

Cape Flattery Silica

AusIMM Resourceful FNQ 2022



**CAPE
FLATTERY
SILICA**

Metallica Minerals Limited (ASX: MLM)
A new economy minerals company



**Metallica Minerals
is an Australian
development
company focused on
delivering high purity
silica sand to a
diversified global
customer-base.**



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Listing Rule Statements and Competent Person Statement



ASX Announcements cited

The following ASX Announcements are cited in this presentation

1. See ASX Release 7 April 2022 “Significant Increase in Measured & Indicated Resources at Cape Flattery Silica Project”
2. See ASX Release 15 June 2021 “Mining Lease Application lodged for Cape Flattery Silica”
3. See ASX Release 21 March 2022 “Cape Flattery Silica Pre Feasibility Study”
4. See ASX Results 28 April 2022 “Positive Metallurgical test work results achieved at CFS”
5. See ASX Release 10 November 2021 “Cape Flattery Silica Sand Project Production Target”

The statements in this presentation concerning Mineral Resource Estimates at the CFS Project are derived from ASX announcements 1, 3 and 5 above.

Listing Rule 5.23: The Company confirms that it is not aware of any new information or data that materially affects the information included in these original market announcements and, in the case of estimates of mineral resources or ore reserves and production forecasts and forecast financial information, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcements continue to apply and have not materially changed. The company confirms that the form and context in which the Competent Person’s findings are presented have not been materially modified from the original market announcement.

Statements concerning production targets and related financial information are derived from ASX announcements 3 and 5 above.

Listing Rule 5.19.2: The Company confirms that all material assumptions underpinning the production target and corresponding financial information continue to apply and have not materially changed.

Competent Person Statement

The information in this presentation relating to mineral resource estimates or ore reserves is based on information compiled and reviewed by Mr Carl Morandy, who is a Member of the Australian Institute of Mining & Metallurgy. Carl is a fulltime employee of Ausrocks Pty Ltd and has sufficient experience that is relevant to the styles of mineralisation under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Carl consents to the inclusion in the presentation of the matters based on his information in the form and context in which it appears.

Ore Reserve Category	Tonnage Mt	SiO ₂ %	Fe ₂ O ₃ %	TiO ₂ %	Al ₂ O ₃	LOI%	Waste Mt	Silica Sand Mm ³
Probable Reserve	46	99.18	0.12	0.14	0.11	0.19	2.6	28.76

- > High purity silica sand resource of 52.2Mt @ 99.18% SiO₂
- > 144 Drill holes completed
- > In-situ SiO₂ averages 99.2% at an 98.5% cut-off grade

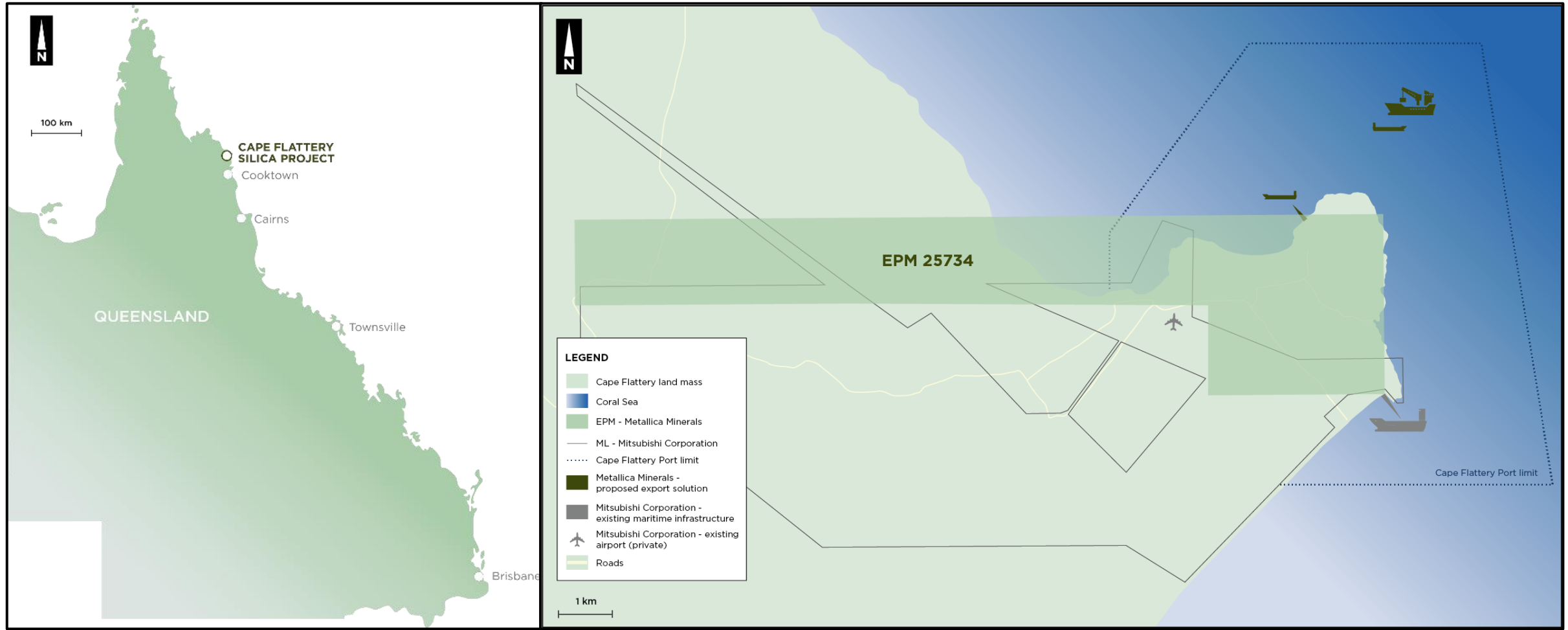
Classification	Silica Sand (Mt)	SiO ₂ %	Fe ₂ O ₃ %	Al ₂ O ₃ %	TiO ₂ %	LOI %	Silica Sand (Mm ³)	Density (t/m ³)
Measured Resource	16.7	99.26	0.10	0.08	0.13	0.17	10.4	1.6
Indicated Resource	35.2	99.14	0.13	0.13	0.14	0.19	22.0	1.6
Inferred Resource	0.3	99.06	0.14	0.16	0.12	0.23	0.20	1.6
Total	52.2	99.18	0.12	0.11	0.14	0.18	32.60	1.6

