



ARK ENERGY

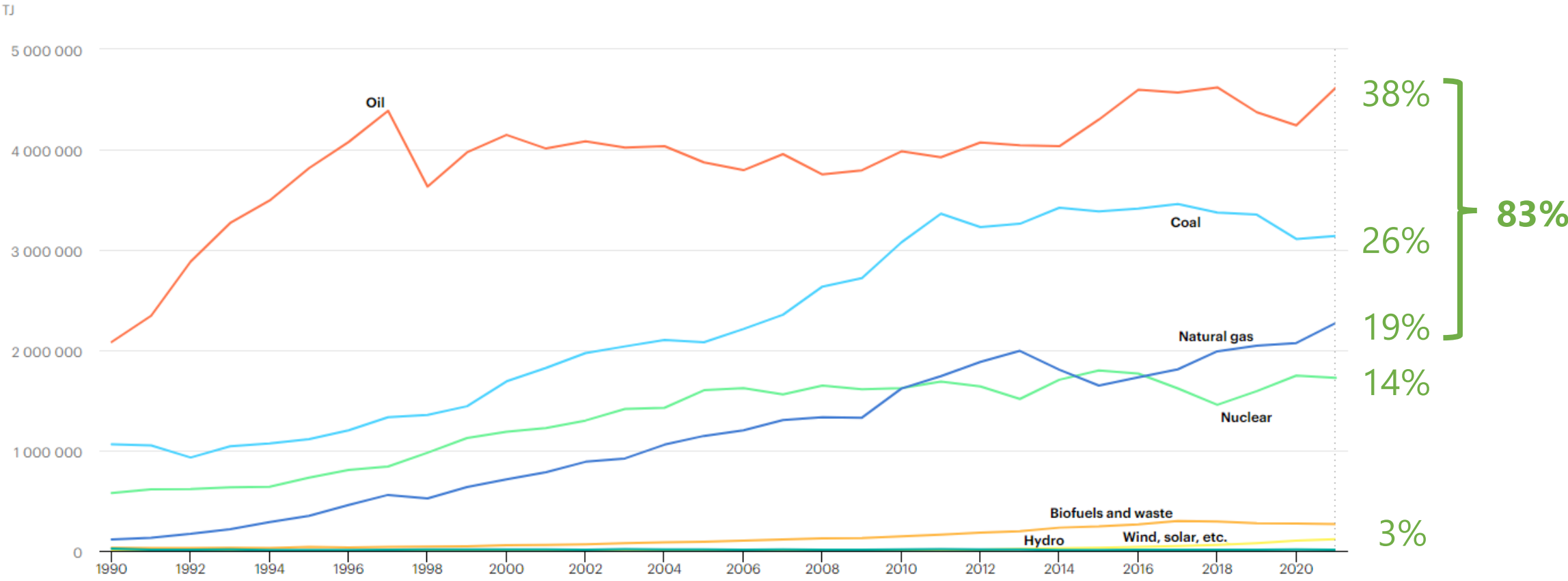
Going for Green: Stronger Together

4th Australia-Korea Critical Minerals
and New Energy Forum

30 October 2023

Sheraton Grand Sydney


Korea's energy mix (1990-2021)



Source: IEA



Australia's merchandise exports to Korea

 **Australian Government**
Department of Foreign Affairs and Trade

[Print version](#)

REPUBLIC OF KOREA

Australia's goods and services trade with Republic of Korea, 2021-22

Source: DFAT-adjusted ABS data

Exports		Destination Ranking: 3	Imports		Source Ranking: 6
Item	A\$b		Item	A\$b	
Coal	16.2		Refined petroleum	9.0	
Iron ores & concentrates	8.3		Passenger motor vehicles	3.6	
Natural gas	8.1		Pharmaceuticals (excluding vaccines)	0.9	
Confidential items of trade	2.9		Confidential items of trade	0.9	
Beef, f.c.f.	1.8		Other services - details not provided	0.5	
Gold	1.4		Electrical machinery & parts, nes	0.3	
Other ores & concentrates	1.4		Miscellaneous chemical products, nes	0.3	
Total	48.6		Total	20.1	

\$24 billion
50% of Australia's exports



Introducing Ark Energy



Korean parent company



Australian sister companies



ARK ENERGY



Resources & Energy (Fossil Fuels)



