



## Embodied decarbonisation: How critical minerals, mining and manufacturing majors are transitioning to clean energy

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*Paper #9 in a series on value-adding critical minerals opportunities in Australia (7 of the 8 previous articles first published in [Renew Economy](#); the other in [Climate and Capital Media](#)).*

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Accelerating decarbonisation, using low cost variable renewable energy (VRE) with battery storage, pumped hydro, enhanced grid interconnection, dynamic pricing, EV-to-grid and demand response management firming, is the key solution to the climate crisis, energy security and grid stability, here and globally.

It is also paramount to support the expansion of Australia's value-adding industries onshore. While gas, diesel, and coal currently dominate Australia's powering of value-added operations, we need to realise our opportunity and our global competitive advantage to become a world-leader in driving decarbonisation in mining, metals, heavy industry and manufacturing across the board. This will counter the extreme market price fluctuations and instability of traditional fossil fuel sources.

The recent outage from Chevron's Wheatstone gas plant, the third gas plant breakdown this summer in Western Australia, is a case in point.<sup>1</sup> Wheatstone provides ~17% of WA's gas production. Its failure triggered an energy crisis with an immediate impact on major alumina and ammonia nitrate operations, including South32, Wesfarmers and Alcoa, with Alcoa shutting down operations in a refining unit and resorting to emergency diesel generation.

Currently, Australia's mining sector derives its energy requirements from diesel (41%), gas (33%), grid electricity (22%), and other fuel sources aggregating to form the remainder. The mining sector accounts for ~10% of Australia's total energy demand, with energy consumption rising 6% over the last year.<sup>2</sup> The use of electricity in alumina and aluminium refining doubles this mining share nationally. The expansion of our critical minerals industry, as well as decarbonisation of aluminium refining, will intensify the demand on Australia's electrical grid and increase the needed investment in grid-firming.

Our nation's massive VRE and critical minerals resource comparative advantages provide a once in a century opportunity for Australia to become a global leader in decarbonised heavy industry.

The shift is taking place in the context of an escalation of climate policy ambition and public and private investment into renewables globally, including in the US, China, and Australia, as we [address elsewhere](#).

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<sup>1</sup> AFR, [Chevron Struggles to Fix WA Gas Plant as Alcoa Boots Up Diesel](#), 8 January 2023

<sup>2</sup> ARENA, [Renewable Energy in the Australian Mining Sector](#), 21 July 2020

**Below, we review the efforts of Australian mining and refining, energy and manufacturing companies in decarbonising their operations by shifting to renewables.**

## **Australia's critical minerals decarbonisation opportunity**

It is imperative that Australia captures the value of surging global critical minerals demand generated by the clean energy transition.

As critical mineral mining and refining expands here, we have an opportunity to embed decarbonisation in new projects across the value chain, harnessing Australia's low-cost, reliable VRE and building onshore supply chains at global scale.

The Australian Government published its 2022 Critical Minerals prospectus in December, summarising the key future projects across all metals and minerals required for the energy transition.<sup>3</sup>

A key example is **Liontown Resources'** Kathleen Valley lithium project, currently under development in Western Australia. Zenith Energy has been brought in to develop one of the largest off-grid wind, solar and BESS for a mining operation in West Australia. The off-grid facility will power a significant component of the Kathleen Valley lithium mine, a key development project for Tesla, Ford, and LG Energy Solutions. The facility will involve a **30MW Wind** and **16MW Solar Farm** with a 17MW battery firming solution.<sup>4</sup>

A concurrent theme across all projects identified in the federal prospectus is the companies' promises to meet their energy demand using commercial and sustainable renewable energy.

Government support is key to fast track approvals that incorporate worlds-best decarbonisation objectives, and to crowd in private capital by deploying patient, national-interest equity, infrastructure, debt, export credit and grant finance, via, for example, the Future Fund, CEFC, NAIF, EFA and ARENA, and state level funders such as Queensland's CleanCo.

