



# Domestic Downstream Processing in PNG and Exporting to Australasia

Company Presentation

ASX:MRL

PNG Mining & Petroleum Investment Conference, Sydney  
December 2022





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Statements contained in this announcement relating to Mineral Resources and Ore Reserves estimates for the Central Cement and Lime Project are based on, and fairly represents, information and supporting documentation prepared by Mr. Rod Huntley, who is a member of the Australian Institute of Geoscientists. Mr. Huntley has sufficient and relevant experience that specifically relate to the style of mineralisation. Mr Huntley qualifies as a Competent Person as defined in the Australian Code for Reporting of Identified Mineral Resources and Ore Reserves (JORC) Code 2012. Mr Huntley is an employee of Groundworks Pty Ltd contracted as a consultant to Mayur Resources and consents to the use of the matters based on his information in the form and context in which it appears. As a competent person Mr Huntley takes responsibility for the form and context in which this initial Ore Reserves Estimate prepared for the Central Cement and Lime Project appears.

Statements contained in this announcement relating to Ore Reserves for the Orokolo Bay Mineral Sands Project Western Area are based on, and fairly represents, information and supporting documentation prepared by Mr Troy Lowien, a Member of The Australasian Institute of Mining and Metallurgy Mr Lowien qualifies as a Competent Person as defined in the Australian Code for Reporting of Identified Mineral Resources and Ore Reserves (JORC) Code 2012. Mr Lowien is an employee of Groundworks Pty Ltd contracted as a consultant to Mayur Resources and consents to the use of the matters based on his information in the form and context in which it appears. As a competent person Mr Lowien takes responsibility for the form and context in which this Ore Reserves Estimate prepared for the Orokolo Bay Project Western Area appears.



# Mayur Resources

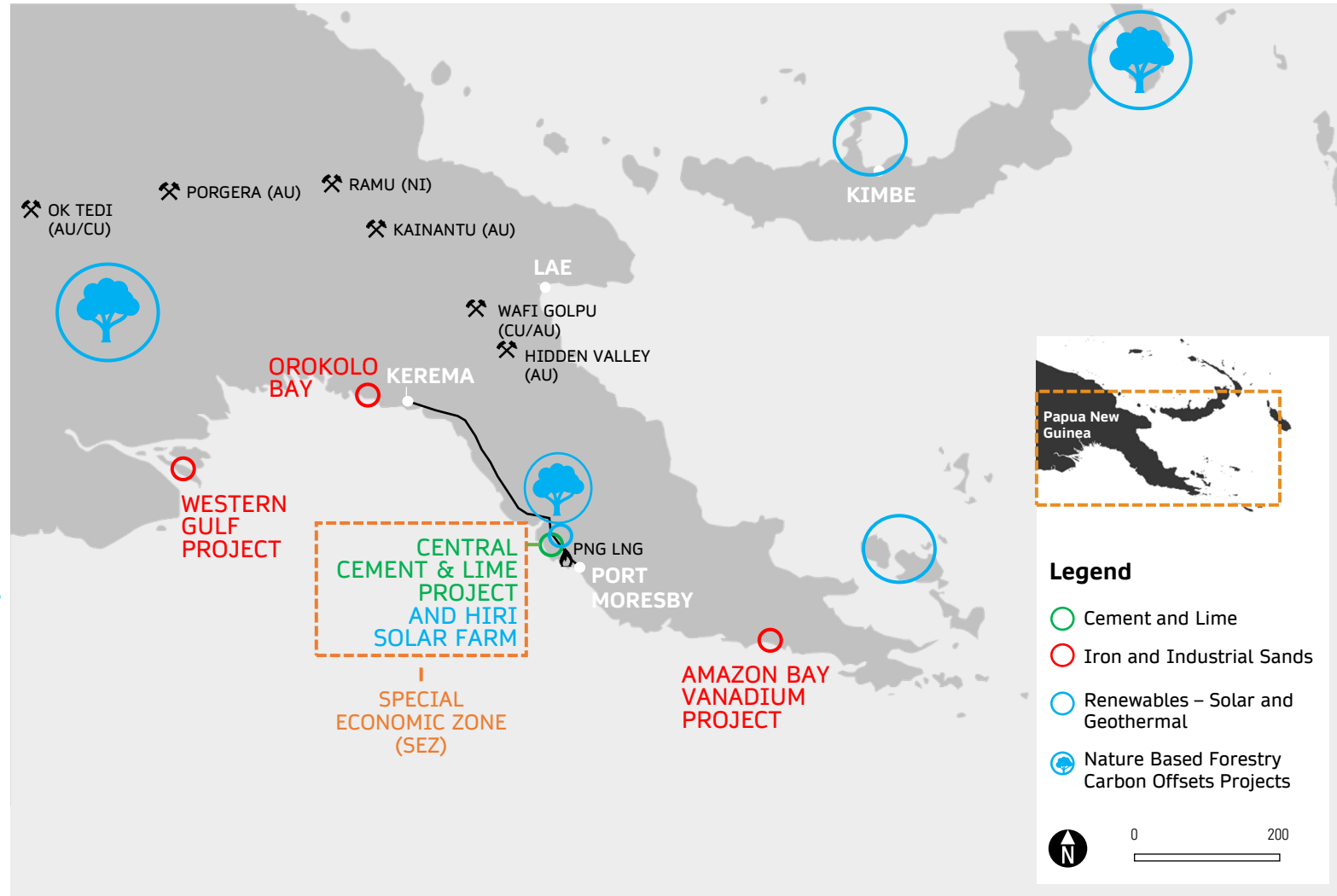
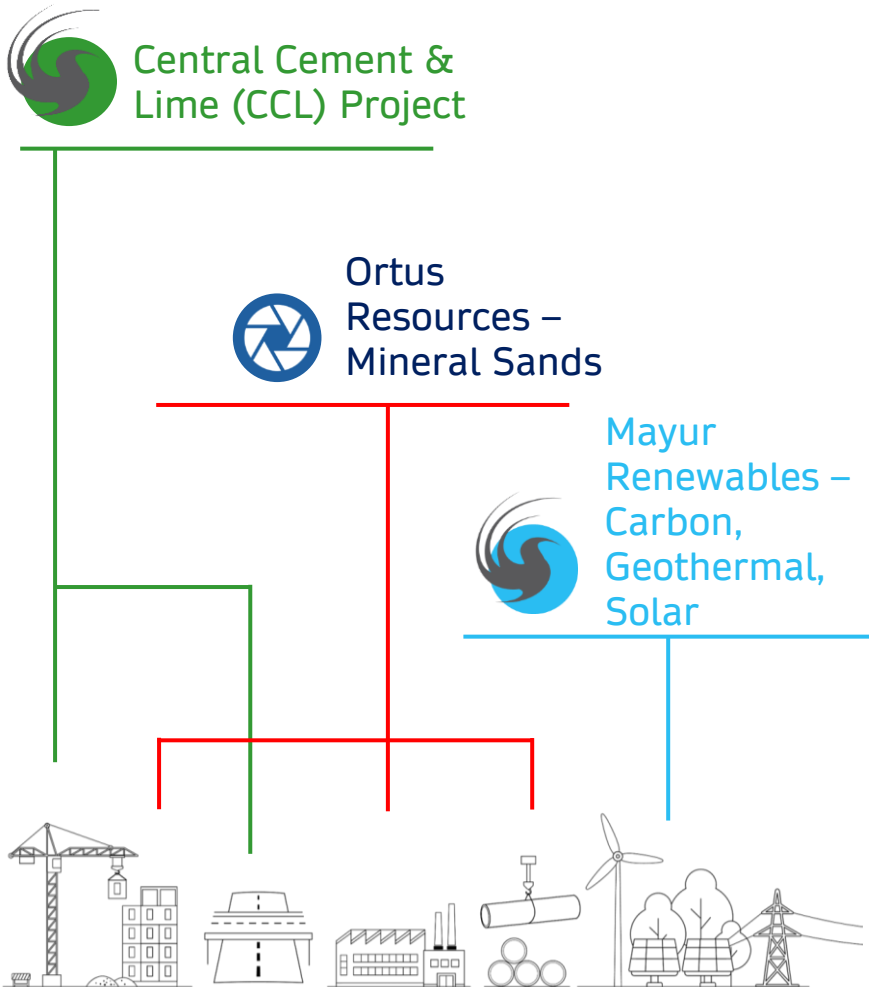
## Portfolio Overview





