IEA Bioenergy Workshop · Scaling Asia-Pacific Bioeconomies

Thinking Globally: Looking Beyond Catchments

Building resilient Asia-Pacific biomass supply chains

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Residues are Fake News.

If your model needs them, you will fail.”

— Steve Walker

The fibre is real. The “free tonne” is not. Every commercially recoverable tonne has…



an owner



a recovery cost



an alternative use

Are we solving the wrong problem?

Bioenergy in this region is mainly a feedstock and supply-chain challenge, with a commercial and engineering solution.

How it is usually framed

A market failure

↓

Fixed by policy and subsidy

↓

Technology is expected to make the supply appear

How leaders should frame it

A feedstock and supply-chain problem

↓

Solved by commercial and engineering capability

↓

Policy enables it, and markets fund it

Technology converts fibre. It does not create a supply chain.

Supply chains are built by people who think beyond the next project.

Five shifts in thinking

None of them needs new technology. All of them need leadership.

SHIFT 1

From residue

↓

to fibre value

Every tonne has an owner, a cost and an alternative use

SHIFT 2

From catchment

↓

to portfolio

Supply from many origins, not one circle

SHIFT 3

From distance

↓

to logistics design

Mode, direction and backhaul beat kilometres

SHIFT 4

From fuel

↓

to highest-value use

The same tonne can be fuel, feedstock or reagent

SHIFT 5

From suppliers

↓

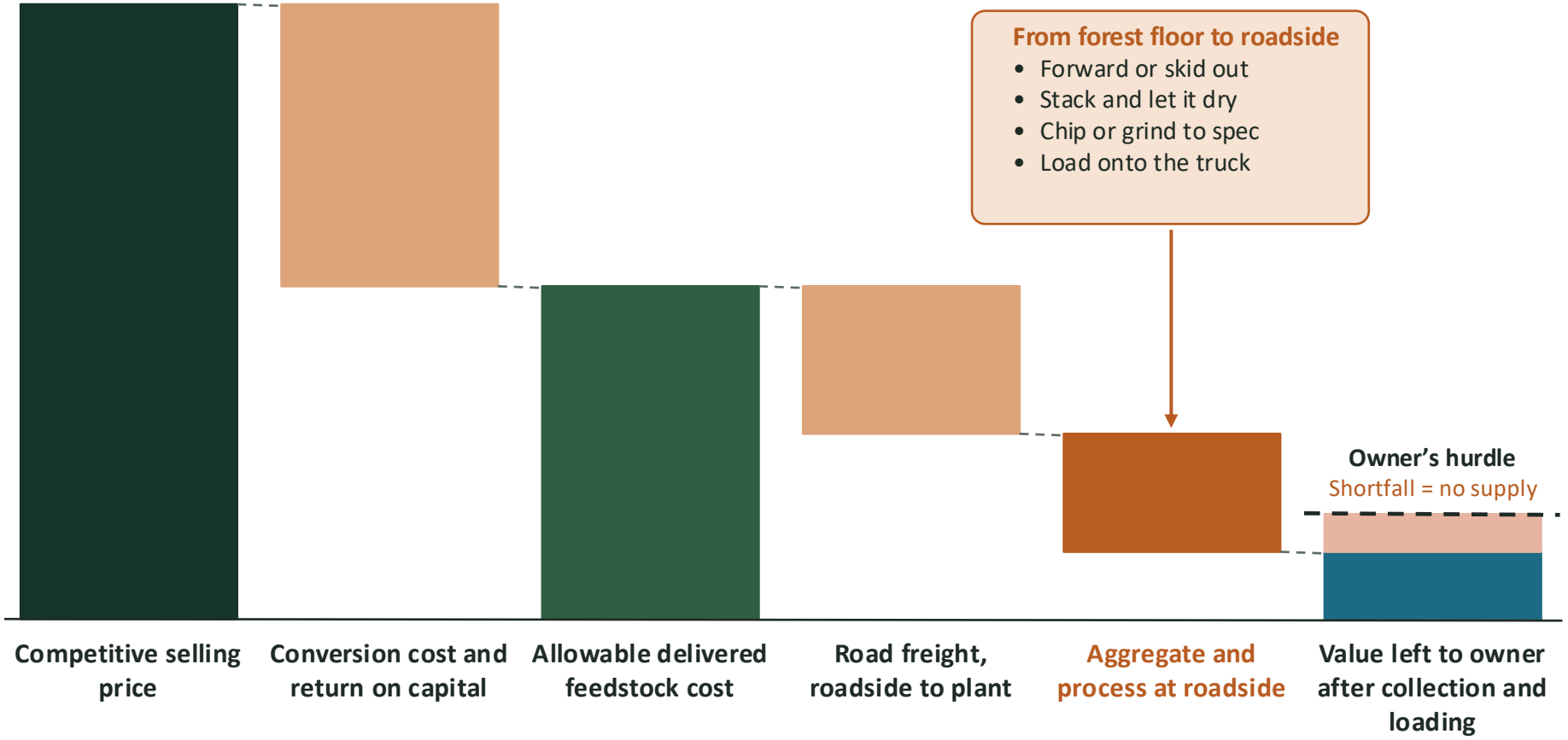
to partners

Producers and hubs share in the value they create

Together they point to one bigger idea: a regional port as a fibre hub, not a plant with a fence around its catchment.