See ASX Release 7 April 2022 “Significant Increase in Measured & Indicated Resources at Cape Flattery Silica Project”

Cape Flattery Silica Location



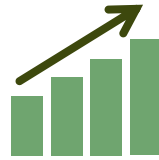
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Company Highlights



Cape Flattery Silica
is **100% owned** by
Metallica Minerals



Demand for
Silica Sands expected
**to grow for solar
panel production**



**46Mt Reserve
high purity**
Silica Sand
resource₁



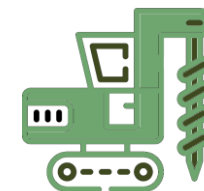
**Mining Lease
Application
lodged₂**



Cape Flattery Silica
is adjacent to the
**current port
boundary**



**Strong financial
results from
Pre-Feasibility
Study₃**



**Major drilling
programs
completed**



**Excellent
Metallurgical
test results
received₄**

1. See ASX Release 7 April 2022 "Significant Increase in Measured & Indicated Resources at Cape Flattery Silica Project", 2. See ASX Release 15 June 2021 "Mining Lease Lodged for Cape Flattery Silica"
3. See ASX Release 21 March 2022 "Cape Flattery Silica PFS – confirms excellent economics, 4. See ASX Results 28 April 2022 "Positive Metallurgical test work results achieved at CFS"

Pre-Feasibility Study outcomes₃



3. See ASX Release 21 March 2022 "Cape Flattery Silica PFS – confirms excellent economics"

* The price assumption is for a 'low iron' silica sand product suitable for solar PV cover glass manufacturing (FOB-Cape Flattery Port)

+Capital development costs include a 15% contingency (\$9.6m)

Project of Regional Significance



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Cape poised for silica mine boom as project gets 'significant' status

An emerging Cape York silica miner could be granted a major water allocation after being deemed a state significant project by Queensland's Department of Regional Development.

Peter Carruthers [Follow](#)

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Quarry

Environmental News, Industry News, News

Metallica turns the tap on Cape Flattery silica sand project

HENRY BALLARD
25/02/2022, 12:27 pm 75

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Mining


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March 16, 2022 | Special Report

AUSTRALIA'S MINING MONTHLY

24 February 2022

Water for Metallica



METALLICA Minerals can tap into a 25,000 megalitre unallocated water reserve at Cape York in Queensland's Far North following the listing of the Cape Flattery silica sand project as a project of regional significance by the Department of Regional Development, Manufacturing and Water.

The silica sand story



- > Silica sand is the most-used commodity on the earth, following air and water.
- > It is the key ingredient in glassmaking, including high-tech glass and specialty solar panels.
- > High-quality silica sand, like Cape Flattery's silica, is required for production of hi-tech glass.
- > Increasing demand for high-grade silica sand underpinned by:
 - » population growth
 - » accelerating electrification
 - » carbon neutrality objectives and Government policy
 - » transition from fossil fuels to greener technologies, particularly solar energy.
- > Silica is a finite resource that is running out.