Renewable Energy & Green Hydrogen



Ark Energy's mandate & mission

Our mandate



Decarbonise the energy supply of Korea Zinc and third-party C&I customers

Our mission



Transform Korea Zinc from a 'Refiner' to a 'Refiner plus Renewable Energy Business'



Become a world class Green Independent Power Producer



Be the safest and most competitive producer of green hydrogen in the world

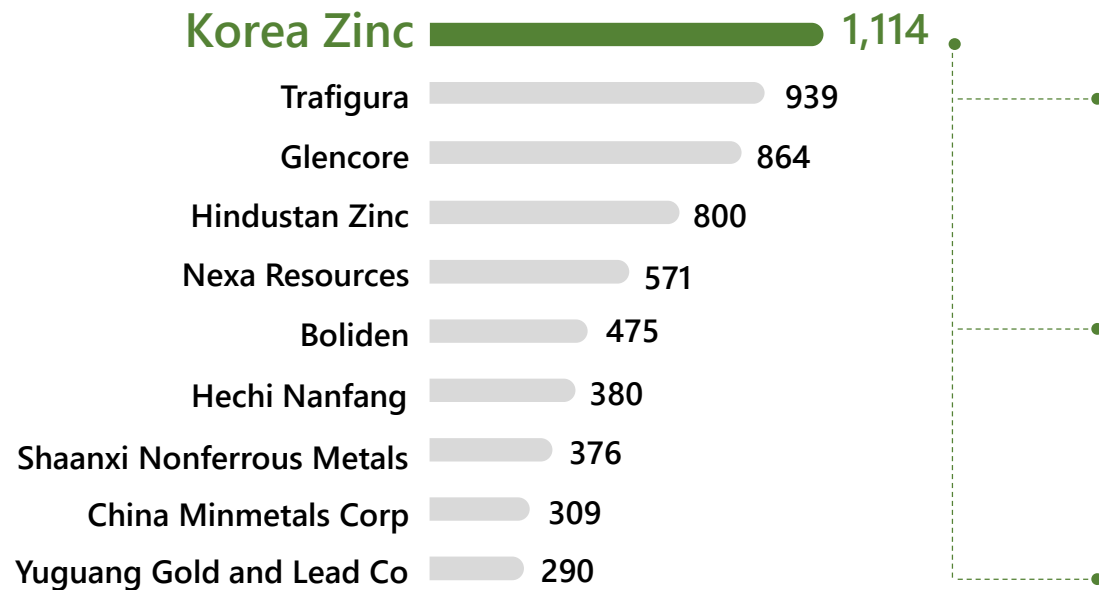


Be an extreme user and demand creator of renewable energy and green hydrogen



Proud heritage

Global zinc production ranking by company and refinery 2022 (kt)



Ranking	Refinery	Company	Capacity
1	Onsan	Korea Zinc	640
2	San Juan de Nieva	Glencore	510
3	Chanderiya EL	Hindustan Zinc	475
4	Chehe (Nanfang)	Hechi Nanfang	380
5	Cajamarquilla	Nexa Resource	340
6	Sukpo	YongPoong	325
7	Xin Zhuye	-	300
8	Kokkola	Boliden	294
9	Jiyuan (Yuguang)	Yuguang Gold and Lead Co	290
10	Hobart	Trafigura	263
30	Townsville	Sun Metals	149



Proud track record in regional Australia



Sun Metals Zinc Refinery
(commissioned 1999)



Transport & Logistics Business
(short-haul and long-haul)



Stevedoring Business
(most cargo types)



First major refiner in the world to join RE100

RE100

CLIMATE GROUP



Companies that join RE100 agree to go 100% renewable with their electricity use.

Financial Review article about Sun Metals joining RE100

18 Companies&Markets

Monday 23 November 2020
The Australian Financial Review | www.afr.com AFR

Giant refinery commits to go 100pc clean

Paul Smith
Technology editor

Sun Metals Corporation, operator of Queensland's biggest zinc refinery, has made a landmark commitment to power its entire operations with renewable electricity by 2040.

The chief executive of the company, which is South Korean-owned, said it had decided to join the global RE100 initiative, under which influential businesses have committed to use only renewable energy.

The move makes Sun Metals the first major refinery in the world to join RE100, and is also significant because it is the second-largest single-site consumer of electricity in Queensland.

Sun Metals had previously made a \$200 million investment in renewable energy, building its own large-scale, 125-megawatt solar farm in 2018. The solar farm provides 22 per cent of the zinc refinery's electricity, and from 2021 it is expected to generate more than 240 gigawatt hours per year (GWh/yr).