Work backwards from the price the market will pay

ILLUSTRATIVE – WATERFALL DIAGRAM



The owner's test

Does the value left after collection and truck loading beat full cost plus opportunity cost?

Roadside recovery often decides it. Every tonne is forwarded, stacked, chipped and loaded before the first freight kilometre.

If not, there is no supply. Change the project, not the grower.

The scale problem: one million + green tonnes a year

PROJECT-SCALE ILLUSTRATION, NOT A CLAIM ABOUT EVERY PROJECT

≈59

loaded B-doubles arriving every day

≈500,000

dry tonnes of fibre

≈500,000

tonnes of water carted in the load

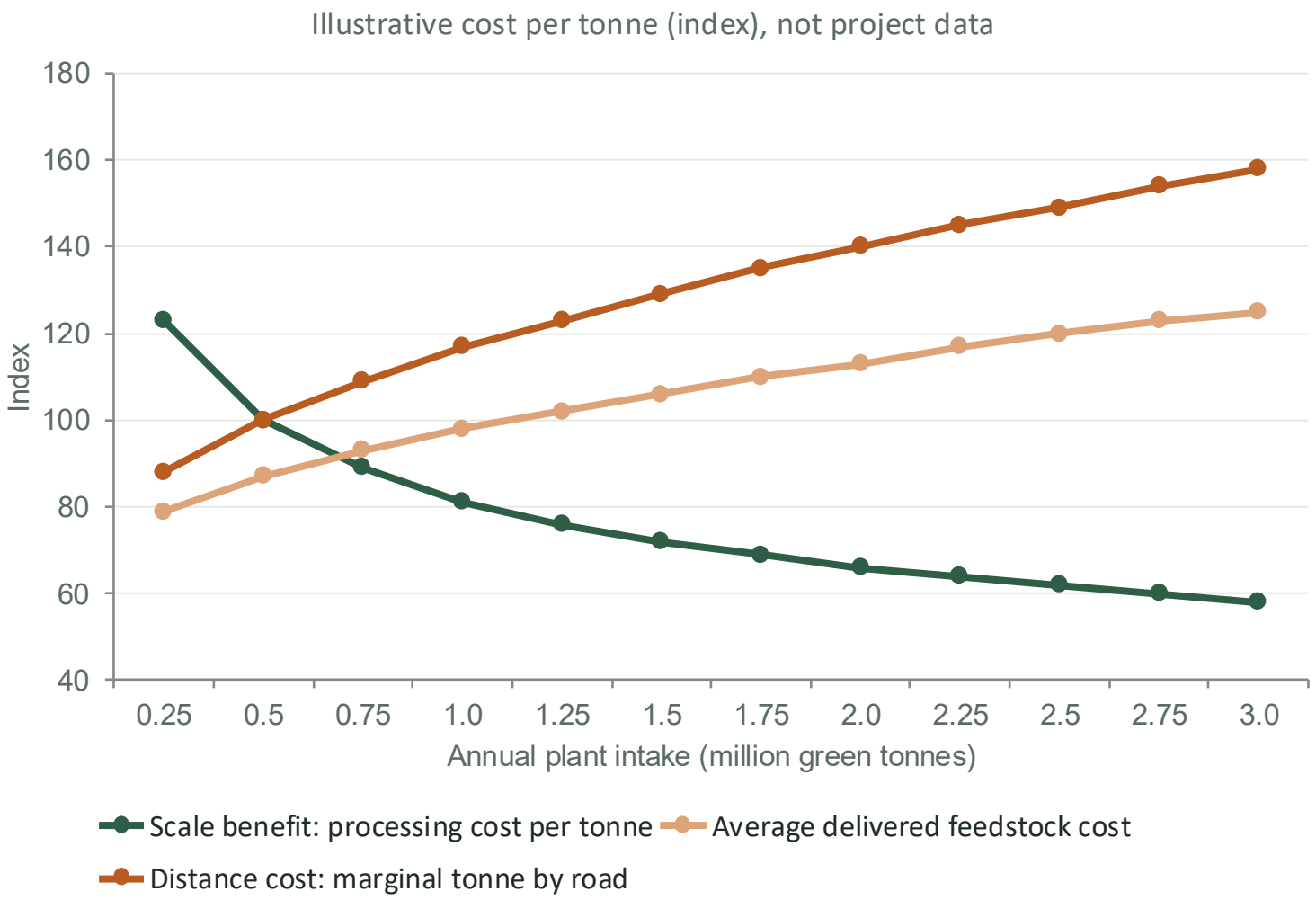
Assumptions: B-double at 46.5 t payload · 365 operating days · 50% moisture content (wet basis).
1,000,000 ÷ 46.5 ÷ 365 = 58.9

Loaded arrivals per day

Vehicle	250 days	300 days	365 days
Triaxle ~28 t payload	143	119	98
B-double ~46.5 t payload	86	**72**	59
A-double ~55 t payload	73	61	50

Before empty return trips. Chip loads can fill the trailer's volume before reaching its weight limit, so real payloads may be lower.