The underlying problem is the lack of leadership from large-scale critical mineral companies on rapid deployment of decarbonising technology and capital. When federal and state governments have clearer, more tangible roadmaps to decarbonising energy than some of the biggest mining firms in the world, commercial considerations mean that smaller-scale critical mineral firms will be reluctant to act. It should be the responsibility of the large-scale, world-leading miners extracting value from Australia's resources to lead capital-intensive renewable energy capacity expansion.

## **Rio Tinto**

Rio Tinto, Australia's #1 energy user, is one of the leading mining companies in Australia with a dedicated climate roadmap.

Rio Tinto's decarbonisation strategy is focussed on the phase-out of coal from grid-connections with renewable power capacity additions across Queensland and Western Australia, transitioning from gas-powered to solar micro-grids, and diesel abatement through electrified transport and hauling solutions. Post the Juukan Gorge debacle, which profoundly damaged its social licence, it is pleasing to see Rio demonstrate its new commitment to decarbonised supply chains as well as operational emissions in a time-frame and capital intensity that better reflects the urgency of the transition than its key Australian competitors.

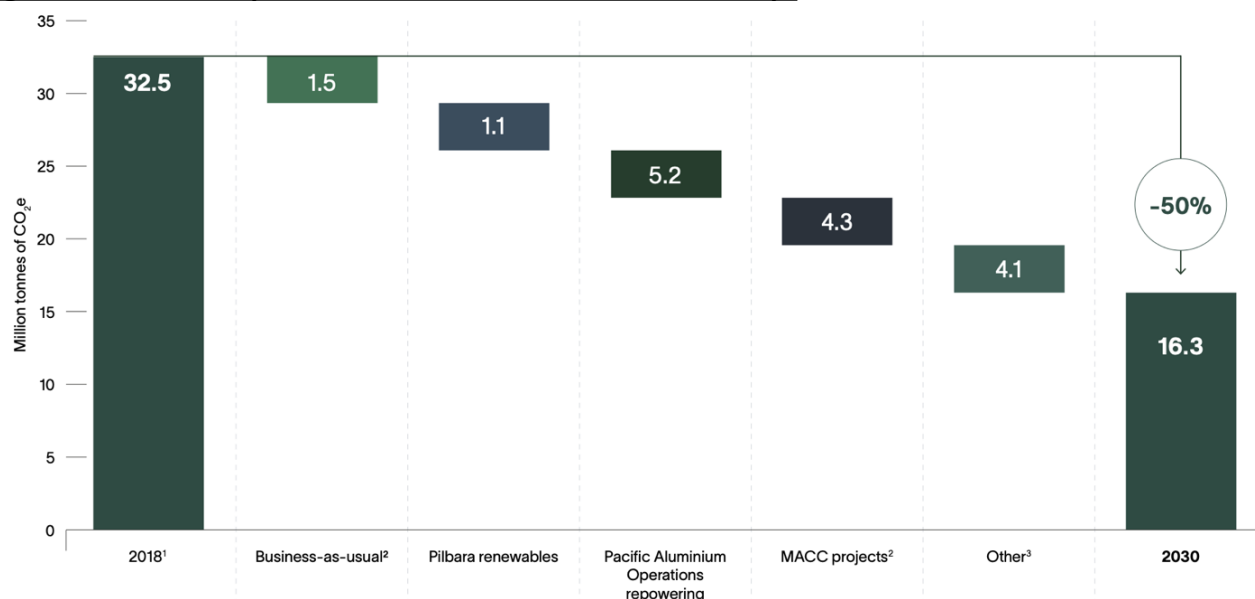
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<sup>3</sup> Austrade, Australian Critical Minerals Prospectus, 2022

<sup>4</sup> Liontown Resources, [Letter of Award for Kathleen Valley Hybrid Power Station](#), 12 September 2022

In 2021, Rio strengthened its climate commitments, with a targeted 50% reduction in Scope 1 and Scope 2 emissions by 2030 (from 2018 baseline), see Figure 2.<sup>5</sup>

**Figure 2: Rio Tinto Operational Emission Reduction Roadmap:**<sup>6</sup>



Source: Rio Tinto Climate Change Report 2021

Rio intends to collaborate with State Governments to capture clean energy value opportunities and transition to a renewable energy powerhouse. It will invest US\$7.5bn in decarbonising projects over the coming decade, with US\$500m annually over the next 3-years.<sup>7</sup>