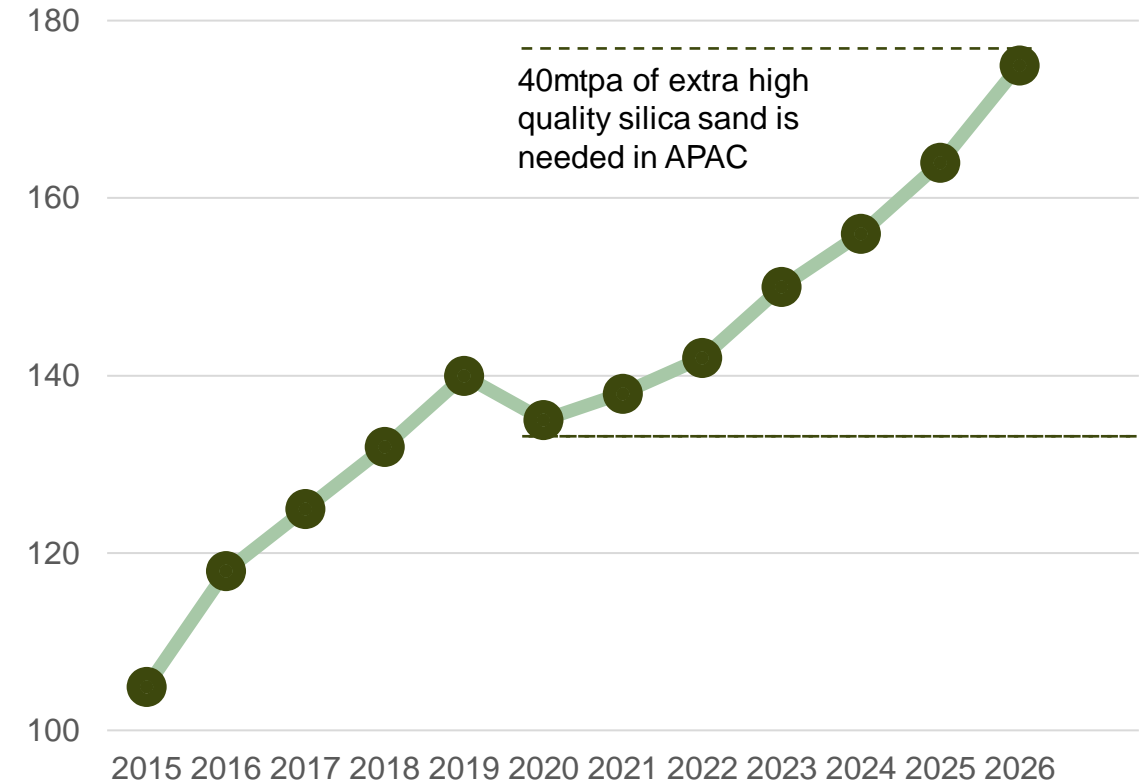
Growth in solar panels



- > Solar PV capacity has grown 20-fold over the past decade and is set to triple over the next 10 years.
- > IMARC estimated the global silica sand market could grow from US\$7B to US\$20B in 2024.*
- > The top five Chinese solar glass producers had a 68.5% share of global market capacity in 2020.

*IMARC, 2021: <https://www.imarcgroup.com/silica-sand-manufacturing-plant>

APAC Sales Volume (mtpa)



Source: IMARC Group, Report Title: "Asia Pacific Silica Sand Market: Industry Trends, Share, Size, Growth, Opportunity and Forecast 2021-2026," February 2021