Sun Metals predicts it will use 1100GWh/yr next year, and it is now also investigating the possibility of acquiring wind-power assets in Queensland.

The company said it intended to deliver a combined wind and solar portfolio to provide 90 per cent of its power needs, with the remainder made up of other technologies such as batteries, biogas and hydrogen. "We have already started our renewables journey... Based on our development pipeline we will easily achieve 100 per cent renewable by 2040," Sun Metals CEO Kiwon Park said.

"We would encourage all major smelters and refineries in Australia to consider joining RE100. The more we all move towards 100 per cent renewable, the more we can save money and create a cleaner future for Australia's industry and the environment."

He said that, in addition to the solar farm, the company had been drawing its power from the national grid, but that it made sense from a long-term strategic perspective to rely on a mix of renewable energy sources.

"It makes sense for us to have different options moving forward, so solar, wind and peaking batteries for short durations of one to two hours," Mr Park said.

"Demand response capability to reduce usage when wholesale price spikes in the national grid, and hydrogen fits into that strategy well."

The Sun Metals pledge comes ahead of *The Australian Financial Review's* two-day Energy and Climate Summit, which kicks off today. The topic of a future energy mix and the growing push for organisations to go sustainably "net zero" and be carbon neutral will be high on the agenda.

Former prime minister Malcolm Turnbull, who will appear at the summit tomorrow, said Sun Metals' commitment represented an important moment in the broader shift away from fossil fuels to renewable power.

"The cost of variable renewable energy has declined dramatically, the cost of storage in the form of batteries is also declining precipitously, and of



Sun Metals already has a solar farm to help power its zinc refinery, near Townsville, north Queensland.

Gas will always be part of our energy mix but a diminishing part and of course coal is, and should be, on the way out.

Malcolm Turnbull, former prime minister

course there is pumped hydro being developed in Queensland as well," he said. "So if you look at the energy economics objectively, it is pretty obvious that the future is variable renewables plus storage."

The Sun Metals announcement confirms that Australian industry can enjoy affordable, abundant zero-emission energy by moving to renewables.

The argument that Australian industry needs more gas is simply wrong. Gas will always be part of our energy mix but a diminishing part and of course coal is, and should be, on the way out."

Globally 269 companies have signed up as members of RE100, with 14 other Australian members including Australia and New Zealand Banking Group, Atlasian, Commonwealth Bank of Australia, Dexus, Macquarie Group,

Mirvac, National Australia Bank, Sun Corp, QBE and Woolworths.

RE100 Australian co-ordinator Jon Dee said Sun Metals' commitment was particularly significant because opponents of making national net zero emissions commitments often cited the inability of heavy industry to function reliably on 100 per cent renewables.

RE100 members in Australia had now created a tipping point in Australia's transition away from coal to renewable energy.

"If Sun Metals can go fully renewable by 2040, there's no reason why every other Australian refinery and smelter can't do the same," Mr Dee said. "This transition can be done even sooner in other sectors. Woolworths uses 1 per cent of Australia's electricity supply and they will be 100 per cent powered by renewable electricity by 2025."



Our decarbonisation journey started 5 years ago



124MW Sun Metals Solar Farm Commissioning in Townsville (2018)