In 2021 (latest available data), Rio Tinto powered over 33% of its global energy demand from renewable sources, dominated by Canadian hydro-electricity. Through 2021, Rio Tinto's primary single-source energy was coal, powering 31.8% of all energy demand, with 13.3% and 20.1% from diesel and gas respectively.<sup>8</sup>

Over 60% of Rio's Scope 1 and 2 GHGs were emitted from Australia in 2021, predominantly from its aluminium and iron ore operations. For Rio to reach its 50% reduction target by 2030, investments into reducing reliance on coal and gas in Australia are paramount.

### ***Rio's Operational Decarbonisation***

A priority focus is its Pilbara iron ore and Queensland aluminium operations.

Rio Tinto operates the world's largest integrated portfolio of iron ore assets, powered by one of the largest microgrids of gas-based power. At 480MW, the grid contributes to ~30% of the company's emissions. In April 2022, Rio established its **Pilbara Renewables Project**, a **1GW integrated network of solar and wind**, 7 times larger than WA's current highest capacity operational solar farm.<sup>9</sup> Alongside a planned Battery Energy Storage System (BESS), this will abate ~1 million tonne per annum (Mtpa) of CO<sub>2</sub>-equivalent, reducing the iron ore division's Scope 1 and 2 emissions by 30%.

<sup>5</sup> Rio Tinto, [Central Queensland Leads the Way in Clean Energy](#), 12 October 2021

<sup>6</sup> Rio Tinto, [Climate Change Report](#), 2021

<sup>7</sup> Rio Tinto, [Annual Report](#), 2021

<sup>8</sup> Rio Tinto, [Sustainability Fact Book](#), 2021

<sup>9</sup> Rio Tinto, [Harnessing Renewables to Decarbonise the Pilbara](#), 28 April 2022

In November 2022, Rio announced a planned investment of \$600m into the Project for the development of **two 100MW solar farms and 200MWh on-grid BESS** by 2026.<sup>10</sup> The project will decrease Rio's Scope 1 and 2 emissions by 10% and displace 30% of Rio's gas consumption in the Pilbara. Initial funding has been approved and financial close is expected in 4QCY23.

Rio Tinto's decarbonisation of WA operations is supported by its **34MW Gudai-Darri Solar Farm**, commissioned in August 2022. Connected to Rio's microgrid via the Tom Price 45MW / 12MWh battery system, the solar farm will power a third of the average electricity demand of Rio's first iron ore greenfield expansion in over a decade.<sup>11</sup>

Decarbonising aluminium is a key challenge. 60% of world's aluminium production was powered by coal in 2020, with Rio's aluminium operations, centred in Queensland, accounting for ~70% of the entity's direct and indirect emissions. Rio also plays a critical role in driving the development of competitive firm VRE and "supporting Queensland's renewable energy targets".<sup>12</sup> Rio's aluminium assets within the Gladstone region – Boyne smelter, Yarwun alumina refinery and Queensland Alumina refinery – will require 1,140MW of thermal energy supply to operate, or **4GW of wind and solar**.<sup>13</sup>

In June 2022, Rio made a formal market Request for Proposals (RFP) for the development of a large-scale, grid-direct, wind and solar integrated project to power its Gladstone assets. In October 2021, Rio Tinto signed a statement of cooperation with the Queensland Government to transition Central Queensland into an industrial and renewable energy powerhouse.<sup>14</sup>

### ***Rio's Value Chain Decarbonisation***

In July 2022, Rio partnered with Ford Motor Company to develop sustainable and secure supply chains for battery and low-carbon materials for Ford's EV division. The partnership will support the decarbonisation of Rio's operations in lithium, aluminium, and copper, and enhance Rio's shift into critical minerals, with Ford a key customer of Rio's Rincon lithium proposal in Argentina, and the development of North American aluminium and battery supply chains for Ford's electric truck line-up.<sup>15</sup>

