,742	22,501	22,596	20,183	23,941	23,186	20,792	20,401	19,792	19,252	20,282	19,532	13,027	16,975	16,963	16,970	16,292	17,514	17,272	17,180	16,953	16,595	16,249	15,593	12,497	
Cobalt Production (metal eq.)	T		2,585	4,993	5,676	4,255	4,909	3,115	3,985	4,260	4,501	4,180	3,788	2,869	5,002	2,865	2,018	2,139	3,315	2,118	1,698	1,704	1,721	1,822	1,742	1,918	1,714	
Amsul Production	T		31,522	64,851	66,974	57,545	67,873	61,150	58,167	58,052	57,348	55,229	56,463	52,198	43,447	46,403	44,009	44,363	46,116	45,534	43,813	43,622	43,156	42,628	41,622	40,630	33,057	
Scandium Sales (Sc2O3 eq.)	T		0	0	2	3	5	7	10	13	16	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	