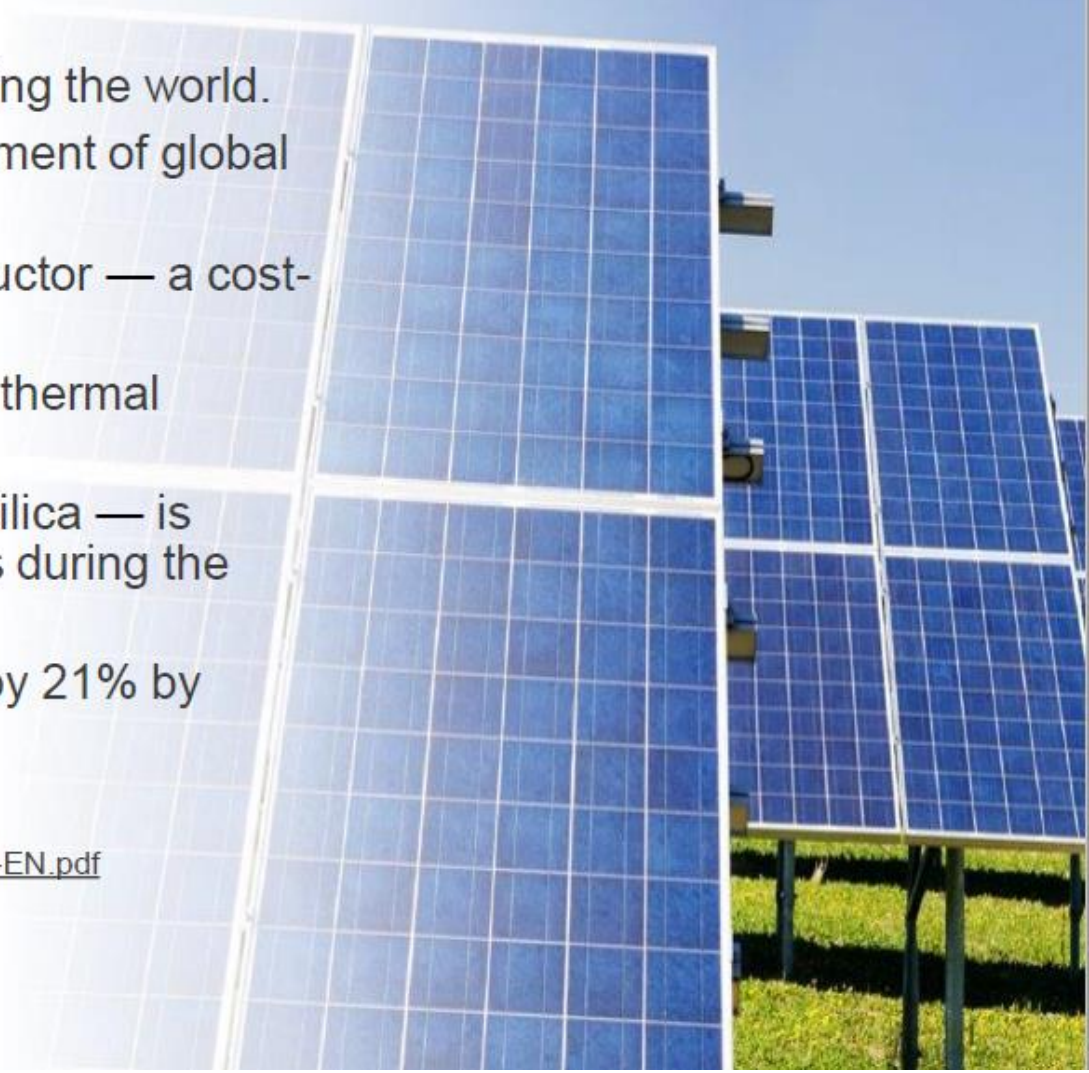


From silica to solar panels — our sand will help the transition to net zero

- > Global trend to move to net zero emissions by 2050.
- > Silica is a 'new economy' mineral and has a role in decarbonising the world.
- > As a key component of solar panels, it is critical in the development of global renewable energy.
- > Silica is used in more than 90% of solar panels as a semiconductor — a cost-efficient material with good energy efficiency.
- > It offers high corrosion resistance, long-term durability, optimal thermal expansion properties, good photoconductivity and low toxicity.
- > Every kilogram of polysilicon — a refined material made from silica — is expected to save more than 7,000 kilograms of CO2 emissions during the lifetime of a solar panel.*
- > Increased development of solar could reduce CO2 emissions by 21% by 2050.**

*SolarPower Europe/EPIA and WACKER analysis, 2017: <https://www.wacker.com/h/medias/7416-EN.pdf>

**IRENA, 2019: https://irena.org/-/media/Files/IRENA/Agency/Publication/2019/Nov/IRENA_Future_of_Solar_PV_2019.pdf



Pathway to net zero



- > The International Energy Agency (IEA) highlights reaching net zero by 2050 will be based largely on renewables, with solar power as the single biggest supply source.
- > IEA report states the pathway to net zero requires annual additions of solar PV to reach 630 gigawatts and wind power to reach 390 gigawatts by 2030.*
- > Together this is four-times the record level achieved in 2020.
- > For solar PV, this means installing the world's current largest solar park roughly every day.