# Mayur Resources – A decade in the making & AU\$70m invested

A portfolio of Net Zero import displacement and export projects ready to be built





# Revenue Ready Project Portfolio

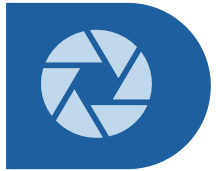


## Aggregates & Quicklime – CCL Project Phase 1:

A new large scale, low-cost, high-grade aggregates & quicklime manufacturing facility to meet critical demand from battery minerals and environmental sectors in support of the global energy transition. Awaiting Consultative Forum with PNG Government.

Fully Permitted & Construction Ready

Target for 1<sup>st</sup> Revenue:  
Aggregates - 2H CY2023  
Quicklime – 2H CY2024



## Ortus Resources - Orokolo Bay Project:

Developing a new low cost, net zero vanadium titano-magnetite and industrial mineral sands business. Awaiting Consultative Forum with PNG Government.

Fully Permitted & Construction Ready

Target for 1<sup>st</sup> Revenue:  
Q4 CY2023



## Clinker & Cement – CCL Project Phase 2:

A new world-class, long-life project hosting large scale mineral resources on site to manufacture key cementitious products and building materials offering security of supply to PNG & Australia. Awaiting Consultative Forum with PNG Government.

Fully Permitted & Construction Ready

Target for 1<sup>st</sup> Revenue:  
To Be Updated



## Mayur Renewables

Developing a portfolio of carbon credit and renewable energy projects to deliver environmental and economic value to PNG

Feasibility stage



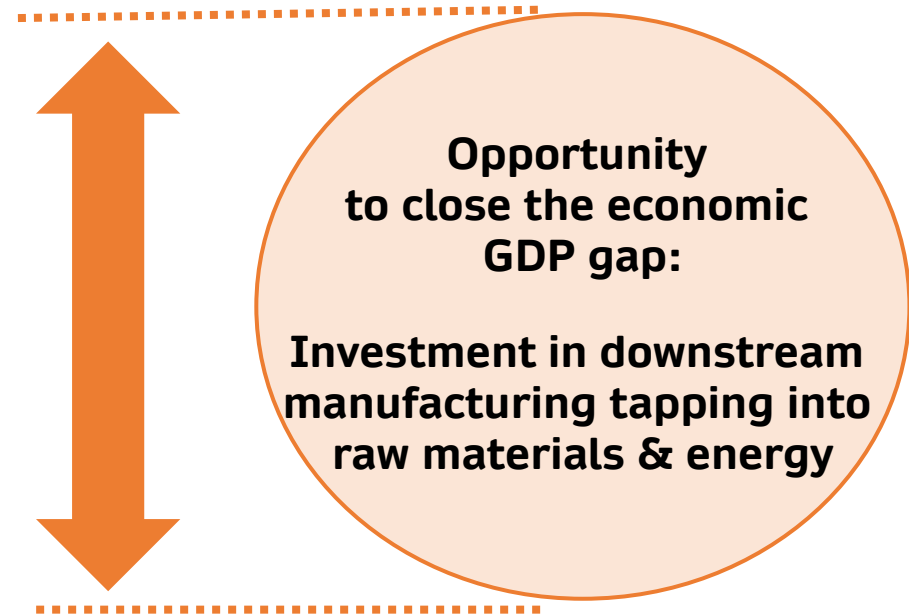
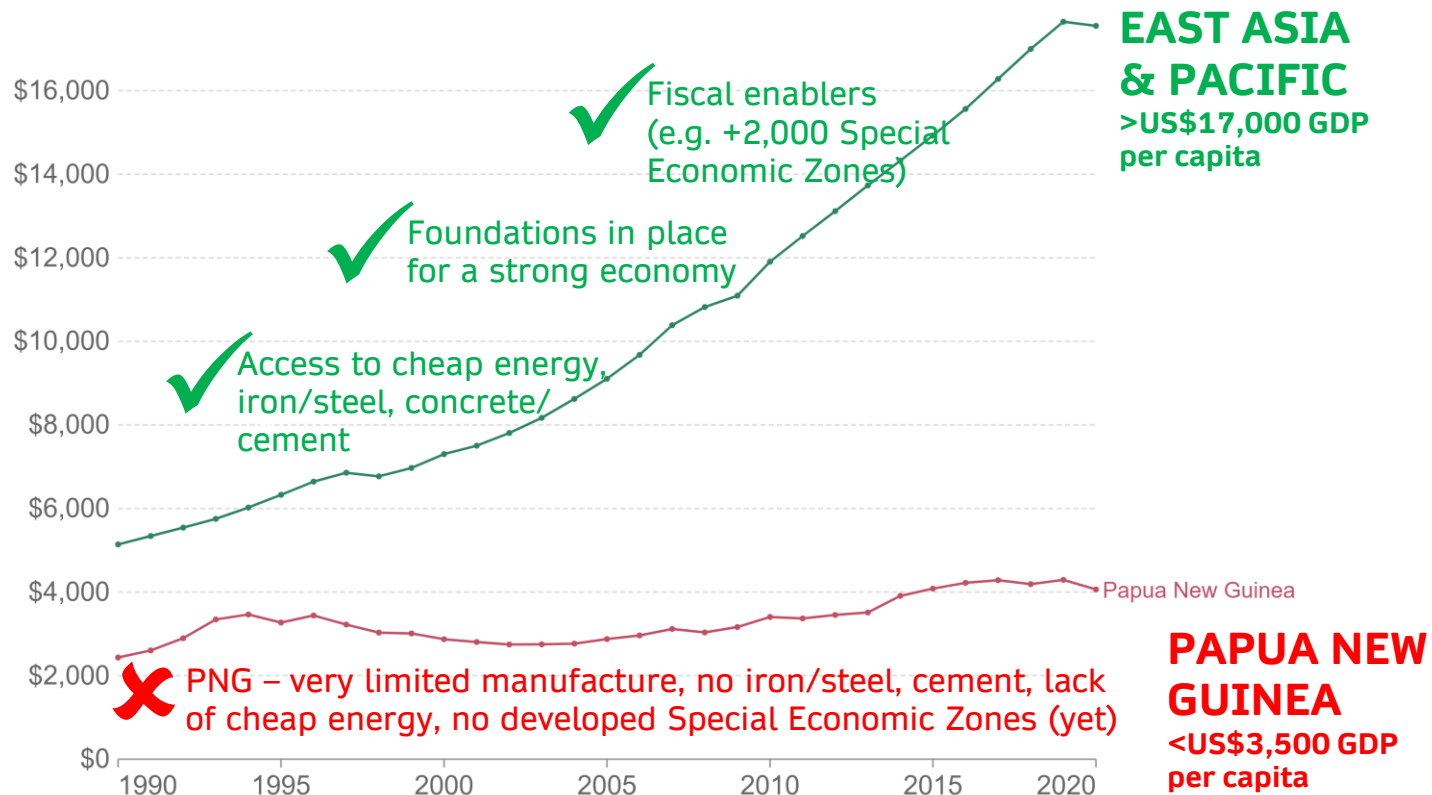