Why catchment models fail: distance eats the scale benefit



Distance eats the scale benefit

Processing cost falls with scale, but every extra tonne is trucked further. The last tonne sets the price.

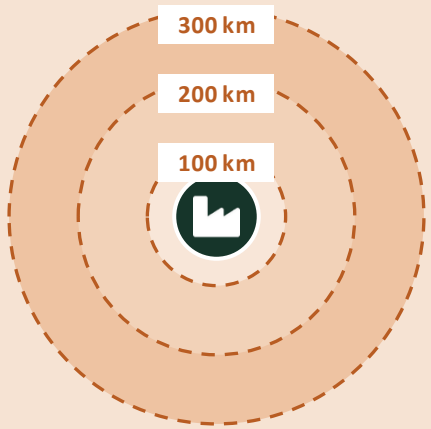
The circle sets the size

Past the crossover, every extra tonne costs more than scale saves. The plant stops growing where the catchment says, not where the market says.

Australia thinks catchment. Asia thinks portfolio.

Their competitive moat has always included global supply.

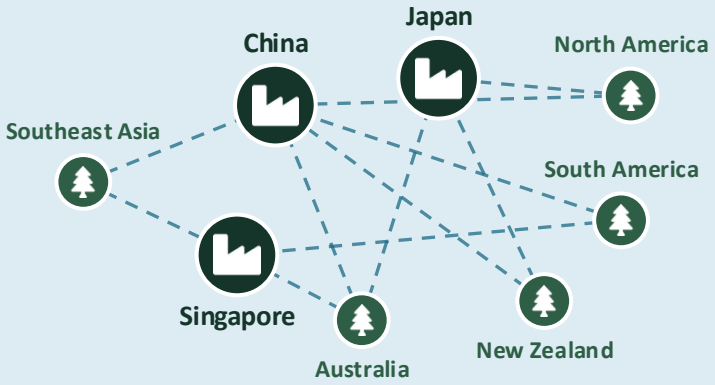
AUSTRALIA: CATCHMENT



- Local fibre first
- Larger plant = wider road radius
- Marginal tonne travels further
- Delivered cost rises
- Plant scale constrained by local resource
- Catchment defines procurement

"How much fibre exists inside the circle?"

ASIA: PORTFOLIO



- Multiple origins
- Global specification-based buying
- Long-term contracts + spot
- Shipping scale
- Vessel positioning / backhaul
- FX and freight arbitrage
- Switch origins as economics change
- Local supply where competitive

"What supply portfolio gives the lowest delivered cost and highest plant utilisation?"

Catchment model
Plant scale limited by local radius

vs

Portfolio model
Plant scale supported by multiple global origins

→ More procurement flexibility | Higher utilisation | Greater scale | Lower exposure to one supply basin

One of the structural reasons **Asian processors have repeatedly outcompeted Australian processors in internationally traded commodity markets**, alongside scale, capital utilisation, labour costs, market depth, industrial clustering and proximity to customers.

If Australia builds plants around a 200 km fibre radius, it is competing with processors whose feedstock catchment is the world.

Global aggregation and shipping logistics are not a workaround. They are part of the competitive moat.

History suggests Australian processors ignore this at their peril.

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The expensive kilometres are often the first 100

Distance is not the problem. Logistics geometry is.

Road haulage · B-double, forest to port



A$12.50/t 50 km × A$0.25

A$20/t 100 km × A$0.20

A$32.40/t 180 km × A$0.18

Rate per t-km falls with distance as fixed truck costs are spread further. A-doubles can be cheaper; triaxles cost more.

Bulk grain vessel · Australia/NZ to China

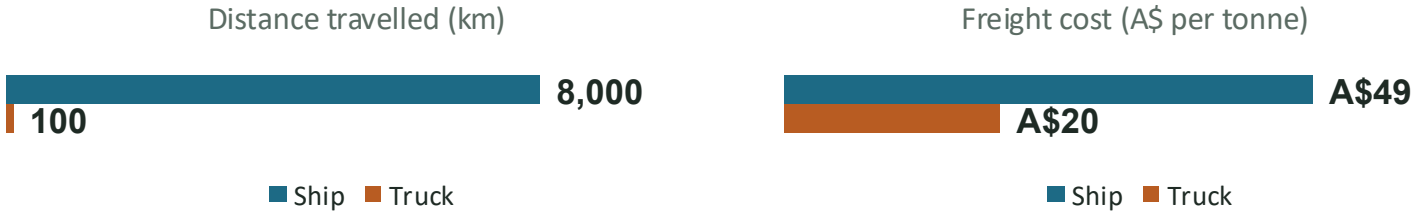
~8,000 km

US$35 / t × 35,000 t ≈ US$1.2m per voyage

US$1.2–1.5m
total voyage freight

~US$0.004
per t-km (≈ AU$0.006)