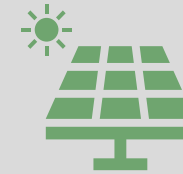
*IEA, 2021: <https://iea.blob.core.windows.net/assets/4719e321-6d3d-41a2-bd6b-461ad2f850a8/NetZeroby2050-ARoadmapfortheGlobalEnergySector.pdf>



CFS: a significant emissions abatement opportunity



- > CFS's 1.35 mtpa production of high quality Silica sand, could produce over 133 million 375W solar panels on the basis of 74% of the panel comprised of SiO₂
- > That's equivalent to 3.35 billion panels over a 25 year mine life at full production
- > With an assumed output of 4.0 kWh/day, those panels have the potential to generate over 41,312 MWh of renewable energy over their operating life (25 years)



Enough Silica to produce over **3.35 billion** solar panels



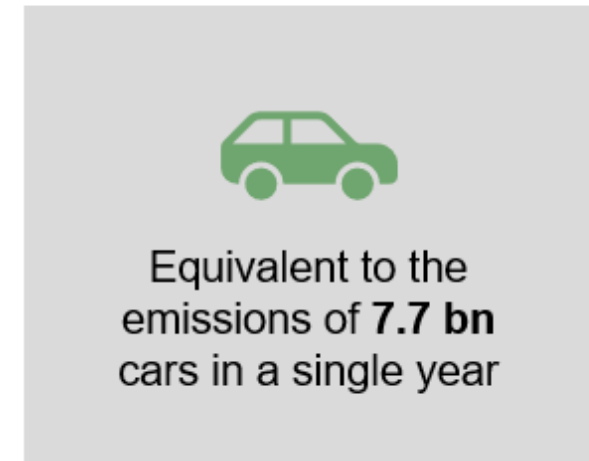
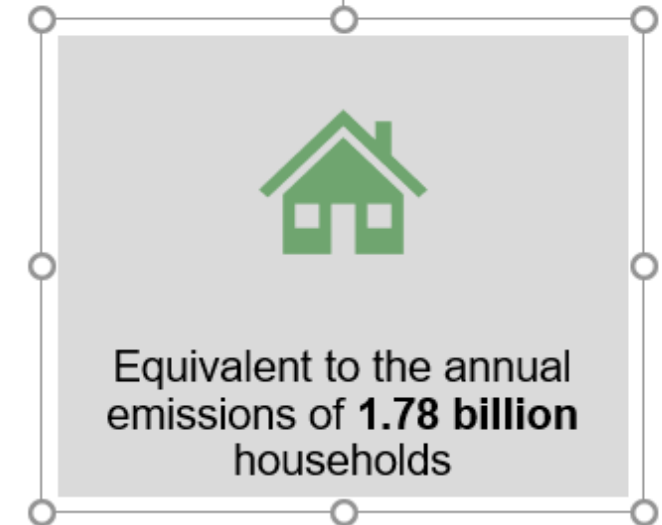
With the potential to generate over **41,312 MWh** of renewable energy

** Detailed analysis of energy production and emissions abatement opportunity carried out by Arche Energy using information derived from third parties, heuristics and assumptions.*

CFS: a significant emissions reduction opportunity



- > The emissions intensity of a solar panel over its lifetime is around 40g CO₂-eq/KWh
- > The emissions intensity of a coal fired power station is around 900g CO₂-eq/KWh
- > The emissions reduction opportunity is the difference between emissions from coal fire power generation and those from solar panels over the life of those panels
- > This is in the order of 35,528 Mt of CO₂



** Detailed analysis of energy production and emissions abatement opportunity carried out by Arche Energy using information derived from third parties, heuristics and assumptions.*