# Nation building Investment Opportunity in PNG – Building Block Growth

PNG must become self sufficient with cheap energy, use its own resources to displace imports and establish a robust downstream processing manufacturing export industry

## GDP per capita

Measured in constant international-\$.  
Our World in Data



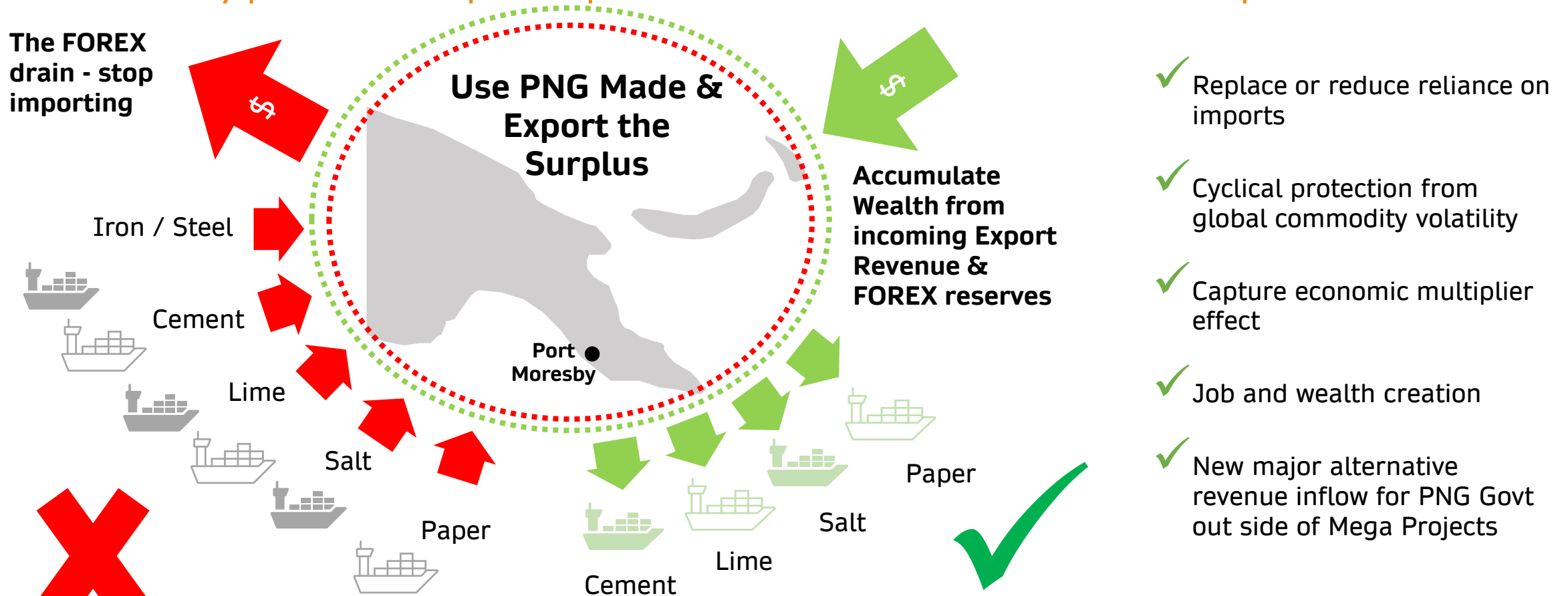
Source: Data compiled from multiple sources by World Bank

OurWorldInData.org/economic-growth • CC BY



# Large Import Replacement & Downstream Processing Opportunities

Invest and be part of 'Changing the Balance' – PNG transition to self sufficiency with locally produced import replacement of 'THE BASICS' .....and expand from there



**Manufacture locally to support Domestic PNG & Export Surplus**



# Nation building in PNG – its not just a Concept ...Reality Awaits

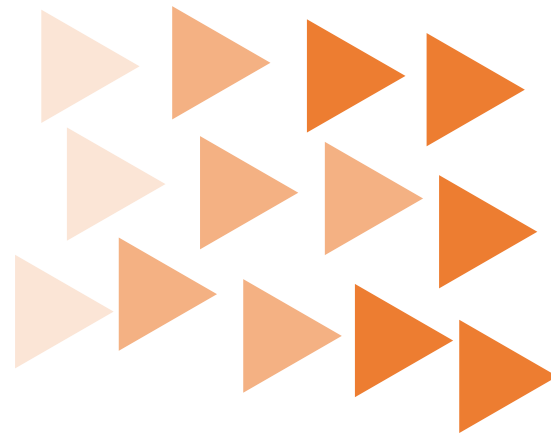
Get the formula right; *downstream processing projects already fully approved, currently in the funding stage, establishing PNG Made Goods + Exporting Surplus*

✓ Huge energy, mineral, land & ocean resources BUT....