In September 2022, Rio Tinto announced a partnership for the supply of low-carbon products to Volvo Group, with a focus on decarbonising Rio's diesel exposure, piloting Volvo's electrified hauling solutions.<sup>16</sup>

In October 2022, Rio partnered with the Canadian Government to invest C\$737m to decarbonise its iron ore and titanium operations in Quebec, and establish a critical minerals processing facility.<sup>17</sup>

## **BHP**

BHP's is targeting a 30% reduction in operational Scope 1 and 2 emissions by 2030, relative to FY2020.<sup>18</sup> It has committed US\$4bn into operational decarbonisation by that date, half the

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<sup>10</sup> Rio Tinto, [Rio Tinto Plans Further Investment in Renewable Energy in the Pilbara](#), 30 November 2022

<sup>11</sup> Renew Economy, [Rio Tinto Starts Commissioning Gudai-Darri Solar Farm and Tom Price Battery](#), 22 August 2022

<sup>12</sup> PV Magazine, [Rio Tinto Targets Large-Scale Solar as Part of Shift to Renewables](#), 9 June 2022

<sup>13</sup> Rio Tinto, [Calls for Proposals for Large-Scale Wind and Solar Power in Queensland](#), 8 June 2022

<sup>14</sup> Rio Tinto, [Central Queensland Leads the Way in Clean Energy](#), 12 October 2021

<sup>15</sup> Rio Tinto, [Ford MOU for Battery and Low-Carbon Materials Supply](#), 21 July 2022

<sup>16</sup> Rio Tinto, [Volvo Partner for Low-Carbon Materials Supply and Pilot Sustainable Hauling Solutions](#), 13 September 2022

<sup>17</sup> Rio Tinto, [Partners with Government of Canada to Decarbonise RTFT and Boost Critical Minerals Processing](#), 11 October 2022

<sup>18</sup> BHP, [Annual Report 2022](#),

commitment of Rio Tinto (where Rio is half BHP's market capitalisation). This will be reflected by an annual capital allocation of US\$200-600m over the next 5 years.<sup>19</sup> Reducing GHG emissions is a key component of BHP's climate change strategy. However, BHP's management response to meet its 2030 emissions target is to split the coming decade into two periods, delaying real action.

FY21-25 is focussed on the conversion from fossil-fuel based purchased and self-generated electricity into renewable sources and investigating feasibility studies for diesel displacement in operated assets. FY26-30 focuses on green electricity and investing into diesel displacement for material movement, light vehicles, and stationary equipment.<sup>20</sup> A cynic might view this as BHP promising to follow Rio Tinto and Fortescue once they have done the hard yards.

The sole evidence of BHP decarbonising and scaling its renewable energy supply lies in power purchase agreements (PPA) for its Australian and Chilean operations established in FY22.

### ***BHP's Power Purchase Agreements***

In February 2021, BHP signed a PPA to supply up to 50% of its Kwinana Refinery energy demand from Risen Energy's **132MW Merredin Solar Farm**, the largest solar facility in Western Australia.<sup>21</sup>

In April 2022, BHP signed a PPA with Enel Green Power for development of the **\$200m 76MW Flat Rocks Wind Farm in WA**.<sup>22</sup> This is expected to reduce Nickel West's Scope 2 emissions by a third relative to 2020 levels from 2024.

BHP signed a PPA with TransAlta for the development of an off-grid large-scale renewable energy project in WA. The **Northern Goldfields Solar Project** includes a 27MW solar farm at Mt Keith, a 10.7MW solar farm and 10MW BESS at Leinster, which will be integrated into TransAlta's remote power grid.<sup>23</sup> The project is the first on-site solar farm and battery system for BHP.

