

BHP

Examples of how partnerships between actors in the value chain can enable the transformation of the steel industry

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Image: BHP Nickel West solar farm

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Numbers presented may not add up precisely to the totals provided due to rounding. Due to the inherent uncertainty and limitations in measuring greenhouse gas (GHG) emissions and operational energy consumption under the calculation methodologies used in the preparation of such data, all GHG emissions and operational energy consumption data or references to GHG emissions and operational energy consumption volumes (including ratios or percentages) in this presentation are estimates. There may also be differences in the manner that third parties calculate or report GHG emissions or operational energy consumption data compared to BHP, which means that third-party data may not be comparable to our data. For information on how we calculate our GHG emissions and operational energy consumption data, see our Methodology tab in our ESG Standards and Databook, available at bhp.com.

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BHP

**Our purpose
To bring people
and resources
together to build
a better world**

BHP has a Climate Transition Action Plan (CTAP) with targets, goals and commitments

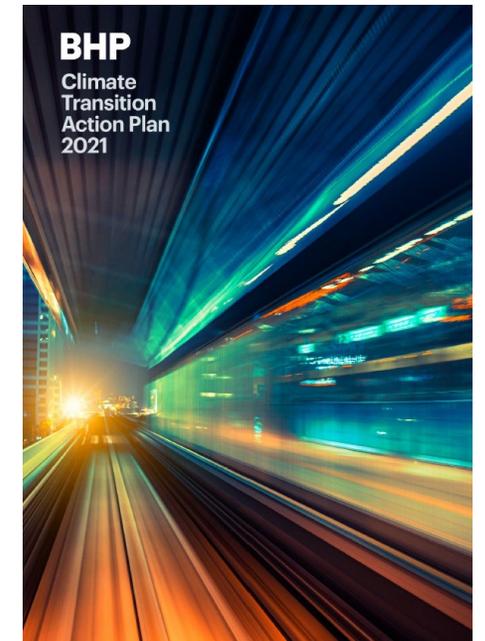
 Operational greenhouse gas (GHG) emissions targets and goals for the medium- and long-term. We met our short-term target for FY2022.

 Value chain GHG emissions targets and goals for the medium- and long-term.

 Assessing capital alignment with a 1.5°C world and the transition to a low-carbon economy.

 A position on just transition for the environment, our communities and workforce.

 Strengthening our policy engagement.



Value chain (Scope 3) GHG emissions

Medium-term (2030) goals¹ – on track

- To support industry to develop technologies and pathways capable of 30 per cent emissions intensity reduction in integrated steelmaking, with widespread adoption expected post 2030.
- To support 40 per cent emissions intensity reduction of BHP-chartered shipping of BHP products.

Long-term goal¹

- We are pursuing the long-term goal of net zero Scope 3 GHG emissions by 2050. Achievement of this goal is uncertain, particularly given the challenges of a net zero pathway for our customers in steelmaking, and we cannot ensure the outcome alone.

¹ Refer to the full description of BHP's climate change targets and goals, including essential definitions, assumptions and caveats, at [bhp.com/climate](https://www.bhp.com/climate).

² Subject to the availability of technology, supply, safety standards, and the establishment of reasonable thresholds for price premiums.



Began **feasibility studies into Carbon Capture, Utilisation and Storage, Direct Reduced Iron technologies and the use of hydrogen** with steelmakers

Steel decarbonisation partnerships covering ~13% of global steel production capacity reported in 2021

US\$11 million in venture investments in electrolysis technology

Chartered the world's first LNG-fuelled Newcastlemax bulk carrier (the first of five)