Ark Energy's first wind farm investment



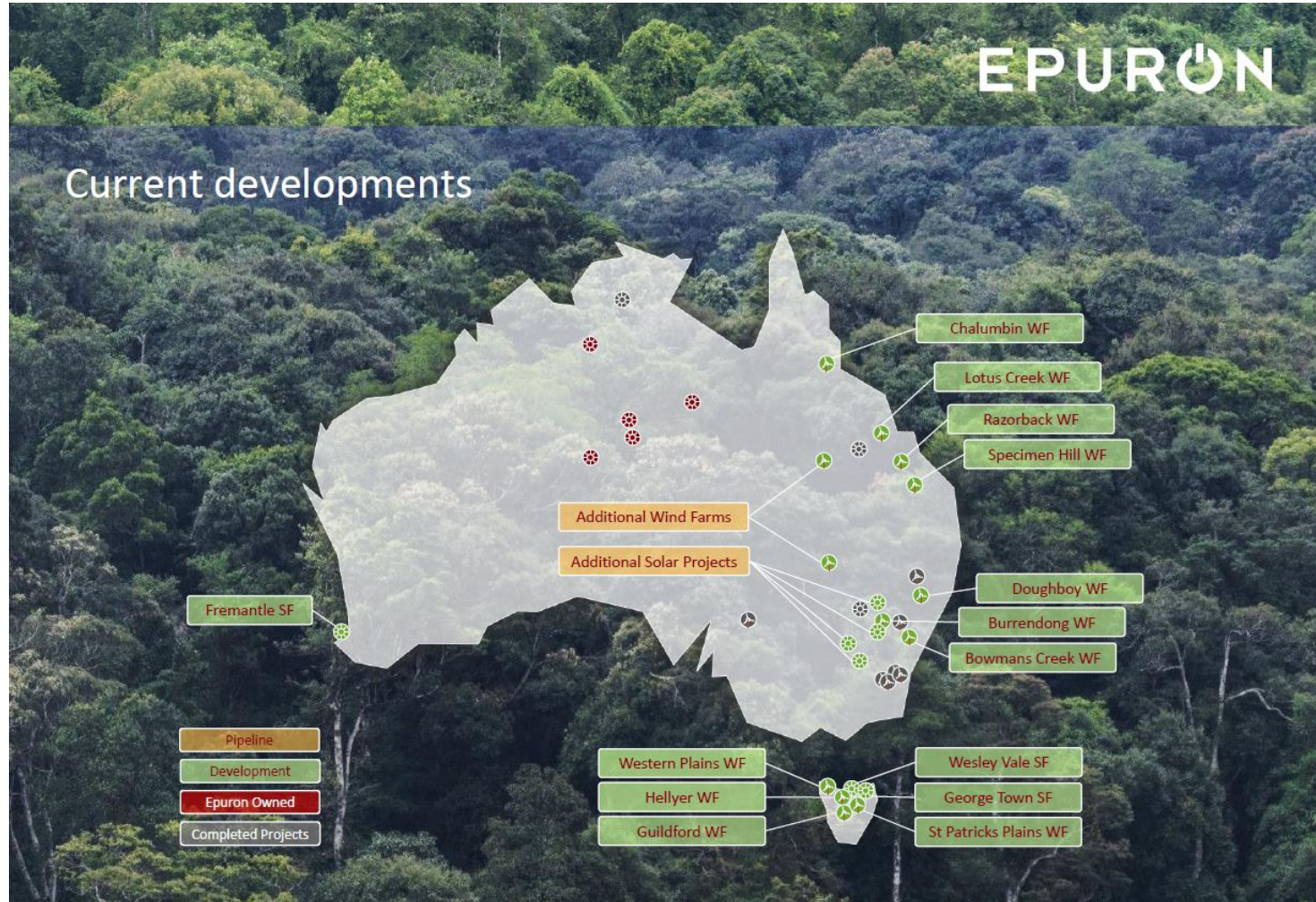
923MW MacIntyre Wind Farm Sod Turning Ceremony (2 June 2022)