Same tonne, two journeys



~30–40×
higher cost per t-km by road than by sea

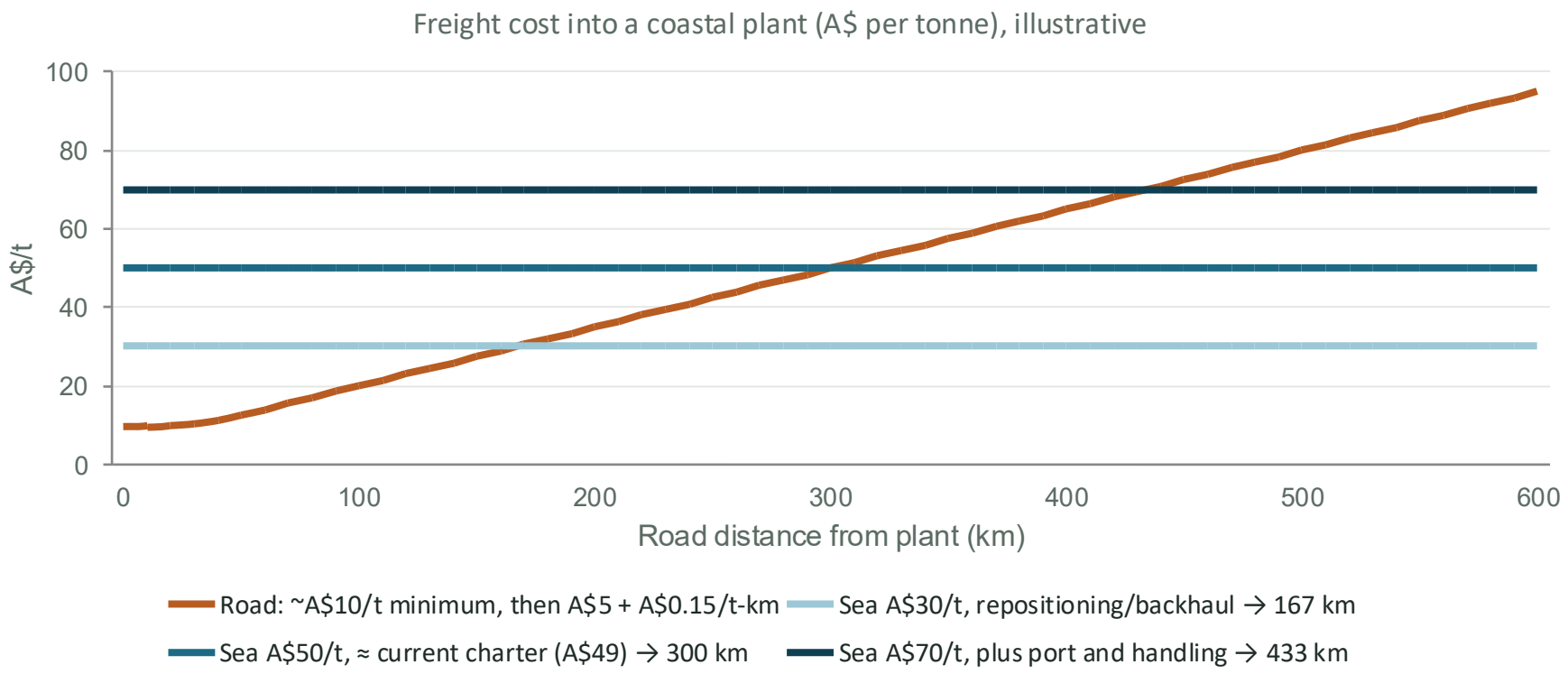
For low-value fibre, access to efficient logistics matters more than straight-line distance to market.

Indicative rates, not quotes. Sea leg assumes ~1 t per JAS m³ and A$1 = US$0.71, and excludes port, handling and inland costs.

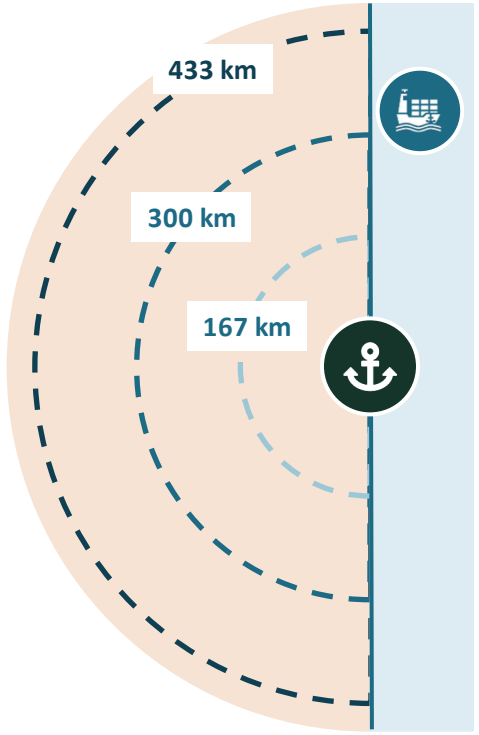
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Where the ship starts to beat the truck

Break-even road radius = where road cost per tonne reaches the landed sea cost



Coastal plant catchment



Road cheaper inside each ring; the ship competes beyond it

Road rate per t-km	2 km: **A$5.00**	50 km: **A$0.25**	100 km: **A$0.20**	180 km: **A$0.18**	400 km: **A$0.16**

+67 km of radius for every extra A$10/t of landed sea cost

½ circle A coastal plant's land catchment is a half-circle, so it reaches the ring sooner

~half the radius if a wet road chip (50% MC) competes with a dry imported chip (12% MC)

Illustrative. Road curve fitted to slide 1 rates. A$50 ≈ slide 1 charter example (ocean freight only, A$49/t). A$30 = possible repositioning cargo into Australia. Freight only.