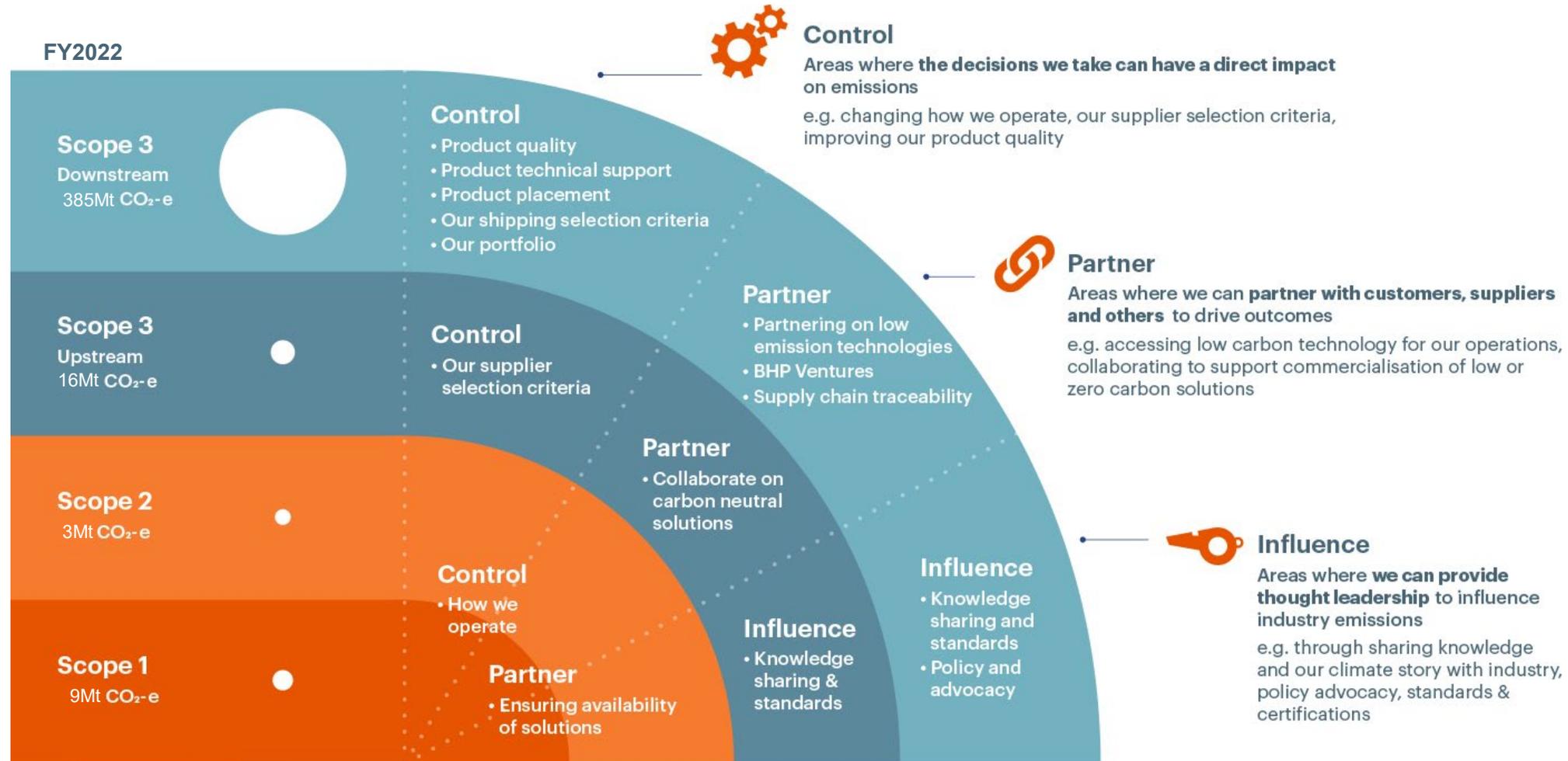


Joined the **First Mover's Coalition** (Shipping sector) **committing to a proportion of zero-emission fuel use by 2030²**

Formed a consortium w/ Rio Tinto and others to analyse and support the potential to **develop an iron ore maritime green ammonia-fuelled corridor**

BHP's Climate Transition Action Plan

A framework to discuss our strategy and engagement



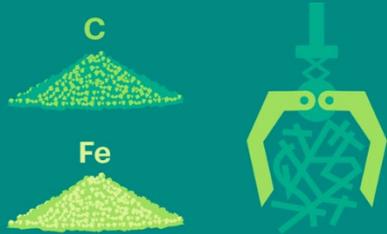
<https://www.bhp.com/sustainability/climate-change>

BHP's guiding framework: Steel decarbonisation in three stages

Regions would transit through these stages at different rates, based on local conditions faced by steel producers