The aggregate renewable energy feedstock from Merredin, Flat Rocks, and Northern Goldfields will supply 100% of the electricity needs of Nickel West's refining operations.<sup>24</sup>

In 2021, BHP announced an intended partnership with Iberdrola to supply 50% of the energy demands of its Olympic Dam operations through the **\$500m Port Augusta Renewable Energy Park** in South Australia.<sup>25</sup> Once built, the long-term PPA would provide renewable energy from a hybrid 210MW wind and 107MW solar farm.<sup>26</sup>

In November 2022, signed a PPA with Neoen to supply 70MW of baseload electricity from the **203MW Goyder South Stage 1 Wind Farm**, supported by its Blyth battery system. The PPA aims to provide Olympic Dam with 50% of its electricity requirements from renewables from July 2025.<sup>27</sup> The Goyder South wind farm is a component of the Goyder South Renewables Zone, a hybrid energy project with a planned capacity of **1.2GW from wind and 600MW from solar**.<sup>28</sup>

An accelerated roll-out of PPAs from renewables is only part of the decarbonisation problem BHP will face in the coming years. Grid electricity accounted for 24.8% of BHP's energy demand in 2022.

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<sup>19</sup> BHP, [Annual Report 2022](#), p.43

<sup>20</sup> BHP, [Climate Change 2022](#), p.19

<sup>21</sup> BHP, [Nickel West Kwinana Refinery to Reduce Emissions from Electricity use by up to 50%](#), 1 February 2021

<sup>22</sup> Enel, [Enel and BHP Strike Deal for 12-year Renewable Energy PPA](#), 5 April 2022

<sup>23</sup> Australian Mining, [Solar Project to Power BHP](#), 2 February 2022

<sup>24</sup> Mining.com, [BHP's Nickel West to be Fully Powered by Renewables](#), 6 April 2022

<sup>25</sup> BHP, [Olympic Dam to Partner with Iberdrola at Port Augusta Renewable Energy Park](#), 14 October 2021

<sup>26</sup> Renew Economy, [Solar Powers Up at Australia's Biggest Hybrid Renewables Park](#), 11 October 2022

<sup>27</sup> Neoen, [Neoen and BHP sign a 70MW Renewable Energy Baseload Contract in South Australia](#), 3 November 2022

<sup>28</sup> BHP, [New Wind and Battery Project in South Australia](#), 3 November 2022

BHP's energy sourcing is dominated by diesel and gasoline, accounting for 58.5% of energy, as in Table 1.

Despite the growth from 0% to 11.5% renewable energy usage, BHP has maintained an equivalent share of energy demand from diesel and gas to power their operations across FY21-22.

**Table 1: ESG Factbook Comparison of BHP, Rio Tinto, FMG and Alcoa:**

ESG Comparison	BHP (FY2022)	Rio Tinto (2021)	FMG (FY2022)	Alcoa (2021)
Market Capitalisation	US\$245.7bn	US\$125.7bn	US\$47.0bn	US\$9.7bn
Scope 1 and 2 Emission Reduction Target by 2030	30% from FY2020 levels	50% from CY2018 levels	100%	50% from FY2015 levels
Planned Capital Expenditure on Decarbonisation by 2030	US\$4bn	US\$7.5bn	US\$6.2bn	N.A.
Reported Annual Investments	US\$200-600m	US\$500m	\$620m	N.A.
Scope 1 and 2 Emissions (Mt CO <sub>2</sub> -e)	12.3	31.1	2.28	21.8
Scope 3 (Supply Chain) Emissions (Mt CO <sub>2</sub> -e)	364.3	553.5	254.7	47.5
Energy Usage (PJ)	149.0	393.0	30.6	184.8
Diesel and Gasoline	58.5%	13.3%	-	2.0%
Gas	14.9%	20.1%	-	55.4%
Coal and Coke	0.5%	31.8%	-	36.1%
Renewables	11.5%	33.1%	-	0.1%
Other	14.6%	1.7%	-	6.4%

Source: Company ESG Databooks

According to BHP's FY2022 ESG Factbook, renewable capacity additions are focussed on decarbonising its Chilean operations. In FY2023, 100% of Escondida and 83% of Spence's electricity demand will be sourced from renewable energy. However, in FY2023, only 5% of one PPAs electricity demand for Leinster, WA, will be powered by renewables out of four PPAs signed across Nickel West and Olympic Dam.