✗ Very Limited in-country manufacturing capability

✗ Key products to 'Build The Basics' are imported at high cost

## The Solution




New Manufacturing Opportunities in **Special Economic Zones** in PNG

Lime & Cement	Iron
	
Concrete	Steel



Emission Offset

Renewable Energy & Carbon Offsets



Protection of PNGs huge carbon forestry reserves



**NET ZERO Manufacturing**

**Produces lower carbon / Net Zero products for domestic and export markets - PNG to have a leveraged strategic edge over other nations**

**Foundation established to attract & compete for greener capital**

✓ PNG manufacturing of finished products set up to service PNG and neighbouring countries

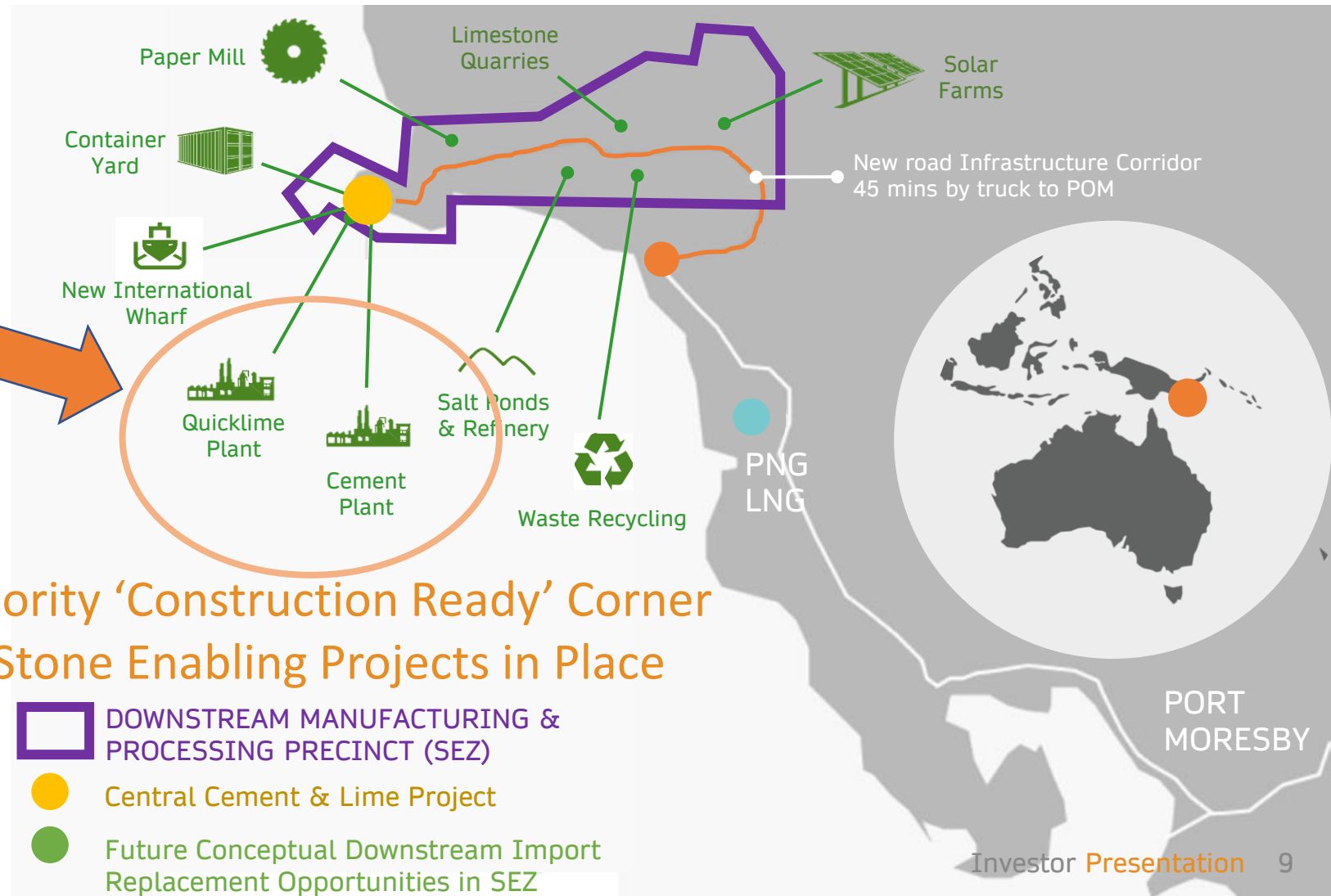
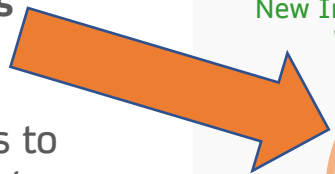




# Downstream Processing Precinct Established with Cornerstone Projects

## Central Province SEZ precinct approved - prime location next to USD30bn of LNG

- SEZ granted (September 2021) by PNG Government to promote new import replacement downstream processing and vertically integrated industries
- Strategically located north of PNG LNG / Papua LNG
- **Central Cement and Lime Projects** corner stone to SEZ growth
- **Infrastructure** - direct road access to Port Moresby; new private deep water international wharf
- Potential for **+500 MW of solar farm** within 5km of PNG LNG
- **Renewable power** source for other future industry such as blue / green hydrogen and ammonia
- PNG Carbon Credits to offset industries established



### Priority 'Construction Ready' Corner Stone Enabling Projects in Place

- DOWNSTREAM MANUFACTURING & PROCESSING PRECINCT (SEZ)
- Central Cement & Lime Project
- Future Conceptual Downstream Import Replacement Opportunities in SEZ