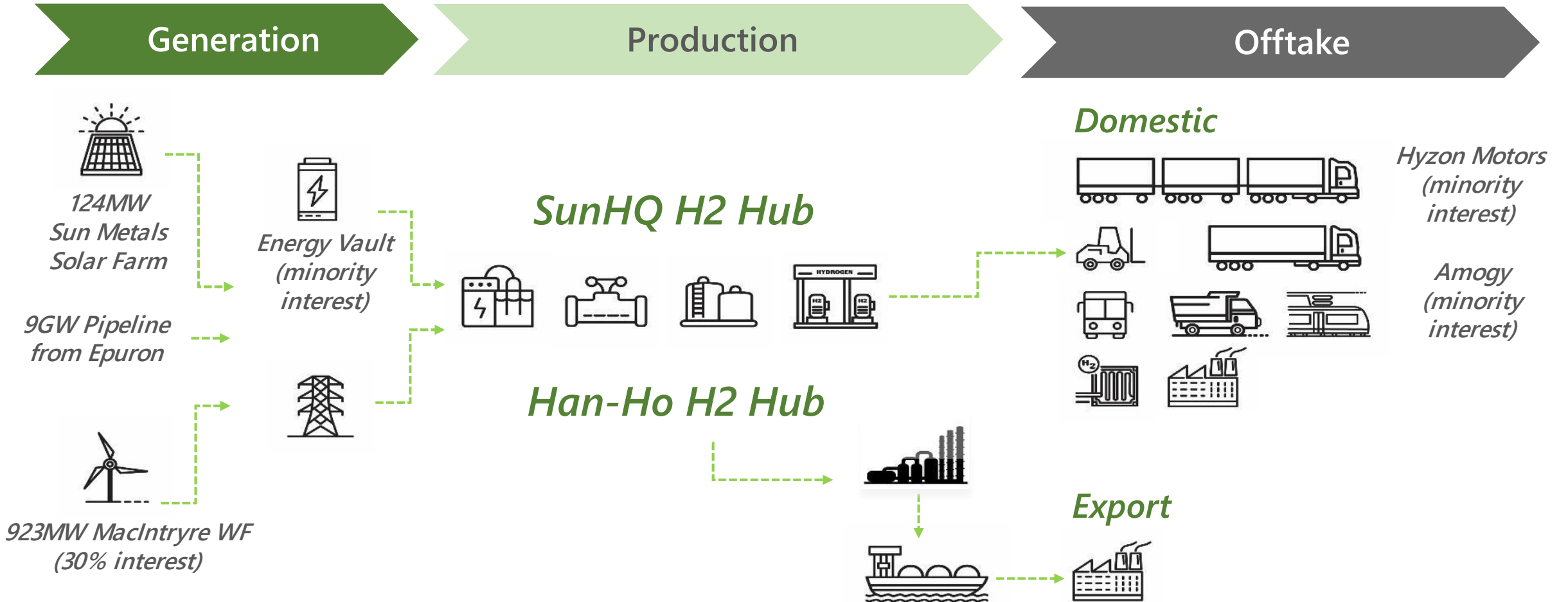
MacIntyre WF is now 50% complete



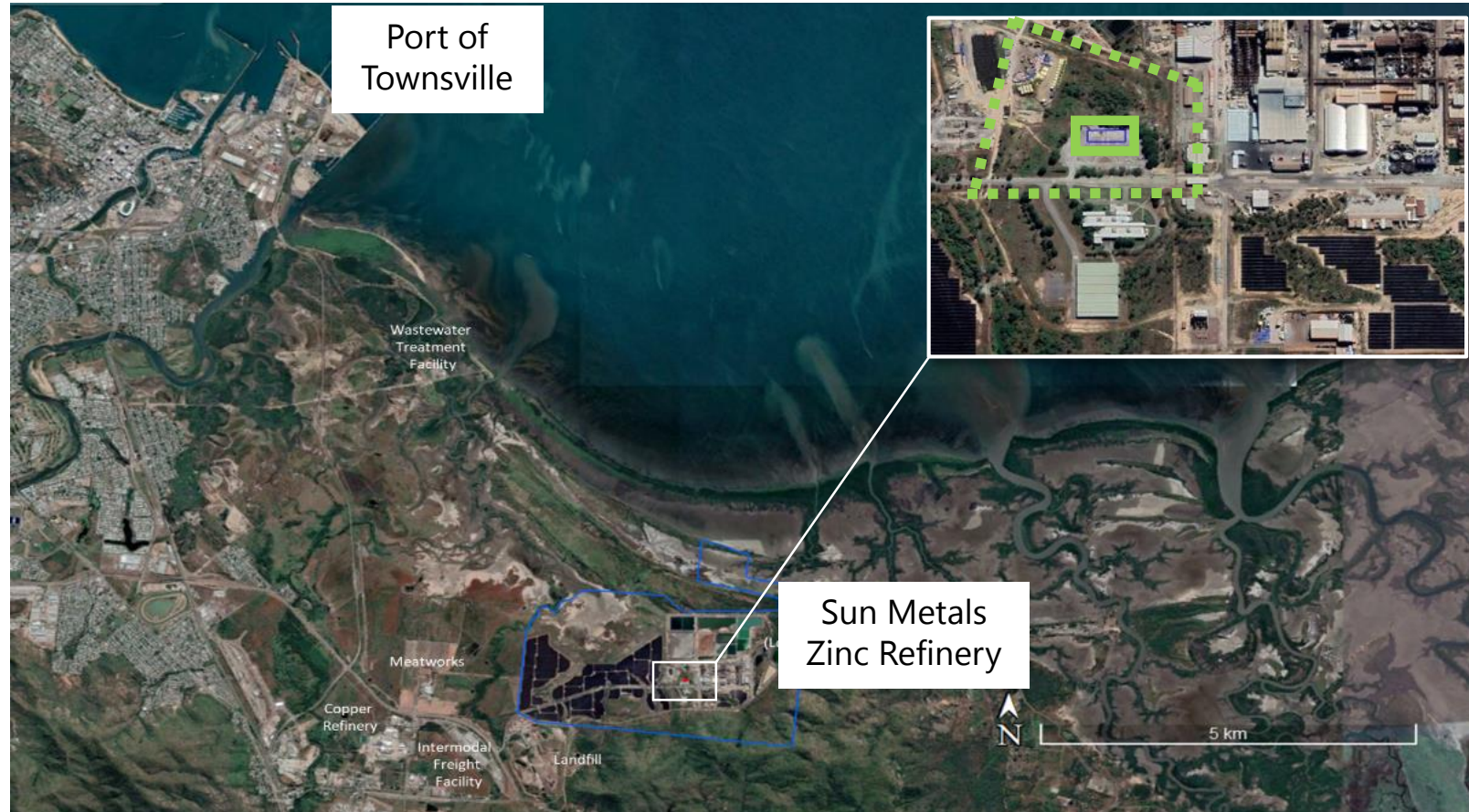
Acquired a 9GW renewable energy portfolio