Optimisation stage

Potential for up to 20% CO₂ reduction vs. BAU

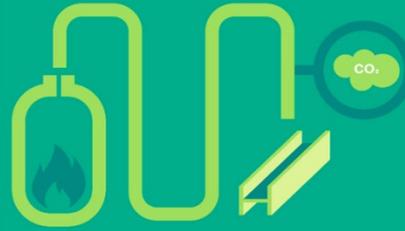


Incremental improvements in raw materials and process conditions for the integrated steelmaking route

Raw Material Quality
Energy Optimisation / Efficiency
Technology Improvements

Transition stage

Potential for 30-60% CO₂ reduction vs. BAU



Modifications to Blast Furnace (BF) – Basic Oxygen Furnace (BOF) route, increased use of renewable energy and installation of low carbon technologies

Low Carbon Fuels
Blast Furnace Modifications
Carbon Capture

Green end state

Potential for >80% CO₂ reduction vs. BAU

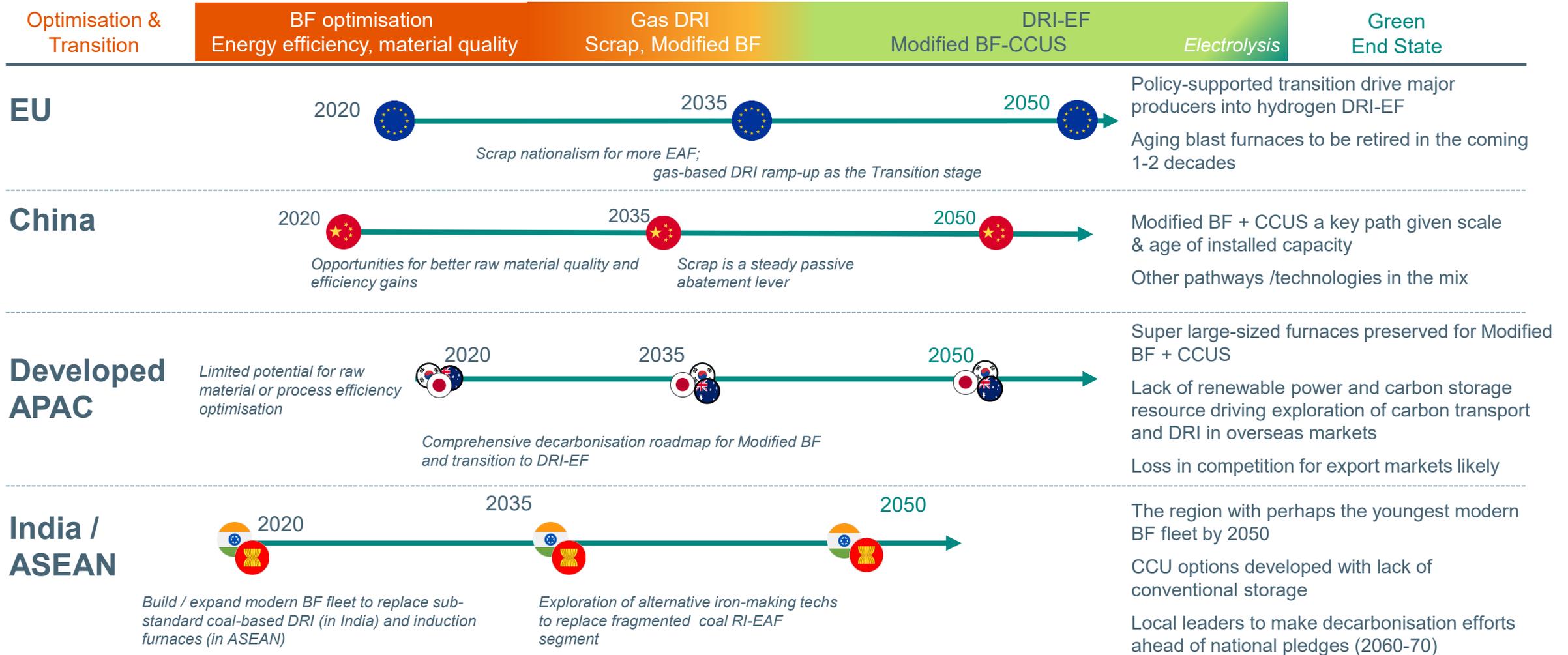


Low carbon technologies have matured and cost competitive for development at scale