# Mayur Resources



## Aggregates & Quicklime



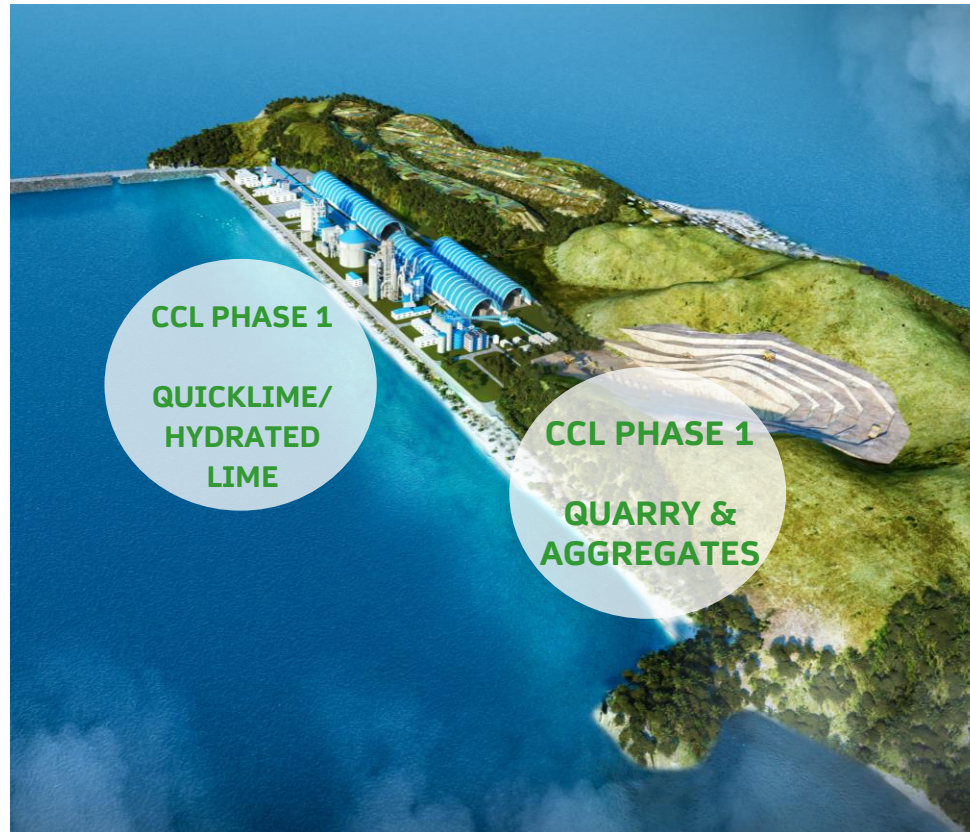


# Fast tracking CCL Phase 1:

## Largest Seaborne Quarry & Quick Lime Import Displacement & Export Project

### Quarry & Aggregates

- ✓ Identified early cashflow opportunity in 2023 via Aggregate Supply
- ✓ Up to 2.5Mtpa Quarry material extraction (high grade limestone)
- ✓ Access to a new 100% owned international wharf
- ✓ 5m draft wharf capable of bulk barge loading (expandable to 10.5m in Phase 1B Quicklime for Handymax vessels) – 13 to 15m draft final depth
- ✓ Meets all international standards for Construction Grade Aggregate
- ✓ Strategically located near to PNG LNG/Papua LNG
- ✓ SEZ Developer & Operator status to develop other supporting industrial activities
- ✓ 100 year mine life with circa 380MT of JORC compliant Resources



### Quicklime & Hydrated Lime

- ✓ Quicklime production (400ktpa) will be fast-tracked to respond to PNG and Australian market opportunities
- ✓ Indonesian High Pressure Acid Leach Nickel plants have huge Quick Lime demand
- ✓ Cashflow will assist funding of cement plant (Phase 2)
- ✓ 18 months construction
- ✓ Mining Licence granted
- ✓ Environmental Permit Secured
- ✓ Special Economic Zone (SEZ) status granted
- ✓ Construction bids received
- ✓ Full support from State, Provincial Governments and Landowners
- ✓ Project de-risked with very attractive economics
- ✓ Scalable growth that is not constrained by the Mineral Resource
- ✓ Renewable (solar) opportunities identified (~500MW)



# CCL Project - Growing criticality of quicklime

Key applications in future facing metal beneficiation and pollution mitigation with an emerging role in energy storage

- Strong and growing applications in pollution abatement, treatment of acidification and water purification
- Critical inputs for processing battery and future green facing metals:
  - Nickel
  - Copper
  - Alumina
  - Uranium
  - Lithium
  - Cobalt
  - Rare Earths
  - Vanadium
- Anticipated **40%** annual growth rate of global EV market from 2021 – 2027
- Expected **17%** annual growth rate of global storage capacity from 2021 to 2030
- Key ingredient in renewable energy storage process developed by Swedish SaltX Technology AB
- **Structural Shift – Production of Battery Metals (BM) needs Quicklime (QL) as input process commodity.... Reality setting in (more BM more QL)**



## Water Treatment

Absorbs and removes pollutants from drinking water, wastewater, sewerage and industrial sludge



## Mineral and Metallurgical Processing

Removes impurities in ferrous and non-ferrous metals processing – a key component in metal recovery



## Construction and Civil Engineering

Stabilises soil for construction of roads, buildings and dams, and enhances durability of roads and pavements



## Chemical and Industrial Manufacturing

Used in the chemical process for paper, paint, ink, plastic, rubber and sugar



## Agriculture and Crop Management

Effects soil pH to improve growing conditions and increase crop yields



## Global Decarbonisation

Acts as a natural carbon sink capturing ambient CO<sub>2</sub> - most prevalent when used in construction





# Mayur Resources



## Clinker & Cement







# CCL Project – Phase 2

## Australasia's first export facing clinker & cement

- ✓ Fully Permitted
- ✓ Mining License granted
- ✓ Environmental Approvals in place
- ✓ Full support from State, Provincial Governments and Landowners
- ✓ Import replacement market for PNG and targeting Australia's circa 50% import market for cementitious products from North Asia
- ✓ Targeting production of the region's first Carbon Neutral Cement







# CCL Project – Phase 2

## Australasia's first export facing clinker & cement

### CCL Phase 2

- Optionality preserved for approx. 910 ktpa cement grinding capacity and infrastructure expansion to support clinker and cement plant and operations, including:
  - clinker raw mix grade quarry material (containing limestone, marl, alumina silicates and iron correctives);
  - expansion of CCL Phase 1 wharf; and
  - expanded power plant
- Further optionality to construct additional quicklime kiln capacity (over and above CCL Phase 1)

### CCL Phase 2

# CLINKER & CEMENT

Targeting production of **1.65Mtpa of clinker** for export markets and **~910ktpa cement grinding capacity** for domestic and export markets

An environmentally attractive product benefiting from significant supply chain advantages