Our investments across the H2 value chain



SunHQ H2 Hub – Location



— Stage 1 boundary

- - - Area available for Stage 2



SunHQ H2 Hub – H2 production facility



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SunHQ H2 Hub – Refuelling facility



SunHQ H2 Hub – Unique use case



Existing 140t rated
Diesel Prime Mover



Future 140t rated Hyzon Motors
Hydrogen Fuel Cell Electric Truck (FCET)



SunHQ H2 Hub – Partners



Australian Government
Australian Renewable
Energy Agency

ARENA



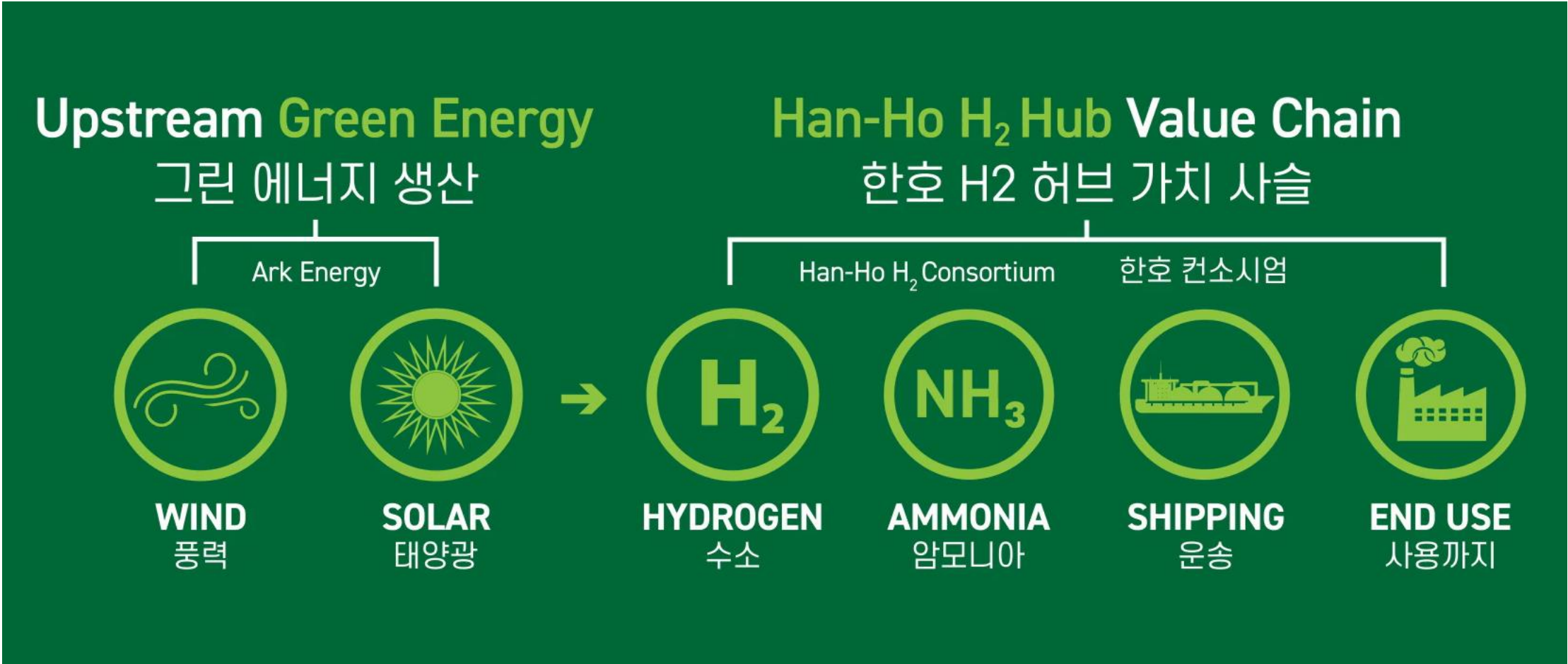
Launched our Han-Ho H2 Hub consortium



Brisbane (21 September 2022)



Building a new green energy supply chain



Collinsville Green Energy Hub – Location



Collinsville Green Energy Hub – Wind



Collinsville Green Energy Hub – Solar



Han-Ho H2 Hub – Green H2 production