Modified BF with CCUS
Direct Reduction with Green Hydrogen
Electric Steelmaking
Other New Technologies

Differentiated regional steel decarbonisation pathways

Key enablers are policy, supply of renewable power and carbon storage capacity, age and scale of blast furnace fleet



Partnerships with customers and other industry leaders

Looking to scale modified Blast Furnace projects, engage research and technology providers to de-risk alternate pathways

Customer Partnerships	Research	Ventures
 <p>Partnerships with 5 key customers</p> <p>~13% of reported global steel production</p> <p><i>Test, design and scale Modified BF, CCUS and DRI-EF plant trials</i></p> <div style="border: 1px solid #90EE90; padding: 5px; margin-bottom: 10px;">Sign MOUs, scope core projects</div> <div style="text-align: center;">✓</div> <div style="border: 1px solid #FFD700; padding: 5px; margin-bottom: 10px;">Complete feasibility studies & test work</div> <div style="text-align: center;">✓</div> <div style="border: 1px solid #FFD700; padding: 5px;">Plan and execute plant trials</div>	<p>Fundamental and industrial programs in Australia, China, North America and Europe</p> <p>Leading research institutes, industrial consultants and technology providers</p> <p><i>Optimise raw material performance in Modified blast furnace</i></p> <p><i>Develop DRI - EF processes for Pilbara ores</i></p> <div style="border: 1px solid #90EE90; padding: 5px; margin-bottom: 10px;">Start exploratory test work & concept studies</div> <div style="text-align: center;">✓</div> <div style="border: 1px solid #FFD700; padding: 5px; margin-bottom: 10px;">Support plant trials & product performance</div> <div style="text-align: center;">✓</div> <div style="border: 1px solid #FFD700; padding: 5px;">Explore demo plant options</div>	 <p>Investing in green end state technologies</p> <p><i>Test electrolysis in concept then assess for scale up</i></p> <div style="border: 1px solid #90EE90; padding: 5px; margin-bottom: 10px;">Initial investments & lab testing</div> <div style="text-align: center;">✓</div> <div style="border: 1px solid #FFD700; padding: 5px; margin-bottom: 10px;">Pilot campaigns with BHP ores</div> <div style="text-align: center;">✓</div> <div style="border: 1px solid #FFD700; padding: 5px;">Assess scale up options</div>
	<div style="border: 1px solid #90EE90; padding: 2px; display: inline-block;">FY22 Progress</div> <div style="border: 1px solid #FFD700; padding: 2px; display: inline-block; margin-left: 10px;">FY23+ Focus</div>	

Partnering with key steelmakers across the world

China Baowu

- MOU signed in November 2020



<https://www.bhp.com/news/media-centre/releases/2020/11/bhp-partners-with-china-baowu-to-address-the-challenges-of-climate-change>

JFE Steel

- MOU signed in February 2021



<https://www.bhp.com/news/media-centre/releases/2021/02/bhp-partners-with-jfe-to-address-decarbonisation-in-the-steel-industry>

HBIS Group

- MOU signed in March 2021



<https://www.bhp.com/news/media-centre/releases/2021/03/bhp-inks-mou-with-hbis-to-mitigate-emissions-in-the-steel-industry>

POSCO Group

- MOU signed in October 2021



<https://www.bhp.com/news/media-centre/releases/2021/10/bhp-and-posco-ink-mou-to-explore-decarbonised-steelmaking>

Tata Steel

- MOU signed in July 2022



<https://www.bhp.com/news/media-centre/releases/2022/07/bhp-and-tata-steel-reinforce-commitment-to-decarbonise-steelmaking-in-india>

Next steps for how we will progress partnerships

We intend to progress our customer partnerships over three phases:

1. Conduct feasibility studies or laboratory/bench-scale research and development;
2. Pilot-scale trials, where we test potential solutions to key technical challenges;
3. Trials at customer plants.

In line with our goals, we intend to progress projects that in aggregate have the potential to deliver a 30 per cent emissions intensity reduction if adopted at scale post-2030.

We will also continue exploring opportunities for other partnerships that are complementary to our geographic or technology priorities, or that can help make existing projects more effective and efficient.

BHP