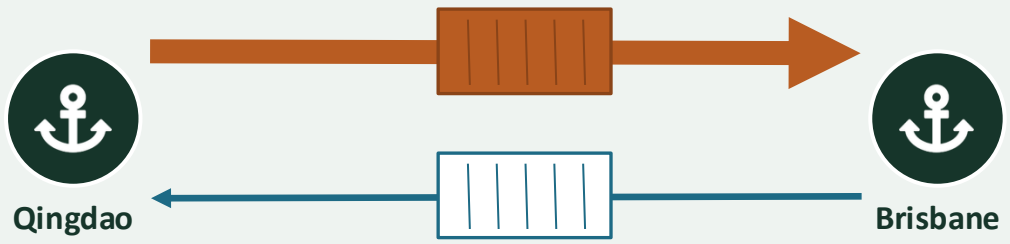
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Backhaul and repositioning can transform freight economics

The cheapest freight fills capacity that must move anyway.

1 Container imbalance · 40 ft box, 28 t payload

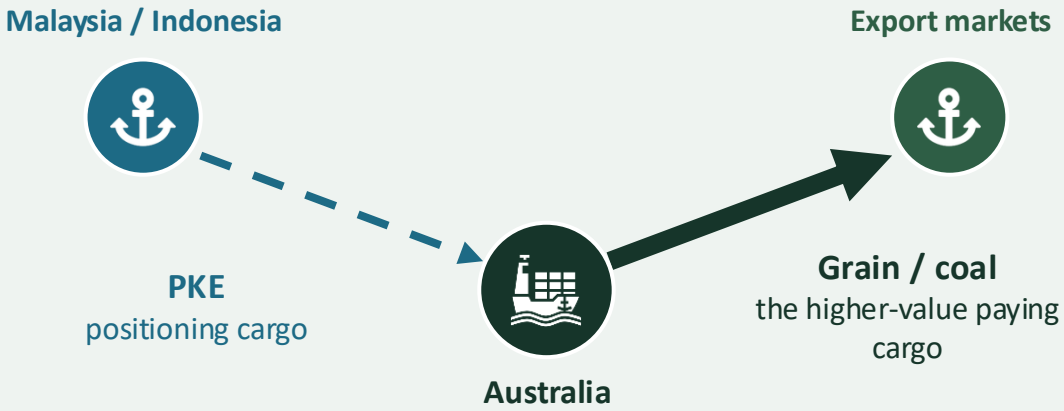
US$4,500 /box → **US$161/t**



US$150 /box → **US$5.36/t**

~30× **Same box. Similar distance.**
The box must go back to Asia anyway. Any return revenue beats shipping it empty.

2 PKE into Australia · bulk carrier positioning



Positioning cargo
Only has to beat sailing empty

Dedicated cargo
Must pay for the whole ship

The cheapest tonne to move is the tonne that fills capacity that was going there anyway.