In CY2022, the NEM sourced 34.9% of its power from renewable energy, its highest penetration to date. South Australia's grid was powered by 67.7% VRE on average in 2022, and 22.4% in Queensland. WA's SWIS also averaged 35% over 2022.<sup>29</sup> BHP's grid connectivity in Australia consistently underperformed these states, and national renewable penetration.

For a firm that prides itself on global leadership, BHP is a laggard in both value-adding Australian critical minerals and in embracing climate science through inhouse actions. It sees scaling out diesel abatement solutions is a future battle, not one to be fought today and it continues to underperform in capital involvement into renewable energy and emission reduction targets.

<sup>29</sup> AEMO, [OpenNEM](#)

In contrast, Sun Metals and Fortescue Metals Group are exemplars of leading capital intensity and rapid deployment of decarbonised and renewable solutions across Australia.

## Sun Metals

Sun Metals is the Australian subsidiary of Korea Zinc, the largest zinc, lead, and silver producer globally, and its Townsville Zinc Refinery is the second largest single-site consumer of electricity in Queensland. Sun Metals has committed to power its entire operations with renewable energy by 2040, with an interim target of 80% by 2030.

In 2018, Sun Metals committed \$200m for the development of its **143MW Solar Farm**, with the capacity to provide ~25% of the refinery's electricity demand, the largest integrated industrial solar project in Queensland.<sup>30</sup>

In 2021, **Ark Energy Corporation** was founded by Korea Zinc with the goal of decarbonising its entire energy supply, starting with Sun Metals. In December that year it acquired a 100% interest in Epuron, a leading utility-scale wind and solar developer in Australia. Through the acquisition, Ark Energy has developed 6.5GW of wind and 500MW of solar energy generation across Queensland, NSW, and Tasmania.

### ***Sun Metals Queensland Wind Precinct***

In March 2021, Ark Energy partnered with ACCIONA on the **923MW MacIntyre Wind Farm**, acquiring a 30% stake.<sup>31</sup> The project, which commenced construction in June 2022, will provide ~64% of Sun Metals' zinc refinery's energy requirements.



MacIntyre Wind Precinct under construction near Karara, QLD.

A total \$1.96bn will be invested into the aggregated **1,026MW MacIntyre Wind Precinct**, making it one of the largest onshore wind farms globally. The Queensland Government allocated \$170m in enabling transmission infrastructure to connect the Wind Precinct to the NEM.<sup>32</sup>

<sup>30</sup> ANZ, [Greening the Zinc Economy](#), 28 April 2022

<sup>31</sup> QLD Government, [Work Starts on Mega Wind Farm](#), 2 June 2022

<sup>32</sup> Infrastructure Partnerships Australia, [MacIntyre Wind Precinct](#)

In November 2022, ACCIONA announced a new \$2bn investment into the MacIntyre Wind Precinct with the **1,000MW Herries Range Wind Farm**.<sup>33</sup> The Precinct will now produce a total capacity of 2GW, with an overall investment of \$4bn. At 360 turbines, the Precinct is the largest wind project in Australia, dwarfing the 511MW Stockyard Hill Wind Farm and 453MW Coopers Gap Wind Farm.<sup>34</sup>

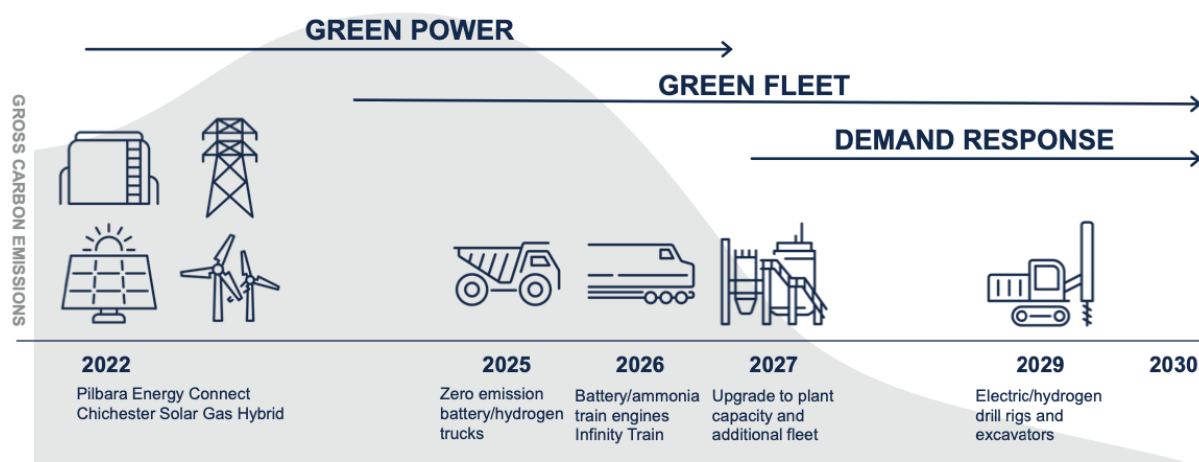
## Fortescue Metals Group (FMG)