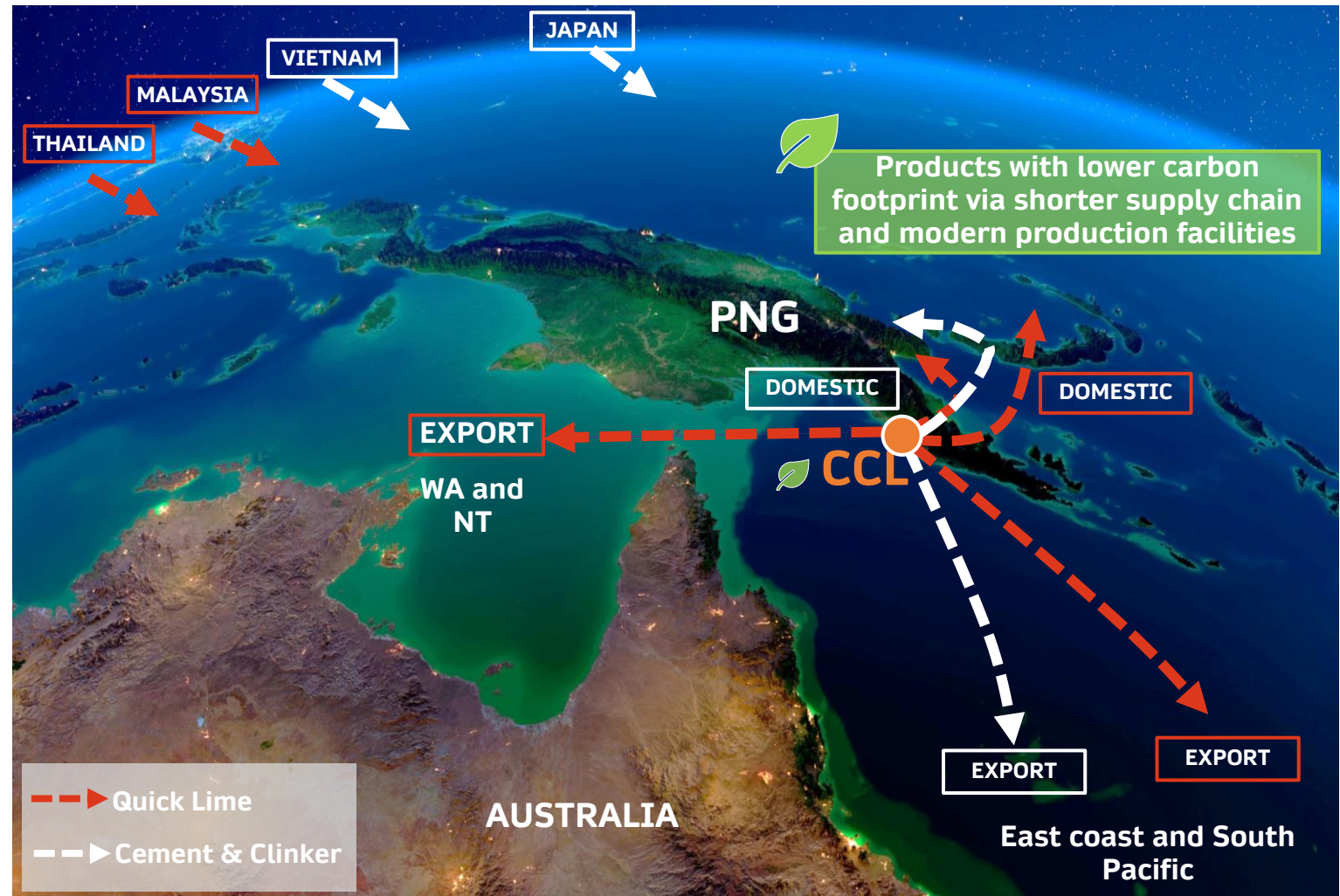




# Advantages over current supply from Asia

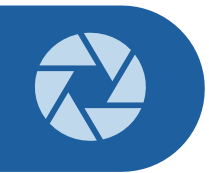
## Domestic and export advantages over current suppliers

- Domestic and export freight advantages
- Significantly closer to users in Australia and the South Pacific than other seaborne supply
- Lower shipping cost and carbon footprint due to shorter sailing times
- Shorter lead times and enhanced responsiveness to customer needs
- Reduced risk of supply chain/shipping interruptions with shipping routes either in PNG or Australian waters





# Mayur Resources



## Iron & Industrial Sands

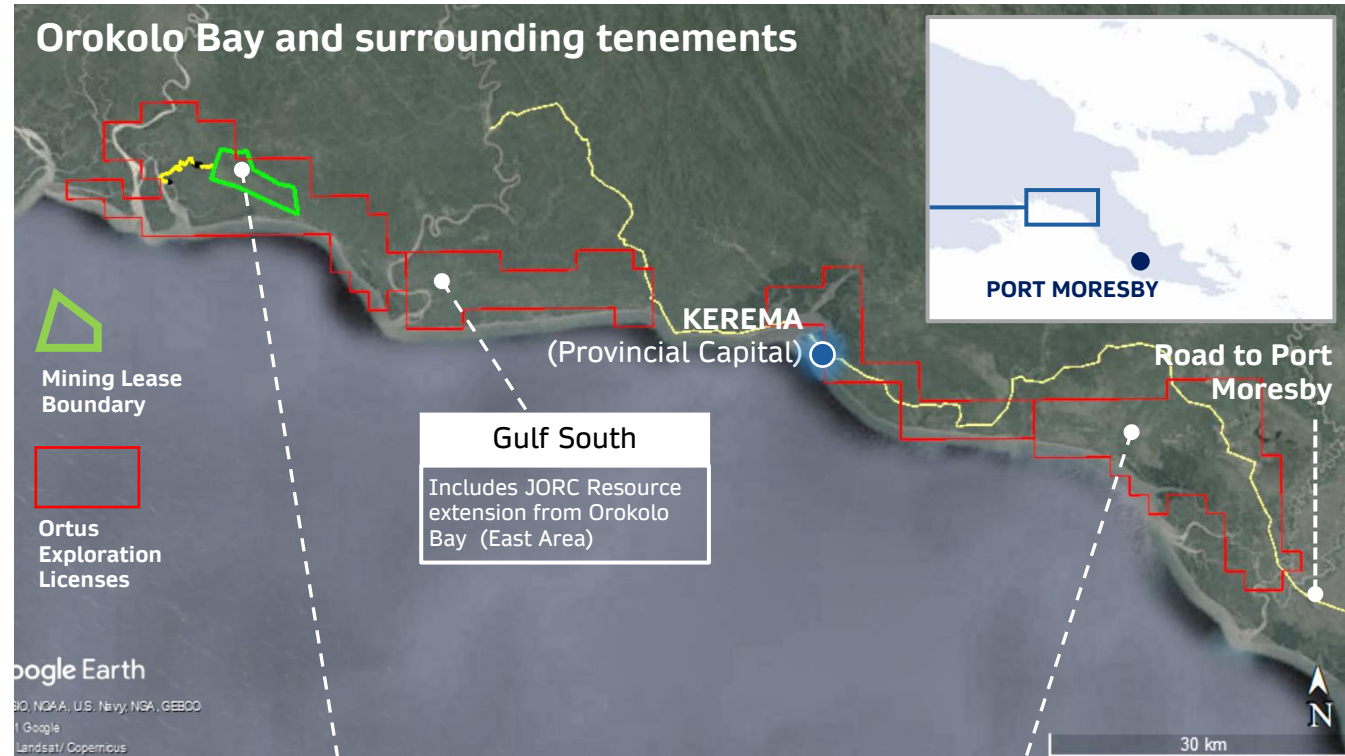




# Ortus Resources

## Orokolo Bay Iron and Industrial Sands Project

- **25-year Environmental Permit** in place for the Project
- **Mining Lease granted** in December 2021<sup>1</sup>, main construction work to commence in late 2022, targeting initial production in late 2023 with a short ramp up to 500kt pa of magnetite
- Prioritisation of early magnetite cashflow
- Expansion capex to produce construction sands, DMS and zircon concentrate to be funded from initial cashflow within 12 months
- Site enabling works commenced
- Offtake discussions on-going with focus on higher value magnetite into the Asian market
  - Offtake Agreement with Chinese specialist pellet manufacturer
  - Offtake Terms Sheet with Leading Japanese Trading House<sup>2</sup>
- A\$8M cornerstone investment from leading PNG mining contractor HBS<sup>3</sup>



**1** Orokolo Bay

**FLAGSHIP PROJECT** to be brought into **production in late 2023**

8 years of development including +2000 drill holes and extensive studies (PFS and DFS)

De-risked with Mining Lease granted and HBS secured as strategic delivery partner (December 2021)

**2** Malalaua

Future expansion target Extensive drilling completed

Malalaua to be the “next cab off the rank” (very similar mineralisation to Orokolo Bay)

1. See MRL ASX release 13 December 2021  
2. See MRL ASX release 14 December 2021  
3. See MRL ASX release 15 December 2021