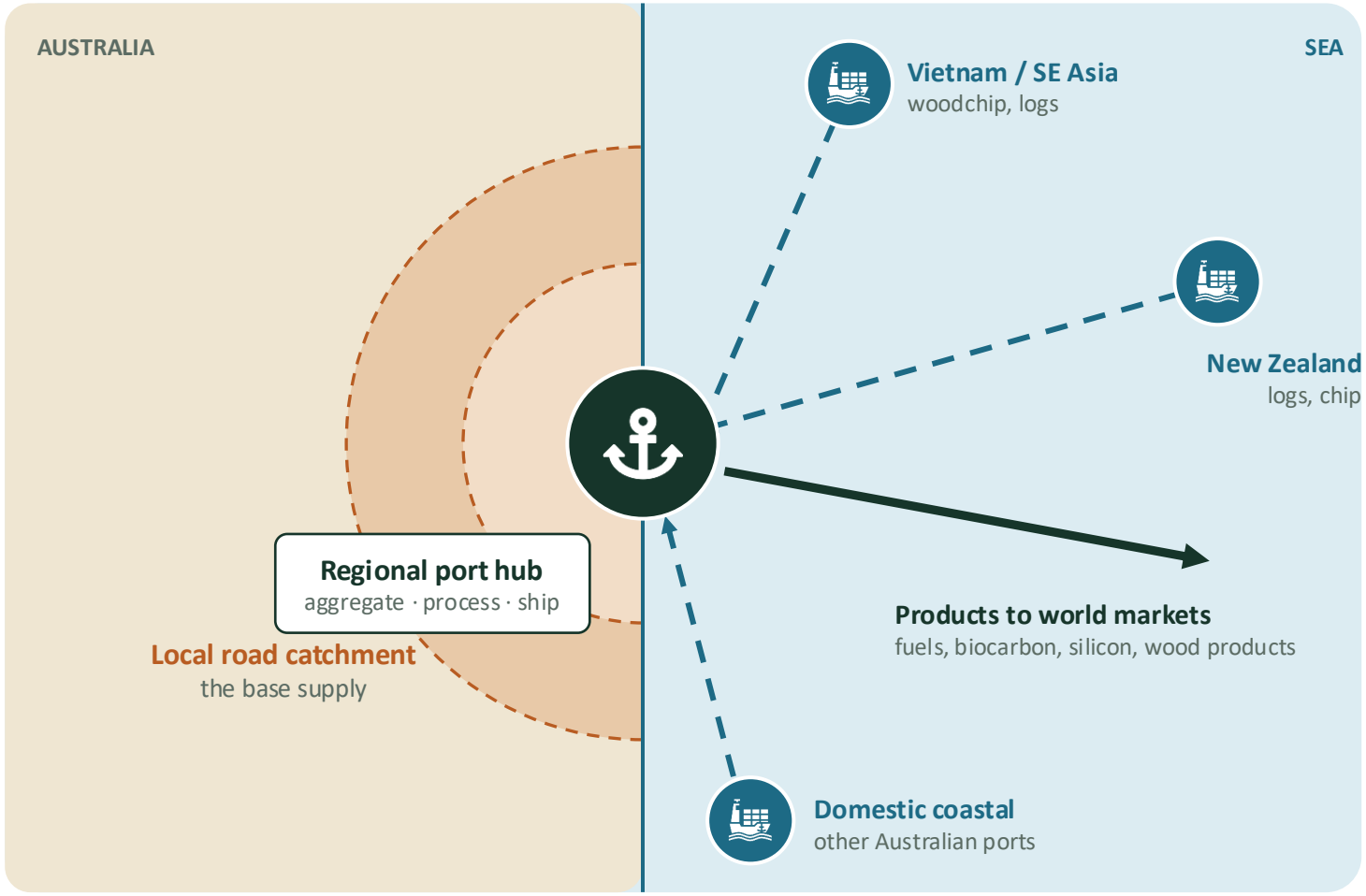
For biomass strategy, don't model freight as distance × $/t-km. Direction, asset utilisation, vessel positioning, trade imbalance and return loads can matter more than distance itself.

Indicative rates, not quotes.

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What if the port, not the plant, is the hub?

Local fibre is the base. The region's fibre supplies the scale. Australia processes it, not just exports it.



Why now

21.4 Mm³ NZ log exports in 2025, ~90% to China, as China grows more of its own timber

US$2.2bn Vietnam woodchip exports, Jan–Nov 2025

Backhaul ships already position into Australia for grain and coal

Design it in from day one

Biosecurity-ready import pathways

One traceability and certification standard for every origin

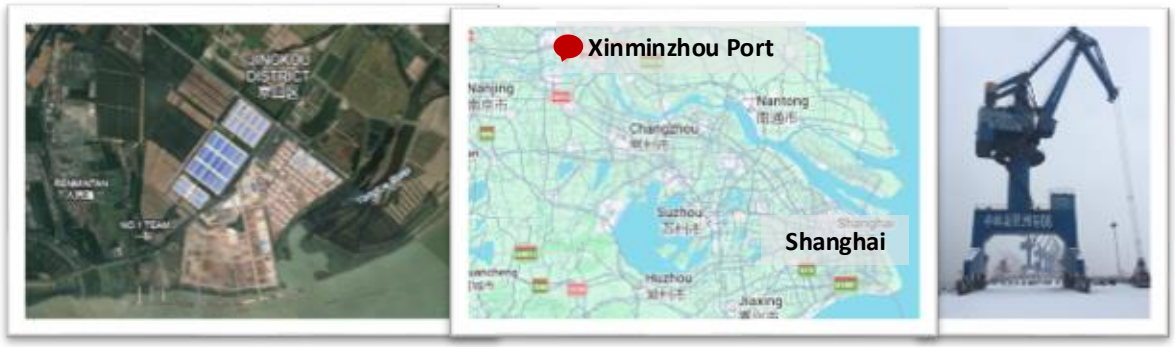
Port land, berths and handling

Local growers as the contracted base, not the residual

Stop asking what is inside the circle. Ask what the port could become.

Port hubs were a policy choice, not an accident

When native forest supply changed, China and India moved processing to the port, and to the world's fibre.





Xinminzhou, China

Zhonglin Xinminzhou Port · Zhenjiang, Jiangsu · Yangtze River

1998	First natural forest logging bans, after the Yangtze floods
2014–17	Commercial logging of all natural forests halted nationwide
Then	Govt's forestry investor builds the port and global trading arms

~12 Mm³ imported logs a year through Jiangsu's ports (~40% of China's log imports)

Kandla, India

Deendayal Port · semi-desert Kutch, Gujarat · Gandhidham timber cluster

1996	Supreme Court suspends felling; unapproved sawmills closed
2000	Kandla zone becomes a Special Economic Zone
Then	Timber processing moves to a desert port, across India from its forests