Han-Ho H2 Hub – Green NH3 production



5,000 tonnes per day

Green Ammonia plant

일일 5,000톤의 그린 암모니아 공장



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Han-Ho H2 Hub – Port of Abbot Point

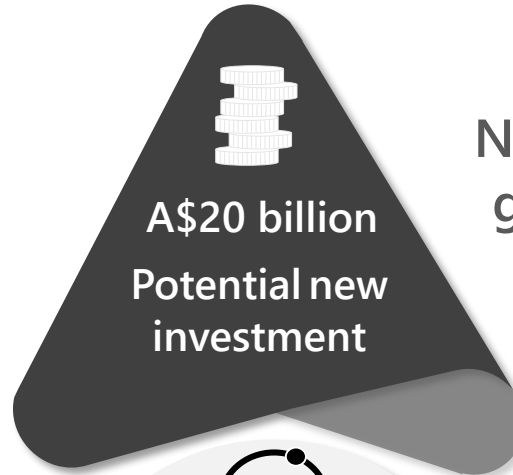
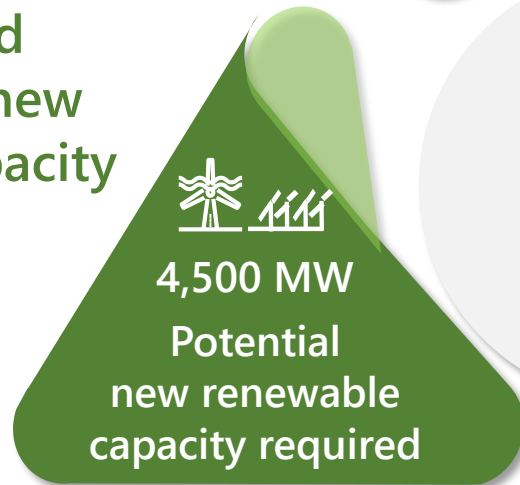
Existing deep water port
at Abbot Point

현재 운영 중인 Abbot Point

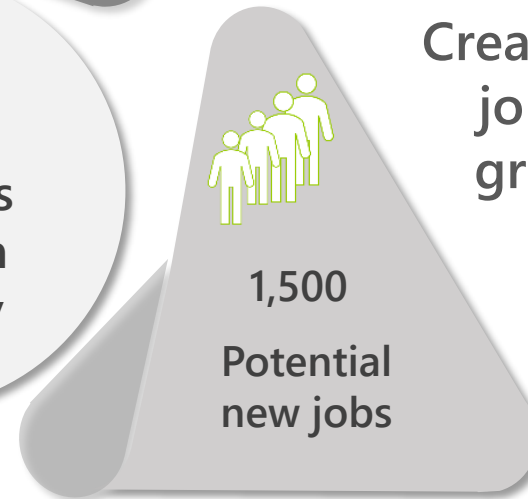


What Han-Ho H2 Hub means for Australia

Our hydrogen load
requires significant new
renewable energy capacity



Accelerates investment in
North Queensland across the
green ammonia value chain



Creates high quality
jobs in the new
green economy



What Han-Ho H2 Hub means for Korea





Transforming the bilateral relationship between Australia and Korea

한국과 호주 양국간의 상호 협력 강화



ARK ENERGY



Thank **you**

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