Our Environmental, Social & Governance (ESG) approach

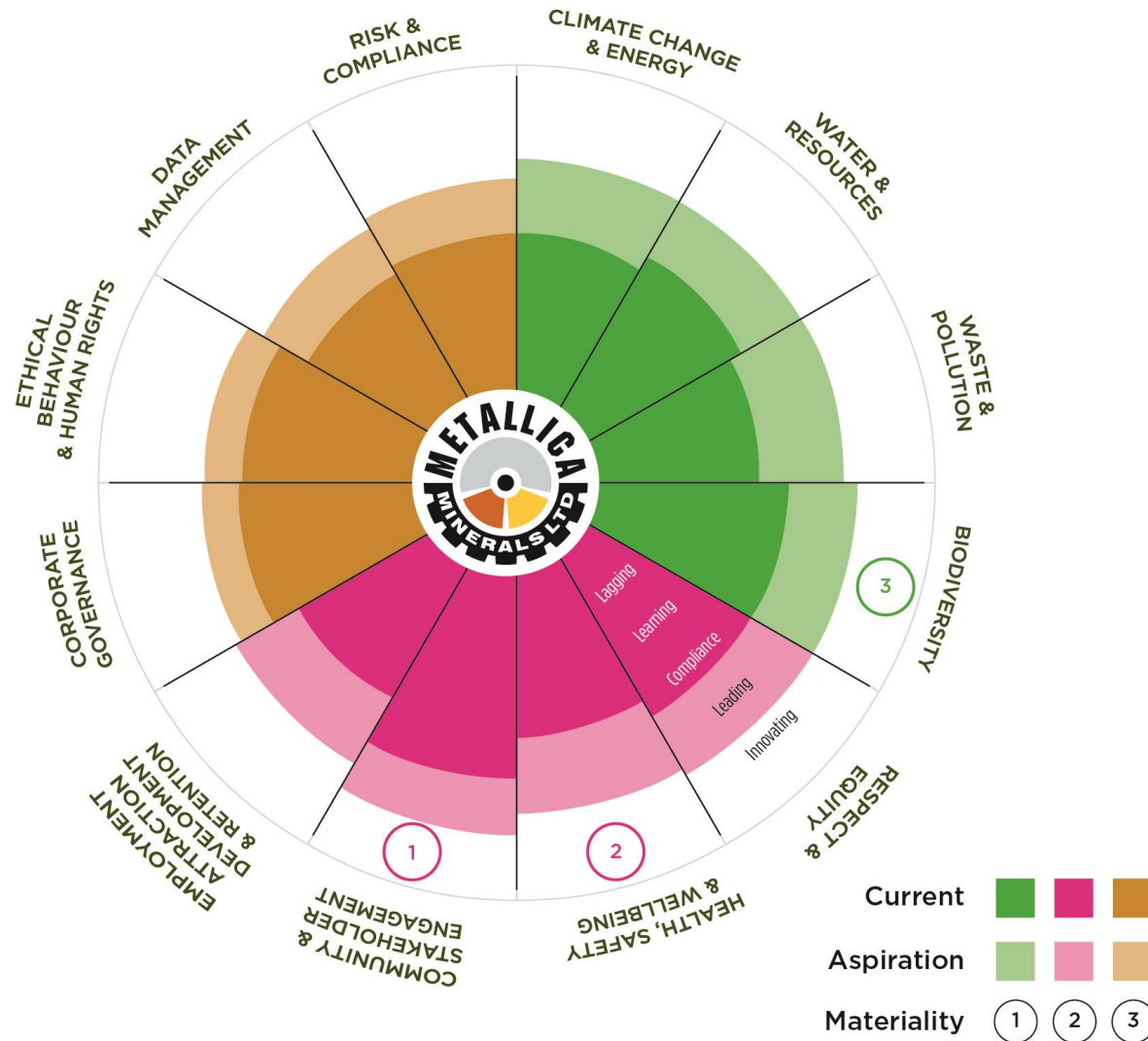


- > Adopting a low-impact approach to silica sand mining to minimise environmental impact.
- > Environmental management at the Cape Flattery Silica project will be comprehensive.
- > Key objectives include:
 - » minimising the operation's footprint
 - » protecting biodiversity
 - » responsible water use
 - » rehabilitating disturbed areas after disturbance.
- > No chemicals will be used in production.
- > Minimal dust will be produced during mining activities.
- > Adopting progressive rehabilitation.
- > Appropriate buffers, tree protection zones and offsets will be established.
- > Additional seeding with preferred species will be undertaken.



L-R Nathaniel Walker, Naamon Walker, Niall Corbus, Vernon Yoren, Shailand Deeral-Rosendale and Trenton McLean

ESG benefits and principles



Feedback and shared perception across the CFS internal and external stakeholders surveyed was highly complimentary regarding CFS’s consultative approach to addressing environmental and social aspects of the proposed project.