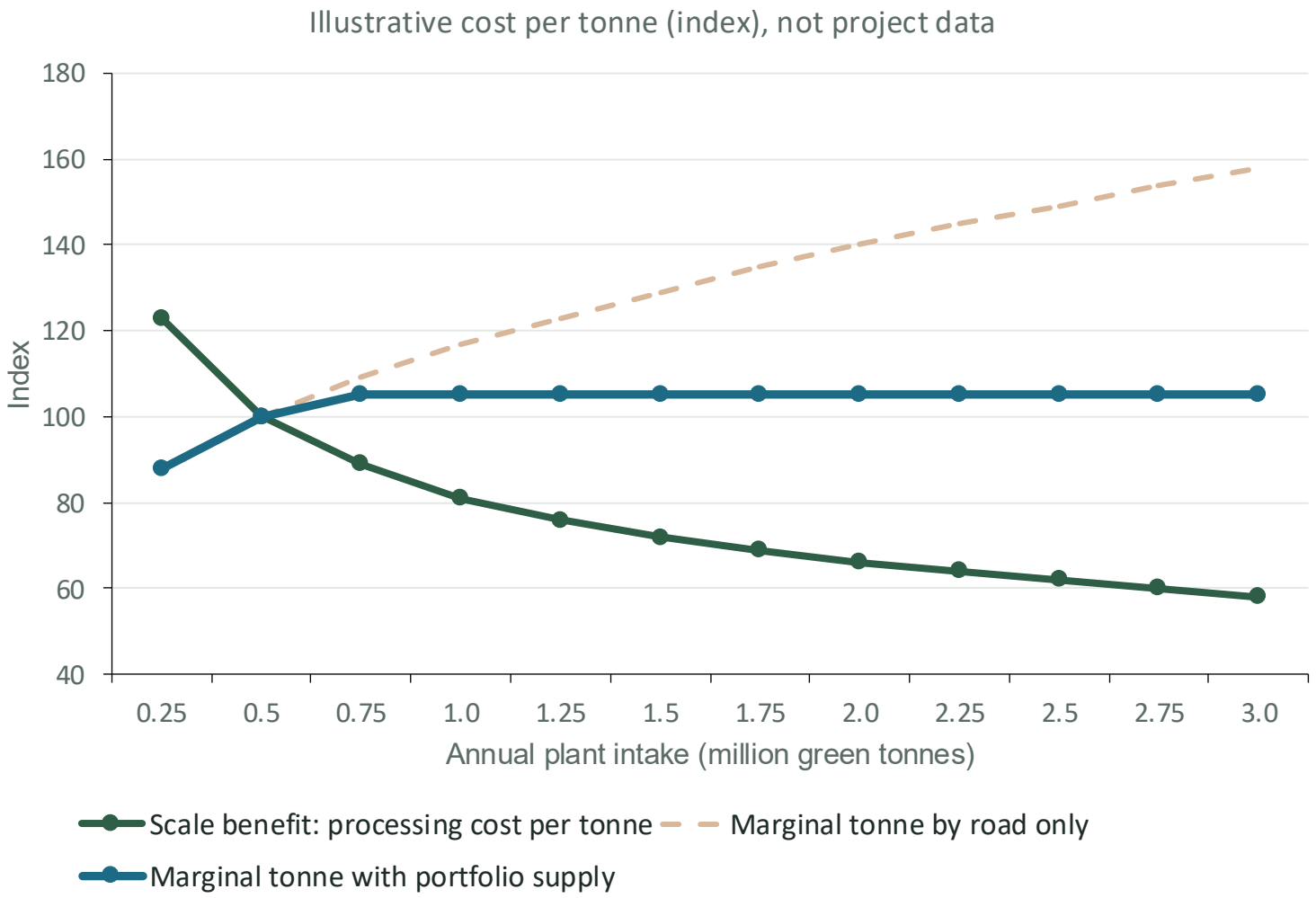
~3.5 Mm³ imported timber a year through Kandla, about 65% of India's timber imports

Both hubs were policy responses to a change in native forest supply.

Australia is progressively ending native forest harvesting. Should we have a port-hub response?

Sources: FAO (2001) on China's 1998 bans; Forest Trends (2016) on the 2014–17 natural forest logging ban; Wood Central (2026); Supreme Court of India, T.N. Godavarman Thirumulpad v Union of India (1996); Indian Forester 150(11) (2024). Port-hub link and CFG role: speaker's experience (China Forestry Group NZ, 2016–21).