Under Dr Andrew Forrest’s leadership, FMG has a nation-leading decarbonisation roadmap targeting net zero operational emissions by 2030, and a world-leading complete value chain target of net zero emissions by 2040 (Scope 1-3). FMG has committed 10% of its after-tax profits to fund renewable energy growth through Fortescue Future Industries (FFI), with a further 10% committed to growth opportunities in other commodities. Fortescue’s capital allocation link to company performance provides a consistent financial base of ~US\$620m annually to renewable energy. By 2030, FMG aims to invest US\$6.2bn into leading decarbonisation in Australia.<sup>35</sup>

Unlike its iron ore competitors in WA’s Pilbara, FMG has a tangible plan and capital allocation framework to deploy 2-3GW of renewables and battery firming, transmission networks and site infrastructure via its US\$700m **Pilbara Energy Connect (PEC)**. In FY2022, stationary power generation accounted for 14% of the entity’s emissions, powered by 42% diesel and 58% gas. The PEC involves a high voltage transmission network between the Solomon Hub and Iron Bridge, eliminating the need for diesel-power generation at Iron Bridge, with a 16MW and 26MW battery system at Solomon and Iron Bridge to provide renewable firming.

The Herb Elliot Port will be connected to the PEC, powered by renewable energy, aiming to eliminate most Scope 2 emissions from its operations.<sup>36</sup> The PEC is powered by the FMG / Alinta Energy’s 60MW Chichester Solar Gas Hybrid Hub, capable of powering 100% of Fortescue’s Christmas Creek and Cloudbreak mining sites’ daytime operations with renewable energy.<sup>37</sup>

**Figure 3: FMG Operational Emissions Decarbonisation Roadmap:**<sup>38</sup>



Source: FMG Decarbonisation Execution Plan

<sup>33</sup> ACCIONA, [Expand the MacIntyre Wind Precinct to 2000MW](#), 28 November 2022

<sup>34</sup> QLD Government, [Queensland Wind Farm Precinct to Dwarf All Others](#), 28 November 2022

<sup>35</sup> FMG, [Climate Change Report](#), 2022 p.9

<sup>36</sup> FMG, [Climate Change Report](#), 2022 p.12

<sup>37</sup> PV Magazine, [Alinta Switches on WA’s Largest Remote Solar Farm](#), 16 December 2021

<sup>38</sup> FMG, [Execution Plan for Industry Leading Decarbonisation](#), 20 September 2022



## Fortescue Future Industries (FFI)

Beyond renewable energy capacity, FMG has established a pathway to decarbonise mobility and hauling in its operations. In January 2022, FFI acquired Williams Advanced Engineering (WAE) for £164m to utilise its R&D in high-performance battery systems and electrification.<sup>39</sup> March 2022 saw WAE and Fortescue announce the development of its zero-emission Infinity Train, a regenerating battery electric iron ore train that uses gravitational energy to fully recharge its battery stores without additional charging requirements for the return trip.<sup>40</sup>

Fortescue announced a partnership with Liebherr to supply zero-emission power systems for the joint development of renewable mining haul trucks and accelerate the commercialisation of battery systems in heavy industry.<sup>41</sup> Electrification of FMG's mining haul trucks will displace over 200 million litres of diesel and reduce Scope 1 emissions by 25%.