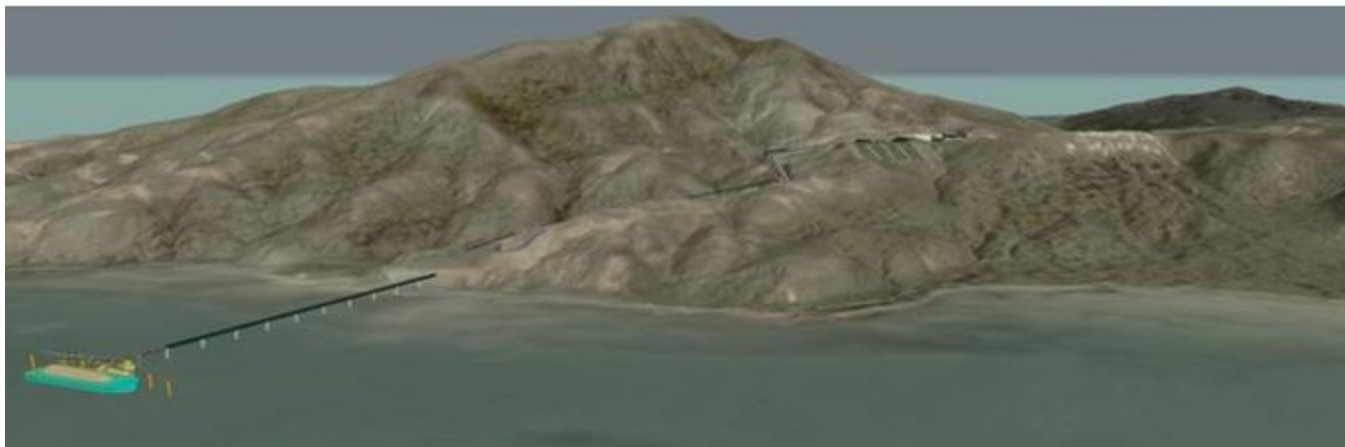
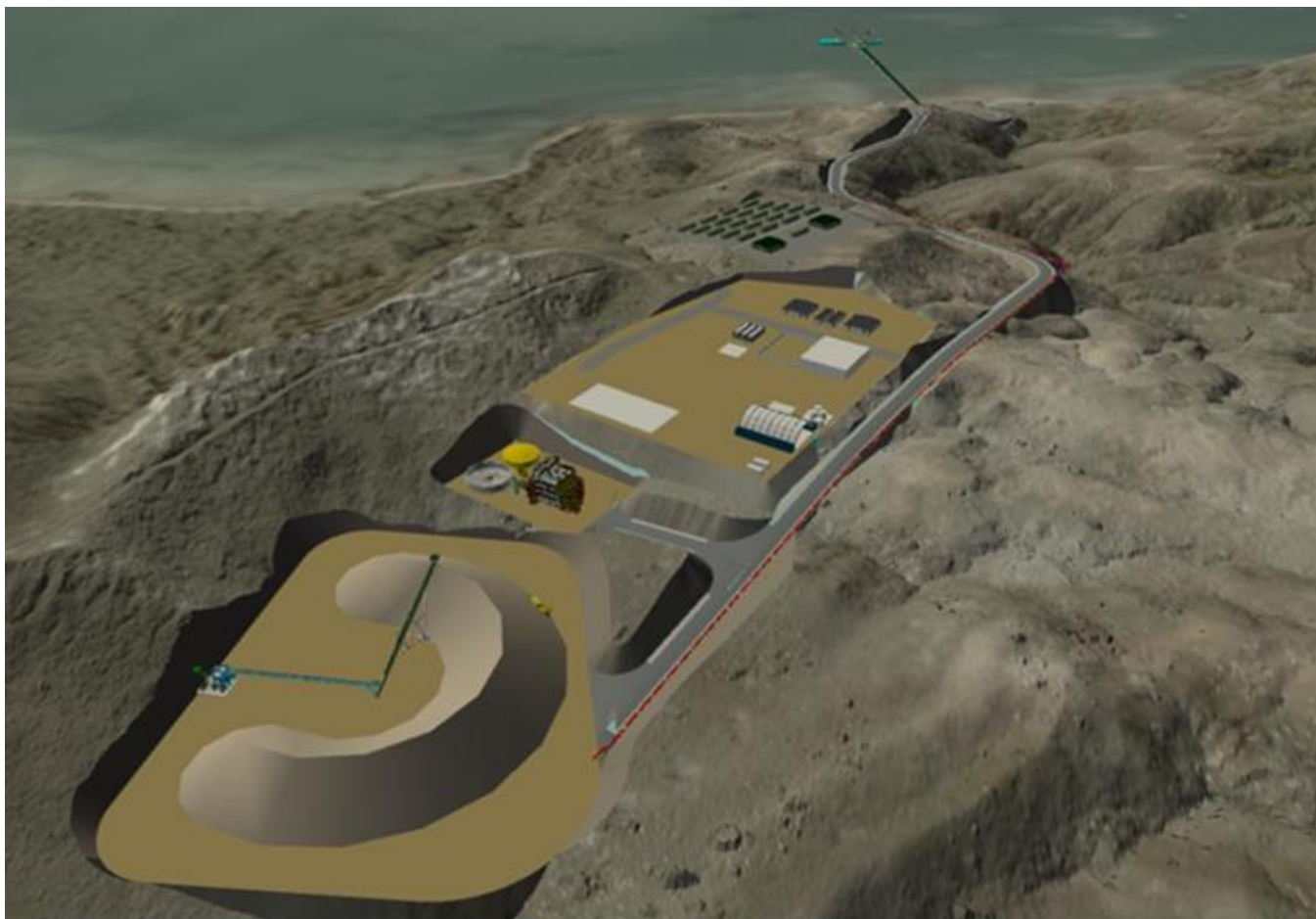
Signing of the ACHA – Walmbaar Aboriginal Corporation Chairman, Shailand Deeral-Rosendale and Directors, Pauline McLean and Travis Bally with Metallica Executive Chairman Theo Psaros.