With a port hub, scale is no longer set by the circle



The marginal tonne stops climbing

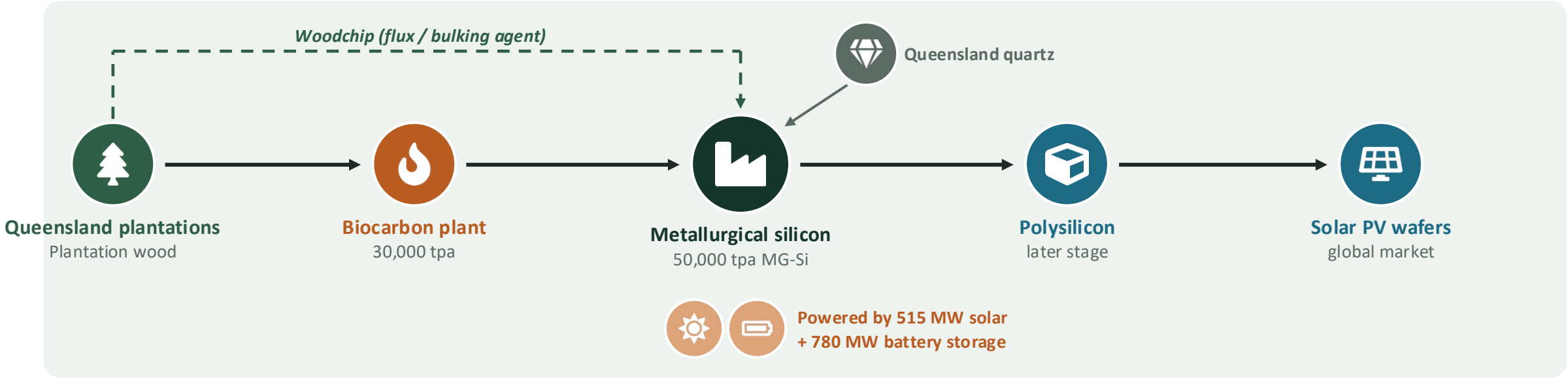
Sea, coastal and hub supply cap its cost at what the alternative costs to land.

Fibre no longer sets the immediate scale ceiling

The constraints shift to market, port capacity and capital.

Case study: biomass inside the solar supply chain

Northern Quartz Campus, Lansdown (near Townsville, Qld) · proponent Solquartz Pty Ltd (Quinbrook portfolio)



30,000 tpa	50,000 tpa	Up to A$4.5bn	~2,000
biocarbon production	metallurgical-grade silicon	estimated capex	ongoing jobs (~1,200 in construction)

Australian Government Major Project Status (Feb 2026) · Queensland prescribed project · commercial operations targeted by 2030

Disclosure: Terrafolia Advisory advises Solquartz on plantation wood supply. Sources: business.gov.au Major Project Status register (Northern Quartz Campus, Solquartz Pty Ltd); quinbrook.com/portfolio/northern-quartz-campus. Capex and jobs as provided by the proponent.

Here biomass is not a fuel. It is a chemical reagent.

Silicon is made by reducing quartz with carbon in an electric arc furnace. The carbon and the electricity set the footprint.

Conventional MG-Si (most global output)

Reductant	Low-ash coal, often imported (e.g. Colombia)
Power	Largely coal-fired grids
Carbon released	Fossil CO_2

Northern Quartz Campus model

Reductant	Plantation biocarbon, plus woodchip
Power	Solar + battery storage
Carbon released	Biogenic CO_2, regrown in the plantation

3.26 t CO_2

per tonne of silicon comes from the reductant carbon itself (stoichiometric)

10.5–13 MWh

electricity per tonne of silicon: about 0.5–0.65 TWh a year at 50,000 t

~11 t CO_2e

global average footprint per tonne of silicon (2019), over half from electricity

Swap fossil carbon and coal power for plantation biocarbon and solar, and the solar supply chain starts from a renewable base.

Brazilian producers already use plantation charcoal, so the biocarbon route is proven. Sources: Saevarsdottir et al. (2021), J. Sustainable Metallurgy 7, for CO_2 and electricity figures; coal supply: industry sources.

Aggregation helps: Corbet's, Gympie case study...

Public capabilities (corbets.com.au)

Aggregate	Land clearing and grinding; crushing and screening plant
Transport	Log, walking-floor and tipper trailers carrying timber, timber residue and cattle feed
Grade	Hardwood and cypress chip, forest mulch, bark grades, compost blends
Sell	Energy, landscaping, agriculture and nursery markets

Family owned for 40+ years, founded in sawmilling. Depots at Gympie, Dalby and Goondiwindi.

The hub value test

Value added
Better specification, fuller loads, reliability, market access

>

Extra cost
Double handling, site operation, stock and losses



Head office, workshop and fleet yard. Photo: Corbet's Group



Organics yard: graded stockpiles and compost windrows. Imagery © 2026 Google

What it would take: leadership, not new technology

Each group has a different job. None of them can do it alone.

Governments and ports

- Plan port land, berths and biosecurity-ready import pathways
- Fund investment-ready supply data and regional supply chains, not just plants
- Back regional collaboration, not only national self-sufficiency

Investors and developers

- Start from the market and the supply portfolio, not the resource map
- Size the plant to the port, not the circle
- Price in logistics design and backhaul from day one

Industry and growers

- Build the capability to aggregate, specify and trade
- Contract for a fair share of the value
- Supply the base, and compete for the margin

Regional partners

- Common certification and traceability across origins
- Treat NZ and South-East Asia as supply partners, not just competitors
- Share data, as IEA Bioenergy already does

The constraint is not the resource. It is the size of our ambition. *Someone in this region will build the first fibre port-hub.*

THINKING GLOBALLY

1
The fibre is real.

But every tonne has an owner, a cost and an alternative use.

2
The circle is the limit.

Catchment plants stop growing where distance eats the scale benefit.

3
Ports are a Portfolio opportunity.

Local supply as the base. The region's fibre for scale.

4
The choice is leadership.

China and India chose. Australia's trigger has already arrived.

Stop counting residues. Start thinking globally.

Who builds the region's first fibre port-hub, and with which neighbours?

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