In November 2022, FFI announced a partnership with Windlab to develop the wind and solar **10GW Super Hub** in Northwest Queensland. Forrest's private subsidiary, Squadron Energy, acquired 75% of Windlab in June 2020. The Super Hub aims to feed into Queensland's electrical grid and FFI's planned industrial-scale Gladstone green hydrogen project.

The initial stage includes the **800MW Prairie Wind Farm** and the **1,000MW Wongalee Project**, currently in development planning, with construction to commence 2025, and power generation by 2027, leveraging North Queensland's untapped renewable energy base, and helping drive the nation's clean energy transition.<sup>42</sup>

The Hub will also accelerate the development of the Northern Queensland REZ and play a vital role in Queensland's proposed **SuperGrid** – the Queensland Government's Infrastructure Blueprint to enable the state's energy supply transition and realise its goal of 50% renewables and a 30% economy-wide emission reduction by 2030.<sup>43</sup>

## Alcoa

Alcoa operates the Portland aluminium smelter, Victoria's largest electricity user, accounting for over 10% of total demand.<sup>44</sup> In 2021, it sourced over 55% of its energy demand from gas, and 36% from lignite.<sup>45</sup> Renewable energy accounted for only 0.1% of its energy demand.

Alcoa announced its sustainability and decarbonisation technology roadmap in 2021, with a 2030 corporate target of 50% reduction in Scope 1 and 2 emissions from a 2015 baseline, and an interim target of 30% reduction by 2025. It has placed a heavy dependence on its proposed \$4bn **1,000MW Spinifex Offshore Wind Farm** with Alinta Energy to be commissioned by 2027, with the goal to power 100% of its Portland aluminium smelter from renewables, supported by the Victorian and Federal governments.<sup>46</sup>

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<sup>39</sup> WAE, [Global Green Renewable and Resource Co. Fortescue to Acquire WAE in Race to Net Zero](#), 23 January 2022

<sup>40</sup> FMG, [WAE Settlement Powers Development of World's First Infinity Train](#), 1 March 2022

<sup>41</sup> FMG, [Liebherr to Supply Green Mining Haul Trucks Incorporating Fortescue's Zero Emission Power System](#), 15 June 2022

<sup>42</sup> Windlab, [Game Changing North Queensland Super Hub to Power Green Hydrogen with Wind and Solar](#), 14 November 2022

<sup>43</sup> Queensland Government, [Queensland SuperGrid Infrastructure Blueprint](#), September 2022

<sup>44</sup> ARENAWire, [Offshore Wind Could Unlock Green Aluminium](#), 13 October 2022

<sup>45</sup> Alcoa, [Sustainability Report](#), 2021

<sup>46</sup> Spinifex, [Offshore Wind Farm Project Overview](#)

In October 2022, the proposal received \$1.5m from ARENA to conduct a pre-development resource assessment.<sup>47</sup> The key difference between Spinifex and the 20+ proposals for offshore wind in Australia is its support from a value-adding mining major as the fundamental off-taker for future renewable energy.

Alcoa can play a global leadership role in enabling renewable energy investment via their long term offtake agreement, derisking what is potentially the first of a number of offshore wind projects leveraging A\$40bn of new investment in clean energy across Australia.

There is momentous potential for embodied decarbonisation of value-added industry in Australia, across traditional resources, critical minerals, metals, manufacturing and elsewhere – that is, onshore mining, refining and production using our world-leading abundance of renewable energy resources. While some of the companies reviewed above are taking a lead, there is significant room for greater ambition, enhanced capital investment, and public-private co-investment to embed firm VRE in operations and value chains and help ensure Australia's competitive advantage in an increasingly rapidly decarbonising world.

***This analysis is for public interest purposes highlighting the national strategic interests and opportunities for Australia from the global energy transition. It should not be construed in any way as general or specific financial advice. Tim Buckley is a shareholder in BHP.***

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<sup>47</sup> Renew Economy, [Offshore Wind Power Plans for Portland Smelter gets Federal Boost](#), 6 October 2022