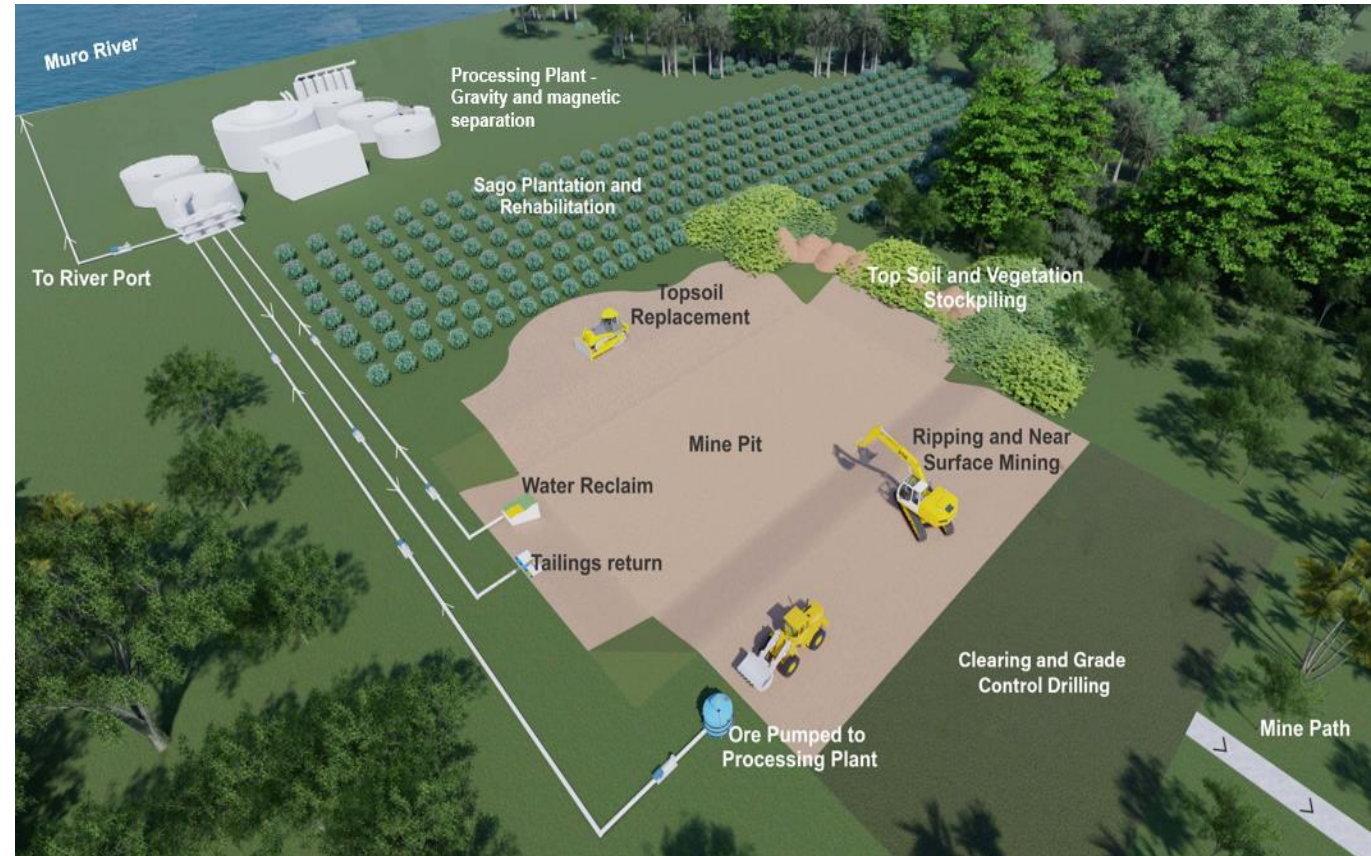


# Mining overview

## Near surface deposit facilitates simple mining process

At near surface deposit facilitates simple mining process:

1. Clearing/ripping and stockpiling of topsoil and vegetation
2. Prior to mining closely spaced infill drilling to be undertaken to optimise mining process
3. Small excavator side casts ore from shallow pit <5m
4. Side cast ore is loaded by Front End Loader (FEL) into Feed Preparation Plant and pumped to Processing Plant
5. Ore is processed with product pumped to river wharf
6. Sand tailings are pumped back to the pit, with water captured and re-used
7. Final contouring and spreading of topsoil and vegetation in preparation for Sago Palm plantation
8. Mechanized sago plantations as part of rehabilitation provides major ESG opportunity for Landowner's post mining