Planned project operations

Key site infrastructure includes:

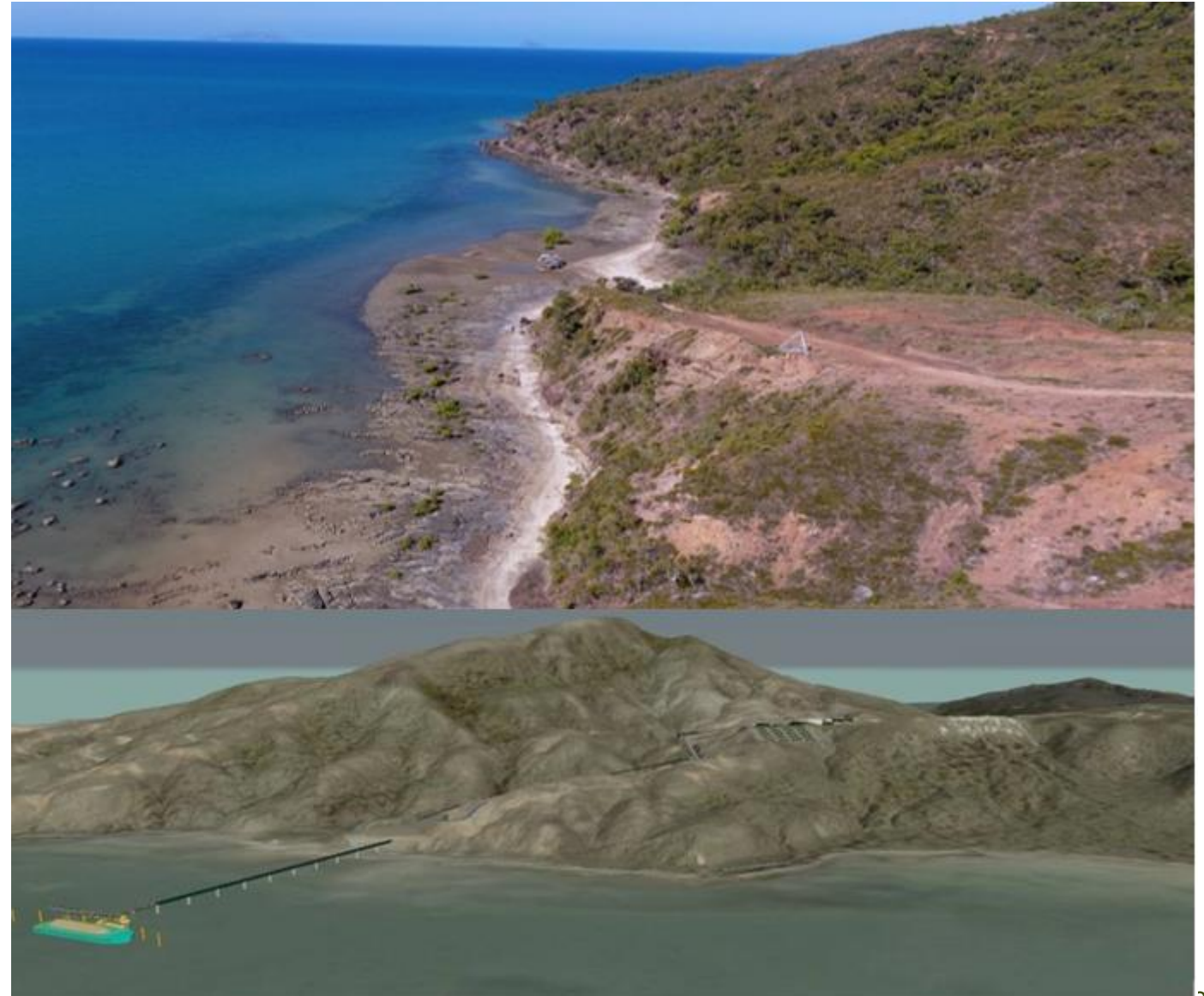
- > Product stockpile
- > Processing plant and pad
- > Conveyor
- > Jetty infrastructure facility
- > Purpose-built accommodation facility.



Purpose Built Jetty



- > A purpose-built jetty is planned (subject to Development Approval) and located within the port limit of Cape Flattery
- > Location identified and approved in principle by Dingaal and Nguurruumungu Clans
- > Location supported by Ports North.



“I’d put my money on the sun and solar energy. What a source of power! I hope we don’t have to wait until oil and coal run out before we tackle that.” — Thomas Edison, 1931.