# Mayur Resources



## Mayur Renewables - Carbon



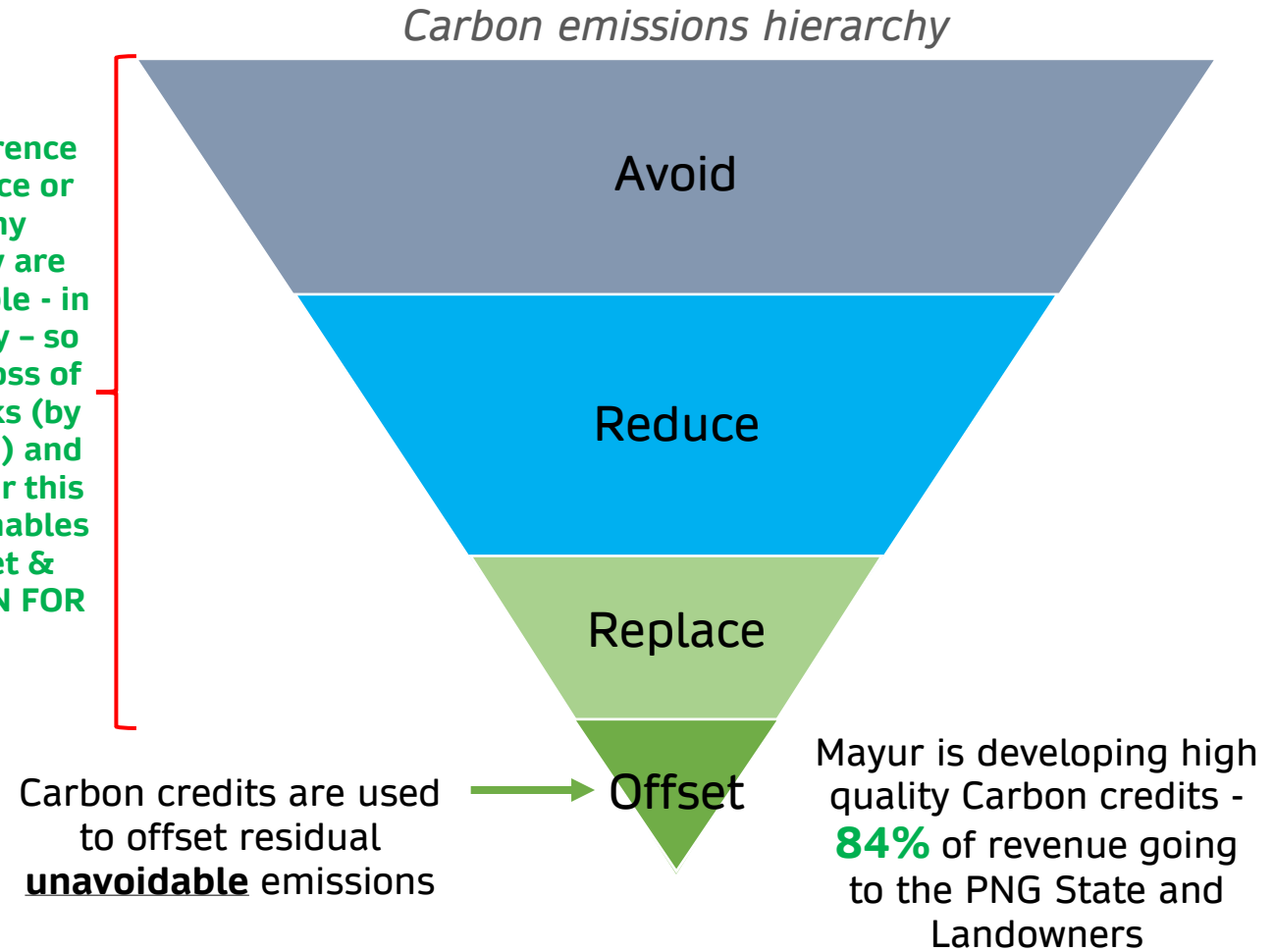


# Carbon credits – taking back PNG with super majority take

Carbon offsets can enable PNG's need for economic growth and development

- PNG is a developing nation, that needs to industrialise in a sustainable way as the world is reducing its greenhouse gas (GHG) emissions to address climate change
- New industry is required to stimulate economic growth and improve living standards in PNG - low carbon products will help capture new export markets
- PNG has opportunity to generate large amounts of nature-based carbon credits by reclassifying logging areas and protecting forests
- Credits can be used to credibly offset unavoidable emissions from carbon emitting activities in PNG, with surplus available for trade
- Carbon credits offer an opportunity to generate far more value from PNG's forest resources than revenues from logging

Whilst the preference is to avoid, reduce or replace - many emissions today are simply unavoidable - in PNG and globally - so preventing the loss of huge carbon sinks (by stopping logging) and being credited for this positive action enables a credible offset & VALUE CREATION FOR PNG



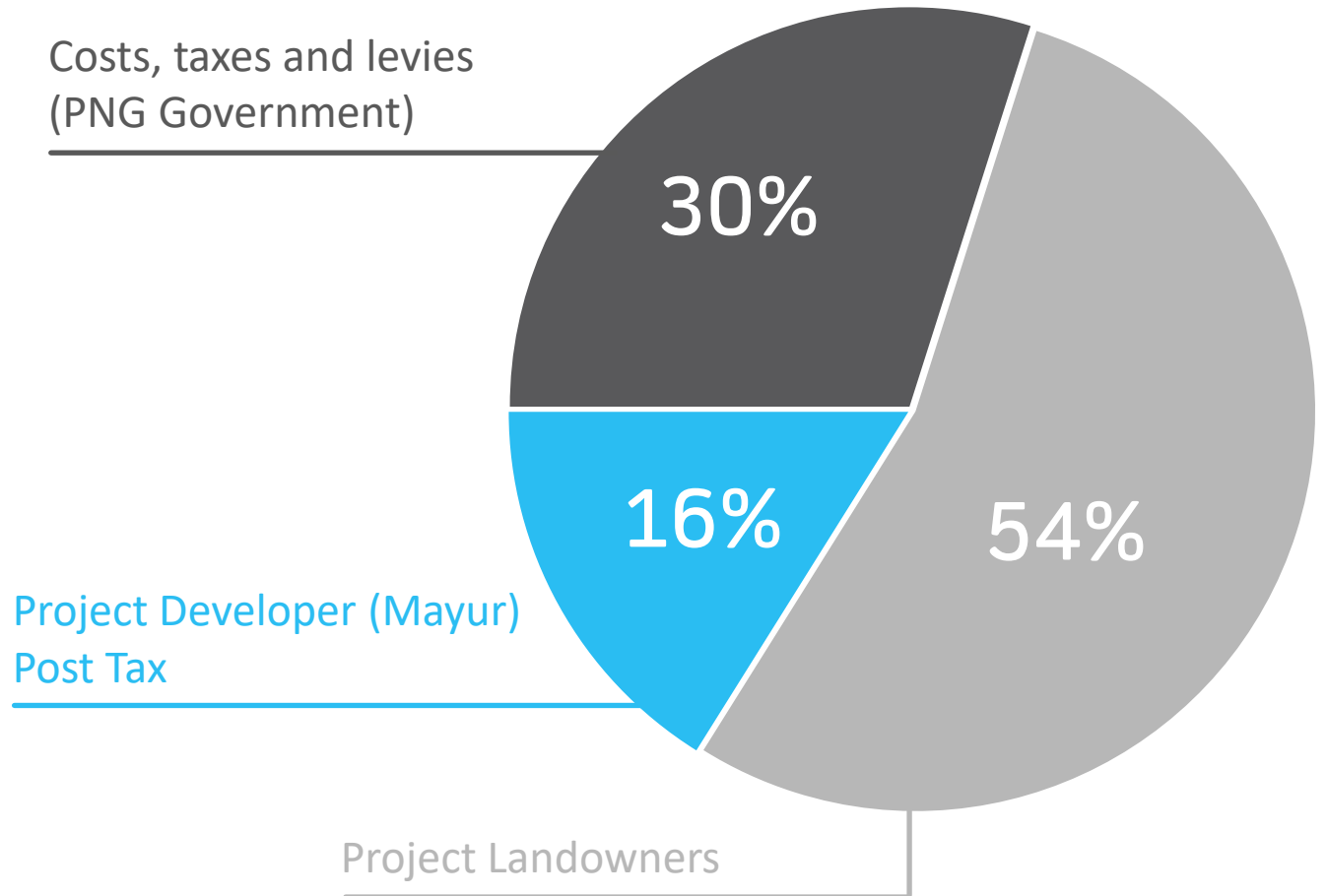


# Carbon credits – a better deal for PNG

Sharing the economic benefits with PNG in accord with PNG’s CCDA Management Act

- Costs, taxes and levies expected to account for approximately 30% of total revenue
- Landowners to receive 54% of all revenue (that includes funding for social benefit projects) that is expected to reflect 70% of profits
- **Landowners share is ‘free carried’**
- Remaining 16% represents after tax revenue to be received by Developer
- Highest quality internationally recognised Carbon Credits to be produced to attach to PNG Made Manufactured Products offsetting emissions
- PNG Strategic Advantage of Net Zero products
- Same Carbon Credits Surplus made available to be internationally traded

**Mayur’s Carbon Credit Revenue distribution model**







# Thank You

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